Oration 12:
2008 K.R. Narayanan Oration

Message from the President
of the Republic of India

I am happy to learn that The Australian National University, Canberra, is organising the annual K.R. Narayanan Oration on the theme of 'Why Environmentalism Needs Equity: Learning from the Environmentalism of the Poor to Build Our Common Future' by Ms Sunita Narain, Director of the Centre for Science and Environment.

India attaches great importance to the conservation of the environment. The government as well as non-governmental organisations are making efforts to do so even while ensuring continued development for the country. A number of measures have been taken to reduce pollution, including increased uses of liquefied gas in public transport, higher standards for emissions from industries and transport and relocation of polluting industries. The government is also focused on conservation of forests and optimal utilisation of water resources.

The issue of greenhouse gas emissions and climate change is currently dominating global attention. We are also concerned about this. We need to look at energy mixes that are sustainable in the long run and explore viable ways of using new and renewable sources of energy. While our demands for energy are growing as a developing country, we have clearly stated that India would not exceed the level of per capita greenhouse gas emissions of developed countries. Our National Action Plan on Climate Change released in June establishes eight missions focusing on solar energy, energy efficiency, sustainable habitats, water resources management, ecosystems, agriculture, a 'Green India' and research.

I wish the oration every success.

Pratibha Patil
New Delhi
16 September 2008

Why Environmentalism Needs Equity: Learning From the Environmentalism of the Poor to Build Our Common Future

Sunita Narain

I am honoured to deliver the 12th K.R. Narayanan Oration. It is a special occasion because our former president K.R. Narayanan was a very special person. Most of us, who knew President K.R. Narayanan, will remember him as an erudite, compassionate, thoughtful politician, who knew his mind and stood by his beliefs. We will remember him for his integrity and for his intellectual might.

I remember him for all this and even more. I remember him for making the system 'bend' to make space for issues, people, ideas and what was right. He did this in his own style, giving of himself to what he believed in. Most importantly, he did this not by standing *against* the system, but by standing *with* the system. For me, he was the ultimate subversive: he made power good.

In the mid-1990s, when K.R. Narayanan was vice-president, my colleague Anil Agarwal, of whom he was very fond, asked if he would release a book on air pollution. But this was no ordinary book, which is ordinarily released in such ordinary functions of our leaders. The book was titled *Slow Murder*. It indicted the most powerful industrialists in the country for manufacturing highly polluting vehicles and demanded change with

the stridency of an angry rebel. This was also the time when the air of Delhi was toxic and dirty. It was also the time when nobody cared about issues of air pollution and its effects on our health and our bodies.

K.R. Narayanan not only agreed to release the book, he agreed to do it from his own palatial and powerful vice-presidential house. In one stroke, the profile of the concern changed. It became acceptable. It became powerful. Since then, government has taken strong steps to combat air pollution in our cities, with some success. But I will discuss more on this later.

Later, Agarwal went back to K.R. Narayanan — this time in the grandeur of the president's house, to request him to inaugurate a workshop on traditional water harvesting. Again, you could say: so what is new? This was the time when rainwater harvesting was a non-issue, which was discounted by technocrats and policy. K.R. Narayanan agreed to inaugurate the meeting and to present awards to the unsung engineers and water managers of rural India; he also agreed publicly to learn from this knowledge. After speaking to the rural engineers who had built structures to hold and recharge rainwater in different ecosystems, he declared publicly that the most powerful house in the country would adopt their humble science and undertake water harvesting. And he did. My fondest memory is of him inspecting the rainwater harvesting recharge wells of the president's estate, accompanied by his bewildered but respectful government engineers. Today, rainwater harvesting has caught the imagination of the nation. Today, rainwater harvesting is seen as an integral solution to building a water secure India.

Still later, he agreed enthusiastically to visit the dusty and still unknown villagers who had done rainwater harvesting and brought their river to life. His visit to Alwar (a district in Rajasthan state) to recognise the achievements of the village of Bhaonta brought with it the pomp of the state — the governor, chief minister and others trekking to the river to see the water that gave it life.

Standing at the river, which had become perennial because of the water harvesting structures made by village communities, K.R. Narayanan said:

> I would like to congratulate the people of this village. Not only have the people revived their river, they have also established democratic institutions to manage their resource. Their initiative and self-reliance is an example and an inspiration to the rest of India.

Today, we need this voice of authority and reason more than ever in the world, as we hurtle towards growth, which can be divisive and destructive or can bring prosperity for all.

The Age of Environment

This is the time when the world is confronted with the knowledge of impending and potentially devastating climatic changes. It is also the time when the world realises that the model of consumption of a few cannot be supported for the majority. It is also the time when we, in India, are realising the pain of environmental degradation of our air, water and forests. This, then, is the time of crisis.

It is also the age of environment. Today, environmental concerns — domestic and global — are defining the way of our economy and our everyday life. The world is battling different but linked developments. The oil price is rising, crippling economic growth as we know it and forcing governments to look for new answers to conservation. Prices of food are skyrocketing, leading to conflict in poor countries dependent on imports and putting pressure on poor communities struggling at the margins of survival. In addition, we see the beginning of signs of climate change in many parts of the world in the form of intensified tropical cyclones, variable and extreme weather events such as heavy rains leading to floods, bitter cold spells and frost that causes crops to fail.

But this is also the time of opportunity. This is the time when we can use the ingenuity and inventiveness of science and society to find ways to 'leapfrog' to the future. We can reinvent the pathway of growth so that we can have economic wellbeing without the pain of pollution and degradation.

The world has to search for new answers to its growth paradigm. For this, it literally has to reinvent what growth and development mean. The question we need to explore is: will these answers lie in the activism of the poor, who are dependent on the environment for their survival, or in the prescriptions of the consuming middle classes? It is also a fact that the movements of the poor and dispossessed against environmental degradation are demanding more than simple technological changes to suit the new generation of needs. They want hard and uncomfortable issues of access to natural resources to be resolved; they want equity and justice to be the bedrock of the environmental movement of the future.

These movements — emerging from the bottom of the world's pyramid, often led by village communities and remarkable individuals — are today showing the way to the future. These movements are products of democracy, as change in any society is a product of negotiation and innovation.

In vast parts of the poor world, where these voices are becoming shouts, environmental warriors have a different relationship with their environment. They live on and off their environment — the land, the forests — and use its resources — medicinal plants, building material, firewood to cook and fodder to feed their animals. They get their water from streams, rivers and ponds. Here the destruction of the environment affects livelihoods and lives, not just lifestyles. High population pressure also means that there is no piece of land or water that is not used — and used with intensity — for daily survival. In these circumstances, if the environment is degraded or the margins of subsistence threatened further, conflict is inevitable. This is why dissent and dialogue has to be part of the alternative model of growth.

Nature's Way or Our Way

A few years before he died, environmentalist Anil Agarwal wrote that the 21st century was going to be the century of the environment. Technological change, he said, would be driven by environmental imperatives. Agarwal believed that any nation that forgot to invest in environmental science and technology would imperil its economy and the lives and health of its people. He also said that, in future, human technologies would be forced to mimic nature's cycles and gentleness. Today we must recognise these words and act on them.

Let us look at the evolution of science itself in the 20th century. Scientists during the last century essentially asked four important questions. At the start of the century, the biggest question in the minds of scientists like Albert Einstein or Neils Bohr was: 'What is Matter'. By the middle of the 20th century, scientists had begun to ask two other important questions, namely: 'What is Life' and 'What is the Universe'. It was around the 1950s that Francis Crick and James Watson unravelled the structure of DNA. This discovery led to enormous developments in life sciences and, more recently, we have begun to see the emergence of biotechnologies based on

the knowledge gathered by life scientists in a very big way. But, by the last quarter of the 20th century, scientists had begun to ask yet another critical question: 'What is the Web of Life'.

This last question is not just about scientific curiosity but human necessity. The fact is that modern technologies and processes of production, so critical to our economies, have adverse impacts on our environment. This technological paradigm is beginning to go beyond the carrying capacity of the Earth's environment and could easily destroy numerous critical geochemical cycles such as the carbon cycle and the nitrogen cycle. Science for ecological security is, therefore, our imperative.

It is here that we will have to learn from nature itself, Agarwal had argued. Nature uses weak forces rather than concentrated forces to do its work. For instance, very tiny temperature differences can transport massive quantities — as much as 4,000 million hectometres or 40,000 billion tonnes — of water from the oceans and travel across thousands of kilometres to deposit it as rainfall over India. But humans still use concentrated energy sources like coal or oil, which then create enormous problems like local air pollution and global climate change. In the years ahead, we will have to learn from nature and move towards much weaker sources of energy — like solar energy, for example.

It is for this reason that the world must begin to listen to the creativity of the action being proposed and practised in its vast but remote parts. These actions are driven with the understanding that progress for countries of the South will not lie in the models practised in other regions of the world. They will have to find new answers to old problems, from growing food without destroying soils to building factories without destroying rivers to building cities without drowning in excreta. And all this will have to be done with limited financial resources and even more limited choices of technology. This can only be done if the world begins to combine the confidence of the literate with the humility of the knowledgeable.

Environmentalism of the Poor: Localisation and Growth

India's environmental movement, like so much else in the country, is about managing contradictions and complexities — between rich and poor, between people and nature.

But the movement in India has one key distinction, which holds the key to its future. The environmental movements of the rich world happened after periods of wealth creation and during periods of waste generation. So, they argued for containment of the waste but did not have the ability to argue for the reinvention of the paradigm of waste generation itself. However, the environmental movement in India has grown in the midst of enormous inequity and poverty. In this environmentalism of the relatively poor, the answers to change are intractable and impossible, unless the question is reinvented.

Just consider the birth and evolution of the green movement. Its inception dates back to the early 1970s with former Indian prime minister Indira Gandhi's famous words at the Stockholm conference on environment that 'poverty is the biggest polluter'. But, in this same period, the women of the Chipko movement in the Himalaya showed that the poor, in fact, cared about their environment. In 1974, years before the environment became fashionable, the women of this poor, remote village, stopped loggers from cutting their forests. In other words, this movement of the poor women was not a conservation movement per se, but a movement to demand the rights of local communities over their local resources. The women wanted the first right over the trees, which they said were the basis for their daily survival. Their movement explained to the people of India that extractive and exploitative economies were the biggest polluter, not poverty.

This is because in vast parts of rural India, as in vast parts of rural Africa and other regions, poverty is not about the lack of cash, but the lack of access to natural resources. Millions of people live within what can be called a biomass-based subsistence economy, where the *gross nature product* is more important than the *gross national product.* Environmental degradation is not a matter of luxury but a matter of survival. In these cases, development is not possible without environmental management.

In the environmental movement of the very poor, there are no quick fix techno-solutions that can be suggested to people who are battling for their survival. In this environmentalism, there is only one answer: we must find a way reduce needs and increase efficiency for every inch of land, every tonne of mineral and every drop of water used. It will demand new arrangements to share benefits with local communities so that they are persuaded to part with their resources for a common development. It will demand new ways to growth.

I say this because it is also clear that the environmental movement of the relatively rich and affluent is still clearly looking for small answers to big problems. Today, everyone is saying, indeed screaming, that we can 'deal' with climate change if we adopt measures such as energy efficiency and some new technologies. The message is simple: managing climate change will not hurt lifestyles or economic growth — it is a win–win situation in which we will benefit from green technologies and new business.

For instance, biofuels — growing fuel, not food, on land to run the cars of the rich — is one such techno-fix. There has been no discussion on whether biofuels, already competing for land with food crops and raising prices, will indeed reduce emissions when vehicle numbers are increasing. With biofuels under criticism for raising food prices and depleting water resources, the next generation technical solution is on the cards: hybrid cars. I am not against either biofuels or hybrid cars. But I know these are small parts of the big change we need. The transition to a low-carbon economy is not just about technology but also about redistributing economic and ecological space. This change will hurt, as indeed will climate change itself; variable weather events that are destroying crops are already hurting the most vulnerable and powerless.

Relearning Knowledge: Water

It is also clear that these new answers will lie in learning the frugality and rationality of societies, and in relearning technologies. Take water management. For many countries of the South, water insecurity, which on the one hand leads to declining agricultural productivity and on the other leads to waterborne disease and death, has become the biggest limiting factor for growth. Today, water management is the starting point for getting rid of poverty in the world. Water security is the starting point for food security.

Countries of the water-stressed South have to plan not for drought relief, but for a relief against drought. This will demand a new paradigm of water management. It will demand realising that water and culture go together and that water shortage is not about mere failure of rain. It is about the failure of society to live and share its water endowment.

But, to get the water-practice right, we first have to deal with the poverty of the professional mind, which, over time, has become fossilised and rigid in its outlook. We literally need a movement for water literacy so that we can build a new understanding based on past traditions and wisdom of our people, who had learnt to survive and indeed make best use of their environment.

Take the fascinating case of ancient Rome and Edo (the ancient Japanese city, on which modern Tokyo is built). Romans built huge aqueducts that ran for miles to bring water to their settlements. These aqueducts even today are the most omnipresent symbols of that society's water management. And many experts have praised the Romans for the meticulousness with which they planned their water supply systems.

But, no, these aqueducts represent not the intelligence but the utter environmental mismanagement of the great Romans. Rome was built on the river Tiber. The city did not need any aqueducts. However, as the waste of Rome was discharged directly into the Tiber, the river was polluted and water had to be brought from long distances. Water outlets were few as a result and the elite appropriated these using a system of slaves. By contrast, the inhabitants of Edo never discharged their waste into the rivers. Instead, they composted the waste and then used in the fields. Because they used common and shared rivers, Edo had numerous water outlets and a much more egalitarian water supply.

When we turn our backs on the water around us, we are following Rome: out of sight, of mind; flush it and who cares — but care we must.

Dying Wisdom: Building New Practice

Ancient Indians understood the speed with which water, the world's most fluid substance, disappears. They understood that the mathematics of water is simple: if you harvest just 100 millimetres of rainfall on just 1 hectare of land, you will receive as much as 1 million litres of water. But, on the other hand, if we do not capture this rainfall, the wettest place on Earth will have water shortages.

Research published by the Centre for Science and Environment (CSE) in the mid-1990s showed that countries like India must learn from their traditional community-based water management systems so that they can

build ways to the future. In today's India it is imperative that groundwater is recharged so that the rate of abstraction is not greater than the rate of the water infiltration. The traditional water systems were designed to ensure that rainwater was stored in millions of disaggregated and diverse structures, which would in turn lead to local recharge of water into the ground. It is this distributed water harvesting that will build water security.

In other words, India must rework the paradigm of water management so that it is designed to harvest, augment and use local water resources so that it leads to local and distributed wealth generation. It is also clear that local and distributed water infrastructure will require new forms of institutional management, as water bureaucracies will find it difficult to manage such vast and disparate systems. It is here that countries like India must learn from their traditional community-based water management systems so that they can build ways to the future.

These ideas have captured the imagination of policy planners in the country. It is now well established that water management strategies will need to devolve power to local communities so that they can build structures for local water conservation and practise its use for efficiency and equity. This protest, alternative practice and policy research has converged into policies to build local water structures under employment guarantee schemes in which the state guarantees the right of employment to the poor. This employment is used to build water conservation structures so that drought relief can become relief against drought.

The Great Water Leapfrog

The problem becomes more intractable as the country progresses and moves from using water in traditional sectors like agriculture to industries and urban areas. It is for this reason that a country like India is considered a traditional water economy that has to make the transition to a modern water economy. In other words, the water sector has to become part of the formalised economy, with formal institutions and mechanisms for its management and pricing.

The point to understand is what this modern and formal water economy means in the rest of the world and what it will mean for countries like India. In the industrialised world, industry and urban households use over 70 per cent of the water resources, while agriculture gets the remaining

30 per cent. In traditional water economies like India, the reverse is true: agriculture consumes over 70 per cent and industry and urban areas the rest. The point is not where we are, but where we are heading.

The fact is that urban areas and industrial centres in countries like India are now putting greater pressure on water resources. Cities across the country need more water for their growing population and, more importantly, their growing affluence. Their growing demand leads to pressure to source water from further and further away. The capital city of Delhi will get water from the Tehri dam, over 300 km away in the Himalaya; the software capitals of the country, Hyderabad, will get water from Nagarjuna Sagar Dam on the Krishna River 105 km away; and Bangalore will get water from the Cauvery, about 100 km away. The desert city of Udaipur used to draw water from the magnificent Jaisamand Lake but it is drying up and so the city is desperately seeking a way out of this new thirst.

The problem is that the 'informal' water economy of rural India — its agriculture-dependent population — still exists. The economy has not transformed from being agriculture-dependent to one that is manufacturing and service sector driven. The water crisis is about the management of these competing needs: the vast rural economies, which need water for their food and livelihood security, and the newer growth economies of modern and industrial India. This water competition is leading to low intensity conflicts between different users. For instance, when the southern city of Chennai wanted to source its drinking water from the Veeranam Lake some distance from the city, farmers agitated against the withdrawal for the thirsty city. When the Gujarat city of Rajkot needed water, farmers drew fire and were killed. In 2005, in two separate incidents in Rajasthan, farmers were killed as they rioted against water withdrawal from their neighbouring reservoir or canal for distant cities.

It is because of this imperative that water policy has to shun the dogma that dictates against the pricing of water and its efficient management. Cities and the industries of rich India must begin to pay for the water they use. But pricing and markets will not suffice. It is also equally imperative that water management paradigms and their technologies are reinvented for this poor-rich world.

These rich cities of the poor world will have to invest in efficiency so that they do not become water wasteful and then learn the science and art of efficiency. Conversely, they will also have to invest in managing

and treating their wastewater. Today, cities extract from cleaner upstream sources and discharge their waste — sewage and industrial effluents — downstream, which in turn leads to increased problem of polluted water and ill-health for poorer users of the rivers. The capital intensity of the modern sewage system — its transportation and eventual treatment before disposal — is such that it cannot be afforded by all users, and even all urban areas. How will the modern cities of India grow without creating water waste and pollution? How will these cities innovate so that they can practise the technologies of recycling and re-use even before their counterparts in the industrial world? The challenge is to reinvent a modern waste management system that re-uses every drop of water discharged, at costs that can be afforded by all.

There is no denying India's water sector needs to be reformed, indeed transformed, so that it can provide clean and adequate water to all. But what has to be accepted is that there is no established model for this transformation. A country like India has to leapfrog over the modern economic paradigm, to create its own — hybrid — version of the water future. Modern water policy will have to be built on the premise that scarcity is not about the lack of resources but about being wise about the use of resources.

Defining the Challenge of Economic Growth

Years before India became independent, Mahatma Gandhi was asked a simple question: would he like free India to be as 'developed' as the country of its colonial masters, Britain? 'No', said Gandhi, stunning his interrogator who argued that Britain was the model to emulate. He replied: 'If it took Britain the rape of half the world to be where it is, how many worlds would India need?'

Gandhi's wisdom confronts us today. Now that India and China are threatening to join the league of the rich, the environmental hysteria over their growth should make us think: not just about the impact of these populated nations on the resources of our planet, but also — again, indeed, all over again — of the economic paradigm of growth that has led to much less populated worlds pillaging and degrading the resources of this only Earth.

Let us be clear. The Western model of growth India and China wish most feverishly to emulate is intrinsically toxic. It uses huge resources — energy and materials — and it generates enormous waste. The industrialised world has learnt to mitigate the adverse impacts of wealth generation by investing huge amounts of money. But let us be clear that the industrialised world has never succeeded in containing the impacts: it remains many steps behind the problems it creates.

Take the example of local air pollution control in cities of the rich world: economic growth in the postwar period saw it struggling to contain pollution in each of its cities — from London to Tokyo to New York. It responded to the growing environmentalism of its citizens by investing in new technology for vehicles and fuel. By the mid-1980s, the indicators of pollution, measured then by the amount of suspended air particulates, declared the cities to be clean. But, by the early 1990s, the science of measurement had progressed. Scientists confirmed the problem was not particulates as a whole, but those that were tiny and respirable, capable of penetrating the lungs and the circulatory system. The key cause of these tiny toxins — this respirable suspended particulate matter — was diesel fuel used in automobiles. So vehicle and fuel technology innovated. It reduced sulphur in diesel and found ways of trapping the particulates in vehicles. It believed new-generation technology had overcome the challenge.

But this is not the case. Now Western scientists are discovering that, as the emission-fuel technologies reduce the mass of particles, the size of the particles goes down and the number emitted goes up, not down. These particles are even smaller. Called nanoparticles (measured in the scale of a nanometre or one-billionth of a metre), these particles are not only difficult to measure, but also — say scientists — could be even more deadly since they easily penetrate human skin. Worse, even as technology has reduced particulates, the trade-off has been to increase emissions of equally toxic oxides of nitrogen from these vehicles.

The icing on the cake is a hard fact: the industrialised world may have cleaned up its cities, but its emissions have put the entire world's climatic system at risk and made millions of people, living at the margins of survival, even more vulnerable and poor because of climate change. In other words, the West not only continues to chase the problems it creates, but also externalises the problems of growth to others, those less fortunate and less able to deal with its excesses.

It is this model of growth that the poor world now wishes to adopt. And why not? The world has not shown any other way that growth can work. In fact, it preaches to us that business is profitable only when it searches for new solutions to old problems. It tells us its way of wealth creation is progress and it tells us that its way of life is non-negotiable.

But I believe the poor world must do better. The South — India, China, and all its neighbours — has no choice but to reinvent the development trajectory. When the industrialised world went through its intensive growth period, its per capita income was much higher than the South's is today. The price of oil was much lower, which meant the growth came cheaper. Now the South is adopting the same model: growth that is highly capital intensive (and, therefore, socially divisive) and material and energy intensive (and, therefore, polluting). The South does not have the capacity to make investments critical to equity and sustainability. It cannot temper the adverse impacts of growth. This is deadly.

Let's stay with the challenge of air pollution. Some years ago, the organisation I work with argued that the city of Delhi should convert its public transportation system to compressed natural gas. The move to gas would give us a technology jump-start, as it would drastically cut particulate emissions. Delhi today has the world's largest fleet of buses and other commercial transport vehicles running on gas. The result is that the city has stabilised its pollution, in spite of its huge numbers of vehicles, poor technology and even poorer regulatory systems to check the emissions of each vehicle. In other words, Delhi did not take a technology-incremental pathway of pollution control on the basis of fitting after-treatment devices on cars and cleaning up fuel. It leapfrogged in terms of technology and growth.

Now, with ever-increasing numbers of private vehicles crowding the roads of our cities and pollution attacking the lungs of people, the question remains: Can we reinvent the dream of mobility so that it does not become a nightmare? Can we make new ways to build a future city that combines the convenience of mobility and economic growth with public health imperatives? In this hybrid-growth paradigm — which combines the best of the new and old — cities would run on public transportation, using the most advanced of technologies. Even as the whole world looks for little solutions to pollution and congestion, the city of the South must reinvent the answer itself.

In other words, we have to rethink the options for our energy and economic security. The South will have to find ways of leapfrogging so that we can have progress without the curse of pollution and inequity. Like the resource challenge, this will also demand enormous creativity so that we can reinvent the economic treadmill of the world.

Equity Provides the Basis of Change

This is the challenge that we in India are discussing to find ways ahead. We know that our cities are on a different development trajectory: people still drive in buses or bicycle or walk to work. In these cities, the car has not replaced the bus, the bicycle or the pedestrian. It has only marginalised them, crowded them out. In Delhi, for instance, even now, 60 per cent of people commute by buses, which occupy less than 7 per cent of the road space, while cars, which crowd over 75 per cent of the roads, transport only 20 per cent of the people. Our cities can and must develop an alternative vision for growth.

The question is: Can these cities leapfrog — from cities with few buses to cities with few cars? Can they build a mobility plan based on swanky buses, trams, bicycle paths and pedestrian walkways? In other words, can they do everything today that modern cities — from Berlin to Vancouver — of the old rich world want to do tomorrow?

In Delhi, policy is now working towards creating a new mobility model. It is building a bus rapid transit system, BRT as it is called, on a 15 km road in the heart of Delhi. This system creates a central lane for buses to drive without obstruction, and segregates the remaining road space between cars (two or three lanes), bicycles and pedestrians. The project is built on the premise that road space must be equitably allocated to the users of the road. It is also investing in a metro and augmenting its bus system, buying 6,000 new buses for its roads.

But we also know that equity is a policy prescription that is easy to talk about and difficult to implement. In Delhi, as well, whereas everybody agrees that public transport is important, the first bus corridor has been contested, not just because of its technical glitches, but also because it is seen as taking away road space from users of cars. As cars have already taken over the road space, the scarce space has to be reallocated and this

creates tension. But equity is a prerequisite when it comes to managing scarce resources in a sustainable manner. The city will have to learn to share its economic and ecological space if it wants a sustainable future.

Climate Change: Equity is a Prerequisite

Climate change is definitely the biggest challenge of our century. However, currently its sheer complexity and urgency is defeating us.

For the past 16 years — the first intergovernmental negotiation took place in Washington DC in early 1991 — the world has been haggling about what it knows but does not want to accept. It has been desperately seeking every excuse not to act even as science has confirmed and reconfirmed the fact that climate change is both real and related to carbon dioxide and other emissions, which are related to economic growth and wealth in the world. In other words, it is human made and it can devastate the world as we know it.

The fact is that science is not just certain but 'unequivocal' that climate change and its devastation are now inevitable. Along with understanding the still obtuse science, we must begin to put a human face to the climate change that is beginning all around us. We must see climate change in the faces of the millions who have lost their homes in the Sidr or Nargis cyclones, which ripped through Bangladesh and then Myanmar. After all, science has clearly established that the intensity and frequency of tropical cyclones will increase as the Earth heats up. We need to see climate change in the faces of those who lost everything in the floods caused by intense rainfall events. We need to know that the thousands of people who died in these events did so because the rich have failed to contain the emissions necessary for their growth.

When I say this, I know, climate-sceptics and purist-scientists will combine to argue that it is difficult to prove cause and effect. After all, we cannot say that this cyclone in Bangladesh is related to climate change. It is a natural disaster, not a human-made crime. Climate complexity is clearly at the edge of chaos here. The fact is we will never be able to make certain predictions or direct correlations between events that we see around us and the warming that is now inevitable. But, when the world is unequally divided between the polluters and the victims, clearly prevarication and denial will be the name of the game.

Talk Not Action

As the call for action is becoming more strident and more urgent (as it must), the world is looking for small answers and petty responses. On the one hand, there is a well-orchestrated media and civil society campaign to paint China and India as the dirty villains on the block. If they 'cry' about their need to develop, the response is to tell them that they are most vulnerable: 'We cannot afford to waste time in the blame game. Even if, in the past, the Western world created the problem, *you* must in *your* interest take the lead in reparations.'

The West's hysteria is growing. But so is their inaction. The irony is that these countries had agreed in 1997 to make a small cut in their gargantuan emissions in the interest of us all. These emission cuts were nowhere close to what was needed, then or now, to avert climate change. The fact (which is mostly unsaid) is that these countries have done nothing, absolutely nothing, to contain their emissions. Between 1990 and 2005 — when they agreed to cut emissions — rich country emissions increased by 11 per cent and emissions from the growth-related energy sector increased by 15 per cent. They have reneged on their commitment. They have let us all down.

Energy Is the Key

It is the world's need for energy — to run everything from factories to cars — that is the cause of climate pain. The fact also is that, after years of talk, no country has been able to de-link its growth with the growth of carbon dioxide emissions. No country has shown how to build a low-carbon economy, as yet. No country has been able to reinvent its pathway to growth, as yet.

This then is the challenge. After years of talk, the proportion of new renewable energy — wind, solar, geothermal, biofuels — comprises just about 1 per cent of the world's primary energy supply. It is misleading to say that renewable sources add more electricity than nuclear power. It is an old renewable — hydroelectric power — that makes the world light up.

What is tragic is that the world is hiding behind the poverty of its people to fudge its climate maths. The renewable sector is made up of biomass combustion — the firewood, cow dung, or leaves and twigs used by the desperately poor in our world to cook their food and light their homes. It is this that is providing the world its space to breathe.

We are the Change

What then is the way ahead?

First we must accept that the rich world must reduce emissions drastically. Let there be no disagreements or excuses on this matter. There is a stock of greenhouse gases in the atmosphere that has built up over centuries in the process of creating nations' wealth. It is a natural debt. This has already made the climate unstable. Poorer nations will now add to this stock through their drive for economic growth. But that is not an excuse for the rich world not to take on tough and deep-binding emissions reduction targets. The principle has to be that they must reduce so that we can grow.

The second part of this agreement is that poor and emerging rich countries need to grow. Their engagement will not be legally binding but based on national targets and programs. The question is to find low-carbon growth strategies for emerging countries, without compromising their right to develop.

This can be done. It is clear that countries like India and China provide the world with the opportunity to 'avoid' additional emissions. The reason is that we are still in the process of building our energy, transport or industrial infrastructure. We can make investments in leapfrog technologies so that we can avoid pollution. In other words, we can build our cities on public transport; our energy security on local and distributed systems — from biofuels to renewables; and our industries using the most energy (and, therefore, pollution) efficient technologies.

We know it is in our interest not to first pollute, then clean up; or first to be inefficient, then save energy. But we also know that technologies that exist are costly. It is not as if China and India are bent on first investing in dirty and fuel-inefficient technologies. We invest in these, as the now rich world has done, to make money, which can then be invested in efficiency.

As yet, the rich world has found small answers to existential problems. It wants to keep its coal power plants (even as it points fingers at China and India). It wants to build new coal power plants. It believes it can keep polluting and keep fixing. This time, the answer it has hit upon is carbon capture and storage — to pipe the emissions underground and hope the problem will just go away. In this way, it hopes it can have its cake and eat it too.

It also wants to keep its cars and add more. Or drive more. It can do this by simply growing fuel and pumping it into vehicles. It does not matter if this biofuel is a small blip in the total consumption of oil: all the corn in the US can only meet 12 per cent of current US petrol use. It does not matter if there is not enough land to grow food and fuel in the world. The cynics will say, after all, that corporations rule the oil and food business. Scarcity will only increase their business. But the realists should say that the 'illusion' of solutions is the opiate of the rich. This way they do nothing while creating an illusion of action — and turn their attention to the countries that are just learning the mind-matter game.

In spite of fact that science tells us that drastic reductions are needed, no country is talking about limiting their consumption: this is not ironical. Every analysis proves that efficiency is part of the answer but it is meaningless without sufficiency. Cars have become more fuel efficient so people drive longer and have more cars. Emissions continue to grow.

The New Deal

If we know that the emerging world can leapfrog to make the transition to cleaner technology, why is this not happening? Why is it that the world talks big but gives small change?

When the Kyoto Protocol was being negotiated, the world decided to invent the clean development mechanism (CDM) to pay for the transition in the poorer world. But the mechanism was designed to fail. The obsession was to get the cheapest emission reduction options for the rich world. As a result, the price of the certified emission reduction (CER) unit used in this transaction has never reflected the cost of renewable and other high technology options. It is a cheap and increasingly corrupt development mechanism. It is also a convoluted development mechanism, in which rules bind governments not to think of big change. In fact, current CDMs provide disincentives for governments in the South to

drive policies for clean energy or production. Any policy, which is already designed for good is bad in the CDM portfolio. It is not additional and it will not qualify for funding.

The world must realise the bitter truth. Equity is a prerequisite for an effective climate agreement. The fact is that without cooperation, this global agreement will not work. It is for this reason that the world must seriously consider the concept of equal per capita emission entitlements so that the rich reduce and the poor do not go beyond their climate quota. We need climate responsible action. We need effective action.

Rights-Based Agenda

In 1990, the Washington based World Resources Institute (WRI) published a report that showed that annual greenhouse gas emissions of the developing world almost equalled those of the industrialised world, and that, in fact, the emissions of the developing world would overtake the industrialised world's emissions in the near future. However, CSE found that the methodology used by WRI to compute the responsibility of each nation favoured the polluter.

Under the WRI methodology, each nation was assigned a share of the Earth's ecological sink, but the assignment was proportional to the nation's contribution to the Earth's emissions. The sinks are natural systems, oceans and forests, which absorb emissions. Global warming is caused because emissions exceed this natural capacity of the Earth to clean pollutants. WRI had estimated that the world produced 31,000 million tonnes of carbon dioxide and 255 million tonnes of methane every year. It then estimated that the sinks of the Earth naturally assimilated 17,500 million tonnes of carbon dioxide and 212 million tonnes of methane annually. On this basis, it then computed a 'net' emission of each nation by allocating a share of the sinks to each nation based on its gross emissions contribution.

CSE, in its critique, argued that there were two main types of 'sinks' where carbon dioxide is reabsorbed by the biosphere: the oceans and terrestrial sinks. While terrestrial sinks, such as forests and grasslands, may be considered national property, oceanic sinks belong to humankind. They can be regarded as common global property. CSE then apportioned the sinks on the basis of a country's share in the world's population,

arguing that each individual in the world had an entitlement to the global commons. This allocation, based on individual rights to the Earth's natural cleansing capacity, changed the computation of nations' responsibility drastically. For instance, under the WRI methodology, the US contributed 17 per cent of the world's net emissions, while the CSE methodology computed that it actually contributed roughly 27.4 per cent. Similarly, China's contribution of net annual emissions decreased from 6.4 per cent (WRI estimate) to 0.57 per cent, and India's from 3.9 per cent to just 0.013 per cent.

This allocation of the Earth's global sinks to each nation, based on its population, created a system of per capita emission entitlements, which, taken together, were the 'permissible' levels of emissions for each country. This, according to CSE, would create a framework for trading between nations, as countries that exceeded their annual quota of carbon dioxide could trade with countries with 'permissible' emissions. This would create financial incentives for countries to keep their emissions as low as possible and to invest in zero-carbon trajectories.

We have also argued that, as much the world needs to design a system of equity between nations, nations of the world need to design a system of equity within the nation. It is not the rich in India who emit less than their share of the global quota. It is the poor in India, who do not have access to energy, who provide us the breathing space. India, for instance, had per capita carbon emissions of 1.5 tonnes per year in 2005. Yet, this figure hides huge disparities. The urban-industrial sector is energy intensive and wasteful, while the rural-subsistence sector is energy-poor and frugal. Currently, it is estimated that only 31 per cent of rural households use electricity. Connecting all of India's villages to grid-based electricity will be expensive and difficult. It is here that the option of leapfrogging to off-grid solutions based on renewable energy technologies becomes most economically viable. If India's entitlements were assigned on an equal per capita basis, so that the country's richer citizens must pay the poor for excess energy use, this would provide both the resources and the incentives for current low energy users to adopt zero-emission technologies. In this way, too, a rights-based framework would stimulate powerful demand for investments in new renewable energy technologies.

This rights-based agenda is critical in the resolution of the climate change challenge. The fact is that climate change, more than anything else, teaches us that the world is one; if the rich world pumped excessive quantities of

carbon dioxide into the atmosphere yesterday, the emerging rich world will do so today. It also tells that the only way to build controls is to ensure that there is fairness and equity in the agreement, so that this biggest cooperative enterprise is possible.

Strengthen Global Democracy

In conclusion, there is no doubt we live in an increasingly insecure world. Indeed, the state of insecurity in the world is made more deliberate, more wilful, because of the intentional and unintentional actions of nation-states and governments — all in the name of development and global justice. So, if the rich world is increasingly paranoid about its defence from the failed, bankrupt and despotic states of the developing world, the poor are insecure because they are increasingly marginalised and made destitute by the policies of the rich. The challenge of climate change is adding a new level of insecurity for the world's people. It is also equally clear that a business as usual paradigm of growth will lead the world towards a vortex of insecure people, communities and nations.

It is here that the countries of the South face even greater challenges. They will need to rebuild security by rebuilding local food, water and livelihood security in all villages and cities of their world. And, in doing this, they will have to reinvent the capital and material intensive growth paradigm of the industrialised North that deepens the divide between the rich and the poor. They will have to do things differently in their own backyards. But, more importantly, these countries will have to become the voice of the voiceless, so that they can demand changes in the rules of globalisation in the interest of all.

Sustainable development needs to be understood as a function of deepened democracy. As every society makes mistakes, it is the process of decision-making about sustainable development that will lead to fast rectification and resolution. Sustainable development is, therefore, not about technology, but about a political framework, which will devolve power and give people — the victims of environmental degradation — rights over natural resources. The involvement of local communities in environmental management is a prerequisite for sustainable development.

The South's quest for an alternative growth strategy will have two essential prerequisites.

First, a high order of democracy, so that the poor, marginalised and environmental victim can demand change. It is essential to understand that the most important driver of environmental change in these countries is not government, laws, regulation, funds or technology per se. It is the ability of its people to 'work' democracy.

But democracy is much more than words in a constitution. It requires careful nurturing so that the media and the judiciary, and all other organs of governance, can decide what is in the public, and not private (read corporate), interest. Quite simply, this environmentalism of the poor will need more credible public institutions, not less.

Second, change will demand knowledge and new and inventive thinking. This ability to think differently needs confidence to break through the historical 'whitewash' — the arrogance of old, established, ultimately borrowed ideas. A breakthrough — a mental leapfrog — is what the South lacks the most. The most adverse impact of the current industrial growth model is that it has turned the planners of the South into cabbages who believe they have no answers. The current model has only problems, for which the solutions lie in the tried and tested answers of the rich world.

It is also important that this environmentalism of the poor — built from the bottom up and based on principles of equity and human need — influence the world. To combat climate change, it is essential that the world learns from these movements about the need to share resources so that we can all tread lightly on the Earth, and so that we can all remember, not forget.

In closing, I would like to quote from President K.R. Narayanan. In his address to the nation, on the eve of India's Republic Day, 25 January 2001, he said:

> Let it not be said by future generations that the Indian Republic has been built on the destruction of the green earth and the innocent tribals who have been living there for centuries. A great socialist leader has once said that a great man in a hurry to change the world who knocks down a child commits a crime. Let it not be said of India that this great republic in a hurry to develop itself is devastating the green mother earth and uprooting our tribal populations. We can show the world that there is room for everybody to live in this country of tolerance and compassion.

This is the message the world must learn, fast.

This text is taken from *Twenty K.R. Narayanan Orations: Essays by Eminent Persons on the Rapidly Transforming Indian Economy*, edited by Raghbendra Jha, published 2021 by ANU Press, The Australian National University, Canberra, Australia.

doi.org/10.22459/TKRNO.2021.12