EARTH CHARTER PERSPECTIVES

Winning the Struggle Against Global Warming

A Report to the Earth Charter International Council

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Winning the Struggle Against Global Warming – What Will It Take?

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Abstract

Solving the global warming problem requires a new legally binding international agreement that provides the targets and timetable by which total global emissions of greenhouse gases are reduced to a safe level. Voluntary agreements and agreements that include only some of the world's nations will not solve the problem. Such a new agreement should be based on the *Contraction & Convergence* framework which forces governments to address three critical questions: what is a safe concentration of atmospheric greenhouse gases; when will the total global emissions of greenhouse gases be reduced to the amount needed to maintain atmospheric concentrations at the agreed safe level; how will the permissible annual amount of greenhouse gas emissions be allocated between nations? Regarding the latter, the simplest and fairest way is to give every person an equal share. This is known as a *per capita* allocation which is what *Contraction & Convergence* calls for. Many governments are reluctant to commit to the action needed to solve the global warming problem based on a narrow understanding of the community for whom they are morally responsible. Promoting a *world ethic of universal responsibility* such as the Earth Charter can help generate the necessary motivation and political will needed for national governments to support the negotiation of such a strong agreement. With the certainty provided by a *Contraction & Convergence* agreement, and a growing ethically motivated global community, all sectors can focus in earnest on meaningful mitigation and adaptation actions. Mitigation cannot be achieved only through technological means. The role of natural processes, in particular forest ecosystems, must be recognized and an appropriate economic value given to the carbon they sequester and store. Adaptation means to build resilience and minimise costs by changing those business-as-usual practices that deplete limited natural resources. Adaptation measures will depend on the different types of climate variability each area experiences, and is a 'win-win' solution in both economic and ethical terms. They will bring new business opportunities once people's mindsets have changed and accepted that a certain amount of global warming is now inevitable. Adaptation is also a key action to advance equity among people of the current generation and between generations. Both mitigation and adaptation will require we address the root causes of global warming and promote a shift to sustainable development.

Introduction

If global warming is the mother of all environmental problems - as Al Gore's film "An Inconvenient Truth"[1] suggests and the "Stern Review on the Economics of Climate Change"[2] infers - then we must find a solution soon. Addressing the root causes of global warming will require a level of national and international cooperation not seen since the Allied nations' response during World War II. So it is not unreasonable to speak of 'winning the war against global warming.' The analogy of 'winning the war against global warming' is of course an imperfect one. After all, in such a war who is the enemy but ourselves? Mandela is attributed to have said, 'If you want to make peace with your enemy, you have to work with your enemy. Then he becomes your partner'.[3] The global warming problem can only be solved through partnership and the cooperation of all sectors and nations.

Many possible solutions are being proposed, but what must be done if we are to 'win the war' and solve the global warming problem? We are all aware of the need to reduce our greenhouse emissions from fossil fuel use. But what are the critical steps we must take now to ensure our efforts are not wasted? Solutions are conventionally discussed in terms of 'mitigation' (actions that will reduce the amount of greenhouse gases in the atmosphere and thereby global warming) and 'adaptation' (actions that will moderate or prevent harmful affects given that a certain amount of climate change is inevitable). However, there is confusion about exactly what mitigation involves and how we should be adapting. We offer here some suggestions for what constitutes meaningful mitigation and adaptation. However, there

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[1] Al Gore (2006). *An Inconvenient Truth: The Planetary Emergency of Global Warming and What We Can Do About It*. Rodale, New York.

[2] Nicholas Stern (2007). *Review on the Economics of Climate Change*. HM Treasury, United Kingdom; http://www.hm-treasury.gov.uk/independent_reviews/stern_review_economics_climate_change/stern_review_report.cfm.

[3] http://www.la.unu.edu/quotation_africa.asp

are two preparatory steps we must take if our attempts to mitigate and adapt are to succeed. These two steps are often not discussed nor are they widely recognized as being essential ingredients in the global warming public policy cookbook. However, without these steps we will not succeed in solving the global warming problem.

First, we need a *new legally binding international agreement* that provides the targets and timetable by which total global emissions of greenhouse gases are reduced to a safe level. Second, to generate the motivation and political will needed to solve the problem, we should promote a *world ethic of universal responsibility* based on respect and care for all people, future generations, and the greater community of life. We first discuss the significance of these two frameworks - a new international legal agreement and a world ethic of universal responsibility - and then consider what actions constitute meaningful mitigation and adaptation.

A New International Legal Agreement

Voluntary agreements and agreements that include only some of the world's nations will not solve the problem. We need a new legally binding international agreement that will lead to total global emissions of greenhouse gases being reduced to a safe level. If governments fail to take this action, then all our individual and collective efforts to voluntarily reduce greenhouse gas emissions will serve no real purpose. The challenge we have is to reduce the total annual global emissions of greenhouse gases[4] to a rate that stabilises the concentration of those gases in the atmosphere at a safe level - that is, a level that does not cause significant climate change. The Earth system has a natural capacity to remove greenhouse gases from the atmosphere and store them on land and in the ocean[5]. Currently, humans are releasing carbon dioxide gas into the atmosphere at a faster rate than natural processes can absorb it.

In solving the global warming problem, what really matters is the total global emissions of greenhouse gases. The sad fact is that any benefits to the global climate system gained from reducing your greenhouse gas emissions by double-glazing your home's windows, or cycling rather than driving a car to work, can and will be offset by greenhouse gas emissions from dirty factories in Australia, deforestation in Brazil, or cars driven in Beijing. Unless there is an agreed target and timetable for reducing greenhouse gas emissions to a safe level there can be no guarantee our efforts will help solve the problem. Indeed, why should we expect such a complex problem to be solved effectively by random and uncoordinated policies and actions?

Fortunately, the nations of the world have signed the UNFCCC – the United Nations Framework Convention on Climate Change[6]. This commits all nations to work together in solving the global warming problem. The UNFCCC allows for the ongoing negotiation of additional agreements, called 'protocols,' to guide the specific actions needed to solve the problem. The Kyoto Protocol[7] was one such agreement negotiated under the UNFCCC that commits nations to take some 'baby steps' (albeit important ones) along the road of reducing greenhouse gas emissions. However, national governments now need to agree on a new protocol that commits everyone to reducing the total global emissions of greenhouse gases to a safe level. But what would such a new protocol look like?

The answer is called *Contraction and Convergence*[8]. "C & C" is a framework that forces governments to agree on three vital questions. First, what is a safe concentration of atmospheric greenhouse gases? Is it twice the current concentration? Half the current concentration? The present concentration? Many scientists argue a safe concentration

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[4] The main greenhouse gas of concern is carbon dioxide, which is released from burning fossil fuel (oil, gas and coal) for energy and from clearing and degrading forests.

[5] This natural process is more accurately described as the global carbon cycle; with a finite amount of carbon being circulated between different stocks in the ocean, on land, and in the atmosphere. See discussion by Richard Houghton at http://www.whrc.org/carbon/index.htm.

[6] The text of the *United Nations Framework Convention on Climate Change* is available at http://unfccc.int/essential_background/convention/background/items/1413.php.

[7] Information about the *Kyoto Protocol* and associated inter-governmental processes can be found at the web site of the UNFCCC; http://unfccc.int/kyoto_protocol/items/2830.php.

[8] Details on the *Contraction & Convergence* framework can be found at the web site of the Global Commons Institute; http://www.gci.org.uk/.

is what it was during the 1960s. The fact is that the Earth system can absorb a certain amount of greenhouse gases without causing harmful change to the climate. So once a safe concentration is agreed upon, it is then easy to calculate the total global amount of greenhouse gas that can be emitted each year.

The second question *C & C* forces governments to answer is, 'When will the total global emissions of greenhouse gases be reduced to the amount needed to maintain atmospheric concentrations at the agreed safe level?' In 2050? 2100? Next year? The sooner the better, of course, because the longer we wait the more harm is done to people and nature and the more expensive it becomes to fix the problem.

The third important question a *C & C* framework would force governments to reach agreement on concerns how the permissible annual amount of greenhouse gas emissions will be allocated between nations. The simplest and fairest way is to give every person an equal share. This is called a *per capita* allocation, and is what *C & C* calls for. One important feature of *C & C* is that it treats nations fairly[9]. Under this framework, the emission entitlement of people in a poor country will increase relative to what it is now, while that of people in a wealthy country will decrease. This is fair because historically poor countries have not caused the global warming problem and they need to now quickly develop to eliminate poverty. However, under a new *C & C*-framed protocol, all countries, including developing countries, will be committed to meeting their specified national greenhouse gas targets by the agreed date.

Once a new protocol is in place based on the *C & C* framework, national governments can then begin the difficult and complex task of negotiating their way through the various implementation issues - that is, working out how to most efficiently and fairly reduce emissions of greenhouse gases to the agreed safe level. In his report to the UK Treasury, Nicholas Stern, former Chief Economist of the World Bank, argued that international co-operation to solve the global warming problem must cover all aspects of policy to reduce emissions including pricing, technology, the removal of behavioural barriers, as well as action on emissions from land use. *C & C* does not solve all these problems, but provides a framework for their negotiated solution[10].

Once a new international legal agreement is signed, all nations will be working together in a coordinated way, and everyone's efforts to reduce carbon emissions will literally count and be certain to make a real difference. This certainty will also be of great benefit to investors, assist in the development of markets for carbon trading, and help catalyse the generation of new greenhouse friendly technologies. We can then all be confident that the problem will actually be solved in due course. Without such an agreement, all our individual and collective efforts will be to no avail, and we will fail to solve the problem.

World Ethic of Universal Responsibility

Talk of a world ethic for universal responsibility - meaning a sense of responsibility that extends to all peoples, all nations, and the greater community of life on our planet, now and in the future - may appear to some as arcane or irrelevant given the urgent and difficult decisions that must be made to solve the global warming problem. But such a dismissive perspective simply reflects how little attention we pay to the role of ethics in motivating people to action and in creating the political will needed to advance significant social change.

Many national governments have argued against taking substantial action on climate change on the basis that the benefits to their citizens are outweighed by the costs. However, the costs and harm done to people in other countries from global warming is not taken into account in such analyses. Neither is the cost and harm to future generations of their own citizens, let along future generations of people born in other nations. And, of course, neither does this stance suggest much thought has been given to the harm caused to all the other species of life that live on Earth. Such a position is not illogical; it just reflects a very narrow sense of who a government sees as belonging to the community for

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[9] It can be argued that *C & C* is not sufficiently fair and, for example, that poor countries should be more explicitly compensated for the harm from climate change caused by rich nations. However, if the international community thought such compensation was warranted it could be dispensed through other mechanisms.

[10] Each of these implementation issues involves important ethical considerations. See Donald Brown (2002). *American Heat: Ethical Problems with the United States' Response to Global Warming* (Studies in Social, Political, and Legal Philosophy). Rowman & Littlefield Publishers, Inc.

which they are legally and morally responsible. It is clear that many national governments think in this narrow way about international relations.

Consequently, the nations of the world will only agree to a new *C & C* protocol if they become motivated to act with a sense of universal responsibility. Nations must expand their understanding of who belongs to their community of concern so that this includes, in addition to their fellow citizens currently alive, people in other nations and future generations, along with species and ecosystems. We need to respect and care for the entire community of life, those alive now and future generations. Otherwise, why should governments bother making the very significant changes that a new *C & C* framed protocol will demand?

Calling for nations to act with an expanded sense of universal responsibility and commit to a new *C & C* framed international legal agreement is no idle pipe dream. There are many examples of nations acting with an expanded sensibility that involved real sacrifice and commitments beyond those promoting national self-interest. The leadership shown by the USA Government during World War II was one shining example. The founding of the UN Charter was another such historic moment, as was the agreement on the UNFCCC at the Rio Earth Summit in 1992. But, we must be realistic given the current geo-political situation, for the global warming problem is too important to leave to good memories and ideals. From where will spring the political will to motivate governments to act?

The reality is that some governments will only negotiate and ratify a new legal international agreement to solve the global warming problem if the popular support for such a major commitment is evident. In countries with popularly elected governments, the political will must come from a change in the minds and hearts of the people. We, the current generation, must begin to care sufficiently about future generations, people in other countries, and the greater community of life, and demand that our governments show international leadership in negotiating a new legally binding agreement.

The Earth Charter provides one approach for educating and motivating people and governments to act with the necessary sense of universal responsibility[11]. It is a world ethic of values and principles for a more just, sustainable and peaceful world. The Earth Charter can be endorsed and used by everyone, governments at all levels, businesses, communities, and individuals. The Earth Charter was produced by a unique global consultation process, and has been endorsed by the World Conservation Union (the IUCN), among many thousands of other people and organizations. UNESCO has endorsed the Earth Charter as an important resource for the UN Decade of Education for Sustainable Development. Endorsing and spreading the word about the Earth Charter is an inexpensive, simple, and highly effective way of creating the motivation and political will needed to convince our governments to do what is necessary to solve the global warming problem.

Concerted Action: Mitigation, Adaptation and Protecting Forests

A new international legal agreement - based on *C & C* and catalysed by the Earth Charter - would provide the certainty needed for nations and individuals to take concerted action to address global warming. As climate change affects all the basic elements of life for people around the world, a comprehensive suite of actions are needed. Here we consider some aspects of what will constitute meaningful mitigation and adaptation actions aimed at solving the global warming problem.

Mitigation

Amongst mitigation strategies, reducing greenhouse gases goes directly to the proximate cause of global warming. As the Stern Review notes, the current level of carbon dioxide in the atmosphere is 380 ppm (parts per million) and the total warming effect due to all (Kyoto) greenhouse gases emitted by human activities is now equivalent to around 430 ppm of carbon dioxide (i.e. CO_2 equivalent), and is rising at more than 2ppm each year. The Stern Review argues that the risks of the worst impacts of climate change can be substantially reduced if greenhouse gas levels in the atmosphere can be stabilised between 450 and 550ppm CO_2 equivalent. However, it could be that a safe level is far

[11] The text of the *Earth Charter* can be found at the web site of Earth Charter International; http://www.earthcharter.org/.

lower and closer to the pre-industrial level of around 280ppm CO_2 and that total annual emissions will need to be brought down to more than 80% below current levels. The biggest challenge as mentioned above is how to work out a system and mechanisms that facilitate most efficiently and fairly reduction of greenhouse gas emissions to the agreed safe level. However, while achieving this target will require significant economic change, not all change is bad and the transition to a low carbon economy will create significant business and technology opportunities.

A range of technological approaches has been proposed for helping to reduce atmospheric levels of greenhouse gases[12]. Proposed mitigation strategies include: artificial means, such as $C0_2$ storage and geo-sequestration[13]; "terra-forming" technologies that manipulate atmospheric conditions[14], including mega-engineering projects to construct shields that block solar energy from entering Earth's atmosphere[15]; along with more prosaic management approaches such as modifying agricultural practices[16]. Whilst there is no doubt that appropriate technological solutions have their place, such approaches to mitigation ignore the reality that Earth's environment has stayed within life-enabling bounds for the last 3.5 billion years due to natural regulatory processes[17]. We are now dismantling those natural processes as the unintended consequence of unsustainable patterns of production, consumption and reproduction. Solutions must be found that deal with the root causes of human-forced rapid climate change and that protect and restore the natural regulatory processes.

Addressing the root causes of global warming will demand shifting from a paradigm of unrestrained economic growth to one framed by the concept of sustainable development[18]. As articulated in Earth Charter principle 7, we should aim to "Adopt patterns of production, consumption, and reproduction that safeguard Earth's regenerative capacities, human rights, and community well-being." Energy conservation, especially in the built environment and transportation sectors, must be part of a core response. Economically developed societies will need to consider how low-energy consuming lifestyles can be promoted. Fossil fuel must be replaced with energy sources such as solar energy that do not emit greenhouse gases nor further pollute Earth with bio-toxic substances. Earth Charter principle 5 highlights the need to "Protect and restore the integrity of Earth's ecological systems, with special concern for biological diversity and the natural processes that sustain life." One of the most important natural processes relates to the role played by terrestrial ecosystems, particularly the world's forests, in removing carbon dioxide from the atmosphere. Forest protection and restoration is an urgent matter because of the extent and ongoing rate of forest destruction[19]. Unfortunately, it is an issue that to date has received inadequate attention in the global warming policy debate. Nicholas Stern's report to the UK Government was very clear about the importance of forests to solving the global warming problem. As Stern notes, curbing deforestation is a highly cost-effective way of reducing greenhouse gas emissions. Emissions from deforestation are very significant as they represent around 18% of global emissions, a share greater than is produced by the global transport sector. The world's forests are an important part of the global carbon cycle and Earth's natural processes that help regulate the concentration of greenhouse gases in the

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[12] S. Pacala and R. Socolow (2004). Stabilization Wedges: Solving the Climate Problem for the Next 50 Years with Current Technologies. *Science* 13 Vol. 305. no. 5686, pp. 968 – 972.

[13] See research activities at the Australian Cooperative Research Centre for Greenhouse Gas Technologies; http://www.co2crc.com.au/.

[14] "Cloud manipulation" proposal reported by Time; http://www.timesonline.co.uk/article/0,,2090-1734536,00.html.

[15] "Giant Space Shield Plan to Save Planet" report by The Guardian; http://www.guardian.co.uk/climatechange/story/0,12374,1120510,00.html.

[16] Commonwealth of Australia (2006). *National Agriculture & Climate Change ACTION PLAN 2006–2009*. ISBN 0 9757157 8 X.

[17] V.G. Gorshkov (1995) *Physical and Biological Bases of Life Stability: Man, Biota, Environment* (Hardcover). Springer.

[18] *Our Common Future* (1985). Report of the World Commission on Environment and Development chaired by Gro Harlem Brundtland. Oxford University Press.

[19] Global Forest Resources Assessment 2005. FAO, UN.

atmosphere[20]. The world's land-based ecosystems are a natural buffer that soaks up excess greenhouse gases in the atmosphere and stores them in the biomass of trees and in the soil. Indeed, even in the absence of human-caused greenhouse emissions, the geosphere naturally degases carbon dioxide into the atmosphere[21]. The geological record shows forests are adaptive natural buffers that in the past have covered much of terrestrial Earth. The world's forests are an essential natural mechanism for stabilising atmospheric concentrations of carbon dioxide in the short and long term[22].

Forests currently contain around 3-4 times more carbon than is currently in the atmosphere[23]. About half the world's forests have now been cleared for agriculture and human settlement. Much of what is left is commercially logged for timber products, especially wood chip for pulp-based products. Forests that are commercially logged store around 30-40% less carbon that un-logged forests[24]. If we were to halt further deforestation and allow even some of the world's forests that have been logged to naturally re-grow then the amount of carbon taken up and stored in these ecosystems would make a significant contribution to solving the global warming problem.

The standing stock of carbon stored in a mature forest is like a bank account. If a forest is logged, it is as if someone has stolen half the money from your bank account. You might start saving again, but it will take many years before your savings are recovered. Even if you start saving at a faster rate, it will still be a long time before you have the same amount of money in the bank again. When a forest is logged, nearly half the carbon is removed, and it can take 300 years for the carbon to grow back. This is why we should grow our wood in plantations on land that has already been cleared. In such case, the loss of carbon occurred long ago, and establishing a plantation is like starting a new bank account; every deposit is a gain on the total amount of savings.

A commonly discussed argument is that we can log forests and store the wood in long lived products such as a table; but this practice is akin to taking money from one bank account and placing it in another. There are a number of problems with this idea. First, most wood does not end up in long-lived products. Second, what counts is the net change in carbon stocks as logging, transporting and manufacturing timber involves the use of fossil fuel that emits carbon dioxide into the atmosphere. All the carbon emitted during the entire life cycle of a product must be subtracted from the amount of carbon that may end up in a long-lived wood product. In any case, only a small percentage of the wood carbon logged from a forest ends up in a wood fibre product.

As we did during World War II, we must now make tough decisions about our public policy priorities. Winning the war against global warming means changing our priorities and doing things differently. Enough forested land has been cleared to grow food for people and to give us somewhere to live. Plantation timber can be grown on land that has already been cleared and used to meet demand for pulp and related wood fibre products. The time has come to stop clearing and logging the world's remaining natural forests as a major and cost effective contribution to solving the greenhouse problem.

However, implementing this strategy will be difficult and must be one of the key negotiation tasks tackled once we have in place a new legally binding agreement based on the *C & C* framework. The Stern report estimates that the opportunity cost of forest protection in eight countries responsible for 70 per cent of emissions from land use could be around $5 billion per annum initially. This may seem a large amount, but keep in mind that the cost of not solving the

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[20] The term 'forests' as used here refers to 'forest ecosystems'; the living trees, decaying dead biomass, mineral soil, and vast populations of animals (spiders, ants, birds etc.), fungi and bacteria that live in and among the trees and soil and keep the system healthy. Also, we use 'forests' here to include woodland ecosystems as well as forests *per se*.

[21] Examples of such geo-processes include volcanic eruptions and degassing from sections of the ocean floor.

[22] For example, see discussion in Victory Gorshkov, V.V. Gorshkov and A.M. Makarieva (2000). *Biotic Regulation of the Environment: Key Issues of Global Change*. Springer Praxis Books.

[23] Robert T. Watson, Ian R. Noble, Bert Bolin, N.H. Ravindranath, David J. Verardo and David J. Dokken. *IPCC Special Report on Land Use, Land-Use Change And Forestry: Part 1.2 Global Carbon Cycle Overview*. Intergovernmental Panel on Climate Change; http://www.grida.no/climate/ipcc/land_use/.

[24] C. Dean, S. Roxburgh, S. and B. Mackey (2003). Growth modelling of *Eucalyptus Regnans* for carbon accounting at the landscape scale. Amaro, A., Reed, D. and Soares, P. (eds) *Modelling Forest Systems*. CABI Publishing, Wallingford, UK.

global warming problem will escalate the longer we ignore it. In any case, the world can afford such innovative solutions; global military expenditure now exceeds one trillion (thousand billion) US dollars annually[25]. We only need to divert half of one percent of this expenditure to save the world's forests and make a significant and lasting contribution to solving the global warming problem. Nicholas Stern also argued that establishing a carbon price, through tax, trading or regulation, is an essential foundation for climate-change policy. These mechanisms can be used to give an appropriate economic value to the stocks of carbon in mature forests, providing the incentive governments need to take this bold step.

Adaptation

The rapidly changing climate results in adverse consequences for agricultural productivity, water resources, human settlement, human health, and ecological systems. In the past decade, almost 300 million people per year in developing countries have been affected by climate related disasters and each decade the rate increases by 80 million people per year. Floods and droughts affect most people and both are projected to become more frequent under global warming scenarios.[26] Even if our mitigation actions are successful, and atmospheric levels of greenhouse gases are stabilised, we will still have to live with the impacts of rapid climate change due to legacy and lag affects[27].

'Adaptation' means to build resilience and minimise costs by changing those business-as-usual practices that deplete limited natural resources. Adaptation measures depend on the different types of climate variability each area experiences; for example, small island countries may need risk diagnosis and response methods (awareness raising and monitoring), construction guidelines to protect key public assets (hospitals) in vulnerable coastal areas, and protection of coastal ecosystems and biodiversity affected by sea level rise. Some African countries will need to alter land-use and agricultural policies in their marginal agricultural lands given the increased drought-related stress brought by climate change. Another example is provided by the Huang-Huai-Hai river plain area (3H) that currently produces 50% of China's national grain output. To address climate related stagnated winter wheat production, underground water is being withdrawn for irrigation, producing increasingly serious consequences. Wheat production is still declining in spite of huge amounts of water resources being consumed to counter climatic droughts. As a result, groundwater levels have dropped to 30-50 meters below the surface (and down to 80-100 meters in some places); whereas 30 years ago the normal level was only 2-5 meters under the land surface. In this region, agricultural cropping change will be needed as one adaptation measure.

There is no doubt that adaptation can be a 'win-win' solution in both economic and ethical terms. First, the whole purpose of adaptation is to build resilience and reduce costs. Therefore, adaptation will also bring new business opportunities once people's mindsets have changed and accepted that a certain amount of global warming is now inevitable. Second, adaptation is a key action to advance equity among people of the current generation and between generations. This is a perfect opportunity to act in accordance with an expanded sense of our universal responsibility by saving the lives of millions of vulnerable people from the harmful impacts of human-forced climate change and variability, especially droughts and floods. Third, adaptation will contribute to world peace and security by reducing the risk of natural disaster and environmental refugees. Adaptation provides us with a chance to show our solidarity in face of the common danger of global warming.

Finally, adaptation should help us learn a fundamental lesson of what it will take to achieve sustainable development, namely, as noted in the *Preamble* to the Earth Charter, that "Fundamental changes are needed in our values, institutions, and ways of living. We must realize that when basic needs have been met, human development is primarily about being more, not having more."[28] Responding to the challenge of climate change through implementing

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[25] *Recent trends in military expenditure*. The Stockholm International Peace Research Institute (SIPRI); http://www.sipri.org/contents/milap/milex/mex_trends.html.

[26] See World Bank (2006). *An Investment Framework for Clean Energy and Development: A Progress Report*. World Bank, p. 36.

[27] 'Legacy affects' refers to the fact that we are currently experiencing rapid climate change as the result of past actions. 'Lag affects' means there is a delay between carbon pollution of the atmosphere and global warming.

[28] See *Earth Charter* text; available online at Earth Charter International website; www.earthcharter.org.

appropriate mitigation and adaptation strategies will actually force us to consider more sustainable ways of living and alternatives to current consumption and production patterns that are exhausting Earth's natural resources.

Conclusion

One of the most challenging aspects of solving the global warming problem concerns the tension between our "common (universal) responsibilities" - given the global situation faced by all peoples in all nations - and the "differentiated responsibilities" that stem from each nation's unique history, culture and economic circumstances. Principle 2 of the Earth Charter notes we should "Accept that with the right to own, manage, and use natural resources comes the duty to prevent environmental harm and to protect the rights of people" and "Affirm that with increased freedom, knowledge, and power comes increased responsibility to promote the common good." A new international agreement based on the *C & C* framework would be a tangible expression of the international community's commitment to take seriously the ethical implications of our "common but differentiated responsibilities".

Mitigation and adaptation to climate change requires a change of our mindsets (based on the best available information) and a change of our hearts (based on a sense of universal responsibility). These changes of mind and heart needed to be supported by appropriate institutional, policy and legal arrangements nationally and internationally to enable effective action at all levels, in all sectors, and collaboratively between all the world's nations. The necessary mitigation and adaptation actions are interlinked and mutually supportive; for example, emission reduction will slow down global warming, adaptation will protect vulnerable people by changing those practices which deplete natural resources and ecosystems, and the protected forests will absorb greenhouse gases further reducing global warming.

Our place in history will be determined by how we respond to the challenge of global warming. History will judge us harshly if we fail to rise to the challenge, as we will be unable to invoke ignorance in our defence. We have the necessary scientific knowledge and policy compasses to guide us along the way (UNFCCC; *C & C*; The Earth Charter). At the same time, we must be honest and admit that the road to solving the global warming problem will be a long journey full of pitfalls, detours and dead ends; and along the way we must guard against false prophets[29] who say it is all too hard, too expensive, or too easy.

The two frameworks discussed here are all essential stepping-stones along this road. If we activate these frameworks then we will have the foundation on which to build sustainable solutions to the global warming problem. There will be motivated and informed citizens and their governments changed with political will; and an international legal framework that provides certainty for actions aimed at mitigation and adaptation. When you think about it, the side benefits alone that flow from solving the global warming problem will justify the effort.

The world is struggling to take the steps needed to solve the global warming problem, and national governments are wavering at the very juncture when leadership is demanded. Perhaps the time has come when each person needs to take a stand and become a leader in the war against global warming – leadership based on an Earth Charter sense of our ethical responsibilities to find practical collaborative solutions to difficult and shared problems.

[29] Gospel of Matthew 7:15 *Beware of false prophets, which come to you in sheep's clothing, but inwardly they are ravening wolves*.