



Centre for
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Grantham Research Institute on
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The economic crisis and the two great challenges of the 21st century

Nicholas Stern

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Securing our common future: a conference on the future of international development (DFID conference)

1. Two great global challenges and a serious economic crisis

The two great challenges of the 21st century are the battle against poverty and the management of climate change. On both we must act strongly now and expect to continue that action over the next decades. The current crisis in the financial markets and the economic downturn is new and immediate. All three challenges require urgent and decisive action, and all three can be overcome together through determined and concerted efforts across the world. It is important, however, to understand the depth and severity of the two long-term challenges, and their intimate relationship, before we turn to the shorter term.

Our response to climate change and poverty reduction will define our generation. If we fail on either one of them, we will fail on the other. Unmanaged climate change will irretrievably damage prospects for development in many parts of the world, and action on climate change which hinders development can never build the global coalition on which such actions depends.

We know only too well the impact of poverty around the world. But what may be less well-known are the potential risks of climate change, risks to which poor people will be most exposed and vulnerable.

The concentration of GHGs in the atmosphere that cause climate change is already over 430ppm CO₂e. That is over 50% more than the level prior to industrialisation, and we are adding to it at a rate of 2.5ppm per year, and that rate is rising. If we carry on with 'Business-As-Usual' the concentration of GHGs could rise to 750ppm or more by the end of the century. According to the Met Office's Hadley Centre model, a concentration of 750 ppm would result in a roughly 50% likelihood that the world will be 5°C hotter than pre-industrial levels. That is not a remote possibility of some minor event, but a large probability of a devastating transformation of our planet.

It is difficult to imagine what it would be like to try to live in a world that has experienced a rise in temperature of 5°C. Lives and livelihoods would be disrupted in every country. Sea level rise would fundamentally re-draw the outlines of our continents. Patterns and flows of rivers could be radically different. There would be many areas that would become deserts. Populations would be threatened by reductions in the availability of basic necessities, such as clean water and food. Many would have to move away from the most-affected regions, creating new competitions and conflicts.

Poor people would be the most exposed and vulnerable to these changes. The UN estimates that by 2080, climate change could lead to an extra 600 million people affected by malnutrition, 400 million exposed to malaria and 1.8 billion without

enough water. In a world ravaged by climate change, the struggle against poverty would become still more difficult for hundreds of millions of people.

So it is imperative that when we think of the problems involved in development, we understand that they are inextricably linked to the problems we face in tackling climate change. But whilst recognising that we must respond, and respond strongly, to both challenges, we should also recognise the opportunities: a well-constructed response to one can provide great direct advantages and opportunities for the other.

Some may argue that the global financial crisis and economic downturn means we should delay our efforts to tackle poverty and climate change. But delaying on poverty would condemn millions of people to many more years of hardship. And delaying on climate change would mean the stock of GHGs in the atmosphere grows, making the task of dealing with the problem more costly and difficult in the future. Failure at the UNFCCC conference on a new global deal on climate change in Copenhagen in December would badly damage the confidence in and prospects for an agreement, undermining the key private investments and public action.

We cannot afford to delay. We can and must face up to all three challenges together.

So what do we need to do to combat the threat of climate change whilst boosting efforts to reduce poverty and tackling the global economic downturn?

2. Mitigation and adaptation

The management of climate change requires the reduction of emissions of GHGs. The G8 nations at recent summits have endorsed the goal of reducing global emissions by at least 50% by 2050 (which should be relative to 1990). Such cuts are broadly in line with a path could hold greenhouse gas levels below 500ppm CO₂e and then start to reduce them. According to the Hadley Centre climate model, this would reduce the probability of a 5°C increase in global temperature from around 50% to 3% or less. Such insurance could be bought for a worldwide cost of 1 or 2% of GDP over the coming decades and may well be lower than that if technical progress continues with its current acceleration. That action is very sound economics as well as a moral imperative.

We know from the long-term target where countries will need to be in 2050 and we can infer current actions from this. The target 50% reduction means halving global emissions from 40 gigatonnes a year to 20, or around 2 tonnes per capita, given that there are likely to be around 9 billion people in 2050.

For the global target to be achieved, few countries can be much above the annual emissions level of 2 tonnes per capita, since there are likely to be few that are far below. This provides a benchmark against which countries can assess how the sectoral pattern of their emissions may need to change for them to reach this level cost-effectively.

These simple headline numbers mean that, even if developed countries reduced their emissions to zero, the forecast 8 billion people living in developing countries in 2050 would still be able to emit only 2.5 tonnes per capita. With the majority (by population) of countries not covered in Annex 1 of the UN Framework Convention on Climate Change, broadly the non-Annex 1 are the developing countries, already above this level, it is clear that emissions in these countries will have to fall in the long term. Aggregate emissions by developing countries will probably need to peak in the next 20 years if the global 2050 targets are to be achieved. Emissions in rich

countries must decline, and decline strongly, from now and be at least 80% lower in 2050 than 1990 if they are to get their emissions in the region of 2 tonnes per capita by then.

With energy investments potentially locking-in emissions for 40 plus years and urban investments often far longer, developing countries risk making high-carbon investments that they will have to be either prematurely retired or expensively amended.

We know what actions we need to take to cut emissions. They fall into three categories: energy efficiency, low-carbon technologies, and a halt to deforestation.

We also know what policies are necessary to drive these actions: tax, carbon trading and regulation; increased technology support; and measures that halt deforestation.

Those countries that persist along the high-carbon route face additional risks. As other countries cut their emissions and attitudes shift, 'dirty' countries will be less competitive if other manufacturers routinely factor in the carbon price, or find new technologies which undercut their high-carbon predecessors. There would also be a threat, whether we like it or not, of countervailing action against exports from 'dirty' countries or production methods.

But this omits a key point: developing countries should want to go low-carbon. Not only is it the future, but it brings huge benefits. Renewable energy sources can free countries from a dependence on imported fossil fuels. Cleaner transport means less pollution and better health. Halting deforestation protects water supplies, controls flooding and provides bio-diversity. The list goes on.

The transition to a low-carbon future can bring major economic gains. Energy efficiency can help boost incomes. Low-carbon technologies can open up new sources of growth and jobs. They can help even the poorest countries leap-frog old approaches – they can avoid the cost of large grids in the way cell phones helped cut the need for telephone wires. And smarter grids can both enhance energy efficiency and enable new technologies whilst cutting transmission costs. New sources of low-carbon energy – hydro, solar – could help create a comparative advantage for some of the poorest countries.

We should not pretend that de-coupling emissions from economic growth will be easy, especially in the poorest countries. We know many of the barriers to the necessary changes. None is insurmountable, and overcoming many is part and parcel of development.

We should remember that, though the cost of action may be high, the cost of inaction is much higher. Low-carbon growth is the only sustainable option. High-carbon growth will choke itself, first on hydrocarbon prices and second, and more fundamentally, on the hostile physical environment it will create. Low growth is unacceptable in a world of poverty and of aspiration. We know what we must do and if we act we create a safer, more equitable and prosperous world. It is now a matter of political will and the greatest international collaboration the world has seen.

But the fact remains that no matter how successful we are with mitigation, we are now committed over the next few decades to some degree of climate change due to the levels of GHGs already in the atmosphere and those which will be emitted in the coming years. That means countries, all countries, will have to adapt. The challenge is particularly urgent for developing countries as they are earliest and hardest hit.

Adaptation is essentially development in a more hostile climate. It is pointless, and indeed even diversionary or disruptive, to attempt a rigid and comprehensive separation of elements of investments in physical or human capital which are marked for 'development' or 'adaptation'.

Many of the poorest people in the world will be the most exposed and vulnerable to the impacts of climate change that will occur over the next few decades. These are also the people who are least able to afford the costs of adaptation, and who have contributed much less than those in the rich world to the current levels of GHGs in the atmosphere. There is a fundamental inequity here and a strong imperative for the rich countries to provide more funds to developing countries, in addition to current development commitments, to fund the extra costs created by climate change.

Sub-Saharan Africa, where per capita emissions from energy are mostly less than 0.5 tonnes per annum compared with over 20 tonnes for the United States and between 10 and 13 tonnes for European countries, will be particularly hard hit by climate change, unless there is a significant investment in adaptation.

We should also be under no illusion that the developed world is exempt from climate risks: it too must and will adapt. In the short to medium term, we risk a drift into 'adaptation apartheid' in which the rich world adapts in the short run by spending more on flood defences and air conditioners, while the developing world faces increased hardship and risk. In the long run, however, as Archbishop Desmond Tutu argued *'the problems of the poor will arrive at the doorstep of the wealthy, as the climate crisis gives way to despair, anger and collective security threats.'*

Neither adaptation nor mitigation will be cheap if carried out properly and responsibly. The global estimates – which are necessarily approximate – from the UNDP of the extra costs for development arising from climate change are in excess of US\$80bn annually by 2015; and that is for a temperature increase of just 0.8 °C relative to the 19th century. They will be far, far higher for the extra 1 to 2°C that now seem likely even if we act responsibly as a world.

On mitigation, the Stern Review estimates that by 2050 the world could hold below 550ppm CO₂e for about 1% of global GDP per annum while holding below 500ppm would cost us about 2%. If the *average* cost per tonne reduced relative to BAU were \$30 in 2050 for the roughly 60 GtCO₂e less than BAU that will be necessary, then the overall cost (\$30 × 60 annual emissions reductions relative to BAU) would be around \$2trn, or 2%, of world GDP in 2050, projected to be around \$100trn. I think that the costs may well be less than this given the very rapid pace of technical progress now that the world is concentrating on this issue.

The majority of these costs will be borne by the private sector. In Europe the main private emitters are already subject to caps and encouraged to live within these by the carbon price. The private sector will also bear the bulk of the cost of adaptation, as people, firms and farms amend their practices and possibly location to fit with changing weather patterns. Indeed, a vibrant, responsible private sector, faced with sound public policies is best placed to deliver the scale of change demanded.

There will clearly be a key financing role for the public sector. Public funding additional to current commitments for ODA is required for adaptation. It is also needed for mitigation, particularly over the next few years, before carbon markets realise their potential. Financial support will be needed for activities as varied as the introduction of new technology (such as the Clean Technology Fund which the British Government helped to establish at the World Bank) and for reducing deforestation. Both are activities where the market may eventually provide substantial or most of

the finance, but there is a need for front loading. The UN Environment Programme (UNEP) estimates that, if done well, public funds can leverage 3 to 15 times the value in investment in low-carbon technologies.

3. A global deal on climate change

We now recognize the problems and understand what needs to be done to combat climate change. What we need now is leadership and collaboration to achieve a global deal.

The global deal must be effective, efficient and equitable.

For developed countries this means commitments to cut their emissions by at least 80% from 1990 levels by 2050, with credible plans to deliver interim targets consistent with this goal. Given the inequities of the history of emissions, whilst the actual emissions of rich countries would fall by at least 80% they should be responsible for paying for more than this. Though part of their overall effort should take place in developing countries where it can be more cost-effective, developed countries must demonstrate the feasibility of low-carbon growth and set an example for others. Whilst most richer countries are in Annex 1 of the Kyoto protocol, and thus have commitments to cut emissions, there are a number of middle income, or indeed, high income non-Annex 1 countries which should start now to scale-up their own action.

For their part, developing countries, although they have contributed less to the build-up of GHGs in the atmosphere than the richer industrialised countries should nonetheless establish and implement their own climate change action plans starting now. They should also signal their long-term commitment to mitigate, but make this commitment conditional on strong action by the developed countries. The conditions placed on developed countries by the developing, a reversal of conventional conditionality, would consist of i) strong targets ii) clear examples of low-carbon growth iii) carbon finance iv) technology sharing v) funding for adaptation. Under these conditions they would take on targets by 2020 as part of a credible plan to cut global emissions to around 2 tonnes per person by 2050. This would require aggregate developing country emissions to peak by 2030, or earlier. But the feasibility of the necessary commitments, and timely peaking, will require strong climate change action plans in developing countries and support from developed countries now.

The proposal by South Korea of a registry of non-Annex 1 actions and requirements is one way of formalising this contribution into a Copenhagen agreement. Many countries are already starting to step up to the plate – they recognise the challenges and are positioning themselves to take advantage of opportunities. Some are ahead of the curve and showing visionary leadership. And they recognise that many of the actions on energy efficiency and technology show strong returns for development even before one allows for climate change.

Stricter caps for Annex 1 countries, combined with credible long-term mitigation plans by them and, developing countries, should help stimulate the flow of carbon finance from the developed world. Reformed markets could be providing between US\$50 to US\$100 billion a year to developing countries by 2030.

Public funding commitments by developed countries will also be a central part of any deal. Public funding should be invested heavily in developing the low-carbon technologies the world requires, including those appropriate for low-income

developing countries. Public funding could deliver quick emissions cuts by supporting initiatives limiting deforestation: it is estimated that \$10 to 20 billion a year could halve global deforestation, that is, cut up to 9% of global emissions. It can and must be integrated with the development choices of the countries where trees stand. Finally, public funding will also be required to help countries adapt to more hostile climates.

We understand now the structure and key elements of a global deal. 2009 is the year when this deal must be struck. Delay will lead to still higher concentrations, greater damage, higher costs later on when we try to start mitigation from higher concentration levels, and an undermining of market confidence now.

4. Climate change and development policy

The design and support of action on mitigation and adaptation in developing countries requires the careful attention of all those working on development. Delivering additional funds on scale is crucial – the long-standing target of 0.7% of GDP of developed countries devoted to ODA, the 2002 Monterey commitments on funding the Millennium Development goals and the G8 2005 Gleneagles agreement for Africa would almost certainly be higher if we had thought more carefully about climate change. The targets were always bare minimum for reaching the Millennium Development Goals before factoring in climate change. Adaptation will increase the burden on developing governments and compensatory funding for this must be additional to current commitments on ODA. In the circumstances any undershooting on those commitments in the coming years would be unjustifiable. As we look forward to the challenges the developing world faces beyond 2015, and we must soon be examining and formulating the successors to the MDGs beyond 2015, I think that our targets for support from the public budgets of rich countries are likely to be closer to 1.0% of GDP than 0.7% for the coming 2 decades. With the private flows that could come with them and the growth and poverty reduction they could help foster, I think that these flows would constitute very wise investments for the world as a whole as well as being our duty as citizens of the world.

However, though funding should be additional, it does not mean that adaptation funds should be programmed separately from development assistance as a whole. Since adaptation is basically development in a hostile climate, there is no sense in separating out funds and thereby distorting our efforts. Some aspects of the ways in which the funds should be allocated will differ from our usual methods for development assistance, for example, where 'compensation' for direct climate effects such as rising sea levels are involved, but even this does not imply that we need new institutions to manage them. One option would be a window alongside IDA. The same would apply for mitigation funding.

Climate change must be factored into the analysis and actions of all development agencies including DFID, we will find that most of the tools needed for adaptation and the challenge of building low-carbon economies are those of mainstream development. And we shall also find that many aspects of development, such as lower-till and lower-irrigation rice cultivation, save resources, reduce emissions and make for greater resilience against climate change. There will be many other examples, including buildings and infrastructure.

Much of the funding for mitigation is expected to come from the private sector, from carbon finance and private investment. There will be strong ODA elements in both mitigation and adaptation. Risk management and guarantee instruments will be

important too as will technological agreements. Development agencies must find ways of helping combine and channel all these sources. This will require them to work in new ways and with new actors.

5. Overcoming our three global challenges together

I have focused so far on the two big global challenges of this century. Let me now say something about the current financial and economic crisis; it is the most serious such crisis for 80 years. This crisis is having a deeply damaging effect on the developing world. Demand for its exports of commodities and manufacturers have been strongly reduced and capital flows are dramatically lower including direct and portfolio investment and remittances. A world recovery is of vital importance to the developing world, and we must remember that this crisis originated in the rich world. And during the downturn and in the process of recovery we must do our utmost to ensure that the methods that are used do not do further damage. I am thinking in particular of the danger of protectionism. But we must also work hard to ensure that our efforts to reconstruct our financial sectors by overly focussing on domestic banks, risks and issues, do not discriminate against trade finance or assets held in and flows to emerging markets.

We should learn two lessons from what has happened:

- First, the longer risks are ignored and allowed to grow, the bigger the consequences when the crash occurs. The origins of the financial crisis go back several years, to the time financial markets were deregulated, to the dotcom bubbles and the complex derivatives which were erected on the back of a housing bubble. We must not underestimate its seriousness. Strong and co-ordinated monetary, fiscal and financial measures are essential now. We must not make the same mistakes again with climate change, where the costs of delay are much worse and far harder to reverse.
- Second, the financial and economic crisis brings the critical opportunity and the requirement to find a driver of long-term sustainable economic growth to lead us out of this crisis: we do not want again to sow the seeds of the next bubble as we emerge from the crash of the last. The US\$2 trillion global fiscal stimulus for 2009/10, if implemented with a long-term vision, offers the chance to invest in new technologies and investments for low-carbon growth. In the next few years we can invest in new patterns of growth that can transform our economies and societies, in much the same way as the railways, electricity, the motor car and IT did in earlier eras. At the Grantham Research Institute, we have called for US\$400 billion of extra public funding to be made available for the 'green component' of the world stimulus over the next year or so; that would be around 20% of a global package of US \$2 trillion. This could enable us to grow out of this recession in a way that both reduces the risks for our planet and sparks off a wave of new technologies which will create 2 or 3 decades of strong growth and a more secure, cleaner and more attractive economy for all of us.

We can and must, now and simultaneously, handle the short-term crisis, foster sound development and economic growth in the medium term, and protect the planet from devastating climate change in the long term. To try to set the three tasks against each other as a three-horse race is as confused analytically as it is dangerous economically and environmentally. In particular, the developed world must demonstrate for all, especially the developing world, that low-carbon growth

is not only possible, but that it can be a productive, efficient and attractive route to overcome world poverty. It is indeed the only sustainable route.

Conclusion

To conclude, I have argued that the two largest challenges facing our generation – climate change and the fight against poverty – are not in conflict. Moreover, sound, strong and sensible action on the current economic crisis, can and must be part of our response.

We need agreement on this vision this year. And we can do it this year.

We have to do it – there is both a fierce urgency, and a big opportunity for not just developed countries but also the developing world to show leadership. The developed world must face up to its responsibilities on both development and climate change. It will require radical change and real resources. But the prize is immense. We can not only manage the profound risks of climate change we can also find a much more attractive and stronger form of growth: a growth that can last and help us overcome world poverty. I believe that the developing world, if we in the rich world play our part, will accelerate its actions and we can together create an international collaboration which can transform the way the world works together.

We know what we have to do. 2009 offers unprecedented opportunities. Let us not waste them.