Dr Adil Najam, a member of the Nobel prize-winning Intergovernmental Panel on Climate Change, explores the effects of rising sea levels, the importance of leadership in reducing CO_2 release, the roles of different energy sources and the meaning of good governance in tackling these complex issues

Understanding climate change

I study the future. I'm here to look at the long term for policymakers and specifically to address what climate change means to the poorest. We know that the planet is heating up, we know that CO_2 affects the climate, we know that man-made emissions have risen dramatically since the Industrial Revolution and we know there is a connection between this and the rise of temperature. There are some things we do not know as well, such as the role of the oceans (three-quarters of the world's surface), because their natural cycles aren't fully understood. But we know enough to begin implementing a whole range of 'no regret policies'– that is, policies that will definitely improve the situation and that definitely won't make matters worse.

We also know that no amount of policy change by governments will be enough. It's much bigger than that. We have to set the conditions for a new technology of development, the spirit of this being that the environment should not be protected from people, but for people. We also know that climate change is the most truly global challenge and cannot be tackled except with global cooperation.

If you consider the globe, just for a moment, as one single country, you will find that as a planet it is poor, environmentally degraded, insecure, divided and thus poorly governed. So we have some challenges ahead if we are to successfully tackle the causes of climate change as well as the symptoms (such as sea-levels rising, drought and hurricanes). These climatic problems are already creating social insecurities. For instance, we can see a direct relationship between resource shortages and terrible civil unrest. By 2020 between 75 million and 250 million people in Africa alone are projected to be exposed to increased water stress due to climate change.

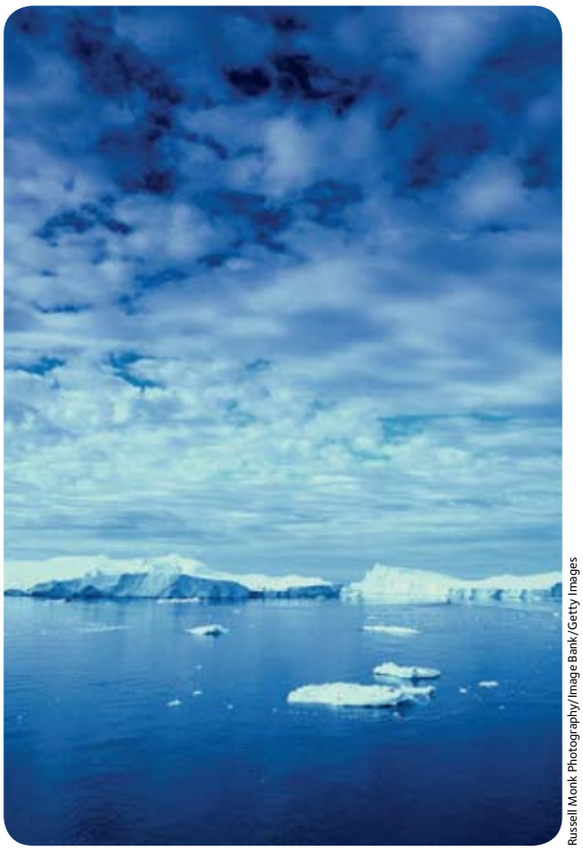
Most at risk: low-lying land

The rise of sea levels is caused largely by the melting of the Arctic, as illustrated by a single glacier, 17 times the size of Manhattan, New York, that broke up just recently. The first people to be affected by the rise of the oceans will clearly be those on low-lying land – Bangladesh and the South Pacific islands, for example.

It's a fact of life that global energy demand continues to rise – energy is at the heart of an industrial society – so the world needs to be interested in emissions. What energy

will be used? What mix of sources? What technologies will be at work and what do we do with the emissions? Fossil fuels, which have taken many centuries to develop, release their carbon over just weeks and days. We need to do more than plant trees to remedy this. To scrub the atmosphere clean of the CO_2 generated by our current output would take many, many planets the size of Earth covered in trees. An integral part of the solution is to have better technology in both the production and use of energy.

For instance, I understand RasGas is one of the largest integrated gas production operations in the world and has to deal directly with the CO_2 as it comes from the reservoir. I also understand that the Supreme Council for the Environment and Natural Reserves in Qatar and Qatar Petroleum has concurred with an initiative taken by RasGas to inject the H_2S [hydrogen sulphide] and CO_2 back into the ground at Ras Laffan, where they stay encapsulated. This is an example of the kind of leadership we need and is the first such initiative I know of in the Middle East. It's economically viable and environmentally beneficial to do this, and it could even become a profit centre.



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Natural understanding: as energy demand continues to rise, the world needs to be interested in emissions and in managing their impacts on the environment

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Gain from new technologies

Fingers often point at China for being irresponsible in building a new coal-fired power station every three weeks, but I also see some positive signs for the future in what China is doing. These new power stations are far cleaner, with less waste and less emissions, than the 1970s plants in the United States. China is learning how to grow faster with less energy. That's a lesson that is very useful for other developing countries. China can do this because it's late into the game and can get more out of the latest technologies available.

In my personal view, nuclear is simply substituting one problem for another. Nuclear safety is a big issue and the matter is also highly politicised around proliferation of nuclear arms. The energy argument goes 'carbon bad, no carbon good, therefore nuclear good', but it's obviously very much more complex than that. There's a significant lack of knowledge in the debate on nuclear energy and this is a grave concern to me. However, no form of energy – other perhaps than whale oil – has gone out of use in the history of mankind. The quest we must pursue is to find an energy mix that meets our needs as a planet and that doesn't harm us in doing so. This energy mix will still have fossil fuels in it, but as we look towards meeting the energy needs of the future, we will see a number of other energy sources being added to the mix.

There are environmental challenges for gas too. It is a transition solution because the emission levels in both production and use are significantly lower than for oil and coal. There are also political issues here that need to be resolved in terms of regasification, pipelines and compression at the delivery end.

Life on earth: just as the ecosystems supporting our flora and fauna are complex, so measures to combat climate change must take a wide range of factors into account

Bioethanol has been a recent buzz, but if not done properly, ethanol production can actually have a negative output in terms of its energy cycle. The United States and Europe both have farming systems that are reliant on huge subsidies and thus government incentives skew the market towards ethanol production. To illustrate this I'd like to talk about tortillas. Mexico grew corn, a staple of the country's diet and a key ingredient in tortillas, until the United States subsidised, grew and shipped corn flour cheaper under the North American Free Trade Agreement (NAFTA). Mexico then became a net importer of corn. The Unites States has more recently decided that ethanol feedstock is a better crop to subsidise and corn farmers are rushing towards corn for ethanol. The result is a spike in the price of corn in North America, including in Mexico, resulting in a manifold increase in the price of tortillas in Mexico. Subsidies can make for imperfect markets that don't respond to the actual needs of the population. For similar reasons, China has abandoned support of ethanol feed because it is in conflict with a higher priority: food production.

From oil to renewables

Oil at its exchanging rate at over $150 a barrel is also a dynamic factor. The recent price rises have driven up the value of all energy sources, which is why techniques such as tar seam reclamation, though very poor environmentally speaking, have become economic to achieve.

What is really interesting is that the most rapid developments in renewable energy, such as solar, wind and geothermal sources, are coming from the private sector. The innovative response of the private sector to the demands of development are another very good example of what I mean by the good governance we so urgently need to remedy the situation. People cannot just wait for the lawmakers to get around to making new policies. They need to seek ways to profit by responding to the huge global demand for energy that doesn't harm the environment. So it's not a matter of the environment versus development. Can you really call development 'successful' if it damages the very atmosphere that life depends on? The question is how to 'develop' without harming the environment, while also remedying the damage done already. Kyoto, where many of the world's governments signed up to an accord – the Kyoto Agreement – to reduce carbon emissions, is not enough. But it is a start.

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The Stone Age didn't end because we ran out of stones and the 'fossil fuel age' won't end because we run out of oil, coal and gas. This is a matter of choices – as citizens, as corporations, as consultants, as non-governmental organisations, as governments – as to what kind of future we want. The good governance we all need is the sum of all these responses. It's down to us. This is the responsible leadership we need to solve the problem.

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