Other worlds are possible

Human progress in an age of climate change

Forewords by R K Pachauri, Ph.D, Chairman of the Intergovernmental Panel on Climate Change and Prof. Herman Daly, University of Maryland

---

The sixth report from the Working Group on Climate Change and Development

R K Pachauri Ph.D

'It is crucial that we engage in fresh ways of thinking about development and sustainability. This volume provides a valuable perspective to policymakers and financial institutions on how new development approaches can be achieved.'

Prof. Herman Daly

'Climate change, important as it is, is nevertheless a symptom of a deeper malady, namely our fixation on unlimited growth of the economy as the solution to nearly all problems.'

Prof. Jayati Ghosh

'The presumptions and aspirations of what constitutes a civilised life will have to be modified. The model popularised by 'the American Dream' is perhaps the most dangerous in this context, with its emphasis on suburban residential communities far from places of work, market and entertainment and linked only through private motorised transport.'

Prof. Wangari Maathai

'People have to feel that they belong, and the voice of the minority must be listened to, even if the majority has its way. We need systems of governance that respect human rights and the rule of law and that deliberately promote equity.'

Prof. Manfred Max-Neef

'Solutions imply new models that, above all else, begin to accept the limits of the carrying capacity of the Earth: moving from efficiency to sufficiency and well-being. Also necessary is the solution of the present economic imbalances and inequalities. Without equity, peaceful solutions are not possible.'

David Woodward

'The alternative economic model described here revolves primarily around a revitalisation of rural economies, taking advantage of the synergies arising from consumption patterns at low-income levels (raising demand, production and consumption of basic goods, of and by low-income communities in a virtuous cycle).'

This report represents the work and views of a range of individuals and civil society groups. It is a contribution to the debate on what other worlds are possible. Not all the views and policies discussed are necessarily held by all the groups and individuals.

Photo: © Nigel Dickinson/WWF-UK

Contents

Foreword by R K Pachauri

'It is crucial that we engage in fresh ways of thinking about development and sustainability. This volume provides a valuable perspective to policymakers and financial institutions on how new development approaches can be achieved.'

The *Up in Smoke?* series was launched in 2004 by members of the UK's environment and development communities in order to address the threats posed by climate change to human development. Since the publication of the first volume, the findings issued by the Working Group on Climate Change and Development have only become even more crucial. It is increasingly clear that climate change will have a significant impact on the world's most vulnerable regions, influencing economic opportunities or the lack of them, as well as resource availability and human health. I was privileged to write the foreword for two volumes of this report, first in 2004 and again in 2007, and I am pleased to see that *Other worlds are possibl*e, the final volume in this series, expands upon the series' earlier findings by presenting analysis that supports a change in our current development paradigm.

It is clear that current mitigation and adaptation responses are inadequate and that the model of development currently being pursued globally will only exacerbate the worsening impacts of climate change. The Fourth Assessment Report of the Intergovernmental Panel on Climate Change (AR4) states, 'There is high agreement and much evidence that with current climate change mitigation policies and related sustainable development practices, global GHG emissions will continue to grow over the next few decades.' This growth in emissions will exacerbate problems in vulnerable developing states and could easily lead to economic and social turmoil, in turn posing an even greater threat to the environment, human life and global security. Therefore, the current pattern of development pursued worldwide will continue to endanger the well-being not only of citizens in developing countries but also of those in the developed world.

The *Up in Smoke?* series has thus far focused on defining the grave challenges presented by global climate change and emphasising the urgent need for new development models. This volume identifies how we might encourage new approaches towards development. By exploring new focus areas for policy, calling for changes in fundamental principles of our economic system, and highlighting steps towards achieving an alternative model of growth and development, *Other worlds are possible* explores how, with innovation and effort, we can achieve a development model that is sound and sustainable, using alternatives that are currently within our reach.

In order to move towards a sustainable future, it is crucial that we engage in fresh ways of thinking about development and sustainability. This volume provides a valuable perspective to policymakers and financial institutions on how new development approaches can be achieved. I sincerely hope that this important publication will be regarded as a call-to-action for the creation of a more responsible and sustainable development paradigm.

R K Pachauri Ph.D, Chairman, Intergovernmental Panel on Climate Change
Director-General, The Energy and Resources Institute
Director, Yale Climate and Energy Institute

Foreword by Prof. Herman Daly

'Climate change, important as it is, is nevertheless a symptom of a deeper malady, namely our fixation on unlimited growth of the economy as the solution to nearly all problems.'

Climate change, important as it is, is nevertheless a symptom of a deeper malady, namely our fixation on unlimited growth of the economy as the solution to nearly all problems. Apply an anodyne to climate and, if growth continues, something else will soon burst through limits of past adaptation and finitude, thereby becoming the new crisis on which to focus our worries.

The fact that the contributors to this volume realise this makes *Other worlds are possible* a serious study. The fact that they seek qualitative development that is not dependent on quantitative growth makes it a hopeful study. It is a valuable collection of the specific and the general, of the grass roots details and the macroeconomic big picture regarding climate change and economic development.

The reader is told up front that, 'This report represents the work and views of a range of individuals and civil society groups. It is a contribution to debate on what other worlds are possible. Not all the views and policies discussed are necessarily held by all the groups and individuals'. Although I did not find any contradictions among the various contributions, they differ greatly in approach and perspective—mainly between top-down and bottom-up modes of thought. Some people like to start with a big picture. They are impatient with concrete details until they can fit them into or deduce them from a framework of meaning consistent with first principles. Others are impatient with a big picture unless they first have a lot of concrete details and examples that inductively suggest a larger pattern. I confess that I belong to the first type, but that is more of a bias than a virtue. Both approaches are necessary, and are present in this collection, but the bottom-up predominates, at least in number of pages.

My advice to the top-down types is to first read Max-Neef's fine big-picture essay. Then fit in the inspiring examples of Kenya's Green Belt Movement, Thailand's self sufficiency, Bhutan's Gross National Happiness, the Happy Earthworm Project, the Happy Planet Index, etc. More inductive types should save Max-Neef for last. I do not mean to characterize Max-Neef as a top-down thinker since he has spent much of his life doing grass roots, 'barefoot' economics. But in this volume's division of labour his is the big-picture essay.

To have packed so much information, inspiration, and analysis into less than 100 pages of clear prose leaves the reader grateful to the authors, the Working Group on Climate Change and Development, and **nef**.

Professor Herman E. Daly, Ecological Economist at the School of Public Policy, University of Maryland and Author of *Steady-State Economics* and *Beyond Growth*

About the *Up in Smoke?* series

Five years of work by the Working Group on Climate Change and Development
The *Up in smoke r*eports are published by the Working Group on Climate Change and Development, which is coordinated by **nef** (the new economics foundation) and IIED (the International Institute for Environment and Development). They can be downloaded from http://www.upinsmokecoalition.org

The first five reports revealed the comprehensive threat from global warming to human development, and the need for a collective, rapid and equally comprehensive response. Altogether they highlighted the urgent need for new development models. This report: *Up in smoke? Other worlds are possible*, the sixth in the series, explores potential new models which might both address climate change and be resilient to it.

Up in smoke?
Threats from, and responses to, the impact of climate change on human development (2004)

What is particularly noteworthy is the fact that this document is being released at an event that benefits from the presence and support of a large number of NGOs involved essentially in development activities. Climate change requires full understanding of its implications for development and, therefore, this document assumes great significance, since reading it would help to define how development policies and actions should and must reflect the reality of climate change today and the prospects of climate change in the future.

R K Pachauri, Ph.D, Chairman of the Intergovernmental Panel on Climate Change (IPCC); Director-General, TERI (The Energy and Resources Institute)

Africa – Up in smoke?
The second report from the Working Group on Climate Change and Development (2005)

I am delighted that such a broad group of environment and development organisations, many of which are faith based, have come together to speak with a common voice, drawing attention to climate change in the African context. It is well known that climate change will have particularly devastating effects on Africa. Indeed, case studies in this report suggest that this is already happening. But this report also shows the strength and creativity of African people in times of stress. What is needed most now is that Africans are supported in their efforts to build on these strengths.

Archbishop Desmond Tutu

Up in smoke? Latin America and the Caribbean
The threat from climate change to the environment and human development
The third report from the Working Group on Climate Change and Development (2006)

This publication – the product of the commitment and effort of a group of concerned agencies – is an important contribution to greater awareness about climate change. It is a call to action not just for the governments and peoples of Latin America and the Caribbean but also for leaders in developed countries, the principal emitters responsible for the impacts and effects climate change.

Juan Mayr Maldonado, Former Minister of Environment, Colombia; President of the first Conference of the Parties to the UN Convention on Biological Diversity

Betty Mkusa, Malawi, is growing drought resistant new breed of plants, in this case Jathropa, which can be used to produce oil and be used to make soap. “I am trying to grow plants that can survive”, she says.
Photo: Marcus Perkins/Progressio.

Africa – Up in smoke 2
The second report on Africa and climate change from the Working Group on Climate Change and Development (2006)

Africa of course is… seen by experts as particularly vulnerable to climate change. The siz e of its land mass means that in the middle of the continent, overall rises in temperature will be up to double the global rise, with increased risk of extreme droughts, floods and outbreaks of disease.

Tony Blair, former UK Prime Minister

Up in smoke? Asia and the Pacific
The threat from climate change to human development and the environment
The fifth report from the Working Group on Climate Change and Development (2007)

Going through the foreword that I wrote for the 2004 volume, I find that the concerns and priorities that I had touched on as part of that write-up, if anything, have become stronger… It is hoped that this volume will be read carefully by policy-makers, researchers, industry executives and members of civil society in Asia and elsewhere, to gain insights into the challenge of climate change in this region and the steps required to tackle it.

R K Pachauri, Ph.D, Chairman of the Intergovernmental Panel on Climate Change (IPCC); Director-General, TERI (The Energy and Resources Institute)

Summary and introduction

The faith in 'development' can no longer escape criticism, not only because it justifies huge increases in social inequality, but because it has become dangerous, by compromising everybody's future.

Gilbert Rist, author of *The history of development*[1]

This report argues that our chances of triumphing over climate change will rise dramatically if we change the context within which we 'fight its fire'. More than that, it suggests that we are already surrounded by a sleeping architecture of better ways to organise our economies, communities and livelihoods. We have, in fact, much more choice about our collective economic future than we have been led to believe. The challenge, it seems, is now clear, and many of the solutions known. The task is to act.

In October 2004, *Up in smoke? the first report from the UK Working Group on Climate Change and Development*, warned that climate change threatened a great reversal of human progress. It created a united call for action from environment and development groups and identified three overarching challenges:

1 How to stop and reverse further climate change.

2 How to live with the degree of climate change that cannot be stopped.

3 How to design a new model for human progress and development that is climate proof and climate friendly and gives everyone a fair share of the natural resources on which we all depend.

Whilst great flurries of activity now surround the first and, to a lesser degree, the second of these questions, it is the third which remains neglected. If anything, as the world struggles to recover from a major economic recession, the opposite is happening. From the banking sector to high street consumerism in rich countries, there appears to be a rush to return to business as usual. It as is if policy-makers and commentators find it impossible to imagine a world fundamentally different, and better, than the one we already have. Yet the danger is that, without deeply rethinking our economic system to deliver good lives which do not cost the Earth, we will end up with a world much worse than the one we have.

This is not a time for conventional thinking or outdated dogma but for fresh and innovative intervention that gets to the heart of the problem.

UK Prime Minister, Gordon Brown, October 2008[2]

A narrowing of visions

'Development' should mean different things in different places and cultural settings. It should describe a plurality of ways of seeing and interacting with a complex and varied world, itself shaped by diverse political and economic agendas. It should be a difficult word to define because its meaning changes across time and space.

Unfortunately, however, it is not. If anything, it has come to mean something uniform – a one-path-fits-all trajectory for societies, regardless of place, culture and circumstance. A narrow economic definition of the term has come to dominate; its meaning largely set by industrialised countries to favour their own economic interests.

But, this report is not an attempt to produce a singly alternative manifesto to business-as-usual; it is an argument for plurality of development models. We have the unprecedented challenge of meeting human need in the face of climate change, resource scarcity and a deeply troubled world economy. To this upheaval, there is unlikely to be a single other answer.

We are confident, however, of the urgent need to use different models. In that light, the report is an invitation to consider them, to begin to think more creatively and openly about how to organise human affairs on a planet whose life support systems are stressed by our presence. And what, anyway, is the meaning of development, if it undermines the very life-support systems upon which we depend.

At the very least, we are convinced that no one-size-fits-all economic approach is viable any longer.

In five previous reports, the Working Group on Climate Change and Development revealed a global picture of impacts from, and responses to climate change as seen at the community level. The reports were full of scenes of day-to-day crises and disaster management. *Other worlds are possible* is different. It makes the case that we have the power to change the context within which we have to 'firefight' the challenges of climate change and resource scarcity. And, as such, fundamentally change the likely outcomes for society for the better. More than that, it makes the simple point that we are already surrounded by a sleeping architecture of alternatives, some further evolved than others, but all indicative of the fact that we have much more choice about our collective economic future than we have been led to believe.

Broader horizons

Other worlds are possible begins by outlining key trends that, inescapably, demand change to how real human development is secured. Then there are four essays written by world-leading thinkers from the South, and practitioners on development.

Their experience covers Asia, Africa and Latin America, as well as the corridors and meeting rooms of the international financial institutions. They include: Prof. Jayati Ghosh from India, Nobel Prize winner Prof. Wangari Maathai from Kenya, and the development economists Prof. Manfred Max-Neef from Chile, and David Woodward based in Cambodia.

Professor Jayati Ghosh makes the case that without new, less materialistic and aspirational role models for human development, that can realistically be pursued in the light of climate change and resource scarcity, poorer countries are being set up to fail. And, of course, if they fail, by environmental implication, so does everyone else. She writes that the way wealthy nations like the United States have developed has left them vulnerable, and is not the path for others to follow:

> *The presumptions and aspirations of what constitutes a civilised life will have to be modified. The model popularised by 'the American Dream' is perhaps the most dangerous in this context, with its emphasis on suburban residential communities far from places of work, markets and entertainment and linked only through private motorised transport.*

Professor Wangari Maathai argues for a revolution in democratic participation and inclusion in the way that important economic development decisions are made. Both to adapt to climate change and to leap-frog dirty development, significant new financial resources will be needed, along with appropriate technology transfer. Equity and the maintenance of the environment, as the basis for people's livelihoods, must take centre stage in policy decisions, she writes:

> *For humankind to manage and share resources in a just and equitable way, governance systems must be more responsive and inclusive. People have to feel that they belong, and the voice of the minority must be listened to, even if the majority has its way. We need systems of governance that respect human rights and the rule of law and that deliberately promote equity.*

Professor Manfred Max-Neef sets out conclusively to demystify and dispense with the notion that the global economy has no alternative directions it can take. He identifies a series of new fundamental principles upon which he believes we can build. The shape of the future is one of far greater regionalisation and localisation of markets:

> *Solutions imply new models that, above all else, begin to accept the limits of the carrying capacity of the Earth: moving from efficiency to sufficiency and well-being. Also necessary is the solution of the present economic imbalances and inequities. Without equity, peaceful solutions are not possible. We need to replace the dominant values of greed, competition and accumulation, for those of solidarity, cooperation and compassion. The paradigm shift requires turning away from economic growth at any cost. Transition must be towards societies that can adjust to reduced levels of (overall global) production and consumption, favouring localised systems of economic organisation.*

David Woodward, with direct experience ranging from the international financial institutions to the United Nations, argues that systemic change is unavoidable, possible and desirable given the challenges ahead. He believes that a clear outline of a new, flexible development model is visible, one that can both eradicate poverty and address climate change and resource scarcity. Its first steps look much like a global 'Green New Deal':

> *The alternative economic model described here revolves primarily around a revitalisation of rural economies, taking advantage of the synergies arising from consumption patterns at low-income levels (raising demand, production and consumption of basic goods, of and by low-income communities in a virtuous cycle). It also looks at the potential for widespread application of micro-renewable energy technologies in rural areas, exploiting the potential for considerable cost reductions and technological improvements from the creation of a mass market.*

There then follows a wide range of examples of the 'sleeping architecture' of change, drawn from the practical experience of the members of the Working Group on Climate Change and Development. These demonstrate that other worlds are not only possible, but are being created right now. The difference will be whether governments and financial institutions continue to support old, failed approaches, with their policy frameworks and our financial resources, or whether they will move to encourage and replicate new approaches that take account of our changed economic and environmental circumstances.

Box 1. The continuing challenges and commitments for *Up in smoke*…

Up in smoke? – the first report from the Working Group on Climate change and Development – joined together the UK's environment and development communities in a united view on the minimum action necessary to deal with the threat posed by climate change to human development. The proposals it called for in October 2004, repeated below, are much more urgent now that the science is suggesting that we may be just a few years away from entering a new, more perilous and potentially irreversible phase of warming.

Three overarching challenges include:

1. How to stop and reverse further climate change.
2. How to live with the degree of climate change that cannot be stopped.
3. How to design a new model for human progress and development that is climate proof and climate friendly and gives everyone a fair share of the natural resources on which we all depend.

In view of the above, our urgent priorities include:

- a global risk assessment of the likely costs of adaptation to climate change in poor countries;
- commensurate new funds and other resources made available by industrialised countries for poor country adaptation (bearing in mind that rich-country (OECD) subsidies to their domestic, fossil-fuel industries stood at US$73 billion per year in the late 1990s);
- effective and efficient arrangements to respond to the increasing burden of climate related disaster relief;
- development models based on risk reduction, incorporating community-driven coping strategies in adaptation and disaster preparedness;
- disaster awareness campaigns with materials produced at community level and made available in local languages;
- coordinated plans, from local to international levels, for relocating threatened communities when desired by the communities, with appropriate political, legal and financial resources; and
- removing barriers to developing countries gaining access to appropriate technologies.

In addition to these, as organisations striving to improve human well-being in the face of enormous challenges, we will:

- work towards a collective understanding of the threat;
- share the best of our knowledge about how to build human and ecosystem resilience and live with the degree of climate change that is now unstoppable; and
- do everything in our power to stop dangerous climate change and help bring about a global solution that is fair and rooted in human equality.

All past reports of the Working Group on Climate Change and Development can be found at http://www.upinsmokecoalition.org

In October 2008, one of the chief architects of the current global economic order, Alan Greenspan former chairman of the US Federal Reserve, made a historic admission of error:

> *I discovered a flaw in the model that I perceived is the critical functioning structure that defines how the world works.*[3]

Speaking at around the same time in response to the global financial crisis, the UK Prime Minister, Gordon Brown, said:

> *This is not a time for conventional thinking or outdated dogma but for fresh and innovative intervention that gets to the heart of the problem.*[4]

Now is the time to embrace that appetite for new thinking. This report demonstrates that there is no shortage of new ideas to choose from.

Part 1: What is development?

Most definitions of development have common characteristics. Typically, they say something about: improving human well-being and realising our potential in safe and clean environments; creating fair and just forms of governance; providing economic and political freedoms for all; and allowing us to lead dignified and fulfilled lives.[5]

These ambitions are almost universally supported, at least in word. But, their achievement is set heavily in the context of conventional global economic growth. And, such growth is hard-wired at planetary level to the increased use of already-overused resources. Questioning growth tends to cause a reflex action amongst most policy-makers and economists. It is, for many, still heresy.

Yet an active debate has raged at the margins for more than four decades. And, as recently as 2007, writing in the book *Do good lives have to cost the Earth?*, Adair Turner, former head of the Confederation of British Industry, chair of the official UK Climate Change Committee, and now head of the Financial Services Authority, commented:

> *We should… dethrone the idea that maximising the growth in measured prosperity, GDP per capita, should be an explicit objective of economic and social policy.*[6]

But still, according to received wisdom, you can't have development without all that global economic growth entails in terms of its human and environmental costs. The logic runs in circular fashion, rather like accepting that you must work hard, in often poor conditions, worsened sometimes by the economic activity itself, to earn the money, to buy the medicine, to cure yourself of the illness from which you are suffering, because of your over-work in poor conditions. Regardless of the logic, the strategy in practise, along with the typical set of policies that come attached to it, has proved increasingly inefficient and ineffective in recent decades.[7]

The conviction that development is dependent on global economic growth, the result of all countries whether already rich or poor pursuing strategies of economic growth, is a major driver of the destruction of the natural environment. Growth in those areas and countries where 'under-consuming' is the norm, is another matter and is likely to accompany successful poverty reduction. For nations and regions which embrace both great wealth and extreme poverty, redistribution presents itself as the quicker, more effective and less damaging approach than trusting to the vagaries of trickle-down from growth. But in the old convictions about global growth as a panacea, it is as if we hope that by turning natural capital into financial capital we can somehow disengage ourselves from our dependence on the natural environment. In climate change we find evidence that this approach is misguided, myopic and unsustainable.

At the level of most governments, both North and South, there appears to be no consideration of a fundamental alternative to this view of development. Faced with critical flaws in the basic model – such as climate change and the threat of consigning to history the climatic conditions under which civilisation emerged, and the shrinking share of the benefits from global growth reaching the poorest – the official response seems to be to soldier on and hope for the best. For some reason, changing course for a different sea or safe harbour is not considered an option. We must steam ahead, holed below the water line, through iceberg-infested waters, simply because that is the course originally set, and now no one feels able to change it.

Where does this narrow view of development come from? In their book *The Earth Brokers: Power, politics and world development*, investigative journalist, Pratap Chatterjee and political scientist, Matthias Finger argue:

> *Industrial development…can be traced back to the Industrial Revolution and beyond. Indeed, the idea of development is rooted in the Enlightenment ideal of a rational society of free and responsible citizens, i.e., ultimately a society governed by scientific principles and managed accordingly. The emergence of industrial production in the nineteenth century was rapidly incorporated into the development paradigm: industrial development came to be seen as a means – so to speak the motor – of making this modern and rational society come true. Unfortunately, the means turned into an end, development became a goal in itself.*[8]

Since the Second World War, development, so-called, has been as much about power play and geo-politics as it has the improvement of people's lives. As Chaterjee and Finger write, the Cold War underpinned the Western development paradigm and the values upon which it is based:

> *The Cold War became one of the driving forces of industrial development, because it stimulated scientific and technological progress on the one hand, and promoted military-induced industrial production on the other…the Cold War cemented the nation-state system and thus reinforced the idea that nation-states were the most relevant units within which problems had to be addressed. Indeed, because of the Cold War, the nation-states continued to be seen as the units within which development occurs and must be promoted, because it is economic and military strength that defines each nation's relative power… Again, industrial development came to be seen as a means to enhance national power…*[9]

Unfortunately, however, the development paradigm, and the literal means of fuelling it, could render the planet uninhabitable. As NASA climate scientist, Professor James Hansen argues:

> *If humanity wishes to preserve a planet similar to that on which civilisation developed and to which life on Earth is adapted… CO_2 will need to be reduced from its current 385 ppm to at most 350 ppm [parts per million] CO_2, but likely much less than that… If the present overshoot of this target CO_2 is not brief, there is a possibility of seeding irreversible catastrophic effects.*[10]

The problem is that, there are no realistic, foreseeable scenarios, based on perpetual, global economic growth, that enable Hansen's target to be met. But growth as a means of ending poverty has been failing on its own terms, too, with a shrinking share of benefits reaching those who need it most, and generating the paradox that the already-rich now have to consume ever more, to deliver a shrinking share of benefits to the poorest.[11]

Climate change is a serious threat to human development. But it is also holds opportunity. Rethinking how to share a finite planet, meeting our collective needs whilst living within environmental limits could not only rescue civilisation (yes, the stakes are that high) but be a way to tackle deeply entrenched problems of social injustice, and greatly improve overall human well-being.

Not everyone subscribes to this narrow view of development. Increasingly critical voices are being raised. Some key ones are in this report. It looks as if the narrow, conventional definition of development has been partly to blame for the many global environmental, social, political and economic problems we face.

Has the dominant development paradigm failed?

When did the Western notion of development come to dominate – during the Industrial Revolution or after the Second World War? For the purpose of this report, we refer back to around the 1950s to assess its achievements and failings. The popular economist, Jeffrey Sachs, sees economic development as a ladder of growth, 'with higher rungs representing steps up the path to economic well-being'.[14] He adds:

> *The good news is that well more than half of the world, from the Bangladesh garment worker onward…is experiencing economic progress. Not only do they have a foothold on the development ladder, but they are actually climbing it. The climb is evident in rising personal incomes and the acquisition of goods such as cell phones, television sets, and scooters… The greatest tragedy of our time is that one sixth of humanity is not even on the development ladder.*[15]

Yet this view takes no account of ecological limits. Similarly, the UK Chancellor of the Exchequer, Alastair Darling, attempting to boost confidence in the midst of recession, pointed out that the global economy stood to double in size over the next 20 years.

Box 2. The tragedy of development[12]

As climate change accelerates and the rate of plant and animal extinctions speeds up it's possible to see something deeply Faustian in the pact civilisation has made to advance its material standards of living. Instead of a soul being sold for power and success, though, in the age of climate change a one-off fossil fuel inheritance that took tens, even hundreds of millions of years to accumulate, has been burned in a few human generations. In the face of climate change, it is a kind of economic transformation through the dissolution of life-supporting ecosystems. And Faust is the literary character identified by the academic Marshall Berman as the spirit and architect of the modern age.[13]

Whatever is considered modern is considered necessary and unstoppable. Even unaware we all struggle for the mantle of modernity. But the brightness can be blinding. In Goethe's famous tragedy there is a parable for development and the growth economy. Faust's character has many incarnations. His first self is the dreamer. But the dreamer is dissolved and Faust transformed into the lover. Finally, in his last transformation and 'romantic quest for self-development… he will work out some of the most creative and some of the most destructive potentialities of modern life,' writes Berman, 'he will be the consummate wrecker and creator, the dark and deeply ambiguous figure that our age has come to call, "the developer".'

He dramatises a core contradiction of the global economy. Faust is 'convinced that it is the common people, the mass of workers and sufferers, who will benefit most from his work… (but) he is… not ready to accept responsibility for the human suffering and death that clear the way'. Faust progresses, brutally clearing from his path whatever obstacles he comes across even if they are the same people in whose name he builds. The scenes of forced relocation that accompany Faust's work will be instantly recognisable to anyone who has seen the great modern dam projects of China or India.

Berman explains: 'Goethe's point is that the deepest horrors of Faustian development spring from its most honourable aims and its most authentic achievements.' Similarly, the promise of better lives flowing from unrestrained global economic growth unwittingly unleashes forces (amongst them greenhouse gases) that stand to do more harm than growth can repair and do good. The idea of growth, wrapped in self-important modernity, ignores the cost of the means, and then loses sight of the original ends. Faustian development 'entails seemingly gratuitous acts of destruction – not to create any material utility but to make the symbolic point that the new society must burn all its bridges so there can be no turning back'.

From: *Ecological Debt: Climate change and the wealth of nations* by Andrew Simms (**nef** Director of Policy), published by Pluto Books.

Photo: © Nigel Dickson / WWF-UK

But, as Professor Roderick Smith of the Royal Academy of Engineering at Imperial College, observed, with each 'doubling' of the economy, you use as many resources as with all the previous doublings combined (just as 8 exceeds the sum of 1, 2 and 4). He wrote that the physical view of the economy 'is governed by the laws of thermodynamics and continuity' and so 'the question of how much natural resource we have to fuel the economy, and how much energy we have to extract, process and manufacture is central to our existence'.[16]

Humans already use more natural resources and produce more waste than global ecosystems can replace and absorb. One way of illustrating our impact on the environment that brings a sense of perspective, comes from looking at the day in a typical calendar year when the world, in effect, starts overshooting its biocapacity and begins eating into its stock of natural resources. The planet can tolerate a little give and take without environmental collapse as long as, in total, humanity lives within its overall ecological budget. The last year that humanity's levels of resource use fell within the means of our life-supporting natural assets was 1987. As global consumption grows,

the day each year when the world as a whole goes into ecological debt creeps ever earlier in the calendar year. In 1995 it was 25 November. By the turn of the millennium world ecological debt day had advanced to 1 November. In 2007, the world's human population as a whole went into ecological debt on 6 October – two years on this has lurched forward 11 days to the 25 of September.[17] This means that, as a species, we are already in a kind of deficit, an ecological debt.

In Sachs' book, *The End of Poverty,* he fails almost entirely to acknowledge that we live on a finite planet.[18] Or, to consider that, rather than trying to get everyone to ascend the development ladder of material accumulation, another option is for the rich to reduce their consumption, and meet the rest of the world in the middle at the level of sufficiency and sustainability. Sachs' more recent book, Common Wealth: Economics for a crowded planet, does finally acknowledge ecological limits but without working through their full implications. But why has it taken mainstream economists so long to recognise the links between environment and economics, and why do so many still fail to make this link?

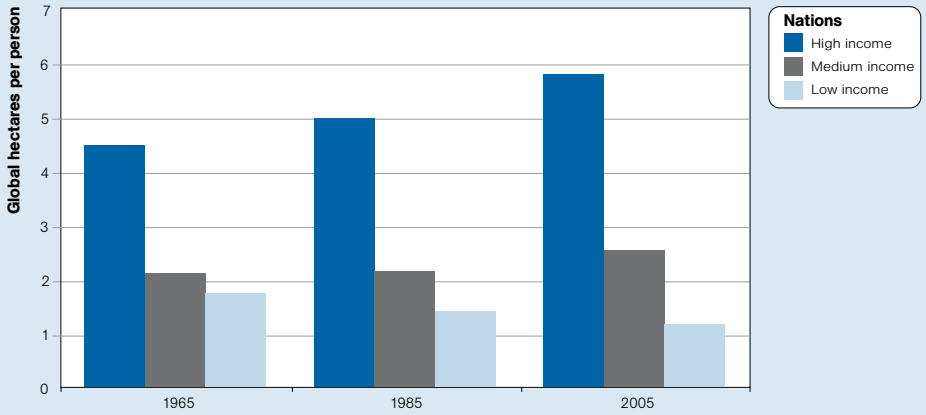
Because, not only is there insufficient space on the top rung of the ladder of high natural resource use for everyone, observations of consumer behaviour in wealthy countries reveal that there is no top rung. Dissatisfaction with material accumulation is built into the process. 'Wants' can never be satisfied. They are driven ever upwards by carefully engineered demand. Only sufficiency is possible for all.[19]

Yet there is a continued focus on economic growth as the answer to all the world's ills. For example, the Commission on Growth and Development (funded by the governments of Australia, the Netherlands, Sweden, the United Kingdom, the World Bank, and the William and Flora Hewlett Foundation) was 'brought together by the belief that the world's challenges – political, environmental, misunderstandings within and between nations, vast differences in living standards within and across countries – are best met in conditions of rising and sustained prosperity, and expanding opportunities'.[20] Its underlying assumption is that '…poverty cannot be reduced in isolation of economic growth…'[21]

However, recent research shows that, 'global economic growth is an extremely inefficient way of achieving poverty reduction'.[22] In the 1990s, it points out, to achieve a single dollar of poverty reduction for those living on less than $1 per day; it took $166 of extra global production and consumption, generating enormous environmental impacts which counter-productively hurt the poorest most. The research stated:

> *In the process of their voracious growth, the economies of Europe and the United States are setting aspirational models of economic development for the rest of the world to follow. But to copy their lifestyles, in an environmental context, is fundamentally unsustainable. For everyone to live at the current European average level of consumption, we would need more than double the biocapacity actually available – the equivalent of 2.1 planet Earths – to sustain us. If everyone consumed at the US rate, we would require nearly five…The problem is one of inverse dynamics…the benefits of economic growth accrue only very weekly to the poorest members of the global community. The costs of growth, however, for example in the consequences of climate change, fall disproportionately on the poorest. As a result, the pursuit primarily of an economic growth strategy to eradicate poverty quickly becomes perverse.*[23]

Figure 1 : Average ecological footprint per person



Source: Simms *et al* (2009) *Comsumption Exlosion* (London: **nef**).

A system has emerged in which the already wealthy become both relatively and absolutely wealthier, receiving the bulk of the benefits of growth. This happens as ownership of everything from property to company shares increases their earning potential. At the same time, the poorest slip further behind, and have their well-being and prospects further undermined by environmental degradation and the fall-out from inequality.

So engrained is the unequal distribution of benefits in this system that in a country like the UK, as the impact of the recession deepened, with increasing numbers of people losing their jobs and homes, many of the country's richest (in this case those with an average wealth of £1.2 million) not only didn't lose out, but 40 per cent of them grew richer still.[24] One reason for this is that, both proportionately and in absolute terms, the rich accumulate more assets, the ownership of which further increases their earning potential and cushions them when hard times strike.

Figure 1 shows that consumption and the ecological burden per person has grown much faster in high-income nations compared to medium- and low-income nations. In high-income nations, the average per capita footprint grew from 4.5 global hectares (gha)[25] per person in 1965 to 4.9 in 1985 and 5.7 in 2005 – an overall increase of almost 30 per cent. In low-income nations the average per capita footprint actually fell from 1.7 gha per person in 1965 to 1.2 gha in 2005; a decrease of just over 40 per cent.[26]

Losing the nursery of civilisation?

The prospect of human development, however defined, looks bleak if we stand to lose, as NASA's James Hansen put it, 'a planet similar to that on which civilisation developed and to which life on Earth is adapted'.[27]

This would prove to be a double failure. First, what kind of development is it that potentially bankrupts its own life-support system? And, second, what kind of meaningful development is possible if the life-support system is chronically compromised?

The growth and growth of emissions

At the time of the Industrial Revolution, CO_2 levels in the atmosphere stood at 280 ppm and now, after 200 years of development they stand at approximately 390 ppm and are rising at an alarming rate. The change is a direct result of a global economy historically and still overwhelmingly dependent on fossil fuels.

Even though the North's Industrial Revolution was powered by fossil fuels, almost half of the CO_2 emissions since 1750 have occurred in the past 30 years. That is the case despite the rise of the environmental movement, a huge energy conservation drive after the 1973 and 1979 oil shocks, and a growing understanding of the science of climate change gleaned from four Intergovernmental Panel on Climate Change (IPCC) reports.

The latest figures from the Global Carbon Project, an international collaboration of leading climate research institutions, estimate that the average annual growth rate in emissions was 3.4 per cent between 2000 and 2008. At the same time, globally, there is no sign of a slowing in the growth of emissions. There has been a constant or slightly increasing trend in the carbon intensity of energy (carbon emissions per unit of energy) over recent years, in both developed and developing nations.[28]

Of the 3.4 per cent mentioned above, 18 $\pm$ 15 per cent of the growth rate is due to carbon-cycle feedbacks (for example less carbon being absorbed by ecosystems affected by climate change or other impacts), while 17 $\pm$ 6 per cent is due to the increasing carbon intensity of the global economy (the ratio of carbon per unit of economic activity). The remaining 65 $\pm$ 16 per cent is due to the increase in global economic growth.[29]

Put simply, this means that each time governments congratulate themselves for achieving 'record levels of economic growth', global atmospheric concentrations of CO_2 conspicuously creep forward.

In June 2009, Dutch researchers from the Netherlands Environment Assessment Agency (NEAA) found that growth rates in carbon dioxide from the burning of fossil fuels and cement production had halved between 2007 and 2008 because of the global economic recession.[30] The drop in production, however, was insufficient to stall growth rates completely. Emissions are still moving fast in the wrong direction, growing at a rate of 1.7 per cent between 2007 and 2008. The analysis based on BP's data on fossil fuel consumption in 2008 found that the slowdown in emissions growth was primarily due to a 0.6 per cent fall in the consumption of oil – the first observed decline in global oil use since 1992.

However, this trend was unevenly distributed around the world. According to researchers, oil use in China continued to rise, but at only 3 per cent, down from an average of 8 per cent since 2001. In the USA, oil consumption fell by 7 per cent, coal consumption slowed by 1.7 per cent, while consumption of natural gas remained constant.

The analysis by NEAA also showed that in 2008, the developing world accounted for 50.3 per cent of CO_2 emissions. It is the first time that emissions from developing nations have exceeded emissions from a combination of developed nations and international travel. This figure does, however, gloss over both the huge, continuing disparities in per capita emissions in rich and poor countries, and the far greater historical responsibility of developed nations for the accumulation of greenhouse gases.

Cumulatively, since the mid-eighteenth century, developing and least-developed economies representing the great majority of the human population, have accounted for just 23 per cent of global emissions.[31] But these are extraordinarily conservative estimates because of the methods employed to monitor emissions.

In 2001, approximately five billion tonnes of CO_2 were embodied in the international trade of goods and services, most of which flowed from developing nations (non-Annex 1 nations of the United Nations Framework Convention on Climate Change (UNFCCC)) to developed nations (Annex 1 nations of the UNFCCC) – that is five billion tonnes excluded from developed nations emissions inventories.[32] This is greater than total annual CO_2 emissions from all EU25 nations combined.[33] Rather than decarbonising, the developed world has simply been outsourcing a significant proportion of its production with the effect of 'carbon laundering' the economies of countries like the UK and the USA.

What target CO_2?

Currently, even the most stringent targets are almost guaranteed to push global temperatures 2°C or more above pre-industrial levels – the point which is widely considered the maximum 'safe' level above which dangerous climate change could occur.

But it is worth noting that there is nothing particularly 'safe' about global surface temperature rise of even 2°C. As Professor Rahmstorf from the Potsdam Institute says:

> *If we look at all of the impacts, we'll probably decide that two degrees is a compromise number, but it's probably the best we can hope for.*[34]

Indeed, NASA's James Hansen argued in 2007 that temperatures should not go beyond 1.7°C (or 1°C above 2000 temperatures) if we are to avoid aiming to avoid practically irreversible ice sheet and species loss.[35] In terms of the social impacts of climate change, what is manageable for some is actually catastrophic for others. For example, small island states argue that 1.5°C is a better target as many of them will disappear with warming beyond this point.[36]

However, given that a 2°C target is now firmly established within the policy context, it is worth noting what it will mean should this temperature be exceeded. The inter-agency report Two degrees, one chance published by Tearfund, Oxfam, Practical Action, Christian Aid states:

> *Once temperature increase rises above 2°C up to 4 billion people could be experiencing growing water shortages. Agriculture will cease to be viable in parts of the world and millions will be at risk of hunger. The rise in temperature could see 40-60 million more people exposed to malaria in Africa. The threshold for the melting of the Greenland ice-sheet is likely to have been passed and sea-level rise will accelerate. Above 2°C lies the greater danger of 'tipping points' for soil carbon release and the collapse of the Amazon rainforest.*[37]

Not only is the 'safe' level of temperature rise misleading, a number of assessments exploring the probability of exceeding various temperature thresholds have been published recently. One study led by climate modeller, Malte Meinhausen, and his colleagues from the Potsdam Institute for Climate Impact Research, demonstrated that stabilisation of greenhouse gas concentrations (defined as CO_2e) at 550 ppm is accompanied by the risk of overshooting a 2°C equilibrium warming by 68–99 per cent.[38,39] According to the IPCC, this is defined as 'likely' to 'very likely'.[40] Meinhausen's work also suggests that only by stabilising emissions at 400 ppm is it 'likely' that the climate will stabilise at 2°C.

However, research published in 2008 by James Hansen and his colleagues at Columbia University in New York argue that atmospheric concentrations of CO_2 should be stabilised at 350 ppm.[41] This has been recently endorsed by economist, Sir Nicholas Stern as 'a very sensible long-term target'.[42]

It is worth noting, however, that Hansen's figure excludes other, non-CO_2 greenhouses gases.[43] CO_2 equivalent (CO_2e) is a unit that accounts for other greenhouse gases in the atmosphere are weighted by their 100-year climate change potential.[44] Hansen's reason for focusing on CO_2 is due to its long atmospheric lifetime compared to other greenhouse gases.

Even more recently, a team of researchers published two papers in the journal *Nature* in early 2009 arguing that to reduce the chance of global temperatures exceeding a 2°C temperature threshold, specific caps on carbon emissions need to be set.[45,46] One of the studies, also led by Malte Meinshausen, found that to reduce the probability of exceeding 2°C to 25 per cent, cumulative CO_2 emissions between 2000 and 2050 need to be capped at 1000 billion tonnes (Gt) of CO_2 (1,500 Gt CO_2e).[47] To reduce this risk by a further 5 per cent, emissions need to be capped at 890 Gt CO_2 (1,356 Gt CO_2e) or less. Given that between 2000 and 2006, 264 Gt CO_2 were emitted – this means if rates of CO_2 are kept at their current rate of 36.3Gt per year, the total carbon budget would be exhausted by 2024 or 2027 depending on the accepted probability of exceeding 2°C (20 per cent and 25 per cent respectively). However, the authors also warn that if global greenhouse gas emissions are still more than 25 per cent above 2000 levels in 2020, the probability of exceeding 2°C rises 53–87 per cent. Given that 80 per cent of greenhouse gases are due to the combustion of CO_2, this means limiting use to less than one-half of the proven economically recoverable oil, gas and coal reserves.[48]

Achieving the 2°C target

Stabilisation at even the 550 ppm level requires huge changes in our energy usage and the way in which the global economy works. But, Nobuno Tanaka, Executive Director of the International Energy Agency (IEA), states:

> *In 2005, CO_2 emissions from the energy sector were some 30 per cent above 1990 levels. They grew by 3 per cent in that year alone – in spite of higher energy prices. The IEA re-assessed its projections: unless strong action is taken, we may be facing a 57 per cent growth in CO_2 emissions by 2030.*[49]

According to the IEA's World Energy Outlook published in 2008, global energy needs are expected to grow, with fossil fuels being the dominant source – this will push up emissions of CO_2 dramatically.[50] The report states:

> *If governments stick with current policies…the world's primary energy needs are projected to grow by 53 per cent between 2005 and 2030.*[51]

Coal's share in world energy consumption increases from 25 per cent in 2005 to 28 per cent in 2030. Over 80 per cent of the increase in coal use is in India and China.[52] These trends lead to continued growth in global energy-related emissions of CO_2 from 27 billion (10^6) tonnes in 2005 to 42 billion tonnes in 2030 – a rise of 57 per cent.[53] This is the IEA's so-called reference scenario.

Government action can, however, alter these trends. This is reflected in the IEA's alternative policy scenario. In this more optimistic case, global energy-related CO_2 emissions would level off in the 2020s and reach 34 billion tonnes in 2030. But, even in the alternative policy scenario, global CO_2 emissions are still one-quarter above current levels in 2030. As the IEA states:

> *In a '450 Stabilisation Case', which describes a notional pathway to long-term stabilisation of the concentration of greenhouse gases in the atmosphere at around 450 parts per million, global emissions peak in 2012 and then fall sharply below 2005 levels by 2030… Exceptionally quick and vigorous policy action by all countries, and unprecedented technological advances, entailing substantial costs, would be needed to make this case a reality.*[54]

However, even an atmospheric concentration of 450 ppm carries a 54 per cent average risk of greater than 2°C warming.[55] In a high growth scenario which assumes that China and India's economies grow on average 1.5 percentage points per year faster than in the reference scenario, energy demand is 21 per cent higher in 2030 in China and India combined. Globally energy demand rises by 6 per cent and CO_2 emissions by 7 per cent above the reference scenario.[56] The majority of researchers still believe that it is scientifically possible to keep global average temperature rise below 2°C. Therefore, it is crucial to ensure that this challenge is politically achievable.

Around 60 per cent of the global increase in CO_2 emissions in 2005–2030 comes from China and India, meaning that they, too, would have to reduce their greenhouse gas emissions if, collectively, we are to have any chance of reaching 550 ppm let alone 400 or 350.[57] Based on current knowledge, a peak at 475 ppm and stabilisation thereafter at 400 ppm is generally accepted as the maximum permissible atmospheric carbon dioxide levels to make a warming of more than 2°C 'unlikely'.[58] To get to the 350 ppm target set by Hansen, coal use would need to be phased out urgently.

So it would appear that in order to preserve the climate which allowed human civilisation to flourish, dramatic action is needed to ensure humanity changes its behaviour. That means rethinking what is meant by the term 'development'. Fortunately, there are already approaches to development that provide 'models' to help us move towards a brighter future.

Rethinking development: towards alternative development paradigms

Rethinking development is difficult. How can you, for example, champion the rights of every individual to have education and access to healthcare whilst at the same time critiquing the very development paradigm that, in some of the world's poorest countries, has allowed advancements in primary healthcare and education?

There is increasing evidence to prove that more money, beyond the point that a level of material sufficiency has been reached, does not bring greater happiness or life satisfaction (Box 3).[59,60] Which is all very well when you've got it, but doesn't help those who haven't, and are yet to achieve a level of sufficiency.

Greater attention, too, needs to be paid to the often hidden costs of superficially affluent societies, in terms of depression, suicide rates, family and community breakdown, addiction – all the symptoms of so-called 'affluenza.' As Thomas Merton said: 'The rich have everything they want except happiness, and the poor are sacrificed to the unhappiness of the rich.'

In order to discover ways of living a good life without having to destroy its environmental foundations, we have to ask ourselves questions like: 'What is it we want? What is it we're striving for? What does the future look like?'

The problem is, we in the environment and development NGOs are calling for change within the context of a system in which the only constraint on an individual's level of consumption is a combination of our geographical accident of birth and the ability to pay. In a culture and economy that recognises no natural limits, this presents a fundamental contradiction. The pursuit of limitless conventional development by some, must, sooner or later preclude the opportunity for development by others.

Unless the system changes, even our best intentions will be overwhelmed by the impact of generally rising consumption.

A new form of 'ecological solidarity' is called for that acknowledges that we are all in it together. Possibly the only way to ensure the success of any future climate change regime is to make sure it occurs in the context of a new development paradigm – a paradigm that has broken free from its carbon chains and its addiction to growth.

Part 2. New narratives

Global media, like the television stations of CNN and Rupert Murdoch, and printed media like the *International Herald Tribune*, the *Economist* and *Time* magazine give one, fairly uniform view of the world. But, if we are to have a future, different narratives more in tune with diverse cultures and better attuned to specific places will need to come to the fore. In reacting to the complexities and uncertainties of economic and environmental upheaval, one size will not fit all. A solution in one location could worsen a problem in another.

For that reason, different voices must be heard. Greater plurality will likely be key to survival. This is one of the main reasons for this latest Up in smoke report; to show that there are alternative ways of seeing and different approaches to making people's lives happier and healthier. These alternatives are not underpinned by global economic growth – they are broader interpretations of development that do not require global growth in order to succeed, even if growth does occur at local or regional level as a consequence of effective poverty reduction.

At the moment, any suggestion that Western notions of development are wrong, or that economic growth is not a panacea, is still treated as heresy in the mainstream. It leads to the criticism of 'wanting to see people remain in poverty'. And the result, too often, is inertia when it comes to addressing flaws in the international financial architecture, unjust trade, extractive industries and the role of corporations, the world's food system, deforestation and climate change. But, critiquing the development paradigm is something different; it is a call for a better, fairer future where people can attain long and satisfied lives without having to destroy the environmental systems that make society possible. Once you begin to look, remarkably, the seeds of new paradigms can be found all around. This report does not present a single alternative vision for a new paradigm, but it does confidently assert that other worlds are possible.

Mary Gomani (44), a mother of five who cultivates the plants and with the money has been able to put herself through school as a result of the small business she has launched cultivating and selling the plants. Photo: Marcus Perkins/Progressio

Professor Jayati Ghosh: Rethinking material realities

Professor Jayati Ghosh is one of the world's leading female economists. She is professor of Economics at Jawaharlal Nehru University, New Delhi, and the executive secretary of International Development Economics Associates (IDEAS).

There is no longer any doubt that we are living in extraordinary and historic times. In many ways, we are witnessing the destruction of the world as we have known it over the past few decades: the comprehensive collapse of deregulated finance and continuing implosion of free market-based economic systems; geopolitical shifts and changing power equations; ecological changes that reinforce the growing realisation within all societies that the earlier paradigms of growth and development can no longer be applied in uncritical ways. But whether this will be a 'creative destruction' that brings about a genuine progressive change is still not clear – it depends greatly upon the ability of people everywhere in the world to demand radically different policies from governments and accept substantially altered lifestyles for themselves.

The current global economic system is broken in very important ways. But fixing it is no longer good enough: the point is to change it. Discussions on changes in economic paradigm in the wake of the global financial crisis are already well advanced, especially with the de facto nationalisation of banks and other companies in important centres of global capitalism and the reaffirmation of the positive role of government spending in combatting recession. What is not adequately recognised, though, is how the previous boom was unsustainable and bound to end badly, and also that it was deeply unequal, so that the world's poor generally did not benefit. Trying to create yet another capitalist boom, even if by using Keynesian policies that were anathemas just a few months ago, is therefore no solution.

So it is depressing to see that most attempts at economic recovery that have been declared by governments across the world are still based on reviving employment by depending upon the same patterns of production and consumption that have already proved to be unsustainable. There is still not enough recognition that we must move beyond the old practices, and seek new ways of ensuring a decent and productive life for all the world's population without creating ecological disaster.

"To start with, a much greater emphasis on creating communities that do not require major and continuous movement of individuals on a daily basis – by bringing together home, work and leisure locations as far as possible – is important. Second, a major impetus must be given to affordable, efficient and fast public transport networks. Third, there must be incentives to reduce unnecessary mobility, for example by using the possibilities created by newer information and communication technology."

These issues are particularly important because the global economic crisis has come at a time when the dire effects of climate change are also beginning to be understood. Preventing future catastrophe caused by climate changes requires not only long-term vision and concern for future generations, but also explicit recognition of the distributive implications – both globally and within countries – of actions that are required to contain or reverse the process. So far, this has not been sufficiently evident, and this may be one reason why interventions in this area have been so much less than what is minimally required.

Many people in the developing world still perceive discussions around climate change as one more imperialist attempt by developed countries to prevent growth of incomes in their own countries and achievement of decent living standards for the poor. While denial of this sort may be derided, such concerns are not entirely without basis. It is obvious that the developed industrial world has been responsible over the past century for most of the climate change effects, and now intends to prevent the developing world from repeating the same patterns. But what is more disturbing is that this deeply unequal tendency still persists even in the period of global slowdown.

Thus, the small minority of the world's population that resides in developed countries consumes the greater bulk of the world's resources and leaves gigantic carbon footprints in per capita terms that are many multiples of those created by the people of developing countries. It is commonplace to hear the argument that the rise of China and India –that is, the relatively faster GDP growth in two countries that account for more than one-third of the world's population – is particularly damaging to the environment. But this misses one basic point. Even if the entire population of the developing world suddenly ceased to exist, production and consumption in the North alone would still be such as to accelerate the process of climate change and use up the globe's natural resources far too rapidly.

So all the negotiations around climate change that focus on 'sharing the burden' or that suggest passing the burden on to poor countries through a system of carbon credits, are misplaced at least to some extent. It has to be recognised that per capita carbon emissions and consumption of scarce natural resources among the population resident in the developed world must reduce – and that too, quite sharply – if any progress is to be achieved on this front.

That does not mean that the current patterns of industrialisation and accumulation in the developing South are sustainable or even feasible. Indeed, simply because of the pressure of numbers, rising incomes in what were previously poor countries have already taken and will continue to take a huge toll on the environment. Developing countries – especially those in tropical regions – are already the worst hit by the adverse effects of climate change in the form of changed rainfall patterns that affect agriculture, greater likelihood of natural disasters, and the like. These are adding to the other huge environmental problems of pollution, degradation and congestion to create problems even for the present generation.

But just consider what would be seen as the necessary minimum standard of living in the North: surely it would include adequate food, permanent shelter, electricity for lighting and running some basic appliances, basic healthcare, and education. If the majority of the population of developing countries is to be brought even close to this minimum standard, it will necessarily require a substantial increase in carbon emissions in such countries. So even under the most stringent conditions, providing basic needs to the population of the developing world will involve an increase in per capita carbon footprint.

Discussions on dealing with climate change have to recognise this basic imbalance. But of course, there is more to it. Relatively small minorities of elite and middle class groups have dominated the process of economic growth across the world, especially in the past two decades. The large and growing inequalities within countries have meant that production has been disproportionately geared towards meeting the changing lifestyle requirements of the rich everywhere, rather than ensuring basic needs for all.

This means that coping with climate change also necessarily requires a reduction of income and wealth inequalities within countries. This is not going to be easy. It will require the global elite, spread across both developed and developing worlds, to curb extravagant lifestyles. It will require wage shares of national income to rise from their current very low proportions, with corresponding declines in the shares of profits and interest. It will require governments everywhere to be more responsive to the needs of the bulk of their citizenry rather than bow to the interests of a privileged minority.

But it will also mean that, even among the less wealthy, the presumptions and aspirations of what constitutes a civilised life will have to be modified. The model popularised by 'the American Dream' is perhaps the most dangerous in this context, with its emphasis on suburban residential communities far from places of work, markets and entertainment and linked only through private motorised transport.

Indeed, the automobile industry provides a telling example. In the United States, the original home of the automobile, the role of big car companies in influencing policy has been problematic. It was associated not only with the systematic destruction of the public transport network in large parts of the USA, but with associated patterns of residence and occupation that required people to be constantly dependent upon automated mobility for work, entertainment, domestic provisioning and even social interaction. This led to the emergence of huge personal dependence upon private transport in all aspects of life.

This model is now being exported to countries in the developing world, as the personally owned automobile moves from being considered a luxury to be aspired for, to being seen as a necessity for 'normal' life. Along with this, as elites and middle class groups with 'voice' opt for the personal vehicle as the preferred transport option, public transport is underfunded; it becomes even more inadequate and increasingly unattractive as a viable alternative. This has already led to massive problems of urban congestion in the metropolitan areas of many developing countries, and is further encroaching upon life even in semi-urban areas.

Capitalist markets created this want and then proceeded to oversupply it: we now have substantial overcapacity in automobile production globally. And the automobile companies have as a result been among the first to be badly affected by the global economic slowdown. Yet in this period of crisis, much of the efforts of governments across the world, beginning with the USA, are directed towards saving these automobile companies, by providing financial lifelines, offering tax sops and generally trying to create more of the same problems that were already proving to be unmanageable. The immediate fears about job losses if some of these companies do shut down have completely overshadowed any questions on the longer-run appropriateness of such production.

The issue involves moving beyond such palliatives as 'green cars' that reduce carbon emissions, although that is obviously desirable. It requires a shift in the way we organise our societies, our locations, our lives. To start with, a much greater emphasis on creating communities that do not require major and continuous movement of individuals on a daily basis – by bringing together home, work and leisure locations as far as possible – is important. Second, a major impetus must be given to affordable, efficient and fast public transport networks. Third, there must be incentives to reduce unnecessary mobility, for example by using the possibilities created by newer information and communication technology.

This is only as far the transport sector is concerned, but of course, similar issues arise in many other sectors. In many of these cases, the need is to move beyond technological change to changing the vector of final demands in ways that allow for more equitable and sustainable consumption across the world.

But there are other goods that clearly do deserve to be in the final demand of the entire population by any reckoning: for example, cooling and refrigerating agents in tropical or hot countries, or heating in very cold countries. There is also no reason why anyone in the world should be denied the benefits of new goods and services – such as communication possibilities – that can dramatically change the quality of life. Here the problem of technology choice is extremely important.

In this context, the current multilateral negotiations on climate change have thus far been hugely disappointing, especially to people in the developing world, because they have barely addressed the crucial issue of technology

transfer. It is no surprise that new and green technologies are dominantly being developed in the North by large corporates: after all they have the resources and now even the fiscal incentives to do so. But the increasingly octopus-like grip of intellectual property rights denies producers in developing countries access to these technologies except under very onerous and typically monopolistic conditions. For any meaningful action on mitigating and adapting to climate change, much more democratic access to new technologies is absolutely essential. And with it, finance to enable producers in the developing world to adopt such technologies is also required.

It is more than obvious now that unfettered markets are simply unequal to these complex and enormous tasks. Not only are they obsessed with short-run profitability, but the incentives thrown up by current relative prices all operate to direct production and consumption in precisely the opposite, unsustainable, direction. So government intervention – within countries and spanning across countries in multilateral efforts – is absolutely essential. Fortunately for those who have been pointing to the need for government action for some time, the state is back in fashion in economic terms. The de facto nationalisation of banking in many important capitalist economies, the need for large firms to keep turning to governments for large bailouts and other props, the recognition that free cross-border trade often operates to worsen environmental damage – all these make the case for public policy much more persuasive.

So we are clearly entering a global phase of much intervention in the economy, and we can certainly use this opportunity to create the changes in patterns of accumulation, production and consumption that will be more sustainable in future as well. But that means we must be continuously conscious of the need to ensure that such governments themselves are democratic, transparent and accountable in their functioning.

Professor Wangari Maathai: What does Africa need to deal with climate change?

Prof. Wangari Maathai is a Nobel Peace Prize winner and author of *The Challenge for Africa*

In this latest report of the Working Group on Climate Change and Development, the coalition asks how the global economy should be reshaped to enable human development in a carbon constrained future. A post-carbon society and addressing climate change mean much more than constraining carbon usage. While Africa is rich in resources, her people are poor; to counter this poverty, Africa needs to develop. For development in Africa to be successful, we need to ensure the right conditions in society that facilitate respect, equity and sustainability.

In trying to explain my work and philosophy, I often look to the traditional African stool to articulate the relationship between peace, good governance and sustainable development. Just as the African stool is made out of a single block of wood, so each leg, or pillar, is reinforced by the others and formed from the same grain. The issues must be addressed together and simultaneously.

The traditional stool is comprised of a seat and three legs. The first leg represents democratic space, where rights – whether human, women's, children's or environmental – are respected. The second leg symbolises the sustainable and accountable management of natural resources both for those living today and those in the future, in a manner that is just and fair, including for people on the margins of society. The third leg stands for what I term 'cultures of peace'. These take the form of fairness, respect, compassion, forgiveness, recompense and justice. The three legs of the stool support the seat, which in this conception represents the milieu in which development can take place. Citizens, feeling secure that the three legs are in place – that their country has strong democratic principles, equitable distribution of resources, and strong cultures of peace – can be educated, productive and creative. In this situation, the spirit of the citizenry not only welcomes development, but drives itself, because individually and collectively the people feel they have the opportunity to contribute. A secure seat also provides the environment in which governments can receive money from multilateral agencies, lending institutions or private donors, and use it accountably and responsibly – free of corruption – for the benefit not of the few, but of the many.

Having a stable stool means ensuring that a holistic approach to development is adopted, placing a priority on democratic governance and respect for human and other rights; equitable, sustainable and accountable use of all resources; and affairs of state that are managed in an accountable and responsible way. When all these are in place, the stool is secure, the state has stability, and development can take place.

I start with this development concept – of the inter-relatedness of democratic space, sustainable management of resources and cultures of peace – as it is all the more relevant and critical when facing climate

"For humankind to manage and share resources in a just and equitable way, governance systems must be more responsive and inclusive. People have to feel that they belong, and the voice of the minority must be listened to, even if the majority has its way. We need systems of governance that respect human rights and the rule of law and that deliberately promote equity."

change which will drastically alter life as we know it. In wealthy countries, the looming climate crisis is a matter of concern, as it will affect both the well-being of economies and people's lives. In Africa, however, a region that has hardly contributed to climate change, its greenhouse gas emissions are negligible when compared with the industrialised world, it will be a matter of life and death.

In my new book, *The Challenge for Africa*, I reflect on what I have learnt working in the area of environmental rehabilitation and community development with the Green Belt Movement for over 30 years. Current economic models create wealth at the expense of the environment and so we need to rethink how we develop. The current model from the industrialised countries which develops through the use of fossil fuels as the driving source of energy cannot be sustained. We must find a balance to improving our quality of life while not undermining the environment, and therefore the capacity of our species and other forms of life to continue. This can be controlled by investing in renewable sources of energy low in carbon – solar, wind, hydropower; sources of energy that will help us to develop without sacrificing the environment.

We all need to recognise that wherever we are, even if we feel that we are very far from the forest that is being logged in the Amazon, the Congo or South East Asia, environmentally we are not far; we are indeed a global village. What is happening in faraway places that undermines environment, the damage that is being done, will affect us all. Change in climate, the rise of the seas, the decline of fresh water will impact us all. This concept of sustainability needs to be understood; we must not develop at the expense of the environment. This means assistance from the North and transfer of technologies, but also African nations taking responsibility for what they can do, striving to develop sustainably and protecting their natural resources.

I wrote *The Challenge for Africa* to encourage Africans and others to think beyond the current economic model which is dependent on resources from the rest of the planet. The fact that humanity's current use of resources is outstripping the planet's ecological capacity should give all of us a reason to pause. It is simply not sustainable for the rest of the world to mine, log, drill, build, dam, drain and pave in a rush to achieve the standards of living of the industrialised countries, which themselves depend on massive resource extraction in the global South. In so doing, they could encourage the growth of sustainable industries that provide good employment in well-managed cities and towns – not crowded filthy slums with virtually no infrastructure that blot too many African cities and too many African lives. Africans, like citizens in other regions of the world, can also work to reduce their dependence on fossil fuels and to harness renewable energy sources to industrialise in a way that provides work for the millions of Africans migrating to cities, and allows some of those currently practising subsistence agriculture to move off the land.

The current financial crisis should not be used as an excuse to delay urgent action on climate change; in fact, it is an opportunity. Though the financial crunch is temporary in nature, the climate crisis is real and long term, and it calls for visionary political will on the part of governments, and social responsibility from the corporate world.

For many years I have asked myself what can I do for the Earth? I want to inspire others to ask that question, and answer it wherever and whenever they can. My experience has taught me that individual efforts do matter. However, unless there is political will and public support around the world, the enormous benefits the environment bestows on us will be lost. Future generations will pay the price. This recognition of the need for both personal and political accountability leads people to the realisation of the central importance of democratic governance. Governments in Africa, as well as individuals, need to do all they can to improve land management – by, for instance, preventing erosion by covering the soil with vegetation and trees, avoiding overgrazing, harvesting water, and retaining essential nutrients in the soil.

We know that a strong linkage exists between the environment, governance and peace. It is essential that we expand our definition of peace and security to include responsible and accountable management of the Earth's limited resources, as well as a more equitable distribution of those resources. Climate change makes the need for this redefinition even more urgent. Scientists have said that Africa will be unfairly hit by the impacts of climate change, and we are already experiencing the impact of climate change through changes in local weather including more prolonged droughts and floods, so it is imperative that action is taken quickly. Solutions must simultaneously tackle poverty and climate change on a global scale with all nations playing their part and stepping up to do what they can.

For humankind to manage and share resources in a just and equitable way, governance systems must be more responsive and inclusive. People have to feel that they belong, and the voice of the minority must be listened to, even if the majority has its way. We need systems of governance that respect human rights and the rule of law, systems that deliberately promote equity.

The challenges facing agricultural communities throughout Kenya are mirrored throughout Africa and many of the poor countries in the global South. In these regions, concern for environmental issues is treated as a luxury. But it is not: protecting and restoring ecosystems and slowing or reversing climate change are matters of life and death. The equation is simple: whatever we do, we have an impact on the environment; if we destroy it, we will undermine our own ways of life and ultimately destroy ourselves. This is why the environment needs to be at the centre of domestic and international policy and practice. If it is not, we don't stand a chance of alleviating poverty in any significant way. Nor will we create for the African people a continent where security and progress can be realised.

For the many reasons that have been articulated, there is a real need to develop a funding mechanism that will not only help industrialised and developed countries to address climate change, but also developing ones.

Both need to address their carbon emissions and take actions to deal with the negative impacts. This is a case of environmental justice and should be addressed more responsibly by all concerned. It is essential that any market or system with carbon credits be part of a national framework and coherent policy of sustainable use and conservation, rather than piecemeal actions that do not act to protect ecosystems as a whole, or provide a front for further indiscriminate exploitation of the natural resources. The markets must serve the forests and not the other way round. This is why there must be multisectoral involvement and cooperation at every level between NGOs and advocates for environmental conservation, indigenous people's rights, human rights, and private and public institutions.

As major polluters, the industrialised countries have a responsibility to deal with climate change at home, but also to assist Africa and the rest of the developing world to address climate change. They are in a position to share their technical know-how to reduce vulnerability and address adaptive capacities. Mechanisms ought to be established – quickly – to raise steady and reliable funds for the prime victims of the climate crisis, who will be poor and rural, very young, and, more often than not, female. And many of them will be African.

One way to ensure that African countries are more self-reliant and competitive is for industrialised nations to transfer technology – with a priority on green technologies – to those nations that are technologically less advanced. Industrialised countries should accept the moral duty to assist Africa and other poor regions to find alternative and renewable sources of energy – such as biomass, wind, hydropower, and solar – and enable the global south to participate in the carbon market so Africa can develop industries based on renewable energy sources. But African countries themselves should also invest in science and technology. Global investors have ploughed billions into new wind, solar, and other alternative energy initiatives. But those funds were almost wholly concentrated in the industrialised countries, along with some in China, India, and Brazil. Almost none of this investment is coming to Africa, despite the continent's vast energy poverty and abundant sun and wind. Africa's challenge lies in making herself a relevant beneficiary of these resources.

While the industrialised world can help mitigate the effects of climate change by supplying Africa with appropriate technology, the continent herself can do her part by prioritising the protection and rehabilitation of its forests. All governments must make a concerted effort to stop unsustainable logging and find mechanisms, such as reforestation programs, whereby the poor can secure a livelihood by protecting and not degrading their environment.

To be assisted to plant trees in developing countries is not making an excuse for developed countries' emissions, the commitment to the Kyoto Protocol remains and there remains a need to address climate change globally. We can, however, assist each other in contributing towards the reduction of carbon and adaptating to the impact of climate change; something which will still be needed, even if northern countries act to cut their emissions to sustainable levels.

Each of us should do what we can to address climate change. In Kenya, the Green Belt Movement has found that by planting trees on hills and other degraded landscapes, communities can help themselves to address environmental degradation, create livelihoods, and adapt to the changes they face.

As I have argued repeatedly, Africa is a rich continent. Conserving the Congo Basin Forest Ecosystem is an excellent example of this and presents an extraordinary opportunity to African heads of state, the international community, and the peoples of the basin. It also requires a re-imagining of what 'development' means, not only across Equatorial Africa, but throughout the continent, and indeed the world. Here the principles of sustainability, accountability, and equity need to be made real and tangible, in a manner that is likely only to become more vivid as the decades pass. 'Sustainability' entails recognising that the destruction of the Congo's forests has global implications. 'Accountability' must mean local, regional and international institutions working in concert to ensure that industrialised countries do not repeat the sins of the colonial period, and extract without genuine recompense or an eye to protecting the resources of the future. This is why the third element – 'equity' – is essential. In order for the ecosystem to be protected, it is vital that the people who live in and around the forests of the Congo basin feel they have a stake in its protection. This will require recognition from multinationals and relevant governments that it is in the companies' own best interests that the forests' essential ecosystem functions are maintained. Equity will also mean international cooperation at an unprecedented level to ensure effective institutions are established that will collect data, map and monitor existing concessions, and ensure transparency and a sound basis for future development.

In conclusion, developing nations, particularly in Africa, will also need assistance to develop their capacity to negotiate more effectively within global climate change policy-making bodies as well as with the private sector. Global meetings help to raise awareness of climate change across the world as one of the critical issues of our times and we need to spread the word to as many people as possible, as quickly as possible. The discussions, the information shared, the commitments and the inspirations work to create momentum for the next part of the process. Every nation must be given a seat at the negotiating table. Good and just cultures of governance and leadership are of the utmost importance to make sure negotiations are fair and equitable, and to reach those most in need. It is time for a more holistic model of development where we are each held to account for the way we live on our Earth.

Without human beings, creatures and plants and trees would flourish; but without these species, human beings have no hope of survival. This is why in thinking about human rights, we need to reach another level of consciousness to appreciate that these other species, too, have a right to their existence and their piece of the Earth. We have a responsibility to protect the rights of future generations that cannot speak for themselves today. The global challenge of climate change requires that we ask no less of our leaders, or of ourselves.

The world on a collision course: Professor Manfred Max-Neef

Prof. Manfred Max-Neef is a famous Chilean economist specialising in development. In 1981 he wrote the book for which he is best known: *From the outside looking in: Experiences in barefoot economics*. It describes his experiences practising economics among the poor in South America. In that year he founded the Centre for Development Alternatives (CEPAUR). He is currently Rector of the Universidad Austral de Chile in Valdivia.

'Solutions imply new models that, above all else, begin to accept the limits of the carrying capacity of the Earth: moving from efficiency to sufficiency and well-being.'

At the same time that the UN Food and Agriculture Organisation (FAO) informs us that hunger is affecting 1,000 million people, and estimates that $30,000 million would suffice to save those lives, the concerted action of six central banks (USA, UE, Japan, Canada, United Kingdom and Switzerland) pours $180,000 million into the financial markets in order to save private banks. If that were not enough, the US Senate approves an addition of $700,000 million. Two weeks later another $850.000 million are approved in the United States. That not being enough, the final rescue package amounted to $8,150,000 million (8.15 trillion) in November 2008.[62]

Facing such a situation, we are confronted with two alternatives: to be a demagogue or to be a realist. If, based on the law of supply and demand, I say that there is a greater demand in the world for bread than for plastic surgery; and much more for the treatment of malaria than for apparel of haute couture; or if I propose a referendum asking the citizens if they prefer to use their monetary reserves to save lives or to save banks; I will be accused of being a demagogue. If, on the contrary, I accept that it is more urgent, more necessary and more convenient and profitable to all, to avoid an insurance company or a bank going bankrupt, instead of feeding millions of children, or giving aid to victims of a hurricane, or curing the dengue, it will be said that I am a realist.

That is the world in which we are living. A world accustomed to the fact that there is never enough for those who have nothing, but there is always enough for those who have everything. There are never enough resources to overcome poverty, but there are more than enough resources to satisfy superficial wants. $8.15 trillion, instead of saving private banks, could generate 270 years of a world without hunger. Would not a world without misery be a better world for everyone, even for the banks?

Some shocking contradictions follow. Table 1 shows where the money goes instead of where it should go.

What are we facing in our world today?

The quadruple crisis

The *quadruple crisis* can be defined as the interplay of four key challenges

1. The rapid and potentially non-linear increase of human-induced climate change affecting all regions of the world.

2. The end of cheap energy, with dramatic effects on societies.

3. Extensive depletion of key resources basic to human welfare and production; like fresh water, genetic resources, forests, fisheries, wildlife, soils coral reefs and most elements of local, regional and global commons.[63] The gigantic speculation bubble that is 50 times larger than the real economy of exchange of goods and services.

The root causes of the crisis

- The dominant economic paradigm, which poses rapid economic growth at any cost, and stimulates corporate greed and accumulation.

- The uncontrolled use of fossil fuels to feed that obsessive economic growth.

- The promotion of consumerism as the road to human happiness.

- The decimation of traditional cultures, in order to impose conventional economic industrial models (which determines the loss of cosmovisions, languages and values that differ from those of the dominant culture).

- Disregard of planetary limits, in relation to resource availability, consumption, waste generation and absorption.

- Overpopulation – (eventual) growth beyond the capacity of the Earth to sustain.[64]

Consequences

These conditions may bring about unprecedented dangerous environmental and social costs.

- Current changes to the climate and potentially irreversible climate change implies loss of much productive land, storms, rising sea waters, massive dislocation, desertification and economic and social problems especially in poorer countries.

- Depletion of inexpensive oil and gas supplies has a direct impact the world over, threatening industrial future development. It will make long distance transportation, industrial food systems, urban and suburban systems as well as many commodities basic to our accustomed way of life increasingly difficult, like: cars, plastics, chemicals, refrigeration.

Table 1. Expenditures and social investment needs

Product	*Annual expenditure (US$ billion)*	*Alternative*	*Necessary investment (US$ billion)*
Cosmetics	18	Reproductive health for women	12
Pet food in USA	17	Elimination of hunger	19
Perfumes	15	Universal literacy	5
Luxury cruises	14	Clean water for all	10
Ice cream in Europe	11	Immunisation of all children	1.3

All are rooted in the assumption of ever-increasing inexpensive energy supply.

- Other resource shortages like fresh water, forests, agricultural land, biodiversity; facing the possible loss of 50 per cent of the world's plant and animal species over the next decades.

Solutions

Solutions imply new models that, above all else, begin to accept the limits of the carrying capacity of the Earth. We need to move from efficiency to sufficiency and well-being. Also necessary is the solution of the present economic imbalances and inequities. Without equity, peaceful solutions are not possible. We need to replace the dominant values of greed, competition and accumulation, for those of solidarity, cooperation and compassion.

The paradigm shift requires turning away from economic growth at any cost. Transition must be towards societies that can adjust to reduced levels of production and consumption, favouring localised systems of economic organisation. We need again to look to the inside.

The myths that sustain the dominant model [65]

- **Myth 1: Globalisation is the only effective route to development**
  Between 1960 and 1980, the majority of developing countries, especially in Latin America, adopted the principle of 'import substitution'[66] which allowed significant industrial development. During that period, per capita income in Latin America grew 73 per cent and in Africa 34 per cent. After 1980, economic growth in Latin America came to a virtual halt, increasing, as an average, not more that 6 per cent over 20 years, while growth in Africa declined by 23 per cent.

  The period 1980–2000 annihilates import substitution, and replaces it by deregulation, privatisations, elimination of international trade barriers and full openness to foreign investments. The transition was from an inward-looking economy to an outward-looking one. The results indicate that the poorest countries went from a per capita growth rate of 1.9 per cent annually in the period 1960–1980, to a decline of 0.5 per cent annually between 1980 and 2000. The middle group of countries did worse, dropping from annual growth of 3.6 per cent to just under 1 per cent after 1980. The world richest countries also showed a slowdown.

  Countries like South Korea and Taiwan, frequently given as examples to be emulated, achieved their development through trade barriers, state ownership of the big banks, export subsidies, violation of patents and intellectual property and restrictions to capital flows including direct foreign investment. It would be absolutely impossible for any country to replicate these strategies today, without severely violating the regulations of the World Trade Organization (WTO) and the International Monetary Fund (IMF).

- **Myth 2: Greater integration into the world economy is good for the poor**
  Poor countries must adapt to a number of rules and restrictions established by the international organisations. The result is that poor countries divert human resources, administrative capacities and political capital away from more urgent development priorities such as education, public health and industrial capacity.

  In 1965, the average per capita income of the G7 countries was 20 times that of the seven poorest countries. In 1995, it was 39 times larger, and today it is over 50 times. In practically all developing countries that have adapted to rapid trade liberalisation, income inequality has increased, and real incomes have declined between 20 and 30 per cent in Latin America.

  Today, more than 80 countries have a lower real per capita income than one or two decades ago. The paradox is precisely that the more marginal countries are the ones that have integrated themselves more completely into the global economy.

- **Myth 3: Comparative advantage is the most efficient way to ensure a prosperous world**
  One of the unquestioned principles of modern politics is the need for global free trade. To doubt its benefits is an act of heresy. However, in spite of its supposed greater efficiency, compared with other systems of economic organisation, global free trade is notoriously inefficient in real terms. By giving greater priority to large-scale production for export purposes, instead of small- and medium-scale production for local needs; and by generating competitive pressures that confront communities with communities the world over, the prices of consumer products may decrease, but at an enormous social and environmental expense.

  There is still a dominant belief about the benefits of adhering to comparative advantages. However, according to the model of David Ricardo (creator of

the concept) the system functions as long as there is no transnational mobility of capital. Internally, capital searches for the most adequate niche that gives it comparative advantage. However, when capital is granted full transnational mobility, it will look for absolute advantages in countries that allow for lower salaries, lower taxes and less environmental regulations. As posed by John Gray:

When capital is (transnationally) mobile it will seek its absolute advantage by migrating to countries where the environmental and social costs of enterprises are lowest and profits are highest. Both in theory and practice, the effect of global capital mobility is to nullify the Ricardian doctrine of comparative advantage. Yet it is on that flimsy foundation that the edifice of unregulated global free trade still stands.[67]

Let's take an example. Nike Corporation (footwear makers), in order to remain competitive, needs to reduce its standards. So, it moves to Indonesia where, through independent contractors, the shoes are made by young girls who are paid around $0.10 to $0.15 cents per hour. As mentioned by David Korten:

Most of the outsourced production takes place in Indonesia, where a pair of Nikes that sells in the United States and Europe for $73 to $135 is produced for about $5.60 by girls and young women paid as little as fifteen cents an hour. The workers are housed in company barracks, there are no unions, overtime is often mandatory, and if there is a strike, the military may be called to break it up. The $20 million that basketball star Michael Jordan reportedly received in 1992 for promoting Nike shoes exceeded the entire annual payroll of the Indonesian factories that made them. [68]

It should be noted that there are 75,000 workers.

- **Myth 4: More globalisation means more jobs**
  According to the International Labour Organization (ILO) in 2000 there were 150 million unemployed in the world and 1,000 million underemployed; i.e., one-third of the world's working force.[69] The situation, as informed by ILO, tends to deteriorate further.

The outsourcing as described in Myth 3 is a necessity for big corporations to remain competitive. It goes without saying that such a process generates unemployment in the place of origin, and underemployment in the country of arrival.

- **Myth 5: The World Trade Organization (WTO) is democratic and accountable**
  Many decisions affecting peoples´ daily lives are being shifted away from local and national governments and are instead being made by a group of unelected trade bureaucrats sitting behind closed doors in Geneva. They are now empowered to dictate whether the EU has the right to ban the use of dangerous biotech materials in the food it imports, or whether people in California can prevent the destruction of their last virgin forests, or whether European countries have the right to ban cruelly-trapped fur.[70]

  Lucas and Hines (2002),
  Time to replace globalisation:
  A green localist manifesto for World Trade

According to the rules of the WTO, if a transnational corporation investing in a given country concludes that there are certain national laws or regulations considered to be inconvenient to its interest, the country is forced to abolish them, or adapt them to the satisfaction of the investor. This means that under WTO rules, the race to the bottom (described in Myth 3) is not only in social and environmental standards, but also in democracy itself.

The WTO has no rules whatsoever about child labour or workers´ rights. Everything in its constitution is shaped to the advantage of corporations. During the discussions that gave origin to the WTO, known as the Uruguay Round, the controversial issue of intellectual property rights, for instance, was put on the agenda by 13 major companies including General Motors and Monsanto. In the negotiations that followed, 96 of the 111 members of the US delegation working on property rights were from the private sector. It should be obvious to conclude that the final agreement serves the corporate interests and undermines poor people's access to knowledge and technology. A dramatic case in point is that poor countries are not allowed to produce their own inexpensive generic pharmaceutical products, and are forced to buy to ones produced, at much higher prices, by the pharmaceutical corporations. The consequences have been particularly tragic in the case of HIV in Africa, where corporate prices are far beyond the purchasing power of the great majority of the suffering population.

In short, the WTO should be recognised not for what we are told it is, but for what it really is: an institution whose main purpose is to make the corporations rule the world.

- **Myth 6: Globalisation is inevitable**
  Renato Ruggiero, former Director General of the WTO, used to say that 'trying to stop globalisation is tantamount to trying to stop the rotation of the Earth'. Bill Clinton pointed out: 'Globalisation is not a political option; it is a fact.' Tony Blair identified globalisation as 'irreversible and irresistible'. Margaret Thatcher immortalised her sentence: 'There is no alternative.' All such statements are evidence of the degree of fundamentalism of the defenders of the system. As a result, the model amounts to a pseudo-religion.

Alternatives are obviously possible. The point is that the dominant model has been the product of the systematic renunciation on the part of the majority of countries, of their right to control economic processes for their own benefit. Yet, any condition that originates in political decisions is obviously reversible.

It may most probably be argued that any change would mean to choose between the present economic rules, on the one hand, or chaos on the other. This is, of course absurd. A fundamental change could be

an increased re-localisation of the economy at local levels, designing new rules that bring production and consumption closer: a human-scale economy.

A new economy

A possible alternative is a new economy based on five postulates and one fundamental value principle.

- Postulate 1: The economy is to serve the people; the people are not to serve the economy.
- Postulate 2: Development is about people and not about objects.
- Postulate 3: Growth is not the same as development; development does not necessarily require growth.
- Postulate 4: No economy is possible in the absence of ecosystem services.
- Postulate 5: The economy is a subsystem of a larger and finite system, the biosphere; hence permanent growth is impossible.
- Value principle: No economic interest, under any circumstance, can be above the reverence for life.

Going through the list, it is not difficult to conclude that what we have today is, one after the other, exactly the opposite. Yet to assume that an economy based on these postulates is not feasible is absurd. It is already being practiced in many countries at local level, since it is obvious that such principles can best work at micro levels.

The most important contribution of a human-scale economy is that it may allow for the transition from a paradigm based on greed, competition and accumulation, to one based on solidarity, cooperation and compassion. Such a transition would allow not only for greater happiness among those who have been marginalised, but also among those responsible for marginalising them, despite what they may believe.

Some of the new rules might include:

- Monetise localisation, so that it flows and circulates as much as possible in its place of origin. It can be shown by economic models that if money circulates at least five times in its place of origin, it may generate a small economic boom.
- Produce locally and regionally everything possible, in order to bring consumption closer to the market.
- Protect local economies through tariffs and quotas.
- Encourage local competition in order to avoid monopolies.
- Levy ecological taxes on energy, pollution, and other negatives. At present we are taxed for goods and for bads.
- Make a greater democratic commitment to ensure effectiveness and equity in the transition towards local economies.

The obscenity of continuing with the same

While one billion people suffer from hunger, and nearly three billion live on less than $2 dollars a day, we witness the obscene concentration of monetary wealth.

The 400 richest Americans accumulate a fortune of $1.75 trillion. Each of them has an average of $3.9 billion. The monetary wealth of these people is more than twice the GDP of sub-Saharan Africa which hosts 800 million people.

Such fortunes continue to expand despite the crisis that affects the immense majority of the world's population.

It should be pointed out that today´s rich are not related to the growth of the real economy, like it was in the days of Carnegie, Rockefeller and Ford. The new fortunes, on the contrary, are based on the destruction of the real economy, as we are witnessing just now.

Of the 400 multibillionaires, 65 come from finance, 51 from speculative investments, 36 from entertainment, 35 from real estate speculation, 30 from computer technologies, 28 from gas and petroleum, 20 from retail. Only five of the 400 are related to the production of industrial goods. This alone demonstrates one transcendental characteristic of the dominant paradigm: that it generates capitalists that are social parasites.

A deep change is not only urgent, but inevitable!

More with less: Rethinking poverty reduction in a changing climate: David Woodward

David Woodward is a **nef** Fellow, and formerly an economic adviser in the Foreign and Commonwealth Office, technical assistant to the UK Executive Director to the IMF and the World Bank, development economist in the Strategy Unit of the World Health Organisation, and economic policy adviser to Save the Children (UK).

This contribution is based on: *More with less: Towards a new economics paradigm for poverty eradication in a carbon-constrained world* (Forthcoming: **nef**).

Climate change and binding constraints on global carbon emissions represent a profound change in the economic environment for development. Responses to this change have been limited to piecemeal 'add-ons' directed to adaptation and mitigation at country level. This is wholly inadequate. The fundamentally different context of accelerating climate change and responses to it, together with the failures of the current economic model to deliver on global objectives, such as poverty eradication and health for all, indicate an urgent need for a fundamental reconsideration of the economic model itself. This will mean a shift from focusing on economic growth as the central objective of development to the primary achievement of societal objectives: meeting basic needs, increasing well-being, and ensuring environmental sustainability.

The alternative economic model described here revolves primarily around a revitalisation of rural economies, taking advantage of the synergies arising from consumption patterns at low-income levels – raising demand, production and consumption of basic goods, of and by low-income communities in a virtuous cycle. It also looks at the potential for widespread application of micro-renewable energy technologies in rural areas, exploiting the potential for considerable cost reductions and technological improvements from the creation of a mass market.

'The alternative economic model described here revolves primarily around a revitalisation of rural economies, taking advantage of the synergies arising from consumption patterns at low-income levels – raising demand, production and consumption of basic goods, of and by low-income communities in a virtuous cycle.'

Major progress will require changes in the global economy. Current international discussions, in response to the financial crisis, provide an opportunity for such change; but only if they are much more inclusive and have a much broader agenda than is currently envisaged.

Implications of climate change for the economic environment for development

Climate change represents a fundamental change in the global context in which development must take place in the coming decades. Globally, we need to reduce carbon emissions drastically and quickly if we are to have any real chance of limiting the global temperature rise to the widely agreed 2°C above pre-industrial levels.

This implies a rate of reduction in global carbon intensity of 7–11 per cent pa, to be sustained over a period of 30–35 years. By comparison, the reduction between the 1960s and the 1980s in response to the oil price crises of the 1970s (which entailed a more than tenfold increase in oil prices, with devastating consequences for the global economy, and particularly developing countries) was just 1 per cent pa over the course of two decades.

The current assumption is that this can be achieved through the application of new technologies for the reduction and/or sequestration of carbon emissions. However, even on the most favourable assumptions, it is at best highly questionable whether this can be achieved by means of known and anticipated technologies. Moreover, there are serious doubts about many of these technologies in terms of their potential scope (e.g., carbon sequestration); net effects on carbon emissions and other environmental impacts (e.g., biofuels, nuclear energy); sustainability if widely applied (e.g., available reserves of uranium for nuclear energy); and potential effects on development (e.g., impacts of substantial biofuel production on basic food prices).

We therefore cannot simply assume that carbon emission reduction targets will be achieved through technological changes without adverse effects on development. In practice, the coming decades are likely to be characterised by a combination of

- the consequences of failing to meet global carbon emission targets (more frequent and severe extreme weather events);
- the consequences of efforts (successful or otherwise) to achieve these targets (e.g., higher energy and transportation costs, higher food prices owing to greater biofuel use, greatly reduced long-distance tourism, reduced demand for exports, etc.); and
- the consequences of responses to climate change itself (including reduced aid budgets owing to revenue losses and diversion of public spending) and its knock-on effects (e.g., more restrictive immigration policies).

For most, if not all, low-income and least developed countries, and many middle-income countries, the implications of such changes are unambiguously negative, and in many cases very severe. Such negative effects are important, not only because of the (potentially very considerable) human costs, but also because of

their implications for adaptive capacity in the countries concerned. By undermining adaptive capacity, they will also greatly magnify the economic and social effects of climate change itself. There is a real risk that a large proportion of the developing world will be locked into a downward spiral of economic failure, reversal of human development, declining public sector effectiveness and reduced adaptive capacity, culminating in eventual social and economic collapse.

Responses to the changes in the economic environment for development resulting from climate change

Like the mainstream development community more generally, the UK's Department for International Development's (DfID's) response to climate change whilst high-profile in some regards, has fallen far short of this fundamental change in the global context for development. It has closely mirrored its reaction to concerns about the impact of structural adjustment programmes on poverty, health and education in the late 1980s and early 1990s. In both cases, the issues have been treated as secondary concerns, and essentially separate from the process of development; and the response has been to maintain the same underlying economic model with limited add-ons at country level – social safety nets and relative protection of health and education spending in the former case; and programmes for adaptation to and mitigation to climate change in the latter case.

This raises two fundamental issues.

First, it raises the question of what development is for. In the 1980s and 1990s, we found that the preferred neoliberal model of development was not fulfilling our social and human development objectives of poverty reduction and the improvement of health and education. Over the last decade, serious questions have emerged as to its environmental sustainability and its resilience to global environmental processes, notably climate change. If the basic economic model is failing to achieve our societal goals, or even to allow societies to adapt to this failure, then continuing to promote this model, subject only to minor and piecemeal correctives, seems an inappropriate and inadequate response. Rather, these failures indicate a need to reconsider the model itself, and to investigate alternatives which might be more beneficial.

Second, the focus of such add-on responses exclusively at national level belies the nature both of development and of climate change as fundamentally global processes, in need of global responses. While there are wide variations in (and equal uncertainties around) likely manifestations of climate change in different localities, they are the product of global rather than local emissions and atmospheric concentrations of carbon dioxide.

These two considerations are inter-related. The evolution of the global economy over the last 25–30 years, through the process of commercial globalisation, has made national economies increasingly dependent on the global economy – and thus seriously curtailed the policy space available to any national government. If one compares only the options available to a national government within the global economic system as it currently operates, taking all other countries' policies as given, it is quite predictable that the result will favour the current model, because it is designed specifically to favour and promote this model.

This indicates an overwhelming case for reconsidering the underlying neoliberal economic model which bilateral agencies like DfID continue to support and promote; and to do so at the global level (i.e., while making available the necessary policy space through appropriate changes in the global economic system) rather than only on a country-by-country basis. Only on this basis can a judgement be made about the appropriateness or otherwise of the promotion of a particular economic model on a global basis.

Basic principles for an alternative approach to development in the context of climate change

The obvious starting point for such reconsideration is the basic purpose of development and of the economy more broadly. At the most basic level, this might be considered to comprise:

- fulfilling basic needs (poverty eradication, broadly defined);
- increasing quality of life (well-being); and
- sustaining these achievements over the long term (sustainability).

This requires a shift away from economic growth as the primary criterion of success or failure of economic policy. Economic growth is not intrinsically good or bad. It is good to the extent that it promotes the fulfilment of basic needs and/or increases quality of life, and bad to the extent that it undermines them immediately, or in the long term; for example, through adverse environmental effects.

What, then, might an alternative model look like, if it placed these three societal objectives at the centre of policy design in the context of climate change?

The association of carbon emissions in developing countries with urbanisation suggests an increased focus on reinvigorating rural economies as a driver of development. Rural-led development would help to slow rural-urban migration, reducing the strain on urban infrastructure, and would be more effective in reducing poverty, which is high in rural areas.

However, the focus of the current model on agriculture, and particularly export agriculture, as the basis of rural development, has had limited benefits – partly because of the weakness of many tropical agricultural prices over the last 30 years (which itself largely reflects the increase in their supply owing to widespread promotion). Equally, agriculture is among the sectors most vulnerable to the impacts of climate change; and growing awareness and concern about climate change is already encouraging a shift towards local purchasing – a trend which can be expected to intensify over time. At the same time, as the recent food crisis has demonstrated, increasing use of

biofuels in the North has the potential to threaten food security in the developing world through major increases in the world prices of basic foods.

This suggests a need for rural development to be based largely on the diversification of rural economies away from agriculture; and for agriculture itself to be oriented primarily towards local needs rather than exports. It is almost inevitable that such a diversification would entail a substantial increase in energy consumption in rural areas. In fact, it is arguable that the limited availability of energy in rural areas in many low-income countries has been an important constraint to their development and diversification.

While carbon constraints clearly should not be allowed to limit development, it is clearly important to minimise the carbon emissions which result. This suggests an emphasis on renewable energy sources. There is a potentially important synergy here between climate change mitigation and rural development. A major reason for the inadequacy of energy infrastructure in rural areas in many developing countries is that scarcity of population, together with limited public resources and purchasing power, makes conventional centralised electricity generation financially unviable. However, the potential for renewable electricity generation (solar, wind, hydroelectricity, and in some cases wave and tidal power) is often considerable. Renewable generation is also more conducive to decentralised generation systems, producing electricity on a relatively small scale at community level. The widespread application of microrenewable energy technologies in rural areas could have a transformative effect even greater than that of mobile telephony in the field of communications, stimulating the regeneration of rural economies, while limiting carbon emissions (and slowing deforestation by reducing reliance on fuelwood).

The two key obstacles at present are the relatively high cost of such technologies (again, given limited resources); and their lack of adaptation to the circumstances of rural areas of low-income countries, both technically and in terms of the limited availability of technical skills for installation and maintenance.

These constraints, in turn, are a product of the market for such technologies, which is of limited scale, and dominated by demand in the North. By creating a large-scale market in the South, it would be possible simultaneously to incentivise technological development more suited to conditions in rural areas in the developing world, and to drive costs down considerably through economies of scale and learning effects. (Microrenewable technologies remain at a very early stage in the product cycle, suggesting the potential for the major cost-reductions which have characterised the evolution of other technologies, from VCRs and DVDs to mobile telephones and computers.)

Such a market transformation could, in principle, be achieved through the establishment of a global fund, financed from new and additional aid, (or other resources generated by new forms of international taxation on pollution or currency speculation and directed to climate change mitigation), to finance the universal application of appropriate microrenewable technologies in rural areas in all low-income countries. Appropriate phasing of such a programme would be important, however, in order to avoid bottlenecks in the production process increasing costs.

As well as favouring low-carbon production processes, consideration should also be given to the carbon content of the increase in consumption resulting from (or required for) development. Industrialisation processes, both under the current model of development and in the 'import-substituting industrialisation' model prevalent in Latin America in the 1960s and 1970s, have generally relied on growing consumption of goods with considerable energy content, either for the domestic market or for export. In the latter case, energy content is further increased by the need for transportation to distant (primarily Northern) markets. Reliance on long-distance tourism (which has been promoted particularly in many small island economies) similarly embodies very high carbon content.

Global carbon constraints suggest that the growth of demand for such goods will need to be at best limited, and quite possibly negative, over the coming decades. (While carbon content may be reduced by increased use of renewable energy technologies, carbon sequestration, etc., there are considerable uncertainties regarding the viability such technologies and the net carbon savings available, while the recent food crisis demonstrates the potentially devastating side effects from a development perspective. Together with the phenomenal scale of the reduction required in global carbon emissions, this suggests that a marked reduction in total energy use will also be required to achieve emissions reduction targets without serious adverse effects on developing countries.)

This suggests, first that we should anticipate constraints on the overall growth (and level) of global consumption; and second, that such constraints will be eased to the extent that consumption growth is concentrated on goods with lower rather than higher energy content. If meeting basic needs is a primary objective of policy, we should also focus increases in consumption on those whose basic needs are not met as a result of inadequate incomes – that is, the poorest. A given absolute increase in income also gives rise to a greater increase in well-being at a lower rather than at a higher initial income level.

While there is a need for further empirical research, a strong prima facie case can be made that these objectives coincide – that is, that the energy content of the additional consumption of poor households (in global terms) as their income increases is lower than that of better-off households. Purchases by poor households, particularly in rural areas, are typically of goods which are (or can be) locally produced using relatively limited energy inputs, (e.g., higher-value foods, clothing, basic household goods, etc.). This suggests a strong case for focusing on measures aimed directly at increasing the incomes of poor households rather than on increasing economic growth and relying on the benefits trickling down to the poor.

Such consumption patterns also have the potential to create a virtuous circle of poverty reduction – although this is again a hypothesis which requires further investigation. Casual observation suggests that the poorest households spend additional income primarily on products produced by other poor households, further reducing poverty, while the better-off spend a much smaller proportion of their income increases on goods produced by the poorest.

If this is the case, then focusing on increasing the incomes of the poor (rather than on overall economic growth) can have indirect, as well as direct benefits in terms of poverty reduction. As household A's income increases, it purchases goods and services from poor households B, C and D, increasing their incomes; and they similarly provide additional incomes to households E, F, G, etc. In effect, this is equivalent to a Keynesian-style multiplier operating within poor communities; but their generally very limited integration in the global economy makes the effect potentially much stronger than in better-off communities.

These synergies can be maximised by coordinating the increases in demand and supply associated with poverty reduction. This would entail focusing poverty reduction measures such as microcredit, vocational training, microenterprise support, agricultural extension, etc., specifically on increasing the supply of goods whose demand will be increased as poverty is reduced (based on estimates of changes in consumption patterns based on household expenditure surveys).

Accelerating poverty reduction is also essential to increase adaptive capacity to climate change and other environmental and economic shocks. The lack of resources available to households is a key obstacle to the (often relatively small) investments required for adaptation. Particularly in rural areas, faster poverty reduction can also provide additional environmental benefits by reducing pressures for unsustainable production methods to maintain or increase short-term incomes for immediate consumption needs.

The impact of poverty on adaptive capacity is compounded by its effects in worsening health (e.g., through under-nutrition and unhealthy living and working environments) and limiting access to education, two other key determinants of adaptive capacity at the household level. Progress in these areas could be further accelerated by substantial increases in public resources for education (particularly, but not only, at primary level, to match increases in demand), and for comprehensive primary healthcare.

Implications for the global economic system

While some progress could be made in the direction indicated above within the existing global economic framework, the effectiveness of such an approach would be critically dependent on substantial changes in international economic arrangements. These include an end to the active promotion of neoliberal approaches to development by international players such as the IMF, the World Bank and DfID; measures to increase the public resources available in developing countries, notably through measures to control tax competition and transfer price manipulation by transnational companies, possibly supplemented by international taxes (e.g., on carbon emissions and/or currency transactions); and increased flexibility within international trade agreements for the appropriate use of trade measures such as import tariffs in support of development.

Current discussions on international economic arrangements following the financial crisis provide a potentially valuable opportunity for such changes. However, this requires a much broader agenda than is currently envisaged, extending beyond the immediate needs of the financial system to encompass societal objectives such as poverty eradication, health and education for all, the control of climate change and other aspects of environmental sustainability. It also requires a much broader participation in discussions, including low-income and least-developed countries (which are wholly excluded from the G20), on a full and equal basis. Current economically weighted voting systems mean that this is also not possible through the IMF or the World Bank.

There is an urgent need for a genuinely global process, based on contemporary standards of democracy, transparency and accountability, to establish a global economic system capable of meeting the fundamental challenges of climate change, poverty and health, and to do so on an equitable and sustainable basis.

Implications for aid donors and financial institutions

It should be emphasised that the approach to development is not intended as a blueprint, and that it requires further consideration and research. Rather, the intention is to demonstrate:

- that it is possible to envisage alternatives the mainstream model of economic development currently promoted by aid donors and financial institutions;
- that a prima facie case can be made that such alternatives may be more conducive than the mainstream model to the objective of poverty eradication in a carbon-constrained global economy subject to accelerating climatic change;
- that there is therefore a strong case for active investigation of such alternatives; and
- that it is inappropriate for aid donors to continue promoting the current economic model in these circumstances.

Departments like DfID can make an overwhelming case at home and abroad, both within the UK Government and in international fora, for an inclusive global process to re-engineer the global economic system to achieve global social and environmental goals, in the fundamentally changed context of accelerating climate change and binding constraints on global carbon emissions. Together two of these key dimensions add up to a global green new deal: of re-regulating international finance, and delivering an economic stimulus for low-income rural communities through boosting small-scale renewable energies

Part 3. Other worlds are possible: The work of the Coalition

In this section, the practical emergence of new approaches to development is explored. While relatively uncoordinated, and often lacking mainstream support, these examples represent the fertile ground that exists for the emergence of new development models.

There are a number of alternative approaches to 'doing' development which seek to marry the achievement of well-being of all with environmental sustainability. They range from *Gross National Happiness (GNH)* in Bhutan, and the *Sufficiency Economy* in Thailand, to the *Harmonious Society and Circular Economy* in China and the *Sumaj Kamana* or 'Well Living' approach, a concept at the heart of a new development paradigm emerging in Bolivia. *The Green New Deal*, the fifth alternative development paradigm, merits special attention as an approach to development that is particularly relevant to 'developed' economies such as the UK.

Self-sufficiency economy in Thailand[71,72]

In Thailand, His Majesty King Bhumbiol Adulyadej , 'developed the philosophy of the Sufficiency Economy to lead his people to a balanced way of life and to be the main sustainable development theory for the country'. The philosophy is underpinned by a middle path between local society and the global market.

The aim of the approach is to allow the nation to modernise, but to do so in a more sustainable manner – one which will not lead to detrimental outcomes arising from rapid economic and cultural transitions. 'By creating a self-supporting economy, Thai citizens will have what they need to survive but not excess, which would turn into waste.'

The King goes on to state that sufficiency is about living in moderation and being self-reliant so as to avoid endogenous and exogenous shocks that could destabilise the country. 'The Sufficiency Economy should enable the community to maintain adequate population size, enable proper technology usage, preserve the richness of the ecosystems and survive without the necessity of intervention from external factors.' According to the King, 'If we contain our wants, with less greed, we would be less belligerent towards others. If all countries entertain this – this is not an economic system – the idea that we all should be self-sufficient, which implies moderation, not to the extreme, not blinded with greed, we can all live happily.'

Gross National Happiness in Bhutan[73]

For over 30 years, the Kingdom of Bhutan has followed the words of His Majesty, the King Jigme Siongye Wangchuck, who stated that 'Gross National Happiness is more important than Gross National Product.' Development in this instance becomes a continuous process towards achieving a balance between the material and non-material needs of individuals and society. The country's philosophy of development recognises that growth should not be an end in itself. Included in Gross National Happiness is a middle path in which spiritual and material pursuits are balanced'.[74]

Gross National Happiness (GNH) has four main pillars:

1. Sustainable and equitable socio-economic development.
2. Conservation of the environment.
3. Preservation and promotion of culture.
4. Promotion of good governance.

The Centre for Bhutan Studies explains the reasoning behind the GNH approach like this:[75]

> *Across the world, indicators focus largely on market transactions, covering trade, monetary exchange rates, stockmarket, growth, etc. These dominant, conventional indicators, generally related to Gross Domestic Product (GDP) reflect quantity of physical output of a society. GDP, along with a host of supporting indicators, is the most widely used indicator. Yet GDP is heavily biased towards increased production and consumption, regardless of the necessity or desirability of such outputs, at the expense of other more holistic criterion. It is biased against conservation since it does not register conservation or stocks. Indicators determine policies. The almost universal use of GDP-based indicators to measure progress has helped justify policies around the world that are based on rapid material progress at the expense of environmental preservation, cultures, and community cohesion…*
>
> *The Gross National Happiness index is generated to reflect the happiness and general well-being of the Bhutanese population more accurately and profoundly than a monetary measure. The measure will both inform Bhutanese people and the wider world about the current levels of human fulfilment in Bhutan and how these vary across districts and across time, and will also inform government policy… The nine dimensions are:*

1. *Psychological well-being*
2. *Time use*
3. *Community vitality*
4. *Culture*
5. *Health*
6. *Education*
7. *Environmental diversity*
8. *Living standard*
9. *Governance*

It's also clear that Bhutan's approach to measuring progress differently is much more than an exercise in producing decorative indicators, or policy window-dressing, as the Centre explains:

> *Happiness is a public good, as all human beings value it. Hence, the government of Bhutan takes the view that it cannot be left exclusively to private individual devices and strivings. If a government's policy framework, and thus a nation's macro-conditions, is adverse to happiness, happiness will fail as a collective goal. Any government concerned with happiness must create conducive conditions for happiness in which individual strivings can succeed. In this context, public policies are needed to educate citizens about collective happiness. People can make wrong choices that lead them away from happiness. Right policy frameworks can address and reduce such problems from recurring on a large scale.*[76]

The Green New Deal

One new and innovative approach to visioning new development paths has been proposed by the Green New Deal Group – a group of experts from the financial, energy and environmental fields. Underpinning their thinking is the recognition that the global economy is facing a triple crunch – '…a combination of a credit-fuelled financial crisis, accelerating climate change and soaring energy prices underpinned by an encroaching peak in oil production'.[77] They liken this combination of factors to 'a perfect storm the like of which has not been seen since the Great Depression'.

The Green New Deal entails:

> *…re-regulating finance and taxation plus a huge transformational programme aimed at substantially reducing the use of fossil fuels and in the process tackling the unemployment and decline in demand caused by the credit crunch. It involves policies and novel funding mechanisms that will reduce emissions contributing to climate change and allow us to cope better with the coming energy shortages caused by peak oil.*[78]

The Group points out that the three linked threats – financial meltdown, climate change and peak oil have their roots in the current model of globalisation which is of course true. However, it is not globalisation per se; it is the model of development that underpins globalisation that is the root cause of the problem. Drawing their inspiration from Franklin D. Roosevelt's 'courageous programme' launched in the wake of the Great Crash of 1929 the Group believes that: '…a positive course of action can pull the world back from economic and environmental meltdown'.[79]

The Green New Deal consists of two main strands: First, it outlines a structural transformation of the regulation of national and international financial systems, and major changes to taxation systems. And, second, it calls for a sustained programme to invest in and deploy energy conservation and renewable energies, coupled with effective demand management. This will allow a stabilisation of the '…current triple-crunch crisis' by '…laying the foundations for the emergence of a set of resilient low-carbon economies, rich in jobs and based on independent sources of energy supply'.[80]

Focusing on the needs of the UK, the Green New Deal involves:

- A bold new vision for low-carbon energy production that will involve making every building a power station. The strategy will involve tens of millions properties with maximised energy efficiency. Alongside this will run a 'maximised' renewable energy programme.
- Creating and training a 'carbon army' of workers to provide the human resources for the vast environmental reconstruction programme that is required if truly sustainable development will ever be achieved.
- More realistic fossil fuel prices that are high enough to create economic incentives to drive efficiency and bring alternative energy sources to market whilst, at the same time, reflecting the true environmental costs of burning fossil fuels.
- A wide-ranging package of financial innovations and incentives to assemble the tens of billions of pounds that need to be invested in the development of new, efficient energy infrastructure and initiatives to reduce energy demand.
- Re-regulating the domestic financial system to ensure that the creation of money at low rates of interest is consistent with democratic aims, financial stability, social justice and environmental sustainability.

- Breaking up the discredited financial institutions that have needed so much public money to prop them up in the last credit crunch.
- Re-regulating and restricting the international finance sector to transform national economies and the global economy.
- Subjecting all derivative products and other exotic instruments to official inspection.
- Minimising corporate tax evasion by clamping down on tax havens and corporate financial reporting.

The 'perfect storm' provides unparalleled opportunities to envision a more sustainable and equitable future. Whilst the Green New Deal is focused on the UK, the Group makes it quite explicit that one of the aims of the Green New Deal is to develop: '… an alternative development paradigm, capable of delivering real poverty reduction in a carbon-constrained world'. The development of just such an 'alternative paradigm' is what this report from the Up in smoke Coalition is intended to catalyse.

What are NGOs doing to re-think development?

In different ways, and not always coherently, the NGO community works to create a world where poverty has been reduced and people are able to achieve a standard of living that is environmentally sustainable, fulfilling and secure, in the sense of guaranteeing livelihoods with sufficient access to food and energy supplies.

Rather than pursuing growth at the expense of the environment, the intelligent stewardship of nature can be an effective means to fight poverty. According to the World Resources Institute (WRI):

> *When poor households improve their management of local ecosystems – whether pastures, forests, or fishing grounds – the productivity of these systems rises. When this is combined with greater control over these natural assets, through stronger ownership rights, and greater inclusion in local institutions, the poor can capture the rise in productivity as increased outcome. With greater income from the environment – what we [sic] refer to as environmental income – poor families experience better nutrition and health and begin to accumulate assets. In other words, they begin the journey out of poverty.*[81]

In common with the views of many other NGOs, environmental income here is seen as a 'fundamental stepping stone in the economic empowerment of the rural poor'.[82] Ecosystems can be a genuine 'wealth-creating asset', and healthy ecosystems can help reduce people's vulnerability to climate change. Unfortunately, most forms of development have valued economic growth per se above ecosystem health – and, as the global economy has grown, ecosystems have been severely stressed and several have collapsed. So development needs to be re-defined to acknowledge the important part that nature has to play in poverty reduction and long-term sustainable development. In other words, a more nurturing approach to nature and the service it provides, rather than the current extractive view.

But as the WRI point out, for the poor to make money from protecting nature they:

> *… must be able to reap the benefits of their good stewardship. Unfortunately, the poor are rarely in such a position of power over natural resources. An array of governance failures typically intervene: lack of legal ownership and access to ecosystems, political marginalization, and exclusion from the decisions that affect how these ecosystems are managed. Without addressing these failures, there is little chance of using the economic potential of ecosystems to reduce rural poverty.*[83]

Many of the case studies in this report echo Wangari Maathai's concern that environmental and governance issues should be linked in development projects. This applies to projects coordinated by civil society at the grassroots or funded by governments.

An area that is underexplored, however, is research into the environmental impact of using an ecosystem as a wealth-creating asset. When successful, are people no longer happy with a sustainable life and left wanting to move up the consumer chain? Following a Western model that acknowledges no limits, most will want more if more can be had. So, in a world facing limits how can we ensure that people continue to live sustainable and happy lives without undermining the resource base? This is the question that all new approaches must address directly. At the very least, we need an indicator to tell us when consuming more actually becomes detrimental to our livelihoods and life satisfaction.

nef developed a measure that tackles this dilemma. The Happy Planet Index (HPI) described as 'an innovative new measure that shows the ecological efficiency with which human well-being is delivered', allows us to look at development in a very different light. It shows the ecological efficiency with which lives of relative length and satisfaction are enabled. It differs markedly from the indicator of national income usually referred to by commentators to say whether or not the economy is growing, and relied on by governments to measure their success – Gross Domestic Product (GDP):

> *The HPI shows that 'good lives do not have to cost the Earth'! take Germany and the US for instance; people's 'perceived' and, to some extent, 'measured' sense of life satisfaction is almost identical in both countries as is life expectancy; however, Germany's ecological footprint is roughly half that of the US – basically Germans are as happy as Americans but use half the resources as Americans to achieve happiness. The opposite is also true; Russia and Japan have roughly the same ecological footprint but if you are born in Japan*

you are likely to live 17 years longer than if you were born in Russia and you likely to be about 50 per cent more satisfied than the average Russian.[84]

Paradoxically, Pacific Islands have always rated quite low on the UN's Human Development Index. This always proved confusing to researchers who went there and discovered that despite rating low on the HDI, Pacific islanders seemed pretty happy; then again, why wouldn't you be happy if you lived in island states – prior to climate change and the environmental degradation often synonymous with development, life on a Pacific island was bucolic. Indeed, this situation has become known as the 'Pacific Paradox'.

So what are the factors that make life 'happy'? **nef** suggests that to live within our environmental limits and increase well-being for all, we must:

- eradicate extreme poverty and hunger, improve healthcare, and relieve debts that block poverty reduction;
- use indicators like the HPI and more detailed national accounts of well-being to set meaningful policy goals and measure progress;
- shift values away from individualism and material consumption towards cooperation, social interaction, and greater quality of life through 'five ways to well-being';[85]
- support meaningful lives, by ensuring a healthy work-life balance, and recognise the value of social, cultural and civic life;
- empower citizens and promote open governance;
- work towards one-planet living by consuming within our environmental limits;
- design systems for sustainable consumption and production; and
- work to tackle climate change (and other global cumulative and systemic environmental threats).

The HPI takes life expectancy and well-being, not 'growth' as its primary objectives. With 'happy life years' as the outcome and planetary resource consumption as, what the report calls, the 'fundamental input', the goal of development can be redefined. It becomes the delivery of 'high levels of well-being within the constraints of equitable and responsible resource consumption'.

Currently, according to the HPI report, 'the biocapacity of the Earth is around 11.2 billion hectares or 1.8 gha per person in 2001 (assuming that no capacity is set aside for non-human species). In 2001, humanity's demand on the biosphere – its global ecological footprint – was 13.6 billion gha, or 2.2 gha per person. At present, therefore, our footprint exceeds our biocapacity by 0.4 gha per person, or 23 per cent. This means that the planet's living stocks are being depleted faster than nature can regenerate them.'

Box 3. Measuring what matters: The Happy Planet Index

nef has long advocated for alternative measures to be developed and used on a systematic basis. In 2006, we devised and launched the Happy Planet Index (HPI) to capture the true health and wealth of nations. The HPI measures the ecological efficiency with which nations deliver long and happy lives for their citizens by drawing on just three indicators: ecological footprint; life expectancy; and life satisfaction. According to orthodox models of development, higher levels of consumption are the route to a better quality of life for all. But by measuring progress differently, the HPI shows that this is not necessarily the case. Nations with the same ecological footprint can produce lives of greatly differing length and well-being and it is possible to live long, happy lives with much smaller environmental impact.

Crucially, we believe any new measures of societal progress should take account of how people experience their lives – their subjective well-being. The HPI uses the single indicator of Life Satisfaction to do this but scientific advances in measurement mean that it also now possible to capture different components of people's well-being, from how people feel about their lives, to whether they are functioning well and realising their potential, to whether they have the psychological resources needed for resilience.

Early in 2009, **nef** set out a framework for how such measures could be built into alternative measures of societal progress and published the first ever National Accounts of Well-being. In it we call for national governments to directly measure people's experience of their lives to better assess their relative success or failure in supporting a good life for their citizens.

www.happyplanetindex.org

www.nationalaccountsofwell-being.org

Box 4. Collective rights[86]

Food matters. Yet it is an area where globally we are failing to meet humanity's current needs and are in danger of not meeting future needs… We are, but should not be, playing a high-stakes poker game with the sustainable agriculture upon which all our lives – directly and indirectly – depend. It would be ironic and potentially tragic if – just as other sectors are turning to and seeing the value of open source, informally networked means for innovation – farming and food, which have been based on such systems for millennia, move in the opposite direction.

Geoff Tansey and Tasmin Rajotte
Future control of food. Earthscan.

As Tansey and Rajotte have described, the intellectual property rights systems (IPRs) that increasingly govern farming and food is a hugely complex world of laws, agreements and regulations that facilitate corporate control over the food system. IPRs have been imposed on living materials and beings and the associated knowledge, which are used to produce food.

Countervailing systems do exist from the UN, to social movements that attempt to forestall such imposition and enable continued free exchange and the sustainable use of biodiversity for food and agriculture governed collectively.

Agricultural biodiversity has been developed by men and women farmers, pastoralists, fisherfolk, indigenous peoples, forest dwellers and other local food providers. Through careful adaptation and selection over millennia, the relatively few species, which provide the majority of human food (around 100 plant and 40 animal species), have been transformed into millions of varieties and breeds that are resilient in the face of threats from pests, diseases, changing soils, adverse weather conditions and climate change.

The diversity has been achieved through open exchange of seeds and livestock breeds between communities, countries and continents. For example, maize, beans and avocado came from meso-America to the rest of the world. Potatoes and tomatoes came from the Andes to European, Asian and African palettes. Rice, apples and onions from Asia; root crops from Africa; wheat, barley, lentils from the Fertile Crescent of Mesopotamia; succulent lettuces, cauliflower and broccoli from Europe; sheep from West Asia; and cattle from Europe and South Asia. The exchange and subsequent development of varieties and breeds is what gave the world this diversity. The innovation occurred through informal exchange of knowledge and biological materials. If there had been restrictions, diversity would not have resulted – there would have been no innovation.

Until the last century, the idea of private monopoly privilege (IPRs) over these biological resources was unthinkable. Yet that is what is happening with the result of increased reliance on fewer varieties, breeds and genes. The major seed and agrochemical corporations are now proofing their futures by claiming monopoly control over genes that may become critical in enabling plants to cope with environmental stress tolerance. They have filed 532 patent documents on these genes with patent offices across the world.

The existing laws, agreements, commercial contracts and use-restriction technologies are precisely the opposite of what is required to increase the diversity of plants and animals necessary to facilitate adaptation in the face of climate change. Collective rights over these materials would prevent a free-for-all spread of seeds and livestock, with the dangers of contamination by proprietary genetically modified organisms (GMOs) for example, but would ensure that the benefits of the transfers would remain in the hands of small-scale food providers.

Climate justice

NGO concern around climate change is to do with both the injustice of its impacts and many of the proposed solutions. Not dealing with climate change threatens the lives and livelihoods of many poor people, but dealing with climate change in an unfair way may present an equally significant challenge to poor communities.

More pragmatically if poor countries and their populations are likely to sign up to a new global effort to tackle climate change they will look for it to be demonstrably fair. Poor countries have been told too often that signing up to a new international agreement will be in their interest, only for the promised benefits to fail to appear.

Now we face an unprecedented global emergency – which requires an unprecedented global transformation of our energy, transport and agriculture as well as of the way we deal with our forests and seas. The widest possible engagement and ownership of people all around the world will be required to maximise the chances of this transformation taking place.

We need the UN Framework Convention on Climate Change (UNFCCC) to unveil a global agreement to tackle climate change that has justice and fairness clearly and transparently at its heart. Anything less is a recipe for disaster.

Box 5. Greenhouse Development Rights: a framework for equitable decision making at the UNFCCC[87]

Greenhouse Development Rights (GDR) is a means of sharing out the global 'effort', according to the principles of equity in the UNFCCC. Fundamental to the GDR approach is first the need for emergency measures to reduce global carbon emissions rapidly to avoid global temperature rise of 2°C (Figure 2); and secondly the overriding need for poverty reduction in developing countries.

Figure 2. The South's dilemma. The red line shows a 2°C emergency stabilisation pathway, in which global CO_2 emissions peak in 2013 and fall to 80 per cent below 1990 levels in 2050. The blue line shows Annex 1 emissions declining to 90 per cent below 1990 levels in 2050. The green line shows, by subtraction, the emissions space that would remain for the developing countries.

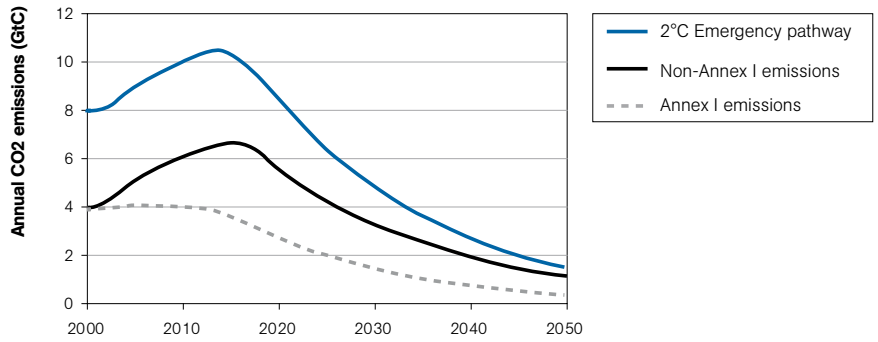
To resolve the tension between these two vital objectives, countries are indexed to illustrate what percentage share of the global effort they should take on. Each country's place in the index is determined according to clearly explained measures of responsibility and capability.

An income threshold of $7,500 is applied to both responsibility and capability, which affects countries' position in the index; the greater the proportion of a country's population that falls below this line, the less of the effort that country is required to take on.

Responsibility is calculated by taking each country's total 'cumulative' emissions since 1990, when the UNFCCC was first drawn up and the first IPCC assessment report published. For each country, a share of its emissions – identified as basic 'survival emissions' below the development threshold – are taken away from the total burden of responsibility.

Capacity is arguably the more important factor in determining the amount of effort a country can take on. This is especially so for Christian Aid, an organisation concerned with eradicating poverty. In GDRs, it is calculated using per capita national income data, adjusted to reflect differences in purchasing power and inequality from one country to another. It reflects the ability of a country to pay for climate mitigation and adaptation. This data is summed to give a total capacity but, again, only above the development threshold.

Figure 2. The South's dilemma.



By combining the calculation of responsibility and capacity it is possible to develop the responsibility and capacity index (RCI), as detailed in Table 2.

The Responsibility and Capacity Index determines that the USA is responsible for about 33 per cent of global action on climate change (through domestic action and funding mitigation and adaptation overseas), the EU27 is responsible for 25 per cent, and Japan for 7.8 per cent. But also that China has a 5 per cent responsibility, South Africa 1 per cent and India 0.5 per cent.

It is clear that very poor countries – such as those falling into the UN's 'least developed' category – should focus their attention and resources on meeting the needs of their people, especially as climate change impacts increase. In the GDRs proposal, they would not be asked to pay for tackling climate change.

Box 5 (Cont'd)

The critical reductions that are required in developing countries are financed by industrialised nations taking on a formal obligation to cut emissions way beyond what is possible domestically. However, bigger developing countries, such as China, in which there are still large numbers of poor people and yet increasing pockets of wealth, would have to pay for some of their own measures both to reduce emissions and to adapt to climate change.

For industrialised countries, their high rating in the index sends a very clear message about what they must do. They must not only cut domestic emissions dramatically, but must also contribute to what is required globally, taking on a share of the effort that those lower on the index can ill afford. This is also the case when it comes to paying for the costs of adapting to climate change.

Interpreting GDRs in the context of the UNFCCC negotiations identifies the following priorities:

- Large cuts in the carbon emissions of industrialised countries, of 40 per cent by 2020, and at least 80 per cent by 2050. These cuts must all to be achieved domestically within the country.
- Each industrialised country must fund the equivalent emissions reductions overseas in low-income countries, on top of their domestic reductions.
- Important technology that may help low-carbon development must be shared with poorer nations
- Wealthy nations must support developing countries in achieving sustainable, low-carbon development and planning to manage adaptation effectively.

Christian Aid has supported the development of the GDR framework which puts quantified numbers on responsibility, capacity and the right to development, and derives real numbers for the level of action every nation should undertake as a response.

Table 2. Perccntage shares of total global population, GDP, capacity, responsiblity and RCI for selected countries and groups of countries, based on projected emissions and income ofr 2010, 2020 and 2030. (High, middle and Low Income Country categroies are based on World Bank definitions. Projections based on International Energy Agency World Energy Outlook 2007.)

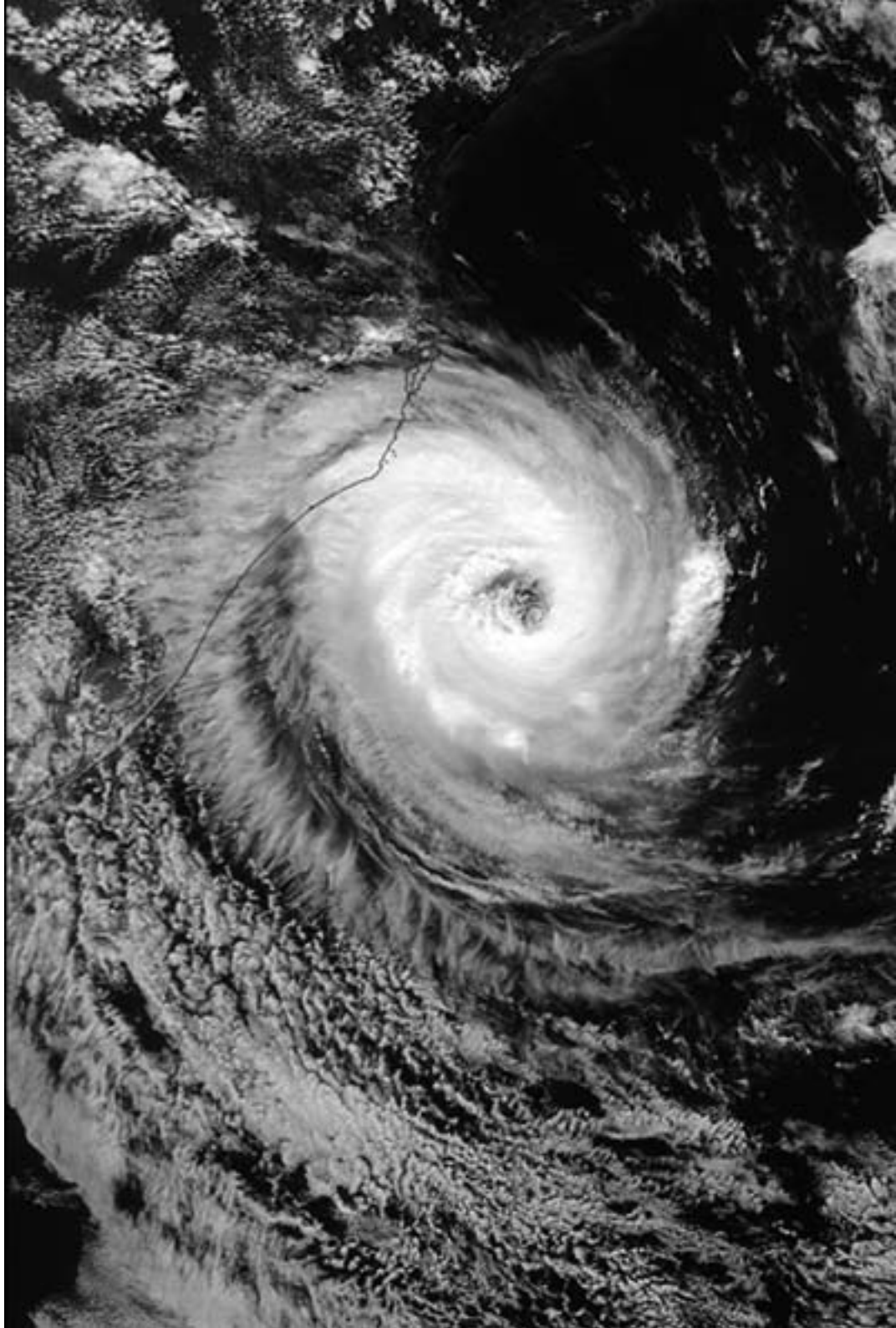
	2010					2020	2030
	Pop'n	*GDP*	*Capacity*	*Responsibility*	*RCI*	*RCI*	*RCI*
EU-27	7.3	30.472	28.8	22.6	25.7	22.9	19.6
EU-15	5.8	33,754	26.1	19.8	22.9	19.9	16.7
EU +12	1.49	17,708	2.7	2.8	2.7	3.0	3.0
US	4.5	45,640	29.7	36.4	33.1	29.1	25.5
Japan	1.9	33,422	8.3	7.3	7.8	6.6	5.5
Russia	2.0	15,031	2.7	4.9	3.8	4.3	4.6
China	19.7	5,899	5.8	5.2	5.5	10.4	15.2
India	17..2	2,818	0.7	0.3	0.5	1.2	2.3
Brazil	2.9	9,442	2.3	1.1	1.7	1.7	1.7
South Africa	0.7	10,117	0.6	1.3	1.0	1.1	1.2
Mexico	1.6	12,408	1.8	1.4	1.6	1.5	1.5
LDCs	11.7	1,274	0.1	0.0	0.1	0.1	0.1
Annex 1	18.7	30,924	76	78	77	69	61
Non-Annex 1	81.3	5,096	24	22	23	31	39
High Income	15.5	36,488	77	78	77	69	61
Middle Income	63.3	6,226	23	22	22	30	38
Low Income	21.2	1,599	0.2	0.2	0.2	0.3	0.5
World	100%	9,929	100%	100%	100%	100%	100%

Disasters, conflict and climate change

Human-induced climate change is modifying patterns of extreme weather. In many cases, it is making hazards – including floods, cyclones and droughts – more intense, more frequent, less predictable and/or longer lasting.[88] This magnifies the risk of 'disasters' everywhere, but especially in those parts of the world where there are already high levels of human vulnerability. As the case study in Box 6. New thinking and practical approaches to humanitarian assistance shows, new thinking and practical approaches to humanitarian assistance are needed to overcome this challenge.

In addition to an increase in the risk of disasters climate change may result in an increase in the risk of violent conflict (Box 7. Military activity and climate change).[89] Climate change already undermines human security, and this will be amplified. However, such risks will not occur in isolation from other key social factors. Research suggests that there are four factors that affect violent conflict which may be exacerbated by climate change. These include:[90]

- vulnerable livelihoods;
- poverty (relative/chronic/transitory);
- weak states – climate change may increase the cost of public services (e.g. education, water, healthcare) and reduce government revenues. This could reduce adaptive capacity of communities and government agencies; and
- migration (internal and international) - while climate change may not be the most important 'push' factor in migration decisions, large-scale movements of people may increase the risk of conflict in host communities.



Box 6. New thinking and practical approaches to humanitarian assistance[91]

In a humanitarian context, vulnerability refers to the capacity of individuals, communities and societies to manage the impact of hazards without suffering a long-term, potentially irreversible loss of well-being. Vulnerability is largely determined by people's access to and control over natural, human, social, physical, political and financial resources. Quality of governance, the vitality of their natural resource base, conflict, urbanisation and demographic change also shape people's vulnerability.

When hazards hit areas where people have limited capacity to reduce their level of risk, manage or deal with the aftermath of extreme weather, the results can be truly 'disastrous'.

A recent study conducted by the UN Office for the Coordination of Humanitarian Affairs (OCHA), CARE International and Maplecroft, mapped specific hazards associated with climate change – focusing on floods, cyclones and droughts – and placed them in relation to factors influencing vulnerability.[92] The results identify hotspots of high humanitarian risk for the next 20–30-year period and are summarised in [Figure X – the map below].

It is important to note that south east Africa and parts of south and South East Asia are risk hotspots for all three hazards analysed. These areas warrant special concern and attention.

The increasing frequency, intensity, duration and range of extreme weather brought about by climate change threatens to worsen humanitarian need and derail global development.[93,94] As well as destroying livelihoods and infrastructure, disaster losses can aggravate financial, political, social and environmental problems, making it difficult for many countries to meet a wide range of development goals. This is especially true under current conditions of skyrocketing food prices, rapidly degrading ecosystems and profound injustices. People in the least developed countries and island states will be affected first and worst. At community and household levels, the poorest and most vulnerable social groups – including women, children, the elderly and disabled – will be hit hardest. For instance, studies have repeatedly found that women and other marginalised social groups suffer more during disasters and find it harder to bounce back afterwards.[95] As such, climate change threatens to exacerbate social inequalities.

To overcome this challenge, CARE identifies a number of principles and commitments to move towards new thinking and practical approaches to humanitarian assistance.

Don't make things worse: We have to get serious about reducing greenhouse gas emissions from energy production, deforestation, transport and industrial processes. Otherwise, we will almost surely shoot past any safe emissions scenario and commit future generations to a very different – and much more dangerous – world.

Act earlier: Time and time again, action by the global humanitarian community is 'too late, too brief, inappropriate and inadequate'.[96] This often results in a cycle of poverty and vulnerability to disasters that is difficult to break. Climate change will exacerbate this situation by worsening weather-related hazards. While risk assessments, emergency preparedness and disaster risk reduction should already be part of longer-term planning, climate change is a wake-up call to ensure this is happening as well as increase the scale and improve the quality of such efforts.

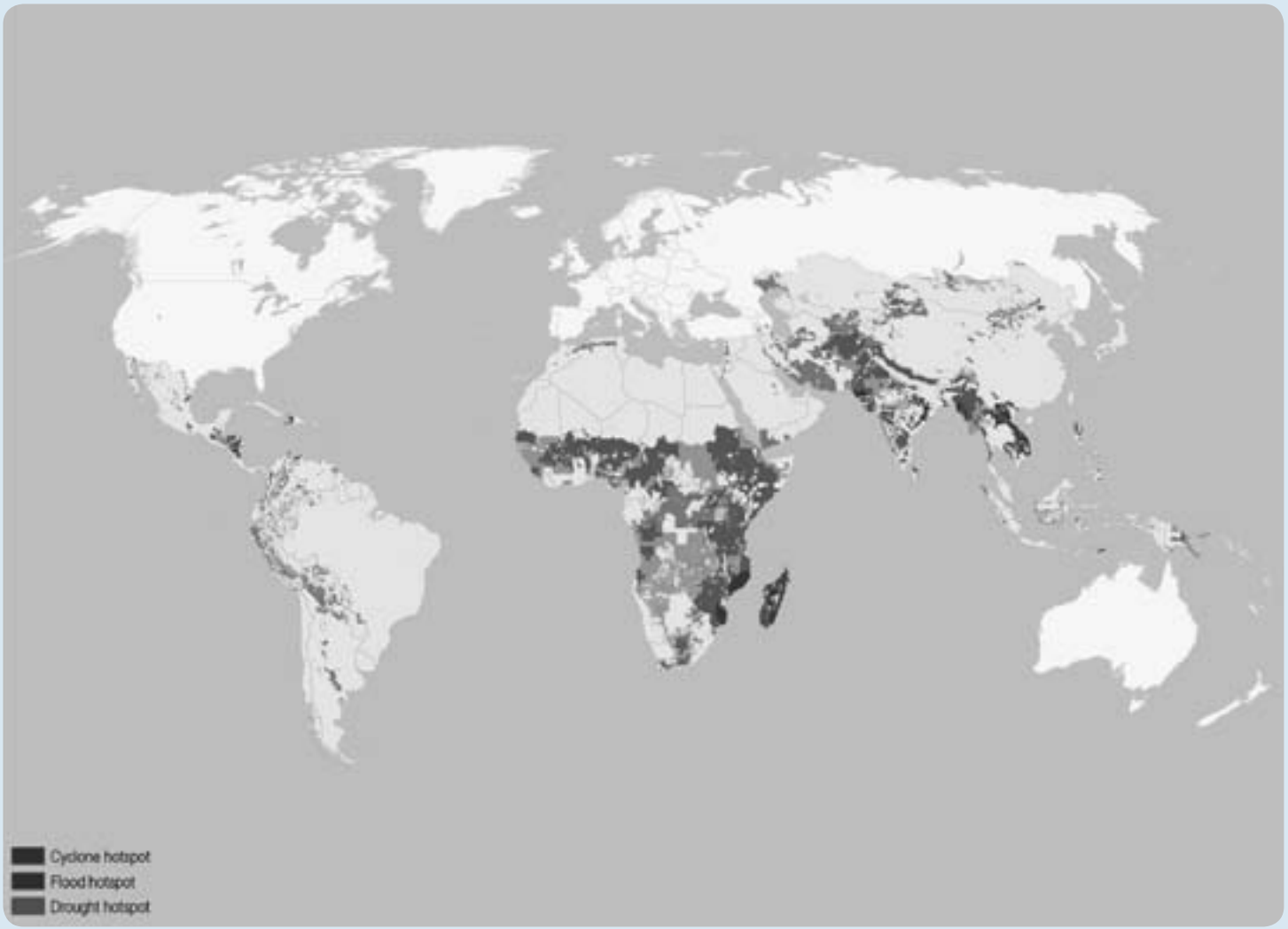
Therefore, it is especially important that the international community:

- **Increase investment in disaster risk reduction (DRR).** Concentrate on reducing vulnerability rather than just reacting to emergencies. Establish mechanisms to provide sufficient funding for adaptation to climate change and risk reduction.
- **Ensure faster and more appropriate responses to disaster.** Invest in early warning systems and be prepared to respond in time to save livelihoods as well as lives. If fragile livelihoods are allowed to erode, people are left more vulnerable to disasters in the future.
- **Act wiser:** We need to avoid inefficient quick fixes. Food aid, which comprises a large proportion of humanitarian assistance, is often necessary. However, it is frequently provided without considering whether it will exacerbate the situation by distorting local markets – potentially leaving the poor and farmers in a worse situation than before the emergency. Donor governments' use of domestic food surpluses to supply food aid, rather than selecting aid delivery mechanisms based on the specific needs and priorities of recipient countries, is particularly inefficient and can be counterproductive.[97]

- **Follow through:** We need to help people get back on their feet after disasters. When disasters hit, the world often responds with generous humanitarian aid (like food, blankets and shelter). However little or no funding is provided for other types of response – such as livestock protection or support for agricultural recovery. This undermines ongoing development efforts and leaves people with few options to go forward once emergency aid ends.

We also need to bridge the humanitarian/development divide by redressing the underlying causes of vulnerability such as detrimental policies and poor governance, social discrimination and degraded ecosystems. The most effective interventions will include:

- Increasing access to essential services (like health and education) and long-term social protection systems.
- Strengthening the capacity of local actors, particularly government at all levels, to better understand the nature of risks they may face and to take appropriate action.
- Empowering local populations to have a strong role and voice in emergency preparedness, response to disasters and subsequent recovery and rehabilitation.
- Improving the accountability of governments and service providers to populations affected by disasters.



This map combines humanitarian risk hotspots for the three major climate-related hazards studied – flood, cyclones and drought. Risk hotspots are defined as areas where high human vulnerability coincides with the distribution of weather-related hazards. Risk hotspots are indicated in transparent layers to show where they overlap.[98]

Box 7. Military activity and climate change[99]

Bruce Kent, co-founder of MAW and a vice-president of the organisaiton. Photo Credit: Supplied by Columban Faith and Justice

The British-based Movement for the Abolition of War (MAW) makes the case that, in the context of development and environmental challenges, war and the preparations to wage war are major causes of environmental damage to land, sea and the atmosphere. The world's military forces and defence organisations use vast quantities of non-renewal resources and occupy large areas of land. This two-way relationship between war and the struggle for resources was highlighted in the original 1987 Bruntland Report.

Paul Rogers, Professor of Peace Studies at the University of Bradford, in the 2001 MAW Remembrance Day Lecture, Can we end war?, at the Imperial War Museum in London made the point that abuse of the environment and the consequent diminishing of natural resources caused by climate change are themselves causes of conflict and war.[100] The exploration for, and the extraction of oil, have, in particular, been closely associated with military activity and conflict, and continue to be so.

That war has significant consequences for the environment was the message of Pope John Paul II in 1990. He said that war 'not only destroys human life and social structures but damages the land, ruins crops and vegetation as well as poisoning the soil and water'. [101]The sea is also damaged by war. Over 20 nuclear reactors have been lost or dumped in the sea and, as a result of accidents, at least 50 nuclear weapons.

Even if there were no wars (and there are over 20 in progress at the time of writing) the consequences of military activity would be highly damaging to the environment. Ruth Leger Sivard, Editor of the once annual World Military and Social Expenditure reports, says: 'the world's armed forces are the largest single polluter on Earth'.[102] For example, the Worldwatch Institute has estimated that about 10 per cent of global CO_2 and other emissions result from military activity.

It is also clear that while the world spends over a trillion US dollars a year on its military, funds will not be available for environmentally sustaining projects, or to enable the world to meet its millennium development goals (a commitment which it is failing to achieve). In April 2008, MAW helped to organise a networking and mapping meeting involving 25 peace, development and environmental organisations to discuss the links between military spending, conflict and climate change and what action this demands.

www.abolishwar.org.uk

Livelihoods

Agriculture has a footprint on all of the big environmental issues, so as the world considers climate change, biodiversity, land degradation, water quality, etc., they must also consider agriculture which lies at the centre of these issues and poses some uncomfortable challenges that need to be faced. We've got to make sure the footprint of agriculture on climate change is lessened; we have to make sure that we don't degrade our soil, we don't degrade the water, we don't have adverse effects on biodiversity. There are some major challenges, but we believe that by combining local and traditional knowledge with formal knowledge these challenges can be met.

Professor Robert Watson, Director of the International Assessment of Agricultural Knowledge, Science and Technology for Development (IAASTD) and Chief Scientist, Defra

The impacts of climate change on livelihoods will be more significant in sectors of the population located in more environmentally and socially marginalised areas or those that have high resource-dependency, such as agrarian societies. Some of these climate-driven outcomes are long term and chronic – for example, declining productivity of agricultural land – while others are episodic (e.g., flooding). These impacts on livelihoods will be widespread, particularly in developing nations.

Industrialised, large-scale agriculture is one of the largest sources of climate change gases. According to IAASTD, agricultural activities account for approximately 30 per cent of global greenhouse gas emissions. Dominant global models of production, consumption and trade have caused massive environmental destruction and put the planet's ecosystems at risk.

Climate change in turn affects all types of agricultural production systems – farming, forestry, livestock production and fisheries are already feeling the impacts of climate change. This will worsen as temperatures continue to rise and extreme events become more prevalent.

In contrast, the world's estimate 400 million small-scale farmers can not only provide food and livelihoods for poor people but can also be environmentally sustainable and more resilient to climate change. Yet, small-scale agriculture is often dismissed by traditional development theories.

Small farmers and rural communities in developing countries will be and already are among the first to suffer from climate change and environmental degradation. Changing weather patterns bring unknown pests along with erratic droughts, floods, and storms, which destroy crops, farmlands, livestock, dwellings, and livelihoods. Climate change threatens to undo the steps towards human development that have been made in poor communities; the building of schools, roads, and health centres, and the installation of piped water are all at risk. Communities now urgently need to

Box 8. Small-scale farmers can help cool things down[105]

Small-scale farmers are 'cooling down the Earth' using sustainable production methods that increase resilience and can enable production to adapt to climate change. Via Campesina, a movement bringing together millions of small farmers and producers around the world, asserts that it is time to change radically from an industrial model of production, processing, trade and retailing of food and agricultural products.

Its members have shown that sustainable small-scale farming for localised food systems is more adaptable and resilient in the face of climate change and can reverse environmental damage, while producing food and providing livelihoods for millions of farming families. They have also shown how agriculture can contribute to cooling down the Earth by using farm practices that store CO_2 in the soil and considerably reduce the use of fossil energy on farms.

Farmers – men and women – have to adjust to climate change by adapting their seeds and production systems to cope with increased uncertainty. They are joining hands around the world with other social movements, organisations, people and communities to develop radical social, economic and political transformations to achieve sustainability in food production through realising food sovereignty.

Food sovereignty policies enable zero carbon production, collection and consumption of local food, and biomass for fuel. This model of production and harvesting is agro-ecological and sequesters CO_2 in soil organic matter and uses organic manures and nitrogen-fixing plants in place of chemical fertilisers. It is smaller scale and people-centred, with both women and men having decisive roles. It is knowledge-intensive and maintains livelihoods. It depends on and provides locally developed crop varieties and livestock breeds that are adapted to local climatic conditions – such as drought-resistant seed varieties, crops that grow in wetlands and flood plains (although some practices produce excessive methane), disease-resistant livestock, etc. It is not dependent on agrochemicals.

This model of production sustains agro-ecosystems, working with and not against the environment and, as a result, productivity is higher. It develops synergies with nature creating space for local experimentation and building the store of knowledge that can be shared, without high costs. This agro-ecological, locally controlled model of production cannot be appropriated or 'owned' by an individual but is responsive to democratic demands and respects collective rights.

Box 9. Fair Trade in the Philippines[106]

Mang Juan works in the sea salt farms and ponds of Pangasinan in the Philippines. A poor man, he successfully battled government bureaucracy to have the freedom to make his own sea salt without paying exorbitant permit fees and taxes. He and hundreds of other salt workers earn good incomes from the naturally occurring white crystals, which they then sell to the local Preda Fair Trade initiative.

For the moment though, business is good because Preda's customers treasure value salt, free of chemicals and additives. However, thousands of salt makers are at risk of being wiped out by climate change. The fear is that rising sea levels may swamp the hard-worked salt ponds.

Preda is a non-profit foundation near Olongapo City, set up 25 years ago to uphold human and environmental rights. Preda Fair Trade was set up to support fair and just livelihoods, so the poor could be self-sustaining. Interest-free production loans and other assistance are provided and Preda helps to sell Fair Trade products all over the world.

Mango farmers benefit from the export of their organically grown produce, which, in dried form, can be found on some supermarket shelves in the UK, such as Waitrose. Preda offers practical assistance at all stages. Two-metre-tall mango saplings are given to farmers free of charge, and interest-free loans are granted that alleviate a family's hardship between planting and harvest time. Preda also promises to buy each entire crop, and pays a premium price for it. Conservation and eco-consciousness are an integral part of Preda's vision. Farmers are taught how to stop fruit flies from laying their eggs in the mango blossom, a problem which prevents the flower being fertilised, and thus no fruit is grown. Preda's initiative is to have a bamboo scaffold erected around each tree, from which platform families staple bags made of recycled newspaper around the blossoms.

Photo: Columban Faith and Justice

This system, coupled with the companion-planting of neem trees, whose antiseptic properties help to keep the soil and surroundings disease free, is not reliant on expensive artificial pesticides, yet still yields blemish-free fruit, increasing the crop's value at harvest time. A virtuous cycle is thus begun, in which the people care for the land and the land for the people. Preda has a commitment to plant 1,000 trees annually. Fair Trade is more than ethical trading. It devotes human effort and earnings to better the lives of the poor, respecting Earth's life systems.

Box 10. Teaching people new ways to farm and grow food has helped them adjust to changing seasons in Burkina Faso[107]

Farming techniques in Burkina Faso. Photo: Jim Loring/Tearfund

The agency Tearfund is helping people in Burkina Faso adapt their farming methods to a changing climate. In Burkina Faso people who already struggle with food and water shortages are experiencing increasing stress on their food systems.

Gourcy, in northern Burkina Faso, is a very poor region with limited infrastructure, low literacy rates and a population dependent on agriculture. Erratic rainfall over the last few years has had a massive impact on the harvests that farmers have gathered. Low, late rainfall, floods, locust infestations and market uncertainties created serious food shortages in 2005.

The population has always faced problems of low crop yields, poor soil and poor farming methods. These problems have been made worse by the advancing Sahara desert and erratic rains. The rains used to be much more predictable and regular, but recently people have noticed changes in the timing and amount of rainfall.

One of Tearfund's partners, the Evangelistic Association for Social Development (AEAD), has been helping people improve their farming techniques and the amount of food their land can produce. Each family is given an ox as a 'loan'. Oxen can work nearly double the area of land that can be done by hand. People are also being taught different methods of farming the land, such as how to use animal manure as a cheap fertiliser. Increased crop yields allow people to start paying back their loans. Basic literacy programmes have also helped people to learn business principles and how to keep accounts. Some farmers have been able to buy other animals for breeding and for food.

Man with Oxen in Burkina Faso. Photo: Mark Archdeckne-Butler / Tearfund.

Cropping wheat in Burkina Faso; Photo Credit: Photo: Jim Loring/Tearfund

These schemes have helped people double the amount of crops they can grow in just a year. Increased harvests have helped families earn more so they can send their children to school and pay for basic healthcare. In addition, having small animals as livestock has provided an alternative source of income, which reduces people's dependency on agriculture. This project is a vital way of helping people adapt to changes in the climate. Teaching people new ways to farm and grow food has helped them adjust to changing seasons in Burkina Faso.

increase their resilience and capacity to withstand climate change related disasters.As these case studies show, small-scale agriculture intelligently practised and supported is a big part of the solution to the problems of underdevelopment and environmental degradation, rather than it being the problem. With the right farming practices, such as agro-ecological approaches, subsistence farmers can become highly productive stewards of the natural environment, helping to store CO_2 in the soil and considerably reducing the use of fossil fuel energy in agriculture. There are additional benefits, such as adaptation and the reduction of vulnerability to climate change. Rather than seeing these farmers as marginal, they are central to reducing the carbon footprint of agriculture and creating both sustainable and productive farming.

Strategies for reducing vulnerability include strengthening and diversifying the livelihood options of the poor and increasing the awareness of communities of the underlying reasons for the changes they are experiencing. Using organic farming methods or introducing indigenous crops may increase resilience; fair trade regimes and the protection of collective rights are also important. Together, communities and NGOs are learning to adapt to the challenges of climate change.

Box 11. Organic farming in the Philippines[108]

The US-based Rodale Institute's research shows that organically managed soils can sequester more than 1,000 pounds of carbon per acre, while non-organic systems can cause carbon loss.[109] Tim LaSalle, Chief Executive Officer of the Rodale Institute says that 'in the age of carbon awareness, we think that farmers should be rewarded for inovative stewardship that builds soil for future generations.'

Columban Faith and Justice is working in the Philippines helping local people to develop sustainable organic methods and promoting stewardship of the land to help mitigate climate change. The Columbans have established two demonstration farms – one in Zambales Province, Luzon and one on Negros Island – which teach organic methods as well as the use of indigenous varieties of rice and corn.

Besides the production and distribution of more than 50 varieties of indigenous rice, the Zambales demonstration farm has become a place of practical experience for graduating students from La Salle University in Manila. The indigenous people of the area, the Aetas, who were displaced by the eruption of Mount Pinatubo, are engaged as resource people in promoting a sustainable environment. Since the destruction of their forests, they have also had to learn farming methods to provide for their families and, with the help of local farmer organisations, they are also learning about organic methods.

On Negros Island, besides the small demonstration farm, the Columbans are developing more than 25 hectares into a mini forest. This area was originally forest area but has been reduced to scrub and a few small trees. Deforestation has been a significant problem on the island with less than 4 per cent of the original forests remaining. Non-indigenous varities are gradually being taken out and relplaced with local indigenous varieties so as to attract back local wildlife biodiversity. The forest also helps to protect and develop water sources. Replanting forests is vital to the future of this area.

The Negros Island has been declared organic and legislation to this effect has been enacted. GMOs are illegal under this legislation. An organic cooperative has been started and the members are holding seminars on agroforestry and biodiversity as well as on organic farming, with alternative and sustainable farming practices being introduced.

There has been a number of presentations in schools on the island on the topics relating to climate change. On Negros Island, the Columbans work in partnership with the Negros Nine Human Development Foundation (www.negrosnine.com).

In Mindanao, Columbans are also associated with sustainable agricultural groups, such as the organic Masipag farmers, and are strong in their anti-mining advocacy in the Subanan tribal areas. Mining will not only destroy the forests and rivers but the fertile rice lands as well. This campaign has been informed by Columban faith and justice work in Britain, where many large mining conglomerates have their headquarters.

Children with organic corn on Negros. Photo: Columban Missionary Society, Philippines

Box 12. Adaptation to climate change by pastoralists in Ethiopia[110]

Waaqqayyo Muudaa used to herd cattle and camels in the vast rangelands of the Fantalle District in the Rift Valley of Ethiopia. But these days he is guarding the trees and the grass that grows in the 15-hectare enclosure that the community established two years ago in the village of Xuxuxii (Tututi). This is a radical change for a 27-year-old man who is used to walking freely herding livestock. Waaqqayyo and his fellow villagers belong to the Karayu clan and live in the central part of the Ethiopian Rift Valley. They are a pastoral people whose livelihood depends on herding cattle, camels, goats and sheep.

For generations, the semi-nomadic life style of migrating in search of pastures for their herds and flocks had served the Karayu well. Within one generation, however, their traditional pattern of life was threatened by the encroachment of irrigated sugarcane plantations, urban development, successive droughts and population increase.

Climate change, manifesting itself in terms of prolonged and successive years of drought, had contributed to poor recovery of pastures. There was increased malnutrition of children and women in the community. Between 2000 and 2002, the pastoralists lost nearly 60 per cent of their livestock as a result of the drought resulting from the long-term change in climate. It was clear that pastoralist livelihood was under threat and things could not continue as before. Adapting to long-term climate change and its consequences was imperative.

For pastoralists, who have for generations led a relatively isolated existence, with very little access to education or health services, change is a difficult prospect. However, Tearfund partner Gudina Tumsa Foundation (GTF), a local Christian NGO, brought the first school and sunk bore-holes that provided potable water; it was on hand to encourage and support the pastoral Karayu to make the needed adjustment. GTF introduced two simple, but critical innovations that will, in the long-term, sustain the livelihoods of the Karayu. The first was the re-introduction and planting of indigenous trees that could withstand the harsh local ecology. The second was the establishment of forage reserves by enclosing sections of the rangelands.

Haji Rooba, an elderly man in his mid-sixties, explained that establishing forage reserves was one of the options that his fellow villagers in Dheebiti chose after much reluctance and debate. He explained that the enclosed area allows the grass to recover and this provides feed for the livestock during the dry season.

In the village Banti Mogassa, tree seedlings have been planted. GTF took care to select indigenous tree species in consultation with knowledgeable community leaders. Some of the trees were selected for their drought tolerance; others were termite resistant and thus good for house construction; some had medicinal value.

Efforts at adaptation to climate change, such as ones that the Karayu pastoralists have embarked upon with the support of Tearfund partner GTF, are valuable beginnings that pave the way for adaptation to the worst of climate change. These innovative efforts need to be supported and scaled up so that wider impact can be achieved.

Photos: Tadesse Dadi/ Tearfund

Box 13. Community action to cope with drought and flood in Nepal[111]

Unusual weather effects are already being felt in Nepal; the climate has become unpredictable. The pre-monsoon has become hot and dry, and the arrival of the rains is often late. Rainfall has changed from low intensity over an extended period to high intensity over a short period. The impact on rice and maize crops has increased food insecurity, while erosion, landslides and flash-flooding have increased in frequency and severity.

In some parts of the Chitwan District in southern Nepal, vulnerable communities face two major disaster risks: not enough water (drought) and too much water (floods). Because of poverty, they are compelled to live at the confluence of two rivers where they are exposed to floods. Meanwhile, their agriculture is primarily dependent on seasonal rainfall; hot, dry summers cause massive crop losses through drought. Few coping strategies have been available. In recent years, climate-induced disasters have increased in frequency and severity, reducing agricultural productivity and threatening livelihoods. Annual flooding adds to the misery.

In 2007, an initiative was launched to increase communities' social and economic capacity to respond to and cope with drought, through more resilient livelihood options. Shallow tube wells (STWs) were installed; pipes are set vertically in the ground to a depth of 6–18 metres, which suction lift water from shallow aquifers. The STWs have enabled communities to reduce their vulnerability to drought while increasing their income-earning potential, making them more resilient to other disasters.

Farmers were organised into groups of 10 and supported to install one STW for each group. The required materials were provided by Practical Action and the group members themselves provided the labour for installation. Training on appropriate agricultural technologies was provided and improved seeds of cereals and vegetables were supplied.

Shankar Kumal with newly installed Shallow Tube Well, Photo: Practical Action

This small support has increased the confidence of the community people significantly and brought enormous changes in their way of thinking. Farmers have initiated vegetable farming during the season when previously they had to leave their farm fallow.

As Shankar Kumal, one of the group members, said: 'now we can lift water whenever we want and we can grow crops in our fields even during the dry season to earn more.'

In the past farmers had often to sow or transplant their crops late because of the delayed onset of rain. This severely affected the yield. Now farmers discuss in groups and allocate some days for each and every family to use the STW so that they can plan their crop sowing and transplanting accordingly. 'I am very happy that I could transplant my rice on time this year', said Dhan Bahadur Kumal, one of the members of the group.

The annual monsoon season floods inundate homes and farmlands, causing severe erosion and the deposition of debris on agricultural lands. While it is impossible to prevent this flooding, various activities have been initiated to lessen the impact. Gabions (wire baskets filled with stones) have been positioned to prevent river-bank erosion. Preparedness plans have been practised whereby communities respond to early warning signals and evacuate their homes, possessions and livestock to higher ground. Food stocks are stored out of the reach of flood waters and precious documents are stored in water-proof wallets.

Crucial to increasing the adaptive capacity of the community has been the establishment of community-based organisations (CBOs) including a Disaster Management Committee, a Savings group and farmers' field schools. Access to knowledge has been improved through linkages established with Government service providers (particularly agriculture and veterinary officers), who are able to give advice and technological support. Community leaders are aware of available sources of information.

Community members constructing Gabions. Photo: Practical Action

Key to the success of this initiative is the involvement of the community from the onset. Raising their awareness of the unpredictability of the future impacts of climate change has encouraged them to identify solutions which not only reduce their current vulnerability but which improve their resilience to the impact of future hazards. While their location-specific vulnerability is largely unalterable, reducing their poverty by increasing their agricultural productivity, facilitating their access to knowledge, coupled with preparedness and other mitigation activities, has significantly increased their resilience to weather-related hazards.

Box 14. Seeds of change[112]

Ecuadorian agriculture has for years now been under immense pressure to conform to the demands of the global food system. Large-scale, intensive operations have replaced many small-scale farms, with farmers being forced off the land as a result.

Narcisa Sinchi, Photo: Michelle Lowe/ Progressio

Small-scale farmers in provinces like Azuay feel the squeeze. Narcisa, who farmed with her elderly mother, explained the problem. 'We have to use hybrid seeds because we have to provide what people want now – good big produce,' she says.

The problem is that farmers like Narcisa can't always afford to buy seeds and fertilisers from seed companies because they are poor. As fellow farmer Edmira Vangari, puts it: 'It is great for the seed companies because they can sell, sell, sell and we have to buy again and again.'

So, Catholic development agency Progressio has been working in Ecuador to support the training of farmers in agricultural methods that are both environmentally and socially sustainable.

This includes agro-ecology, where farmers save the seeds from their crops to plant the next year thus breaking their dependency on major seed firms.

Now, Narcisa and Edmira harvest and save native seeds, which are well-suited to the local soils and climates. They share them with other members of the community.

Harvesting a variety of seeds means that the diets of these families are healthier and more varied. Promoting seed diversity has also proved to be a good way of building the resilience of these farming communities to extreme weather conditions. In the face of climate change, where rainfall patterns are becoming increasingly unpredictable, promoting seed diversity is particularly important.

Narcisa says the scheme has changed her life. 'Before we started this scheme we used to buy seeds blindly. Now, everything has changed. Seed saving and exchange is important to us because there are good new seeds which adapt well to here.'

Problems still remain, and with the first effects of climate change already being felt, there are still times of uncertainty ahead for farming communities across Ecuador. But through the ethos of agro-ecology, communities like Narcisa's can start to see a way forward. It's a route that is healthy, profitable and puts people back in harmony with their natural surroundings.

Box 15. Organic farming in Malawi[113]

Angelina Ngoza. Photo: Marcus Perkins/Progressio

Angelina Ngoza (26) and farmers like her are shielding their families from global food crises and dependence on big business – by going organic.

Angelina is turning her back on chemical approaches to farming – and the large sums she had to pay each year for pesticides, herbicides and fertilisers. A year ago, Progressio helped Angelina and 40 of her neighbours switch to organic production. Instead of spending most of the profit from their crops paying for fertilisers and chemicals, they became self-sufficient.

'Before I knew about organic farming, I was forced to buy high-priced chemical fertilisers to make my crops grow. But I could never afford all I needed. I was taught to use pesticides and herbicides too, but they killed small animals and left burns on my arms. I always worried that these chemicals might one day kill me.'

For people like Angelina who spend 50–80 per cent of their income on food, this is good news indeed. She is now able to feed her family and plan a long-term future without being in debt with agricultural companies.

'After only one year of being organic, I am already harvesting one extra bag of maize for my family and I know my harvests will get bigger in future. Organic farming doesn't harm the soil, it is healthier, and I can charge more for the vegetables I sell in the local market.'

Box 16. Adapting to climate change in rural Ecuador[114]

Carlos Ruiz. Photo: Santiago Serrano/ Progessio

Perched on a steep hillside in the foothills of the Ecuadorean Andes, Carlos Ruiz's farm is thriving. The sizeable plot in the village of El Cristal, which Carlos has helped to care for since he was a boy, provides Carlos, his wife Marta and their three children with more food than they know what to do with.

'We grow tomato, lettuce, beans, banana, pineapple, six varieties of lemon, cabbage, carrot, parsely, yuca…' says Carlos (42), pointing to the various trees and plants that are sprouting in the rich soil.

During an average harvest, Carlos is able to sell a lot of his fruit and vegetables at the local market – he gets about US$ 0.20 for each lettuce. On top of that, the family is able to keep an additional 40 lettuces for use in salads, along with a range of other home-grown produce which they use in healthy, nutritional meals.

Carlos is fortunate, but he's worried. Although his ancestors have cultivated these slopes for hundreds of years, he says his family's way of life is under threat. Changes in the climate – which are leading to changes in the availability of water used to irrigate his many crops – mean Carlos has to plan for a future of possible drought.

'The seasons used to be much more regular', Carlos says. 'But now everything has totally changed. You don't know when it's going to rain; it's cold when it should be hot...'

'The water level in the rivers has dropped', he continues, pointing to the stream which lies at the foot of his farm. 'When it rains very heavily, suddenly the water level rushes up really fast, but then it's all gone again.'

Conscious of the devastating effect a long-term drought could have on his family's livelihood, Carlos has decided to take things into his own hands.

'I read about people in Africa using these potatoes to survive very dry conditions', says Carlos, pointing to a field of leafy green plants. 'Apparently many people were saved by the papa china (a variety of drought-resistant potato), so that's why I planted them, just in case.' He adds: 'We are having to learn how to cope with the new climate – we must think ahead and make sure we are prepared.'

Urban development

Today, with a few exceptions, almost everyone lives in a settlement of some kind. More specifically, though, a side-effect of orthodox development is that the balance continues to shift from a global majority having lived in rural settlements, to towns and sprawling mega-cities becoming home to most of humanity. The overarching challenge for 'post-carbon settlements' will be to align their consumption patterns of water, food, energy, goods and the generation of waste to a level that does not exceed available biocapacity.

In industrialised countries and among high-consuming classes everywhere, this means a significant contraction of consumption and waste production.[115] It also involves dealing with aging infrastructure, and the legacy of suburban sprawl. For many developing countries, it means reversing the trend of 'slumation' on the margins of high-density settlements, and developing infrastructure that functions sustainably, an infrastructure that will be resilient in the face of climate change.

Some low-density settlements, such as villages or rural areas, may be able to achieve a level of fairly comprehensive self-reliance, meeting most of their needs from locally available biocapacity. In contrast, urban settlements, where much future global population growth is expected to occur, are unlikely to achieve significant self-reliance.

The industrial revolution stimulated a great migration of people from rural to urban areas. By the end of 2008, the UN predicted that:

> *…for the first time in history the urban population will equal the rural population of the world and, from then on, the world population will be urban in its majority.* [116]

Today approximately 75 per cent of the European population lives in urban areas, and approximately 78 per cent of all carbon emissions come from urban areas.[117]

Globally, much predicted urban-population growth is set to happen in poor-quality, overcrowded housing – slums – or informal settlements, where approximately one billion urban dwellers already live – almost one in six people on the planet. If current trends continue, there will be two billion people living in slums by 2030, and at least three billion by 2050 – almost a third of humanity. The UN Human Settlements Programme (UN-HABITAT) revealed that already an astonishing 99.4 per cent of the urban population in Ethiopia lives in slums. Similar figures exist for Chad (also 99.4 per cent), Afghanistan (98.5 per cent), and Nepal (92 per cent).[118]

It is hard to adapt non-existent infrastructure to face either peak oil or climate change. And slum dwellers often have no all-weather roads, no piped water supplies, no drains and no electricity supplies; they live in poor-quality homes on illegally occupied or sub-divided land, which inhibits any investment in more resilient buildings and often

Box 17. The struggle of social movements in São Paulo[120]

During the day São Paulo city centre is bursting with life. Upwards of six million people converge on the centre for work every day. Yet after working hours, the centre empties, as highways and the overloaded metro system jam up with commuters. According to recent data, the centre of São Paulo has lost 780,000 people over the last 20 years, with the wealthy moving southwest and pushing out the poor. In parallel, those on lower-incomes began settling in the southern and eastern reaches of the City. The number of people living in slums, known as favelas, quadrupled from 1980 to 1993.

São Paulo is an emblem of unbridled, under-planned, urban development. The first Master Plan to regulate São Paulo's sprawling urban development was drafted in 1971. The City went a full 30 years without any revision to this original Plan. Unregulated growth into environmentally risky and fragile areas accompanied the growth of the favelas. Over the years, the City has chosen to build affordable housing in the outskirts, where land is cheaper, the argument being that price per unit costs were lower.

However, APOIO, an organisation actively engaged in challenging the City's housing policies, notes that these calculations never took into account the need to extend infrastructure to these regions; regions which often have no decent roads, transport, access to water, electricity and other key services.

For example, one community described by the Movement in Defense of the Favela (MDF), a social movement in eastern São Paulo, was relocated to new government housing in a neighbourhood where residents had to walk 40 minutes just to buy bread. Moreover, there is a real danger that these new projects will become 'vertical favelas', marked with all the stigma and social exclusion characteristic of slum-life.

Solutions for those in outer São Paulo and those waiting for housing in the centre seem inextricably linked. Urban policy think-tank, POLIS, recently wrote that affordable housing in the city centre is one of the 'key demands' of social movements in São Paulo, but also one of the 'principal battlegrounds between the social movements and the current City Administration'. POLIS points out that the City Administration under budgeted and under executed its budget for housing programmes in the centre.[121]

Squatter movements propose that the City renovates abandoned buildings in central areas for those needing affordable housing. A visit to Riachuelo, a beautiful 1930s-era former office building in the centre, revealed how a building can be

reclaimed and how squatters can force the city's hand. The building now houses a number of lower-income families. Many residents used to have up to a two-hour commute to their work in the city centre; now they live within walking distance.

MDF and APOIO are supported by CAFOD and a European Commission grant to work alongside communities and bring their demands to policy-makers in City governments. While MDF looks to help those in favelas far from the city centre legalise their land and push for better infrastructure and housing, the organisation also supports the repopulation of the centre. MDF and APOIO, and a number of social movements are adamant that the centre not be turned into an elite enclave at the cost of millions of working people.

This issue has come to the fore over and over again, as the Mayor and City Council attempt to gut the City's Master Plan. One attempt in 2007 was rebuked by urban social movements, both from outer São Paulo and from the centre. Again this year, the same Mayor Gilberto Kassab is trying to make huge changes to the Master Plan and social movements are lining up against the changes. Among other things, the City Administration wants to undo the special status of areas that had in principle been zoned for affordable housing, including many areas in the centre. Urban movements have protested, created public pressure, undertaken an intense lobby effort with City councillors and even sought court injunctions against the 'consultation' process. But activists fear that this time Mayor has the votes he needs on the City Council to make these changes to the Master Plan and set back attempts to revitalise the centre in a more equal way.

Box 18: Happy Earthworm Ecological Center[122]

The Happy Earthworm Ecological Center in Lima, Peru, started its activities in 1991 to counter the advance of the cholera epidemic in the surrounding population. It aimed to reduce the presence of garbage dumps in the area, which are hotbeds of infection.

The initiative came from the Catholic parish in an arid district on the outskirts of San Juan de Lurigancho. Homes tended to be located in areas inaccessible for the municipal garbage collector trucks and this was compounded by the low environmental awareness of the population in terms of waste management. Families undertook training before the project begun. This involved health education and the classification of garbage into three types: organic, non-organic and non-recyclables.

Melchor Vilca Quispe is the garbage collector for the project. Every day he walks around the communities, knocks on people's doors asking for their garbage, which must be sorted. He then brings it, with the help of his push cart, to the Happy Earthworm Ecological Center. The organic refuse goes straight to the composting area for compost production, which is then be fed to the earthworms. The non-organic refuse is classified and stored to be sold monthly as another source of income for the Center. The non-recyclable items are stored and delivered to the municipal garbage truck that usually comes once a week. Around four tons of garbage is collected every month. Of this, 73 per cent is organic for compost production, 3 per cent recyclables sold to the market and 23 per cent non-recyclables.

Earthworms fed by the compost from organic waste of the families in the community produce a waste product called humus. It is an excellent organic fertiliser. The earthworm of the Eisenia Foetida species, or Californian Red Worms, consumes large quantities of decomposed organic material. Of this ingestion, up to 60 per cent is excreted as 'vermicompost', which constitutes an ideal substrate for the proliferation of useful micro-organisms. Worms transform the non-assimilable minerals present in waste and animal remains into nitrates and phosphates which are directly consumed by plants. Worm humus is odorless and it does not rot or ferment. All the studies carried out have concluded that the vermicompost is an organic fertiliser of a very high quality, with a long-lasting effect and is easy and economical to produce.

Sorted garbage being collected from families. The earthworms being fed with freshly collected organic vegetable waste. Photo: Happy Earthworm Ecological Center

The Happy Earthworm Ecological Center serves 270 families from four different human settlements. It is one of the most ecologically friendly initiatives in Peru for handling garbage in communities. The income from the humus production, sales of plants, sales of recycling and income from visits by different institutions, organisations, schools and universities pay the wages of two regular workers employed in the Center. The Ministry of Environment, recently established by the Peruvian Government, helps to disseminate the project's experience in a country coping with serious environmental problems, such as waste management and climate change.

prevents the development of infrastructure and provision of services. Making matters worse, a high proportion of such settlements are on sites that risk worsening climate-related impacts, such as flooding and landslides.[119]

Projects that promote low-carbon city development, protect water resources and green areas, and reduce greenhouse gas emissions should be a priority. Cities are growing; there is a huge opportunity to intervene now to ensure good urban design in small and medium-sized cities before they become large and unwieldy. There are also numerous possibilities for alternative energy technologies, such as solar heating and cooling systems, and good water-management practices all especially beneficial to low-income families. Each country's middle class also has an important role to play in raising awareness, encouraging the efficient use of energy and mobilising resources for adaptation.

Urban development affects whether the risks resulting from the effects of climate change can be managed as well as determining whether emissions from urban areas can be reduced. Sprawling urban development has added greatly to emissions of air pollution and greenhouse gases from transport. The slums of São Paulo represent unbridled urban development and here social movements are working together to reclaim the city centre for affordable housing; they want to improve the lives of millions of working people while at the same time reduce greenhouse gas emissions from transport.

Energy

Energy is central to all human economic activity – heating our homes, cooking our food, powering industry and providing light. But access to clean, safe and affordable energy is far from universal. Nearly two billion people around the world still do not have access to electricity and this is particularly so in rural areas. Without energy, water cannot be pumped or treated and school children cannot study at night. The greatest child killer is acute respiratory infection and this cannot be tackled without dealing with smoke from cooking fires. Energy is therefore inextricably linked to poverty and without access to clean, safe and affordable energy, sustainable development is impossible.

Centralised energy infrastructures can be extremely inefficient.[123] In the UK, Greenpeace estimates that up to two-thirds of potential energy is lost between generator and consumer.[124] Converting heat energy to electricity is at best 50 per cent efficient – a further 5 to 7 per cent is lost in transmission. The large majority of renewables functions far more efficiently and practically if it is integrated into a decentralised energy system where power is generated at or near to the point of use. Developing a renewable, distributed energy (DE) is likely to have a significant impact on an economy's resilience to future energy and food-price shocks, either as a result of climate change or peak oil. But the benefits of such a system go further than simply providing a buffer against price shocks. There are many local economic benefits that can contribute to poverty reduction and improved community self-confidence through greater self-reliance.

As the following case studies show, community-based, decentralised renewable energy options are key to enabling communities to have access to energy and allow development. As Jeremy Rifkin, a contributor from the Foundation on Economic Trends writes: 'What we now have is the possibility of a distributed energy revolution. We can all create our own energy, store it, then distribute it to each other.'

The World Alliance for Decentralised Energy (WADE) economic model has been used extensively to calculate the economic and environmental impacts of a DE system. The model has recently been used by the UK Foreign Office to project China's energy future; by the Federal Government of Canada to look at the country's energy system; and by the European Commission to investigate options for the EU. The Chinese analysis confirms the view that DE can meet demand growth at lower cost owing to its

Box 19. Perspectives from rural India on using clean energy to tackle underdevelopment[126]

Gram Vikas is an Indian NGO using clean energy to enable rural development in the Eastern, coastal state of Orissa, one of the poorest states in the country. The NGO uses decentralised energy options to help communities find lasting solutions to energy needs.

Gram Vikas has been working to provide piped water in tribal or Adivasi villages. These remote villages generally have no grid power making it difficult to pump water to each house. The solution is to use renewable energy to power the supply, notably solar, gravity flow and biodiesel. Solar and biodiesel are used to pump water from wells in the village; gravity flow uses wells or springs at a higher altitude connected to a water tower in the village.

Running water; Photo: Gram Vikas

In the past, Gram Vikas also supported biogas projects, which saw villagers using cattle dung to produce gas for cooking and lighting. Gram Vikas is also using other sustainable techniques in its projects. The bricks used in the school buildings are made in vertical-shaft brick kilns, which are less energy intensive and emit fewer greenhouse gases than normal kilns. It is also adopting architectural methods that reduce the volume of construction materials and enhance thermal efficiency.

Maintenance is a key factor determining the success of clean energy projects. For example, many of the biogas plants built in Orissa during the 1980s and 1990s have fallen out of use because people were not trained in how to maintain them, the upkeep was time-consuming, and families did not keep enough cattle to produce sufficient dung for the plants.

One advantage of the Gram Vikas projects is that a maintenance fund is set up after the infrastructure is built. Every household makes a small contribution to the fund to cover the cost of future maintenance and repairs and one person in the village is nominated to operate the system. Gram Vikas insists on 100 per cent community participation, thus increasing the chances of the project lasting beyond the initial intervention period.

Scaling up all these schemes so that they cover whole districts, will require considerably more investment by government and donors. For example, on

solar, the state government is subsidising some village-lighting and water-supply projects. However, this support is not yet extensive enough to either pay for all the capital costs or transform the energy supply situation across whole districts.

A green light in Orissa?

According to the 2001 census, just one in five rural households has access to electricity (compared to a national average of 46 per cent). This reflects the stagnation in the 1990s of the state government's efforts to electrify all villages.

Regarding future options for supply, the picture has been complicated by the recent privatisation of the electricity sector. This means that communities must now pay for the grid to be expanded to their area, something most lack funds to do. In Orissa, the best approach – defined as the one that is most sustainable, delivering energy to the poorest households – would be to combine an expansion of the grid with the promotion of the decentralised systems mentioned above. Since 2003, all states in India are required by law to fix a minimum percentage of power to be supplied from renewables. This and other measures should mean that, in future, more of the grid electricity is sourced from renewables, such as wind and solar.

Training for maintenance Photo: Gram Vikas

Box 20. Jeremy Rifkin on the 'Third Industrial Revolution'

'We are at the cusp of a Third Industrial Revolution that could open the door to a new post-fossil fuel era. It was the first Industrial Revolution that brought together print and literacy with coal, steam and rail. The second combined the telegraph and telephone with the internal combustion engine and oil. What we now have is the possibility of a distributed energy revolution. We can all create our own energy, store it, then distribute it to each other.

Twenty-five years from now, millions of buildings will become power plants that will load renewable energy. We will need solar power from the sun, wind from turbines and even ocean waves on each coast. We can also make the power grid of the world smart and intelligent; we call it inter-grid. Not far from now, millions and millions of people will load power to buildings, store it in the form of hydrogen and distribute energy peer-to-peer; just like digital media and the Internet.

The first inter-grids are going up in the United States this year in Houston, Texas; Boulder, Colorado; and southern California. The 'Third Industrial Revolution' is an economic game plan. We have the science and technology to do it, but it will mean nothing unless there is a change in will.'

www.foet.org

reduced requirements for transmission and distribution (T&D). This is notably beneficial in China, where T&D costs are high because of the country's size. Combining this factor with DE generation's far lower fuel consumption offers the prospect of cost-effectively reducing CO_2 emissions in China.[125]

Box 21. Cooking stoves in Nicaragua[127]

Progressio has been working in collaboration with the Municipality of Macuelizo, Nicaragua to protect the environment and improve the quality of life for the people who live there. This collaboration has had a direct effect on the beneficiaries, strengthening community participation, reducing consumption of firewood by up to 50 per cent and improved forestry resources and water source management. In addition, it has created better environmental conditions in the home, especially in the area of health, and, at the same time, this has brought about an improvement in household economies.

Señora Sonia Enríquez from the community of Ococona, Macuelizo, used to have a traditional stove, handed down from generation to generation, but it consumed a lot of firewood and had other disadvantages which affected her health.

'The project with Progressio has helped us a great deal in that, along with my family, we've seen changes in a short time.' says Sonia. 'The pollution from the smoke of the traditional stove was affecting our health, mainly mine; for a long time I've been suffering from irritation in my eyes due to the smoke. At first I didn't feel too motivated when we held the initial project meetings because I thought it was just another project in the community which wouldn't respond to any of our needs.'

'Thanks to the training sessions that have been held, I believe we've improved our knowledge about taking care of the environment. Before I thought only the loggers and sawmills destroyed the forest, but we've realised that in the communities, too, there exists a silent enemy which is us, the same inhabitants who use the forest for firewood which we need every day to cook food.'

Old Stove

New Stove
Photos: Progressio

'The experience with the Improved Stoves has also been something new, because almost every day women from neighbouring communities and this community who haven't been project beneficiaries visit me to find out how the stove works. I feel that the improved stoves are modern even though they're built with natural materials. We know that this is only the beginning of great things that we'll do in the community.'

Ecosystems[128]

We need a mechanism that will assist people in developing countries, certainly in Africa, to protect their standing forests and plant trees, to protect their soil, protect biodiversity and protect livelihoods while reducing carbon emissions for everyone.[129]

Nobel Peace Laureate Prof. Wangari Maathai (2007)

Healthy ecosystems provide humanity with essential building blocks for constructing secure and dignified lives. In recent decades, humankind has made unprecedented changes to the environment in order to meet growing demands for food, fresh water, fibre, and energy. These changes have helped improve millions of people's lives. However, they have also undermined nature's ability to provide essential 'ecosystem services' such as climate regulation, water-flow regulation, rain generation, and the provision of wild medicines.

Roughly two-thirds of the ecosystems are in decline worldwide.[130] This poses a profound threat to the millennium development goals – especially those pertaining to hunger, water, child mortality and disease. The loss of forest ecosystems and their services is particularly grave. Between 2000 and 2005, roughly 13 million hectares of forest were cut down each year.[131] In addition to directly reducing biodiversity and increasing barriers to sustainable poverty reduction, deforestation and forest degradation contribute to climate change. Indeed, land-use change is responsible for 18–30 per cent of annual global greenhouse gas emissions.[132,133,134,135] This contribution is the largest of any single sector, with the possible exception of electricity and home heating.[136]

The conclusion is inescapable: if humanity fails to change the way it values and manages forest landscapes, we will lose the fight to avoid dangerous climate change. Urgent support is needed for local solutions to biodiversity loss that provide benefits on all counts. For example, deforestation in Brazil and Indonesia alone is likely to cancel out 80 per cent of all gains achieved if industrialised nations are to meet their commitments under the Kyoto Protocol.[137]

Changes to natural ecosystems influence both climate change and people's ability to cope with some of its damaging impacts. The following case studies clearly show that conserving and managing biodiversity can help natural systems and vulnerable people cope with a shifting global climate.

Box 22. Land, forests and climate change[138]

With the right standards and safeguards in place, efforts to reduce deforestation and re-carbonise degraded lands could result in a win for the climate, a win for poverty reduction and a win for conservation.

Degraded landscapes could have tremendous potential to sequester carbon in soils and vegetation. For instance, there are roughly one billion hectares of farmland in developing countries that could be made far more productive – and more resilient to the impacts of climate change – through conversion to agroforestry systems. This would make a large contribution to reducing poverty while safely sequestering carbon. If completely implemented over the next 50 years, the spread of agroforestry systems could result in 50 billion tons of CO_2 being removed from the atmosphere. This would be the equivalent of replacing 1,400 large coal-fired plants with less-polluting gas-fired facilities or increasing the fuel economy of two billion cars from 12 to 25 kilometres per litre.[139]

Business-as-usual cannot continue since it does not account for the worth of forest ecosystem services and only values trees once they are felled. Incentive structures must be altered to encourage sustainable land and forest use. At the same time, technologies and techniques must be transferred to empower front-line natural resource managers throughout the world.

Wiser land utilisation and management could solve up to 14 per cent of the world's emissions reduction challenge.[140] But while there is broad consensus about the importance of change, stakeholders disagree about the best means to trigger and maintain it. Some stakeholders believe the only way to ensure that change happens quickly, and at a large enough scale to make a difference, is to tap the power of carbon markets. Other stakeholders prefer a more conventional funding mechanism capitalised by earmarking a percentage of funds raised from the auctioning of emissions permits, placing a special tax on marine fuels, etc.

If designed as a 'payment for environmental services,' a fund-based approach could also shift incentive structures and transfer appropriate technologies to the people that need them most. However, this strategy may place funding for improved land and forest management in direct competition with funding to help the world's most vulnerable people adapt to climate change.

Both market- and fund-based approaches to safeguarding ecosystem services share several methodological challenges (such as accounting for leakage and addressing permanence) that need to be addressed through the rigorous application of good science and best practices. There are also substantial risks, including an increase in natural resource conflicts and the possibility that indigenous peoples and local communities will lose traditional land- and forest-use rights. For this reason, proponents argue that standards and social safeguards must be put in place prior to operationalising either approach. It is especially important that checks and balances be established to ensure poor people's activities and interests are factored into the design of projects to reduce deforestation.

Photo: © Daniel Beltra / Greenpeace

Box 23. Replanting trees and mangroves can help protect from hurricanes and rising sea levels in Honduras[141]

Arial photo of a typical Miskito settlement, Photo: Steve Collins/ Tearfund

In the isolated north east of Honduras, many indigenous Miskito and Garífuna people live on the coast, often on narrow strips of land between lagoons and the Caribbean Sea, or near to the mouths of rivers. Here, the climate is fresher because of the sea breezes and there are fewer mosquitoes and other biting insects than in the rainforest, further inland. In recent decades the quality of life in this area has improved through the building of schools, health centres, churches and the installation of piped drinking water. However, climate change is threatening this development.

Rising sea levels and more frequent severe storms predicted as a consequence of climate change will put these communities and the ecosystems on which they depend at risk. Local people have already noticed changes in the climate. Hurricanes passing close by are depositing more rain than before and in 2005, the centre of one village was washed away during the heavy rains with the loss of 1 life and 30 houses as well as several schools, churches and family businesses.

Ernestina amidst the wreckage of her home after Hurricane Gama. Photo: Geoff Crawford/ Tearfund

Ernestina's story

In late 2005, three storms hit Ernestina's community in one month. The third one, Hurricane Gama, destroyed Ernestina's home. A wave formed a weir so powerful that even concrete became like putty. Deforestation on higher ground meant that, unchecked by trees, torrential rain flowed into rivers and lagoons much faster than normal, carrying vast loads of topsoil from hillsides. On the lagoon shores mangroves had been removed leaving the community exposed to flooding.

Water levels rose to uncontrollable levels, sweeping away Ernestina's home and the homes of many other villagers. Ernestina escaped with only the clothes she was wearing.

Children replanting mangroves to protect against the effects of storms and floods. Photo: Steve Collins/ Tearfund

One of the things local people can do to help prepare for climate change is to protect and replant mangroves, sea grapes and other trees that for thousands of years have helped protect these coastal areas from the effects of floods and storms. As local populations have grown and villages expanded, many of these trees have been chopped down to provide space for houses, building materials and firewood.

Tearfund partner MOPAWI works with church and community leaders to encourage local people to preserve and replant these valuable trees. Research has been undertaken to identify the best ways to successfully reforest and meet the communities' wider needs at the same time. MOPAWI also encourages the building of more efficient wood-burning stoves so families need to cut fewer trees for firewood.

Sea grapes stabilising coastal dunes. Photo: Steve Collins/ Tearfund

Box 24. Women protecting the páramo in Ecuador[142]

'My first thought for the future is about the preservation of the páramo,' says indigenous Kichwa farmer-turned-environmentalist Fabiola Quishpe.

Fabiola lives in the remote Andean community of Apahua in Ecuador, some 4,000 metres above sea level. She lives in the páramo, a sensitive area of grassland that acts like a giant sponge, soaking up water and gently releasing it into the valley below.

But despite its vital role, providing water for hundreds of thousands of people, the páramo's delicate ecosystem is under threat. In recent years, up to an estimated 30 per cent of it has been destroyed, which means that water resources for agriculture and consumption in villages like Fabiola's, as well as a vital ecosystem, are at risk.

Fabiola says: 'Water is a very important liquid and it is necessary for all human beings, and for all who live and exist as part of this pachamama (Mother Earth). We need water in order to be able to improve our lives, for cultivation – we must look after the páramos properly. And that's why we are worried because our páramos, our environment, is contaminated, is not well cared for, and so it's in danger.'

But Fabiola, along with other villagers in her community, have been working with Progressio-partner, the Institute of Ecuadorian Studies (IEE), to change all that.

'In our community we are 17 women working together to recover our native seeds and protect our water resources. We have noticed that when women work together the family benefits.'

So popular was the idea of working together that the villagers decided to form a women's association. Across the region, 150 women have become involved in the scheme. Already, says Fabiola, they've seen a significant change.

'Now people don't let their animals graze on the páramo, they don't burn it; we are getting back all the wild grass varieties, the bushes and native animals we lost. People don't even think about damaging the grasslands anymore, instead, they see it as a source of water and know that it's important for conserving water. If we don't have water how are we going to survive?'

Photo: Santiago Serrano/Progressio

Fabiola hopes that improving the natural water sources in villages like Apahua will mean better living conditions, more crops and improved health.

'Rural people eat, breathe and sleep agriculture,' she says. 'We depend on and live from our farms. Because of this the environment is necessary. Improving it means that people can live in the countryside, they don't have to migrate to towns, as there is work here for them, and it improves our health too.'

Box 25. Mother Mariba and the power of protest[143]

Ugandan Shadow Environment Minister, Beatrice Anywar Atim, whilst visiting London for the International Parliamentary Conference on Climate Change, July 2009. Photo: **nef**

Ugandan Shadow Minister for the Environment and Water, Beatrice Atim, believes that protest will be critical in the fight to prevent dangerous runaway climate change. She calls for a global solidarity movement among those prepared to match their conviction with activism. Her struggle to save the Mariba Forest earned her the name 'Mother Mariba' in her native Uganda. But two years after her victory, the story is little known outside her homeland, and she is still on bail for leading the protests that led to change.

Beatrice's story

When families in Uganda were displaced by war and no evidence of their homes remained, they could trace their land by the trees. Because the wells that water our lands depend on trees, people don't cut them. Because trees act as windbreaks, people plant them around their houses. Large trees were believed to house spirits, earning them special protection.

The cultural norms that safeguarded the Ugandan environment have been destroyed by conflict and poverty. But, the struggle we fought and won to protect the Mariba forest has shown that together, we can safeguard our environment.

I remember August 2006 very vividly. The media broke the news. The Government had agreed to sell Uganda's biggest tropical forest, the second largest in Africa, for sugarcane production. This sent a chilling signal to the entire country.

I was outraged. Once tropical forest is lost, the process is irreversible. We called environmentalists to join the fight to save the forest. I brought together NGOs, students, academics, and representatives of Uganda's political parties – including the ruling party, religious groups, and cultural organisations. Because we needed to include every stakeholder, I also invited businesses to join our coalition.

We organised a boycott of Meta sugar. Even when a number of supermarkets tried to repackage the sugar, people refused to buy it. The message from the Ugandan people was clear: 'We can do without sugar, but we cannot do without our forest.'

By the spring of 2008, many felt that a peaceful demonstration, or a hunger strike was the only way we could achieve change.

On 12 April, the protest began. Following a route agreed with the police, nine people carried the petition at the head of the crowd. We began peacefully, but the police panicked and used tear gas. This changed the atmosphere completely. People began chanting: 'We will die for the Mabira Forest.'

Two people died and I was shot at. The Government accused me of unlawful assembly and inciting anti-government protest. They surrounded my house at nightfall, and attempted to arrest me. I gave myself up but was still beaten, and remain on bail.

Undaunted, we commissioned a cost-benefit analysis which proved the Forest's value. The Government was left with no choice. Our refusal to give up saved the Mariba forest.

Making sure that people know that protest works is the only way I can see to protect the environment. The name that I earned, 'Mother Mabira', gives me the strength to carry on. People fought because they value biodiversity. They fought for fresh air. But from where I stand now, it feels very lonely. We need a new global citizenship prepared to stand by the people on the front line of change. No one can fight anyone else's war. But together, we can win the war for the environment we all share.'

Water

The impacts of climate change are centred on the water cycle. In 2008, the IPCC published a special report Water and Climate Change. Overwhelmingly, the report found that both observational records and climate projections show that freshwater resources are extremely vulnerable to climate change with a wide range of impacts on ecosystems and societies. Over the past 40 years, land classified as very dry has more than doubled.

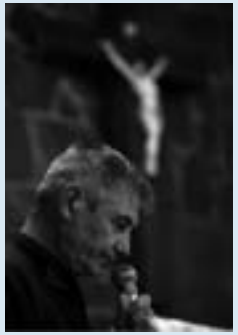
In 2006, the UK's Hadley Centre for Climate Prediction and Research looked at the share of the Earth's land surface prone to extreme, severe and moderate drought. Its research concludes that the percentage of the Earth's land surface that suffers from extreme drought has trebled from just 1 per cent to 3 per cent, in less than a decade at the start of the twenty-first century. But the centre's climate model projects that this trend will continue until extreme drought conditions prevail over some 8 per cent of the land surface by 2020 – and then accelerate until extreme drought affects no less than 30 per cent of the globe by 2090. Historically, a total of 20 per cent of the Earth's land surface has been in drought at any one time, be it extreme, severe or moderate.

This has now risen to 28 per cent and is predicted to be 35 per cent by 2020 and cover 50 per cent – half the Earth's land surface and still rising – by 2090. Droughts will also be much longer in duration.

Drought is projected to affect the great grain-growing areas of Europe, North America and Russia, as well as the Middle East and Central Asia, North Africa and Southern Africa, Amazonia/Brazil, and Central America. Yet although the models forecast a severe, overall drying pattern over our surface, certain areas will get much wetter. A wetter future is forecast for Central Africa, the Horn and East Africa and parts of coastal West Africa, China and Eastern Asia, and high northern latitudes. Although higher rainfall could come equally in the destructive form of heavy inundations as well as beneficial rain, it raises the intriguing possibility of environmental refugees from a dehydrated Europe flooding into Africa by the mid-century.

Episodic flooding or long-term drought will have catastrophic impacts on development. However as the following case studies show, in some places, people are responding to environmental change by rediscovering traditional, more drought-resistant plants, demonstrating the role of sustainable and equitable water resource management and community and ecosystem-based approaches.

Box 26. A Peace prize for an environmentalist bishop[144]



Bishop Cappio; Photo: Franciscans International –www.paxchristi.net

In 2008, a Brazilian bishop who protested against a major river diversion scheme was given an award by the international Catholic peace organisation, Pax Christi. Bishop Luiz Flavio Cappio had been campaigning for three years to halt a project of the Brazilian Government to divert waters from South America's fourth-largest river, saying it would cause lasting environmental damage. The Vice President of Pax Christi International said: 'The struggle behind this award also echoes the many struggles around the world related to land and water resources and rights.'

The project would see water from the 1,800-mile Sao Francisco River diverted via a series of canals and aqueducts to four drought-prone states in north-eastern Brazil. Opponents say the $2 billion scheme will benefit only the wealthiest landowners in the north east and reduce the capacity of dams on the Sao Francisco River to generate hydro-electric energy. The Pastoral Land Commission, a Pax Christi partner, agrees with the bishop that the infrastructures created by the project will cut through several states in Brazil's north-eastern region, generating inevitable conflicts with communities that are displaced from their lands and denied access to the natural common resource – water.

What is being sold by the Government as a project to bring life to a semi-arid region appears to be more driven by export-oriented agribusiness and the steel and mining industries. Also, exploiting groundwater is an alternative that could be given serious consideration. Rerouting the river would be a massive interference with its natural course; 70 per cent of the redirected water is to be used for irrigation, 26 per cent will flow into towns, mainly Fortaleza, and only 4 per cent will remain for other people dispersed through the region.

Bishop Cappio, of the diocese of Barra in Bahia State, helped to create a movement of active resistance. In October 2005, he embarked on the path of non-violent protest with a hunger strike. On that occasion, he interrupted his 11-day fasting when President Lula pledged to begin a broad dialogue on the project with the communities involved. The pledge was not upheld. In November 2007. another prayer-fast was initiated at the São Francisco Chapel on the banks of the river. Writing to President Lula, Bishop Cappio said: 'I restart my fasting and pray. And I only will stop it with the withdrawal of the army from the construction site of the diversion project at the north and the east canals and with the final suspension of the São Francisco River diversion project. There is no other alternative.'

In December 2007, 4,000 people marched with Bishop Cappio from the chapel to the river and together they organised themselves to claim their rights. Later in December, more than 100 groups and networks joined Bishop Cappio and the National Conference of Brazilian Bishops called for a 'fasting for justice day'. Bishop Cappio suspended this hunger strike on 20 December 2007 after falling seriously ill. His doctor and many bishops urged him to 'stop the hunger strike' in order to save his health and be able 'to continue the struggle' with the people. He has vowed to carry on resisting the project.

Box 27. Water resources management in Niger[145]

Changes in climate, including diminishing and irregular rainfall and rising temperatures, have contributed to severe drought and accelerated land degradation in the Sahel region of Niger. As land becomes less fertile, and the demand for water increases, the traditional nomadic pastoralist lifestyle of communities living there has become increasingly unsustainable.

Tearfund partner JEMED has been working with communities adjusting to the changes in climate and environment. In response to recent droughts, communities have developed adaptive approaches to manage water supplies. These approaches, adopted in a time of crisis, are now becoming common practice as water scarcity and pressure on water resources increases. For the Tuareg community, traditionally pastoralist, the variable climate is bringing about huge changes in its way of life.

The nomadic way of life has been lost as communities now consider themselves 'fixed', dependent upon a small area for their economy. JEMED has been helping communities dig deep wells, allowing a community to remain in one place all year round instead of relocating in the dry season to find water. With traditional pastoralist activity no longer providing good food security, alternative measures have been found. This includes a more regular recourse to animal selling, and a greater reliance on grain banks. JEMED has set up grain banks and trained committees to run them in order for communities to have access to affordable grain.

JEMED has also been adopting other water-management measures in an effort to combat the increased desertification of the land. This includes loose stone dikes being built in valley bottoms to increase water infiltration and encourage pasture growth.

With the Tuareg now seeing themselves as fixed, deep wells providing a closer water supply, and livestock rearing intensifying, traditional roles in the family have adapted to fit these changes. As well as water-related activities, including the hard work of drawing water from the deep wells, women are becoming involved in small-stock rearing, a significant shift in tradition and bringing potential new opportunities to Tuareg women. JEMED has been providing sheep to women on a loan basis.

Communities have also diversified into other means of income generation.

Women now practise other activities such as handicrafts, wood selling or running small shops. JEMED has trained women in basic literacy and numeracy to assist them with managing the shops. Men have become increasingly involved in commerce, trading livestock and basic commodities. Despite this diversification, however, many communities fear they have adapted as far as they can by themselves, and that the Sahel no longer provides the means to support them. Men are migrating to Libya to find work, and as climate change brings new challenges – for example, more extreme droughts – communities may need to migrate in much larger numbers to the cities.

At Government level, Niger is in the beginning stages of considering adaptation as part of national policy planning. Niger has submitted a National Adaptation Programme of Action (NAPA) to the effects of climate change to the UNFCCC (United Nations Framework Convention on Climate Change). Measures in this plan include water-control strategies, improving erosion control and water harvesting, and restoring basins for crop irrigation.

Pastoralists in Niger digging irrigation channels.
Photo: Jim Loring / Tearfund.

Pastoralists in Niger drawing water from a well.
Photo: Geoff Crawford/ Tearfund.

Box 28. Experiences of climate change in Ethiopia[146]

These case studies bring together some of the experiences of rural farmers living with a changing climate in Ethiopia as told to a Tearfund programme support advisor.

Mr Babay Zewdu; Photo:Tadesse Dadi / Tearfund

Mr Babay Zewdu (32): Medina village

Mr Babay and his wife have two sons and two daughters, who are aged between 6 and 11. They cultivate two and half hectares of land in the flat, relatively dry lowland area called Rasa Goba; the family also owns a pair of oxen.

Mr Babay explained that he has seen the local climate change in his lifetime. Now, in seven out of ten years, they do not have an adequate harvest. The main staple cereal in their area, sorghum, is usually sown in April and harvested in November. However, in bad years now, the rains do not start until July. Sometimes the rains start well, but then stop early – in late August or early September – again leading to poor harvests.

Another worrying phenomenon that had been seen over the last three years is the rain falling in patches. He explained that within a distance of three to four kilometres, some areas may get rainfall while other areas remain totally dry.

Another change that he feels is associated with the change in the local climate is the increased incidence of crop pests, such as stalk borer and *striga*. He reported that he personally lost 15 sheep within a period of a fortnight as a result of an unfamiliar disease that caused neck swelling and loss of weight. In humans, typhoid and malaria incidences are increasing. During the dry season he said that there is a critical situation in terms of water supply for both humans and livestock.

Mr Gashu Beza; Photo:Tadesse Dadi / Tearfund

Mr Gashu Beza (60): Medina village

Mr Gashu is a farmer in Rasa Goba who cultivates one hectare with his wife and four sons. His two married daughters live elsewhere. He owns a pair of oxen with which he cultivates his land. He recalled that during his youth, the rainfall used to be good and he used to grow cotton and sorghum. In 1984, some of his oxen died and the crops failed. Two years later, there was good recovery, as he remembers. But since then he feels that there has been a continuous decline in the harvest year after year. He pointed out that the rainfall has become very patchy, raining in some places and missing others.

He explained that in an attempt to cope with the variability of the rainfall, people abandoned a variety of sorghum, locally called *keteto* for another one known as *afeso*. The latter variety, although lower yielding, was said to be more reliable in withstanding the variability in the rainfall.

Mrs Genet Arkise; Photo:Tadesse Dadi / Tearfund

Mrs Genet Arkise (35): Abay Atir village

Mrs Genet is a divorcee who lives with her 19-year-old son and 12-year-old daughter in the Rasa Goba area. She has two hectares of land that she used to share-crop with other landless farmers – dividing the harvest 50/50. This year she received only 600kg of sorghum. Her income is supplemented by renting her donkey for fetching water, an enterprise run by her son. The donkey may fetch three to six Birr ($0.66) per day.

She was particularly concerned about the increasing prevalence of crop pests, such as beetles, stalk borer, army worm and grasshoppers that affect crops in the field. She described a situation when four years ago she failed to get any harvest as a result of severe grasshopper attack on her crops. She had the field re-sown, but rains stopped early. She explained that people in the village are forced to fetch water from distant streams or ponds. The only pond that exists in the village was handed over by the village authorities to a group of 70 farm households who irrigate crops. The farmers are preventing other villages from getting access to the pond since they want to use it exclusively for their irrigated plots. In her view, this may lead to serious conflict among the villages as water scarcity is getting more and more critical as the rainy season progresses.

Mrs Genet also feels that there is severe feed shortage for livestock as the grazing area is diminishing. The combination of feed and water shortage is making the livestock susceptible to diseases. She reported that she recently had four goats and two sheep die from illness. In humans, she has observed the increase in the incidence of lung diseases, malaria and typhoid.

Mr Mengesha Beyene; Photo credit:Tadesse Dadi / Tearfunda

Mr Mengesha Beyene (82): Abay Atir village

Mr Mengesha recollected that he used to get much harvest in the past. Sorghum used to be plentiful and it took his family three to four days to bring in the harvest into the granaries. He explained that grain used to be stored in pits dug in the ground, each holding approximately 5,000kg. In those days, the harvest used to last for at least two years. He pointed out that nowadays, the harvest does not last more than seven months. People tend to borrow money from money lenders and rely more and more on market purchase. For him, the sad indicator of the whole problem is that there are very few households who even own granaries these days. The small harvest is placed in sacs and kept inside the *tukul* until it runs out.

Part 4. Conclusion: Time to stop pretending

How should the global economy be reshaped to enable human development in a carbon constrained future? This report shows that while there is no single answer, it is clear that a major reshaping is both unavoidable and desirable. Even more than that, an emerging consensus is discernable around certain common principles to underlie that reshaping. Among other things, these concern equity, without which international agreements cannot be forged, and having to eradicate poverty whilst inescapably moving to live within our collective environmental means.

Previous reports from this coalition listed a series of practical recommendations to do with stopping runaway climate change and learning to live with that degree of warming already locked into the biosphere. These still hold true. But this report attempts to do something different. It makes the point that mere reform within the current global economic system will be insufficient; that alone will not eradicate poverty in a carbon constrained future. To do that, systemic change and new development models will be needed.

This report sets out to begin a broader debate about what those models should look like. The outlines of some have been sketched here. Many more questions remain unanswered however, and much more work needs to be done.

The Working Group on Climate Change and Development was initiated several years ago to bring together environmental and development NGOs. Bringing these organisations together not only created a strong platform for joint campaigning at international level, it also pushed 'climate justice' up the agenda within the organisations themselves. Environmental organisations were able to share their scientific and technical expertise with international development organisations focused on global social justice issues, such as poverty, aid and trade. In that goal the coalition has been successful. Many now have climate change as a central concern. With international recognition, the Work Group created a 'coalition of the willing' model that has been replicated in both Northern and Southern nations.

Governments, too, have followed in accepting the unbreakable link between tackling climate change and international poverty reduction, although it is debateable whether this has been translated into their development practice and that of the multilateral organisations that they fund.

Now a more difficult task lies ahead. Collectively we must devise, manage the rapid transition, and implement new economic models that allow us to meet basic needs and maximise human well-being, without catastrophically over-shooting the Earth's biocapacity to support us. Some of the key questions for further debate are:

- What will an alternative economic development pathway for a post-carbon society mean for patterns of trade, production, consumption, investment and the movement of finance, at a wide range of levels from local to global?
- Given that any solution to the challenge of climate change must be both global and equitable, how can the North facilitate an alternative development paradigm in the South and how can the South facilitate a transition to a post-carbon society in the North?
- What would a post-2012 climate agreement that recognises the implications of the above look like?
- How can we address and reverse environmental despoliation and the destruction of ecosystems.

Most importantly, in terms of solutions, we believe that our governments and institutions must stop pretending that we can carry on in much the same way. The challenge is not only to find answers to these questions, but to find and act on them quickly.

Other worlds are, indeed, possible but the task is to shape and fashion them in the course of the next decade before 'business-as-usual' locks in catastrophic, climatic upheaval.

Endnotes

1 Rist G (2002) *The history of development: From Western origins to global faith* (London: Zed Books).

2 Jamieson A (2008) 'Bank bailout: Alistair Darling unveils £500 billion rescue package' *Daily Telegraph*, 8 October.

3 Clark A and Treanor J (2008) 'Greenspan - I was wrong about the economy. Sort of' *The Guardian*, 24 October.

4 Prime Minister Gordon Brown speaking at a joint Downing Street press conference with Chancellor Alistair Darling, 8 October, 2008. Available at: http://www.number10.gov.uk/Page17114 [5 November 2009].

5 United Nations Development Programme (1991) *Human Development Report 1991* (New York: Oxford University Press).

6 Turner A (2008) 'Dethroning growth' in Simms A and Smith J (eds) *Do good lives have to cost the Earth?* (London: Constable and Robinson).

7 Woodward D and Simms A (2006) *Growth isn't working: The unbalanced distribution of benefits and costs from growth* (London: **nef**).

8 Chatterjee P and Finger M (1994) *The Earth brokers: Power, politics and world development* (London: Routledge).

9 *Ibid.*

10 Hansen J, Sato M, Kharecha P, Beerling D, Berner R, Masson-Delmotte V, Pagani M, Raymo M, Royer D and Zachos J (2008) 'Target atmospheric CO_2: Where should humanity aim?' *The Open Atmospheric Science Journal* **2**: 217–231.

11 Woodward and Simms (2006) *op. cit.*

12 Simms A (2009) *Ecological debt: Climate change and the wealth of nations* (London: Pluto Press).

13 Berman M (1983) *All that is solid melts into air – The experience of Modernity* (London: Verso).

14 Sachs J (2005) *The end of poverty: Economic possibilities for our time* (London: Penguin Press).

15 *Ibid.*

16 Smith R (2007) Carpe diem: the dangers of risk aversion. The 2007 Lloyd's Register Educational Trust Lecture, 29 May 2007 (London: The Royal Academy of Engineering, Imperial College, London).

17 Simms A, Johnson V, Smith J and Mitchell S (2009) *Consumption explosion: The third UK Interdependence Day report* (London: **nef**).

18 Sachs (2005) *op. cit.*

19 Simms A and Smith J (2008) *op. cit.*

20 The Commission on Growth and Development. Available at: http://ww.growthcommission.org [21 October 2009].

21 *Ibid.*

22 Woodward and Simms (2006) *op. cit.*

23 *Ibid.*

24 Warwick-Ching L (2009) 'Rich increase wealth in spite of crisis' *Financial Times*, 23 September.

25 The 'global hectare' is a composite, standardised measure of biocapacity that illustrates the scale of our overall use of forests, productive land, the marine environment and atmosphere.

26 Simms *et al.* (2009) *op. cit.*

27 Hansen *et al.* (2008) *op. cit.*

28 Le Quéré C Raupach M, Canadell, J, Marland G, Bopp L, Ciais P, Conway T, Doney S, Feely R, Foster P, Friedlingstein P, Gurney K, Houghton R House J, Huntingford C, Levy P, Lomas M, Majkut J, Metzl N, Ometto J-P, Peters P, Prentice C, Randerson J, Running S, Sarmiento J, Schuster U, Sitch S, Takahashi T, Viovy N, van der Werf G and Woodward F (2009) 'Trends in the sources and sinks of carbon dioxide' *Nature Geosciences* doi:10.1038/ngeo689; Pielke R, Wigley T and Green C (2008) 'Dangerous assumptions' *Nature* **452**: 531–532.

29 Canadell J, Le Quere C, Raupach R, Field C, Buitenhuis E, Ciais P, Conway T, Gillett N, Houghton R, and Marland G (2007) 'Contributions to accelerating atmospheric CO2 growth from economic activity, carbon intensity, and efficiency of natural sinks' *Proceedings of the National Academy of Sciences* **104** (47):18866-18870.

30 NEAA (2009) Global CO_2 emissions: annual increase halved in 2008, press release. Available at: http://www.pbl.nl/en/news/pressreleases/2009/20090625-Global-CO2-emissions_-annual-increase-halved-in-2008.html [10 August 2009].

31 Raupach M, Marland G, Ciais P, Le Quéré C, Canadell J, Klepper G, Field C (2007) 'Global and regional drivers of accelerating CO_2 emissions' *Proceedings of the National Academy of Sciences* **104**(24):10288–10293.

32 Peters G and Hertwich E (2008) 'CO_2 embodied in international trade with implications for global climate policy' *Environmental Science and Technology* **42**(5): 1401–1407.

33 European Environment Agency (2009) Annual European Community greenhouse gas inventory 1990–2007 and inventory report 2009 (Copenhagen: EEA).

34 Quoted in Heffernan O (2009) 'Copenhagen summit urges immediate action on climate change' *Nature News*, 12 March. Available at: http://www.nature.com/news/2009/090312/full/news.2009.165.html

35 Hansen J (2005) A slippery slope: how much climate change constitutes 'dangerous anthropogenic interference'? *Climatic Change* **68**: 269–279.

36 Rogelj J, Hare B, Nabel J, Macey K, Schaeffer M, Markmann K and Meinshausen M (2009) 'Halfway to Copenhagen, no way to 2°C' *Nature Reports Climate Change* doi:10.1038/climate.2009.57

37 Roach R, Magrath J, Berger R and Pendleton A (2007) Two Degrees, One Chance: The urgent need to curb global warming. Available at: http://publications.oxfam.org.uk/oxfam/display.asp?K=002L0011&aub=John%20Magrath&sort=sort_date/d&m=4&dc=8 [18 September 2009].

38 For example: Meinshausen M, Hare B, Wigley T, van Vuuren D, den Elzen M and Swart R (2006) 'Multi-gas emission pathways to meet climate targets' *Climatic Change* **75**(1): 151–194.

39 Baer P and Mastrandrea M (2006) *High stakes: Designing emissions pathways to reduce the risk of dangerous climate change* (London: ippr).

40 'Likely' in this context refers to the definition of risk used by the Intergovernmental Panel on Climate Change (IPCC) to mean that there is only a 66–90 per cent likelihood of an outcome. 'Very likely' refers to a risk of 90–99 per cent likelihood.

41 Hansen *et al.* (2008) *op. cit.*

42 See: http://www.350.org/about/blogs/lord-nicholas-stern-supports-350ppm-target [12 September 2009].

43 Methane (CH_4), Nitrous Oxide (N_2O), hydroflurocarbons (HCFCs), perflurocarbons (PFCs) and sulphur hexafluoride (SF_6).

44 Climate change potential is defined by the IPCC as the ratio of the time-integrated radiative forcing from the instantaneous release of 1kg of a trace substance relative to that of 1kg of a reference gas.

45 Meinshausen M, Meinshausen N, Hare W, Raper S, Frieler K, Knutti R, Frame D and Allen M (2009) 'Greenhouse gas emission targets for limiting global warming to 2°C' *Nature* **458**: 1158–1162.

46 Allen M, Frame D, Huntingford C, Jones C, Lowe J, Meinshausen M and Meinshausen N (2009) 'Warming caused by cumulative carbon emissions towards the trillionth tonne' *Nature* **458**: 1163–1166.

47 Meinshausen *et al.* (2009) op. cit

48 Using a different methodology, the second paper led by Myles Allen, Head of the Climate Dynamics group at University of Oxford's Atmospheric, Oceanic and Planetary Physics Department yields results that are broadly consistent with Meinshausen *et al.* (2009). More recent research carried out by Head of Climate Impacts at the Met Office Hadley Centre, Richard Betts warns of a scenario in which a 4°C by 2060 is possible. The results of this analysis was presented at a conference held at the University of Oxford in October 2009. See: http://www.eci.ox.ac.uk/4degrees/ppt/1-2betts.pdf [10 October 2009].

49 Tanaka N (14 December, 2008) Statement to the 13th Conference of the Parties to the UNFCCC.

50 IEA (2008) *World Energy Outlook 2008* (Paris: International Energy Agency).

51 *Ibid.*

52 *Ibid.*

53 *Ibid.*

54 *Ibid.*

55 Meinshausen *et al.* (2006) *op. cit.*

56 IEA (2008) *op. cit.*

57 *Ibid.*

58 Where 'unlikely' is defined as a probability of less than 20 per cent.

59 Abdallah S, Thompson S, Michaelson J, Marks N and Steuer N (2009) *The (un)happy planet index 2.0: Why good lives don't have to cost the Earth* (London: **nef**).

60 Clark A, Frijters P and Shields M (2008) 'Relative income, happiness and utility: An explanation for the Easterlin Paradox and other puzzles' *Journal of Economic Literature* **46**: 95–144.

61 Merton T (2005*) The monastic journey* (Saint John's Abbey, Collegeville: Cistercian Publications).

62 Billion as one thousand million, and trillion as one million million.

63 Mander J (2007) *Manifesto on Global Economic Transitions* (San Francisco: International Forum of Globalization, Institute for Policy Studies, Global Project on Economics Transitions).

64 *Ibid.*

65 Some of this section has been adapted from Lucas C and Hines C (2002) Time to replace globalisation: A green localist manifesto for World Trade (Brussels: The Greens/European Free Alliance in the European Parliament).

66 Import substitution seeks to replace imports with domestic production. The direct impact will be on jobs and foreign exchange. There are two components to the logic of import substitution policy. First, directly trying to create jobs and save money by producing domestically what is being imported. Second, strategically trying to reduce dependency on foreign producers in the longer term by using import substitution as a way to stimulate domestic industrial development.

67 Gray J (1998) *False dawn: The delusions of global capitalism* (London: Granta Books).

68 Korten D (1995) *When corporations rule the world* (San Francisco: Berrett-Koehler).

69 ILO (2000) *World Labour Report: Income security and social protection in a changing world* (Geneva: International Labour Organization).

70 Lucas and Hines (2002) *op. cit.*

71 United Nations Environmental Programme, Regional Resource Centre for Asia and the Pacific (UNEP RRCAP). Available at http://www.rrcap.unep.org/ [12 September 2009].

72 UN ESCAP (2006) *Green growth at a glance: The way forward for Asia and the Pacific* (Bangkok: United Nations Economics and Social Commission for Asia and the Pacific).

73 Source: UNEP RRCAP resources, UN ESCAP (2006) *op. cit.*

74 See: http://www.grossnationalhappiness.com/

75 *Ibid.*

76 *Ibid.*

77 Green New Deal Group (2008) *A Green New Deal: joined-up policies to solve the triple crunch of the credit crisis, climate change and high oil prices* (London: **nef**).

78 *Ibid.*

79 *Ibid.*

80 *Ibid.*

81 WRI (2005) *World Resources 2005: Making the wealth of nature work for the poor* (Washington DC: World Resources Institute).

82 *Ibid.*

83 *Ibid.*

84 Marks N, Simms A, Thompson S and Aballah S (2006) *The Happy Planet Index: An index of human well-being and environmental impact* (London: **nef**).

85 The five ways to well-being are elements to be considered in addition to meeting necessary basic needs. Grounded in a large body of well-being research, they distil those activities and approaches which have been shown to underpin and enhance well being. They include: connecting, being active, taking notice, keep learning, and giving. See: http://www.nationalaccountsofwellbeing.org/learn/related/five-ways-connect.html

86 Supplied by Patrick Mulvany, Practical Action.

87 Supplied by Christian Aid.

88 Solomon S, Qin D, Manning M, Chen Z, Marquis M, Averyt K, Tignor M, Miller H (2007) *Climate change 2007: The physical science basis. Working Group I contribution to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change* (Cambridge: Cambridge University Press).

89 Barnett J (2003) 'Security and climate change' *Global Environmental Change* **13**: 7–17.

90 Barnett J and Adger W (2007) 'Climate change, human security and violent conflict' *Political Geography* **26**: 639–655.

91 Supplied by Charles Ehrhart, CARE International.

92 This report, as well as a technical annex and high-resolution maps, can be downloaded from http://www.careclimatechange.org

93 UNDP (2007) *Human Development Report. 2007/8 – Fighting climate change: Human solidarity in a divided world*. Available at: http://hdr.undp.org

94 UNISDR (2005) *Hyogo Framework for Action 2005-2015: Building the resilience of nations and communities to disasters*. Available at: http://www.unisdr.org

95 Enarson E, Meyreles L, Gonzáles M, Hearn-Morrow B, Mullings A, Soares J (2003) *Working with women at risk (*Miami: International Hurricane Centre, Florida International University). Available at: http://www.gdnonline.org/resources/WorkingwithWomenEnglish.pdf

96 CARE International UK (2006) *Living on the edge of emergency: an agenda for change* (London: CARE International).

97 *Ibid.*

98 *Ibid.*

99 Supplied by Tony Kempster, Chair of MAW.

100 MAW works in partnership with the International Peace Bureau, of which it is a member. The Bureau has produced two reports which are directly related to this issue: Warfare or welfare: Disarmament for development in the 21st century (2006) and Whose priorities? (2007).

101 Pope John Paul II's 1990 World Day of Peace Message

102 Sivard R (1993) *World Military and Social Expenditures, 15th edition* (Leesburg, VA: World Priorities).

103 Renner M (1991) 'Assessing the Military's War on the Environment' in Lester Brown (ed) *State of the World 1991* (New York: W.W. Norton).

104 McIntyre B, Herren H, Wakhungu J and Watson R (2008) *Agriculture at a crossroads: Global report* (Washington DC: IAASTD).

105 Based on paper prepared by La Via Campesina in November 2007 for Bali Climate COP. Abridged and adapted in September 2008 by Patrick Mulvany.

106 Supplied by Shay Cullen SSC, Director of the Preda Foundation, Philippines. Submitted by Columban Faith and Justice.

107 Supplied by Tearfund.

108 Supplied by Columban Faith and Justice.

109 www.rodaleinstitute.org

110 Supplied by Tadesse Dadi, Programme Support Advisor, Tearfund Horn of Africa Office, Addis Ababa, Ethiopia.

111 Supplied by Practical Action.

112 Lowe M, Progressio (2007).

113 Ewing K, Progressio (2009).

114 O'Keefe B and Barrett J, Progressio (2009).

115 Simms *et al.* (2009) *op. cit.*

116 United Nations (2007) *World urbanisation prospects: the 2007 revision* (New York: New York Population Division, Department of Economic and Social Affairs, United Nations Secretariat).

117 Stern N (2006) *The Stern Review: the economics of climate change* (Cambridge: Cambridge University Press).

118 UN-HABITAT (2003) *Slums of the world: the face of urban poverty in the new millennium? UN-HABITAT Working Paper* (New York: United Nations).

119 Satterthwaite D (2007) *The transition to a predominantly urban world and its underpinnings: Human Settlements Discussion Paper Series Theme: Urban Change – 4* (London: IIED).

120 Supplied by CAFOD.

121 'Habitação controle social e política pública' *POLIS Institute Observatório dos Direitos do Cidadão* Vol. 31, October 2007. Available at: http://www.polis.org.br/obras/arquivo_260.pdf [1 October 2008].

122 Written by John Din and submitted by Columban Faith and Justice.

123 Casten T and Ayers R (2006) *Energy myth eight – Worldwide power systems are economically and environmentally optimal' In Energy and American society – thirteen myths* (Netherlands: Springer).

124 Greenpeace (2005) *Decentralising power: an energy revolution for the 21st century* (London: Greenpeace-UK).

125 WADE (2005) *Market analysis: China*. Available at: http://www.localpower.org/nar_publications.html [25 March 2008].

126 Supplied by Christian Aid.

127 Zapata A and Cranshaw P, Progressio (2008).

128 With reference to information from case study author Charles Ehrhart, CARE International.

129 Cited in Global Canopy Programme (2007) *Forests now: It's time to deal with up to 25 per cent of global carbon emissions*. Available at: http://www.ForestsNow.org

130 Millennium Ecosystem Assessment (2005) *Living beyond our means: Natural assets and human well being. Statement from the Board*. Available at: http://www.milleniumassessment.org/en/synthesis.aspx

131 United Nations (2008) *The Millennium Development Goals Report* (New York: United Nations). Available at: http://www.un.org/milleniumgoals

132 United Nations Environmental Programme, Convention on Biological Diversity (2007) *Biodiversity and Climate Change*. Available at: http://www.biodiv.org/doc/bioday/2007/ibd-2007-booklet-01-en.pdf

133 FAO (2005) *Incentives to curb deforestation needed to counter climate change*. Available at: http://www.fao.org/newsroom/en/news/2005/1000176/index.html

134 IPCC (2000) *Land-use, land-use change, and forestry: A special report of the IPCC, Intergovernmental Panel on Climate Change* (Cambridge: Cambridge University Press). Available at: http://www.grida.no/Climate/ipcc/land_use/index.htm

135 FAO (2006) Deforestation causes climate change: Key role for developing countries in fighting greenhouse gas emissions. Press release. 4 September 2006. Available at: http://www.fao.org/newsroom/en/news/2006/1000385/index.html

136 Baumert K, Herzog T and Pershing J (2005) *Navigating the numbers: Greenhouse gases and international climate change agreements* (Washington DC: World Resources Institute).

137 Santilli M, Moutinho P, Schwartzman S, Nepstad D, Curran L and Nobre C (2005) 'Tropical deforesation and the Kyoto Protocol.' *Climate Change* **71**: 267–276. Available at: http://www.edf.org/documents/4867_Santillietal_ClimateChange.pdf

138 Written by Charles Ehrhart, CARE International.

139 Pacala S and Socolow R (2004) 'Stabilization wedges: Solving the climate problem for the next 50 Years with current technologies.' *Science* **305**: 968–972. Available at: http://www.sciencemag.org/cgi/content/abstract/305/5686/968. For a layperson's summary, see: http://www.nytimes.com/2007/04/15/magazine/15green.t.html?pagewanted=5

140 *Ibid.*

141 Supplied by Tearfund.

142 Written by O'Keefe B, Barrett J and Camacho L, Progressio.

143 Written by Ruth Potts, based on an interview with Beatrice Atim, **nef**.

144 Written by Pat Gaffney, General Secretary of Pax Christi UK.

145 Supplied by Tearfund.

146 Written by Tadesse Dadi, Tearfund Programme Support Advisor – Ethiopia, January 2006.

There you go!

by Oren Ginzburg

Survival

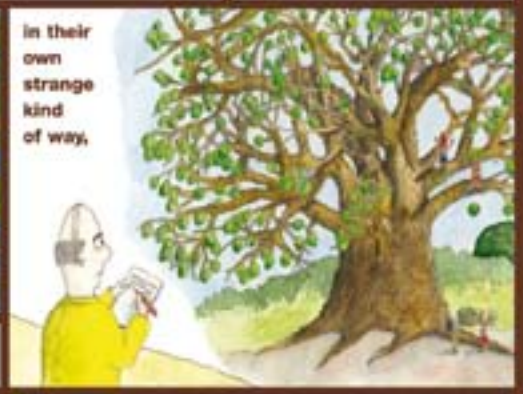
Our original aim was the same as usual:

to bring them sustainable development.

However, in this specific case

we encountered an unexpected challenge.

It turns out that these people,



were already sustainable.
So all we could really bring them was...

Development.

We started with Particpatory Community Development... but they did not fully participate.

We tried income-generating activities... but some people seem satisfied with less than a dollar a day.

We even attempted to empower them... but their reaction was more powerful than expected.

So we opted for a Multi-Stakeholder Cross-Disciplinary Integrated approach.

We developed innovative Private Sector Partnerships.

We developed Vocational Skills adapted to a shifting economy.

We developed tough conservation measures, to protect the environment from further harm.

And we developed ambitious Social Safety Nets – for those unable to take care of themselves.

This has been a challenging process with many lessons learned.

We certainly look forward to applying them elsewhere in the very near future.

But for now let us just say,

Welcome to the Global Village!

There you go! by Oren Ginzburg published by Survival International

To buy this book and for more information on threatened tribal peoples and how you can help, please visit:

WWW.SURVIVAL-INTERNATIONAL.ORG

Supporting organisations (The Working Group on Climate Change and Development)

Written and compiled by: Andrew Simms, Dr Victoria Johnson, climate change and energy programme, **nef** (the new economics foundation) and Dr Michael Edwards, climate change programme development officer CAFOD, with support and material supplied by fellow members of the Working Group on Climate Change and Development

Additional contributions from: Professor Jayati Ghosh, Professor Wangari Maathai, Professor Manfred Max-Neef and David Woodward

Thanks are also due to: all the active members of the Working Group on Climate Change and Development, and Daisy Leitch

Cover illustration drawn and kindly donated by: Andrzej Krauze

Edited by: Mary Murphy

Design by: the Argument by Design – www.tabd.co.uk

new economics foundation
3 Jonathan Street, London SE11 5NH, United Kingdom
Telephone: +44 (0) 20 7820 6300 Facsimile: +44 (0) 20 7820 6301
E-mail: info@neweconomics.org Website: www.neweconomics.org

International Institute for Environment and Development
3 Endsleigh Street, London WC1H 0DD, UK
Tel: +44 (0) 20 7388 2117 Fax: +44 (0) 20 7388 2826
E-mail: info@iied.org Website: www.iied.org

Published by **nef**, November 2009 Registered charity number 1055254 ISBN 978 1 904882 67 1