

Chapter 9

A 'just' climate agreement: the framework for an effective global deal

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I remember how I first learned about global warming. It was in the late 1980s. My colleague Anil Agarwal and I were searching for policies and practices to regenerate degraded common lands. We quickly learned to look beyond trees, at ways to deepen democracy, so that these commons – in India, forests are mostly owned by government agencies, but it is the poor who use them – could be regenerated. It became clear that without community participation, planting trees was not possible. For people to be involved, the rules for engagement had to be respected. To be respected, the rules had to be fair.

In the same period, data released by a prestigious US research institution, the World Resources Institute, convinced our then environment minister that it was the poor who contributed substantially to global warming – by doing ‘unsustainable’ things like growing rice or keeping animals. Anil and I were pulled into this debate when a flummoxed chief minister of a hill state called us. He had received a government circular that asked him to prevent people from keeping animals. ‘How do I do this?’ he asked us. ‘Do the animals of the poor really disrupt the world’s climate system?’ We were equally perplexed. It seemed absurd. Our work told us that the poor were the victims of environmental degradation. Suddenly they were being presented as the villains. How was this possible?

With this question in mind we embarked on our climate research journey. We began to grasp climate change issues, and quickly learned that there was not much difference between managing a local forest and managing the global climate. Both are common property resources. What was needed most of all was a property rights framework that encouraged cooperation. We argued in the following way:

- First, the world needed to differentiate between the emissions of the poor (for example, from subsistence farming) and those of the rich (from, say, cars). Survival emissions were and could not be equivalent to luxury emissions.
- Second, managing a global common resource required cooperation between countries. Just as stray cattle or goats are likely to chew up saplings in the forest, any country could destroy a climate protection agreement if it emitted more than the atmosphere can take. Cooperation was only possible – and this was where our forest experience came in useful – if benefits were distributed equally. We then developed the concept of per-capita entitlements (each nation’s share of the atmosphere), and used the property rights of entitlement to set up rules of engagement that were fair and equitable. We said that countries using less than their share of the atmosphere could trade their unused quota. This would give them an incentive to invest in technologies that would not increase their emissions. But within this process, we told climate negotiators, it was useful to think of the local forest and learn that the issue of equity is not a luxury; it is a prerequisite.

That was 20 years ago. Today, in 2009, we have come a long way, principally in our acceptance that climate change is the greatest existential crisis that human beings have ever faced. We remain weak in our commitment to bringing about change; we are big on words and small on action. In 2009, we have reached the point where we must commit to a very different future.

The framework would propose for this just and effective global climate deal is as follows.

Climate change is all about the economy, stupid

It is important to note that industrialized countries have managed to de-couple sulphur dioxide emissions from economic growth. In other words, emissions have fallen even as national income has risen. But they have failed to do the same with carbon dioxide emissions. Per-capita carbon dioxide emissions remain closely related to a country's level of economic development and standard of living. It is evident that as long as the world economy is carbon-based – driven by energy from coal, oil, and natural gas – growth cannot be substantially de-coupled from carbon dioxide emissions.

The only way to avert environmental devastation is to reduce emissions dramatically. However, in a world where things are never quite so simple, the use of these fuels, and hence carbon dioxide emissions, are closely linked to economic growth and lifestyle. Every human being contributes to the carbon dioxide concentrations in the atmosphere, though the amount emitted depends on the person's lifestyle. The more prosperous a country's economy and the higher its per-capita income, the higher is its fossil fuel consumption for power generation and transport, and therefore the higher its greenhouse gas emissions.

Industrialized countries owe their current prosperity to 'historical' emissions, which have accumulated in the atmosphere since the start of the Industrial Revolution, as well as to high levels of current emissions. Developing countries, meanwhile, have only recently set out on the path of industrialization, and their per-capita emissions are still comparatively low.

Under these circumstances, any limit on carbon dioxide emissions amounts to a limit on economic growth, turning climate change mitigation into an intensely political issue. International negotiations under the UN Framework Convention on Climate Change – aimed at limiting greenhouse gas emissions – have turned into a tug of war, with rich countries unwilling to 'compromise their lifestyles', and poor countries unwilling to accept a premature cap on their right to basic development.

Complexity is no excuse for inaction

Climate change is undoubtedly the greatest challenge of our century. Its sheer complexity and urgency seem overwhelming. For the past 18 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 that climate change is real, that it is related to carbon dioxide and other emissions, and that these emissions are related to economic growth and wealth. In other words, it is man-made and can destroy the world as we know it.

The scientific community is not just certain but *unequivocal* that climate change and its devastating consequences are now inevitable. But along with understanding the still obtuse science we must begin to put a human face on the effects of climate change that are becoming evident all around us. We must see climate change in the faces of the millions who have lost their homes in the Sidr and Nargis cyclones that 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 (Solomon *et al.*, 2007). 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 understand that the thousands of people who died in these disasters did so because the rich have failed to contain the emissions upon which their growth has been built.

Inaction of the rich world

As the call for action has become more strident and urgent (as it must), the world has looked for small answers and petty responses. On the one hand, there is a well-orchestrated media and civil society campaign to paint the Chinese and Indians as the villains of the piece. If they ‘cry’ about their need to develop, the response is to tell them that they are most vulnerable. Rich countries seem to be saying: ‘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.’

This hysteria is growing. But unfortunately, action is not keeping pace.

In late 1997, after years of protracted negotiations, the Kyoto Protocol was established. Under this agreement, the industrialized world agreed to cut its emissions by just 5.2% of 1990 levels by 2008–2012. It is important to realize that the world is nowhere close to achieving even this reduction. Not only has the world’s largest polluter – the United States – walked out of the global agreement, even Europe is finding it difficult to reach this modest target. A review by the secretariat of the UN Framework Convention on Climate Change (UNFCCC, 2007) has found

that between 1990 and 2006, while carbon dioxide emissions of all industrialized countries (classified as Annex I under the convention) declined by 1.3%, this reduction was primarily due to the countries whose economies are in transition. The carbon dioxide emissions of the Annex I countries, excluding countries in transition, actually increased by 14.5% (see Fig. 1).

During the same period, the carbon dioxide emissions of key polluters increased – in the case of the US by 18%, and by a whopping 40.5% in Australia. Even most European countries have seen an increase in their emissions. The only countries that have cut carbon dioxide emissions are Sweden, the UK and Germany. But it is important to note that emissions in the UK and Germany are beginning to increase again. The reason is simple. The UK partly gained its emissions reduction by switching from coal to natural gas, a transition that is now predominantly completed. Germany reduced its emissions greatly because of the reunification of the industrialized west with the economically depressed east. New answers must now be found. In other words, these emission cuts were nowhere close to what was needed, then or now, to avert catastrophic climate change. The industrialized countries have reneged on their commitment. They have let us all down.

So far, the rich world has found only small answers to existential problems. It not only wants to keep its coal-burning power plants (even as it points the finger at China and India), but wants to build new ones. It believes it can keep polluting while finding new ‘fixes’. The latest solution it has come up with is ‘Carbon Capture and Storage’ – to pipe the emissions underground and hope the problem will simply go away. In this way, the rich world hopes it can have its cake and eat it too. Is it not ironic that in spite of science telling us that drastic reductions are needed, no country is talking seriously about limiting its energy consumption? Every analysis shows that while efficiency is part of the answer it is meaningless without sufficiency. Cars have become more fuel-efficient but people now drive more and own more cars. We have to realize that without a global cap on carbon emissions, any measures to improve energy efficiency will remain ineffective.

Energy is the key

It is the world’s need for energy – to run everything from factories to cars – that is the principle cause of climate change. After years of talking about the problem no country has been able to de-couple its growth from the growth of carbon dioxide emissions. No country has yet shown how to build a low-carbon economy. No country has yet been able to re-invent its pathway to growth. This, then, is the challenge. After years of talk, the proportion of new renewable energy – wind, solar, geothermal, biofuels – comprised only about 1% of the world’s primary energy supply in

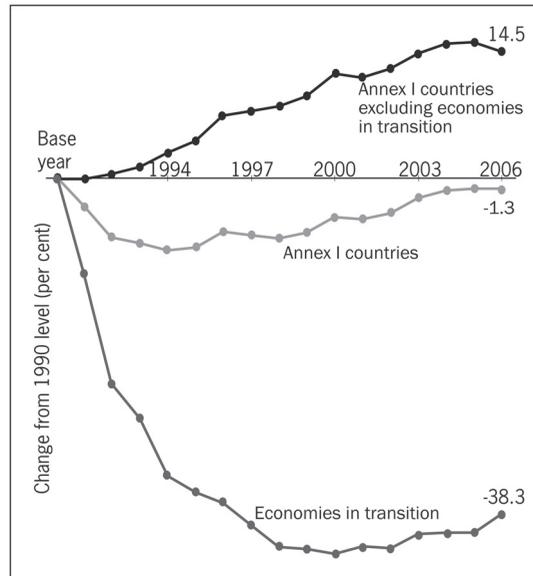


Fig. 1. Carbon dioxide emissions of Annex I countries under the UN Framework Convention on Climate Change, excluding land use, land-use change, and forestry (LULUCF). (Source: UNFCCC, 2007)

2006 (IEA, 2007). It is misleading to say that renewable sources add more electricity than nuclear power. It is ‘old renewable’ energy – hydroelectric power – that makes the world light up.

One of the tragedies of the climate change debate is that the world is hiding behind the poverty of its people to fudge its climate maths. Biomass combustion contributes greatly to the renewable sector – the firewood, cow dung or leaves and twigs used by the desperately poor in our world to cook their food and to 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. There is a stock of greenhouse gases in the atmosphere, built up over centuries in the process of creating nations’ wealth. This has already made our climate unstable. Poorer nations will add to this stock through their desire for economic growth. But that is no excuse for the rich world to avoid adopting tough and binding emission reduction targets. The principle should be that the rich reduce so that the poor can grow. Second, any agreement must recognize that poor and emerging countries need to grow. Their engagement should therefore not be legally

binding but based on national targets and programmes. The challenge 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 such as India and China have the opportunity to 'avoid' additional emissions. The reason is that they are still in the process of building their energy, transport and industrial infrastructures. They can make investments in 'leapfrog' technologies so as to avoid pollution. In other words, they can build their cities based around public transport; their energy security based on local and distributed systems – from biofuels to renewables; and their industries using the most energy-efficient and pollution-free technologies.

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

The just deal: what does it mean?

If we know that the emerging world can leapfrog to cleaner technologies, the question is, why is this not happening? Why is it that the world talks big yet makes only small changes?

As part of the Kyoto Protocol the 'Clean Development Mechanism' (CDM) was invented to pay for the transition in the poorer world. But the mechanism was destined to fail (for ideas on CDM reform see Liverman, this volume). The rich countries were obsessed with obtaining the cheapest emission reduction options. As a result, the price of CERs – the certified emission reduction units 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 mechanism, in which governments are prevented by rules from considering major change. In fact, CDM currently provides disincentives for governments in the South to drive policies for clean energy or production. Any such policy that is designed independently of the CDM framework does not meet the criterion of 'additionality', and does not qualify for funding.

The world must realize the bitter truth. Equity is a prerequisite for an effective climate agreement. 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 effective and responsible action on climate change now.

Conditions for action on climate

Warming of the global atmosphere is possibly the biggest and most difficult economic and political issue the world has ever needed to confront. First, as emissions of carbon dioxide are directly linked to economic growth, growth as we know it is at risk. We will have to reinvent what we do and how we do it. There will be costs associated with this change, but these costs will be a fraction of what we will need to spend if we do not change. Second, admissible growth has to be shared equitably among nations and people. The question now is: Will the world share its right to emit (or pollute), or will it freeze inequities? Will the rich world, which has accumulated a huge ‘natural debt’ – overdrawing on its share of the global commons – repay it so that the poorer world can grow and use the same ecological space. Third, climate change is about international cooperation. Climate change teaches us more than anything else that the world is one; if the rich world pumped excessive quantities of carbon dioxide into the atmosphere yesterday, then the emerging rich world will do so today. It also tells us that the only way to control emissions is to ensure that there is fairness and equity in the agreement, so that the greatest level of cooperation is possible.

There is clear understanding that the rich and the emerging rich worlds need to make the transition to low-carbon economies. There is also much better understanding that the way ahead involves technologies that we already possess. The answer will lie in increasing efficiency in both the generation of energy and in its use for the manufacture of other products. It will also lie in changes to how we do things – from transportation in our cities to everything else. Fact is that we know how to change.

The imperative of energy transformation

It is increasingly understood that the de-carbonization of economies is imperative if the world wants to tackle climate change. It will require substantial investments to move towards a zero-carbon-energy-based economy, eliminating the use of fossil fuels altogether. It is also clear that the existing and growing use of fossil fuels has the potential to ‘lock in’ this energy source for a much longer time than desired, and ‘lock out’ renewable energy sources. The question is, how will the world accomplish this energy transition? And is it even possible?

The shift to renewable energy sources

How can the world make this rapid shift towards renewable energy technologies? If the world waits for most of its oil, gas, and coal resources to be exhausted before

making this transition – something that probably will not occur before the end of this century – then the risk of serious climate change will be inordinately high. It is important to understand the nature of this challenge. The twentieth century saw a major transition away from renewable energy towards a fossil fuel-based global economy. Between 1900 and 2000, world energy use grew more than ten-fold. Even though the energy from renewable sources increased nearly five-fold during the century, its share in total energy use dropped from 42% to 19% (IEA, 2007).

This trend has continued. The January 2007 report of the International Energy Agency (IEA, 2007), estimates that in 2006 the share of renewable energy in the total primary energy supply was just 13%. Significantly, the bulk of the renewable energy budget was made up of biomass burning and hydro-electric power. For instance, the share of renewable energy in India is estimated to be 39%, because of the use of biomass by the poor to cook food. The contribution of new renewables – wind, solar, tidal and geothermal energy – was as little as 0.5% of the world's total energy consumption. The challenge now is to reverse this trend.

It is clear that the market for renewable energy technologies is growing. According to the IEA, wind energy saw growth of 50% per annum and solar energy 28% per annum between 1971 and end of 2006. Modern biomass energy, including new technologies that produce ethanol from agricultural waste, also contains immense potential. Technological advances are also taking place in the use of hydrogen fuel cells. The cost of these technologies has also fallen; but not enough to make them competitive with conventional energy options.

We know that the more the world gets locked into fossil-fuel-based systems, especially efficient and low-cost fossil fuel systems, the longer it will take to get out of them. If the huge energy investments that will be made by developing countries in the next three to four decades lock them into a carbon energy economy like that of the industrialized countries, this will result in an enormous build-up of greenhouse gases. The governments of the world will therefore have to play a key role in 'reinventing the energy system', just as they have played a key role in determining the modern carbon-based energy supply structure since the nineteenth century.

Today the biggest obstacles in the way of renewable technologies are low prices for fossil fuels and subsidies on fossil fuels in many countries. In addition, the renewable energy sector is facing problems of declining public- and private-sector research and development. Rapid expansion in the use of zero-carbon technologies will come only with proactive official policies aimed at increasing research investment and creating favourable economic conditions, allowing mass production to bring costs down even further.

If the solution lies in creating large markets for zero-carbon energy technologies, the advantage lies with the countries of the South, the low carbon emitters. These countries have for the most part not yet invested in the electricity grid; they are not

yet locked into fossil-fuel-based energy systems. However, these countries require huge investment if they are to supply energy to their millions of households.

Toward a framework for equitable entitlements

The tragedy of the atmospheric commons has been the lack of rights to this global ecological space. As a result, industrialized countries have borrowed or drawn heavily from it – and without any control. They have emitted greenhouse gases far in excess of what the Earth can withstand. This was because they were not bound by limits or quotas, and enjoyed ‘free use’ of this natural capital. Some researchers have called this the ‘natural debt’ of the North, as opposed to the financial debt of the South. In this context, curtailing emissions can only be achieved through the creation of rights and entitlements of each nation to the atmosphere so that future responsibilities are clearly demarcated. This allocation of the common space has to be made on the basis of each nation’s past, present, and projected future contributions to the global warming crisis. The world needs to adopt the concept of equal per-capita entitlements to greenhouse gas emissions.

Solving the climate crisis is about sharing growth among nations and people. And clearly this has not yet happened. Between 1980 and 2005, the total emissions of just one country (the United States) were almost double those of China, and more than seven times those of India (see Fig. 2).

In per-capita terms, the injustice is even more unacceptable and immoral (see Fig. 3). Historical emissions – between 1890 and 2005 – for example, amount to about 1100 tonnes of carbon dioxide per capita for the UK and the USA, compared to 66 tonnes per capita for China, and 23 tonnes per capita for India (CSE, 2008). As yet, the world has seen no real change in this situation. No change it can believe in.

Net versus gross emissions: sharing the world’s common sinks

In 1990, the Washington-based World Resources Institute (WRI) published a report which showed that annual greenhouse gas emissions in the developing world almost equalled those in the industrialized world, and predicted that the emissions of the developing world would overtake those of the industrialized world in the near future (WRI, 1990). However, the critique of this report by the Delhi-based Centre for Science and Environment (CSE) found that the methodology used by WRI to compute the responsibility of each nation favoured the polluter (Agarwal and Narain, 1991).

Under the WRI methodology, each nation was assigned a share of the Earth’s ecological sinks, but the assignment was proportional to the nation’s contribution to the Earth’s emissions. The sinks are natural systems – principally the oceans and

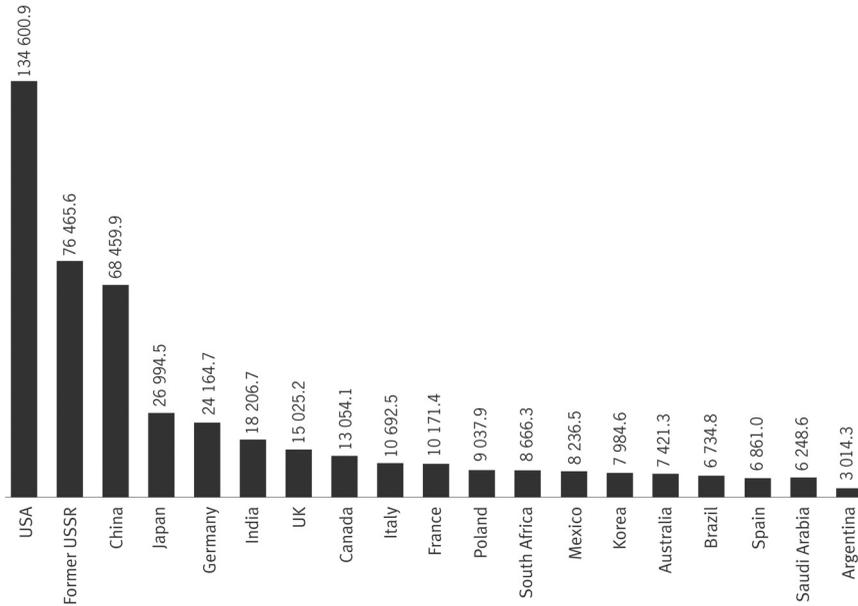


Fig. 2. Cumulative emissions of carbon dioxide 1890–2005 in million tonnes. Rich countries are still the major emitters of total carbon dioxide, with just 15% of the world’s population they account for 45% of carbon dioxide emissions. (Source: CSE, 2008, calculated from the carbon dioxide information of the U.S. Department of Energy)

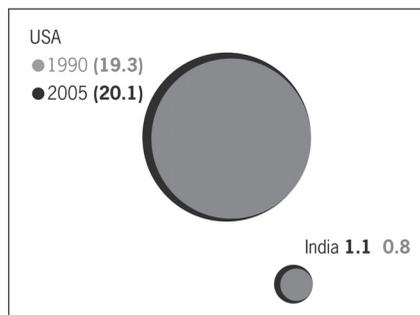


Fig. 3. The per-capita increase in annual carbon dioxide emissions between 1990 and 2005 in the USA is equal to three-quarters of India’s total per-capita emissions in 2005. Current annual per-capita emissions in the USA are almost 20 times higher than in India. (Source: UNDP, 2008)

forests – that absorb emissions. Global warming occurs because emissions exceed the capacity of these sinks to absorb greenhouse gases. The WRI estimated that the world produces 31 billion tonnes of carbon dioxide and 255 million tonnes of methane every year. It then estimated that the Earth's sinks naturally assimilate 17.5 billion tonnes of carbon dioxide and 212 million tonnes of methane annually. On this basis, it calculated the 'net' emissions 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 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 of the world's population, arguing that each individual in the world has equal entitlement to the global commons. This allocation, based on individual rights to the Earth's natural cleansing capacity, changed the calculation of the nation's responsibility drastically. For instance, under the WRI methodology, the USA contributed 17% of the net emissions of the world, while the CSE methodology calculated that it actually contributed roughly 27.4% of net annual emissions. Similarly, the contribution of China decreased from the WRI estimate of 6.4% of net annual emissions to 0.57%, and India's from 3.9% to just 0.013% of net annual emissions.

This allocation of the Earth's global sinks to each nation, based on population, creates a system of per-capita emissions entitlements, which taken together form the 'permissible' emissions level of each country. This, according to CSE, could form a framework for trading between nations, as countries that exceed their annual quotas of carbon dioxide could trade with other countries that do not use up their 'permissible' emissions. This would create financial incentives for countries to keep their emissions as low as possible and to invest in zero-carbon trajectories.

Chinese proposal for burden sharing

The Chinese Academy of Social Sciences has also presented its own model for a carbon budget based on equity and sustainability. Interestingly, the Academy says that, while there have been a variety of proposals with different interpretations of the equity principle for burden sharing and emissions entitlement, there is an 'imbalance' in the debate: only three of the 43-odd proposals for equity have come from researchers in the South.

The Chinese proposal is based on two concepts (Pan *et al.*, 2008): first, if we want to ensure that basic needs are fulfilled for all citizens of the world, then there is no space in the world for luxurious and wasteful emissions; second, emissions need to stay within the geophysical limits of the planet. That means, if emissions exceed the Earth's geophysical limits, then human society must reduce its emissions

to adjust to what the planet can withstand. The proposal accepts that the global human community has to reduce emissions by 50% by 2050. This level then constitutes the global carbon budget that is to be shared between every individual in the world. The budget is allocated to every individual for meeting basic needs, and adjusted in terms of geographical, climatic and resource endowment. For the period 1900–2050, the total global carbon budget was 2272.5 billion tonnes of carbon dioxide, or 352.5 tonnes of accumulative carbon dioxide emissions per capita or 2.33 tonnes of carbon dioxide per capita per year.

The Chinese proposal includes two transfers – one of the budget and one of financial resources. As the developed countries have already exhausted their full share – until 2050 – the proposal calculates the price of this ‘gift’ to developed countries by the developing countries. It also transfers emissions budget to developed countries to meet basic needs. The total carbon budget acquired by developed countries would be in excess of the global average level. For instance, the US carbon budget would increase to 7.71 tonnes of carbon dioxide per capita, as compared to 2.33 tonnes per capita in the initial budget allocation. For Non-Annex I countries, the budget would decline from its initial allocation of 80.5% to 58.9%. This basic entitlement scheme would form the basis of the trading scheme. As a result, countries like the USA, Canada and Australia would be required to purchase 70% of their future emissions budgets.

It also proposes a progressive carbon tax that increases the rate of taxation on the basis of the amount of excessive emissions (from limited to moderate to severe). This tax should not be higher than the cost of renewable energy introduction, so that the framework supports the transition to cleaner energy.

Ad-hoc emissions budgets and entitlements

Another possible approach would be to decide upon future atmospheric concentration limits for various dates on an ad-hoc basis, allowing for some build-up of greenhouse gases in the atmosphere. The targeted atmospheric concentrations could then be translated into a global emissions budget that can be distributed among nations in the form of equal per-capita entitlements. Both the targets and the emissions caps needed to meet them would be subject to periodic scientific review, and therefore per-capita entitlements based on this approach would be subject to review as well. A country that does not use its budget during a particular year could again have the right to trade its unused share. In this case, nations could also simply agree on an ad-hoc per-capita entitlement towards which all countries eventually will converge. This target could be more or less ambitious, but again it would be subject to periodic review, allowing for changes based on new scientific information.

Entitlements within countries

As much as the world needs to design a system of equity between nations, the nations of the world need to design a system of equity within each 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 had per-capita carbon dioxide emissions of 1–1.5 tonnes per year based on different estimates 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% 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 pay the poor for excess energy use, this would provide both the resources and the incentives for current low-energy users to adopt zero-emissions technologies. In this way, too, a rights-based framework would stimulate a powerful demand for investment in new renewable energy technologies.

Let us be clear. The challenge of climate change is a make-or-break situation for the world. It forces us, perhaps for the very first time in our history, to realize that we live together on one Earth. It tells us that there are limits to carbon-based growth; and more importantly that growth will have to be shared between all. Ultimately, we cannot share a vision for how the world will combat climate change unless we are prepared to share the common atmospheric resources of the world. The big question is whether we will meet this challenge. The most convincing answer is that we have no choice. There is no other way.

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