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Decisive Action Vital at Cancún Climate Talks

By John Dillon and Dorothy McDougall

Canadians have just sweltered through the hottest summer in more than 60 years. Heat and drought conditions contributed to a rash of forest fires in British Columbia, while excessive rain wiped out a fifth of the wheat crop in Manitoba and Saskatchewan.

The year 2010 is on track to be one of the warmest on record. *Macleans* magazine writes: "In fact record heat has occurred in 17 countries, including Pakistan, where on May 26, the mercury hit 53.5^{0} C suffocating four people to death."[1] Pakistan was hit by devastating floods that claimed more than 1,600 lives, left four million people homeless and damaged 7.9 million acres of farmland.

In Russia, temperatures as high as 40^{0} C and ruinous forest fires claimed hundreds of lives as Moscow was blanketed by toxic smog. With soil moisture falling to levels seen only once before in 500 years, wheat yields in Russia, Kazakhstan and Ukraine – regions that provide 25% of the world's wheat exports – fell by over 40%.[2]

A huge ice sheet measuring over 250 square kilometers broke off from Greenland's Petermann Glacier in mid-summer and began drifting south, a sign of things to come as Greenland is losing its ice cover at a rate of 100 cubic kilometers a year.[3]

Scientific data demonstrates the reality of climate change, showing increases in seven categories: air temperatures over land, sea-surface temperatures, air temperatures over oceans, rising sea levels, ocean heat, humidity and the temperature of the troposphere (the atmosphere closest to the earth's surface). Three other indicators show declining trends: the extent of Arctic sea ice, glaciers and spring snow cover in the Northern hemisphere.

Referring to North America, the US National Oceanic and Atmospheric Administration (NOAA) reports: "Glaciers and sea ice are melting, heavy rainfall is intensifying and heat waves are becoming more common and more intense. Continued temperature increases will threaten many aspects of our society, including coastal cities and infrastructure, water supply and agriculture."[4]

While climate scientists are careful to say that not every heat wave, drought or flood can be attributed to climate change alone, they also say that climate change is exacerbating the frequency and intensity of these severe weather events.

In this report, we first consider some of the latest developments on the climate change front, including Canadian public opinion. We then evaluate the issues to be debated this year in Cancún in the wake of the failure of last year's UN conference in Copenhagen.

I. Climate Change is Real and Urgent

On the eve of the November 29-December 10 UN conference on climate change in Cancún, Mexico, public opinion polls confirm that the vast majority of Canadians recognize climate change as an urgent and important issue.

An Environics poll commissioned by KAIROS and several other groups asked Canadians whether they agree or disagree with five statements framed at the April 2010 World Peoples' Conference on Climate Change and the Rights of Mother Earth held in Cochabamba, Bolivia.[5] The poll found that:

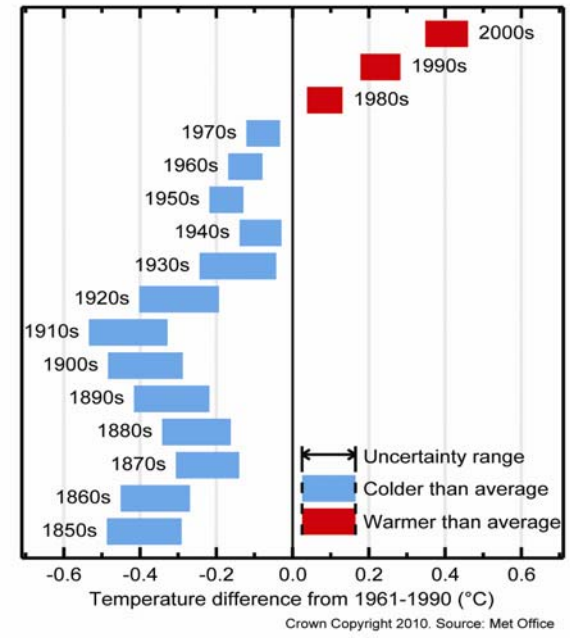
- 87% strongly or somewhat agree industrialized countries, which have historically produced the most greenhouse gas emissions, should be the most responsible for reducing current emissions;
- 85% agree the root cause of climate change is too much focus on economic growth and consumerism. We need an economy that is in harmony with nature, which recognizes and respects the planet.

Misleading Talk of Climate Change "Prosperity"

In contrast to Canadians' genuine concern about climate change, a report from the National Round Table on the Environment and the Economy, *Climate Prosperity*, sets out "to change how Canadians see and think about climate change – from risk to opportunity, from cost to investment," implying that many Canadians stand to benefit economically.[6]

Promoting this idea is dangerous because it will thwart the demand for government action and put at grave risk the health and welfare of all Canadians. Furthermore, globally the effects will be devastating for millions of peoples and cultures as well as whole ecosystems.

In response to the notion that some Canadians might be immune, or even prosper, from the effects of climate change, Climate Action Network Canada warns: "Unfortunately for Canadians, the effects of climate changes are predicted to be greater in our region of the world. [If] global average temperatures, for example, [were to] rise by 2 to 6 degrees Celsius by the end of the century the Canadian average will be within the 6 to 10 degree range."[7]



Melting Ice and Sea Level Rise

If anything, the trajectory for climate change outlined in the 2007 report of the Intergovernmental Panel on Climate Change (IPCC) did not sufficiently take into account how melting Arctic sea ice will amplify future climate change. Darker open waters absorb more than 90% of incoming sunlight whereas white ice reflects light back into space. NASA climate scientist James Hansen asserts that the IPCC report estimates failed "to draw attention to the danger of sea level rise [due to the melting of the Antarctica and Greenland ice sheets]."[8] Whereas the IPCC predicted that global sea levels would rise by 61 centimetres by 2100, the disappearance of the entire Greenland ice sheet could cause a rise of seven metres in global sea levels, wiping out small island states and coastal cities all around the world.

Accelerating feedback loops involving "significant reductions in ice sheets and release of greenhouse gases (methane) from melting permafrost"[9] threaten to take us past a point of no return after which climate change would increase independently of human actions. As Dr. Hansen explains: "Paleoclimatic records confirm that the long-lived greenhouse gases – methane, carbon dioxide and nitrous oxide – all increase with the warming of oceans and land. These positive feedbacks amplify climate change over decades, centuries, and longer."[10] Some fear that climate change in the Arctic may have already reached its point of no return.[11]

Exeter University Geography Professor Chris Turney concludes that the current stabilizing target of 2°C above pre-industrial levels now under negotiation in international climate talks is totally inadequate and must be lowered even further. [12]

This is a kairos Moment

The Greek word *kairos* signifies time laden with new possibilities where there is both crisis and opportunity – a moment when crucial action is called for. Christians perceive it as God's time – a moment of time when God breaks into world history and calls us to transformation. This is such a *kairos* moment. It calls for reflection, renewal and restitution for past behaviour that has endangered the well-being of humanity and the ecological balance of the Earth. Climate change is a result of human action and can be redressed through human action. Climate change is a justice issue that places a value on all of creation both near and far, human and nonhuman. Canadians need to be concerned for both the national impacts as well as the global consequences of climate change.

In *Re-energizing the Future: Faith and Justice in a Post Petroleum World*[13], KAIROS member churches set out the theological and ethical principles inherent in addressing climate change. The core beliefs underlying the call to action are premised on the fundamental truth that Creation belongs to God and humans have an obligation to respect and honour what is God's. The whole of creation is intimately interconnected in a web of relations that is the subject of God's covenant.

II. The Challenge Ahead: From Copenhagen to Cancún

For many, hope is at a premium as the international community gathers for the 16th Conference of the Parties (COP-16) in Cancún November 29-December 10 to continue negotiations under the UN Framework Convention on Climate Change (UNFCCC). In 2009 COP-15 in Copenhagen ended in disarray.[14] The "Copenhagen Accord," negotiated by a mere 26 countries behind closed doors during the last days of the conference, is the source of much controversy and resistance, especially on the part of delegations from several Southern countries. Despite the fact that they were excluded from the framing of the Accord, some developing countries have nominally signed on under duress in order to receive financial help for mitigation and adaptation measures. China, a key interlocutor in its negotiation, is reportedly now distancing itself from the Accord in the run up to Cancún.[15]

The reduction targets stipulated in the Accord are totally inadequate. Industrial country supporters of the Accord, including Canada, listed the greenhouse gas (GHG) emission reductions they aim to achieve in its Appendix. Canada's then Environment Minister, Jim Prentice, announced a new reduction target of 17% below 2005 levels by 2020. If this goal were achieved it would actually mean that 2020 emission levels would be 2.5% **above** 1990 levels whereas under the Kyoto Protocol Canada was committed to reducing emissions to an average of 6% **below** 1990 levels over the years 2008-2012.

An analysis by researchers from the Sustainability Institute, a US non-profit organization, together with the MIT Sloan School of Management and Ventana Systems, concludes that the voluntary pledges made in the Copenhagen Accord "fall short of the level of greenhouse gas emissions reductions required to limit temperature increase to 2^0 C, relative to pre-industrial temperatures. Instead, the proposals, if fully implemented, would allow global mean temperature to increase [by] approximately 3.9^0 C."[16] As stated earlier, even a target of 2^o C is wholly inadequate in light of the most recent science.

Lower Targets

While scientists cannot predict the exact time when Arctic melting will pass a tipping point, there is no room for complacency. The precautionary principle affirms that the lack of complete scientific certainty in respect of timeframes is no excuse for postponing measures to deal with the threat. Delayed action will result in more rapid and deeper consequences.

On the eve of COP-16, many civil society groups are calling for limiting the rise in global temperatures above the pre-industrial era to less than 1.5^0C and as close as possible to 1^0C. Global temperatures have already risen by 0.78^0 C above their pre-industrial levels, of which 0.6^0 C has occurred in the last 30 years.[17] Even if atmospheric CO_2 concentrations were to stabilize at today's level, mean global temperatures could still exceed their pre-industrial level by about 2.4^0 C by the end of the century since one-third of CO_2 emissions remain in the atmosphere for 100 years and one-quarter for 500 years.

We must reduce emissions more quickly than was thought necessary prior to last year's Copenhagen conference. Industrialized countries' emissions must be reduced to 40-50% below 1990 levels by 2020. The implications for industrialized countries like Canada that are heavily dependent on fossil fuels is that we must leave much of the remaining conventional oil and gas in the ground and phase out coal and tar sands production. At the moment the course for most industrialized economies, including Canada, is headed in the opposite direction.

The federal government is spending $100 million on the Geo-Mapping for Energy and Minerals program, searching for oil, gas and minerals in the Arctic despite the fact that petroleum exploration endangers its fragile ecology. An oil spill in the Arctic would be particularly destructive since "none of the conventional approaches – dispersants, booms, burning – would work in Arctic waters."[18] Despite the ecological fragility of the Arctic region companies wanting to explore for oil in the Beaufort Sea are pressing the National Energy Board to suspend a regulation that requires them to be able to drill relief wells during a single drilling season.

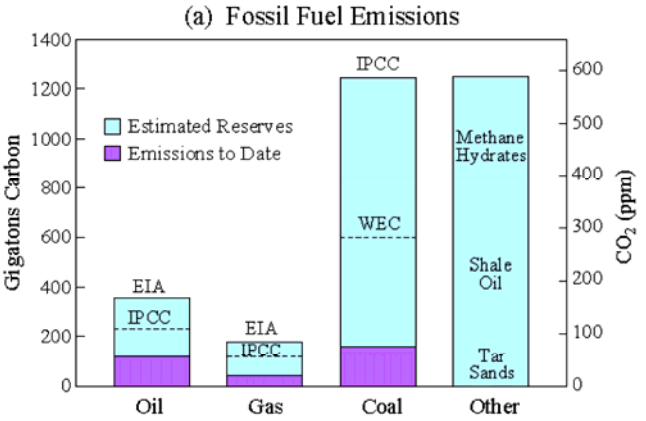
Canadian Inuit won a significant legal victory when a Nunavut court granted an injunction against the continuation of a seismic mapping exercise on the grounds that the firing of air guns underwater threatens narwhal, walrus, beluga whales, seals and polar bears. Nevertheless, Natural Resources Canada said it "remains committed to … its geo-mapping program."[19]

Keeping Fossil Fuels in the Ground

The necessity of keeping fossil fuels in the ground is illustrated by the accompanying graph developed by James Hansen. It shows the number of gigatons (billions of metric tonnes) of carbon in the remaining reserves of various types of fossil fuels relative to the amounts that have been released to date. The historical carbon emissions from burning conventional oil and natural gas are relatively small when compared with the potential emissions that would result if we exploit all the remaining reserves of conventional oil and gas, let alone the much larger amounts of coal and non-conventional fuels contained within tar sands, shale or marlstone rock and methane hydrate crystals.

What's worse is that each of the non-conventional fossil fuels designated as "other" in the graph has a larger carbon footprint than conventional oil and gas:

- extraction of synthetic oil from the tar sands releases two and a half times as much CO_2 as conventional oil extraction;
- exploitation of shale oil deposits would release twice as much CO_2 as conventional oil;
- methane hydrates "are conservatively estimated to [contain] twice the amount of carbon to be found in all known fossil fuels on Earth."[20]



The Alberta tar sands are the most significant source of non-conventional petroleum exploited to date. Canada has also co-operated in an international consortium that includes Japan, the US, India and Germany in experiments conducted in the Mackenzie delta to extract natural gas from methane hydrates.[21]

While US "shale oil" deposits have not yet been commercially exploited, their carbon potential is enormous. What is commonly called "shale oil" is kerogen, an "undercooked" precursor to crude oil that is found not in shale but in marlstone rock. The mining of kerogen requires vast amounts of water, a scarce resource in the US Midwest where the deposits are found. Yet, Shell Oil is experimenting with *in situ* extraction methods similar to the tar sands.

III. Measures on the Table at Cancún Favoured by Industrial Countries

The conspicuous divide between the global North and the global South will be evident on issues debated at Cancún. Industrialized countries and the elite of emerging economies propose a number of resolutions that involve market mechanisms and the protection of the status quo in relation to fossil fuels. Many of them endanger the rights of Indigenous peoples and lead to the continued exploitation of their lands and way of life. They also jeopardize the livelihoods of the world's small farmers and fishers and put at risk whole ecosystems and the life forms that inhabit them. It is incumbent on Christians to view these proposed solutions through the lens of right relationships and evaluate them through the gospel imperative for equity, renewal and restoration.

The criteria by which KAIROS evaluates proposals for dealing with climate change are these:

- **Adequacy.** Will measures lead to sufficient genuine reductions in greenhouse gas emissions?
- **Equity.** Will measures reflect the greater responsibility borne by peoples from the global North whose historical CO_2 emissions have overtaxed the Earth's carbon absorption capacity at the expense of the peoples of the global South who bear least responsibility but stand to suffer most?
- **Care for all Creation.** Will measures restore ecological balance or do they threaten new dangers?
- **Respect for Indigenous communities.** Will measures be consistent with the UN Declaration on the Rights of Indigenous Peoples, especially with respect to the principle of Free, Prior and Informed Consent, and respect the right of Indigenous peoples to manage their land and resources?
- **Restitution**. Will the wealthiest fifth of the world's population who are responsible for 70% of historical emissions recognize and pay their ecological debt owed to the poorest four-fifths of humanity?
- **Justice**. Will measures reduce the ever-growing inequities between rich and poor, treat the most vulnerable justly, and recognize their right to a voice in decisions that affect their livelihoods?

In what follows we shall apply these criteria to evaluate the proposals favoured by industrial countries.

A) Expanded Carbon Trading and Offsets

Under the Kyoto Protocol's Clean Development Mechanism, Northern countries can claim credits for greenhouse gas reductions that take place in the South through the purchase of offsets without actually lowering their own emissions. For example, a typical offset might involve planting trees that are supposed to take CO_2 out of the atmosphere over a period of years. By purchasing such offsets, Northern companies can go on burning fossil fuels.

Newsweek's investigation of the Clean Development Mechanism concluded "It isn't working . . . [and represents] a grossly inefficient way of cutting emissions in the developing world." The magazine called the trade "a shell game" which has transferred "$3 billion to some of the worst carbon polluters in the developing world."[22]

While in theory carbon trading holds out the prospect of an economical way of reducing emissions, the experience to date belies its promise.[23] Patrick Bond, director of the Centre for Civil Society in South Africa,

states that "there is a serious potential for carbon markets to become an out-of-control, multi-trillion dollar speculative bubble, similar to exotic financial instruments associated with Enron's 2002 collapse."[24]

Despite the urgent need for bold and immediate action on climate change, the Canadian government is waiting for the US to pass a climate bill. Aligning our policies with the US and introducing a US-Canada emissions trading system could keep prices low for US emitters, but do little to reduce Canada's GHG emissions.[25] More importantly, the delay in developing effective policies such as regulatory frameworks, conservation strategies, and investments in renewable energy and mass transportation infrastructure means a delay in the critical challenge of achieving real reductions in GHG emissions.

B) Reducing Emissions from Deforestation and Forest Degradation

The Reducing Emissions from Deforestation and Forest Degradation (REDD) initiative is a plan for preventing about 12% of all GHG emissions by preserving the world's forests. REDD would put a price on the carbon stored in trees and include an offset program allowing companies in industrial countries to claim credits by paying to avoid deforestation in the South.

However, forest protection projects have already displaced many Indigenous peoples and forest-dependent communities from their traditional lands and put forests under control of private companies. Monoculture eucalyptus groves which are proposed to come under the purview of REDD not only jeopardize the biodiversity of many regions, they have resulted in the drying up of streams and water as well as air contamination due to the use of toxic chemicals. In an attempt to bribe the governments of developing countries to co-operate, the Copenhagen Accord explicitly ties their acceptance of REDD to "the mobilization of financial resources from developed countries."[26]

Bolivia's President, Evo Morales, in a letter to his Indigenous brothers and sisters around the world, strongly rejects the REDD proposal as a commodification of nature on the false premise that "only what has a price and owner is worth taking care of."[27] Morales calls for respect for the sovereignty of developing countries and the rights established by the UN Declaration on the Rights of Indigenous Peoples concerning recognition and respect for Indigenous peoples management of their forests. The International Indigenous Peoples' Forum on Climate Change, speaking on behalf of some 60 million people who depend on forests for their survival, has warned that "REDD will steal our land. States and carbon traders will take control over our forests."[28]

C) Agrofuels

KAIROS first investigated the pros and cons of producing liquid fuels from crops such as corn, palm oil or sugar cane in 2007. The study found that producing ethanol from corn uses almost as much energy as what is contained in the final product while releasing only 12-13% fewer GHGs. Case studies from Brazil, Colombia and Indonesia showed that while small-scale projects in local communities may be viable, large-scale agrofuel production for export poses serious threats to food sovereignty, biodiversity and human rights in the global South. (See *Are Agrofuels Alternatives to Oil?*, March 2007).

Since then, evidence of the destructive impact of agrofuel production has increased. Thousands of people have been dispossessed from their lands. In Thailand, 40,000 families were forced off their farms to make way for plantations. Monocrop plantations growing sugarcane for ethanol or oilseeds for biodiesel have eroded soils, exhausted nutrients, dried up rivers and polluted downstream fisheries with pesticides.[29]

D) Biochar

A widely touted technology for capturing CO_2 emissions involves burning plant biomass in a low oxygen environment so that its carbon content is not released and then burying the resulting charcoal, called biochar, in the soil. However, a recent study has concluded, "buried biochar is not stable, and could also increase the breakdown of humus in the soil. At the same time, its ability to improve crop yields appears sporadic, short-lived, and dependent on local conditions."[30] Author and columnist George Monbiot notes: "The energy lecturer Peter Read proposes new biomass plantations of trees and sugar covering 1.4 billion hectares … [But] the global total of arable land is 1.36 billion hectares. [Read's proposal would] double the cropped area of the planet, trashing most of its remaining natural habitats [and occupy] land used by subsistence farmers, pastoralists, hunters and gatherers and anyone else who isn't producing commodities for the mass market: poorly-defended people whose rights and title can be disregarded."[31]

E) Geoengineering

Geoengineering involves large-scale intervention in the Earth's oceans, soils or atmosphere.[32] At first glance many of these technical fixes appear to be pure science fiction but in fact some are gaining support among governments and corporations in the face of their own inaction in ending their use of fossil fuels.

A study by the ETC Group, a research facility dedicated to the conservation and sustainable advancement of cultural and ecological diversity, exposes the futility of a

number of these techniques for combating climate change. A telling quote by airline owner and industrialist Richard Bronson frames the issue quite eloquently. He states: "If we could come up with a geoengineering answer to this problem, then Copenhagen wouldn't be necessary. We could carry on flying our planes and driving our cars." [33]

Some of the principal geoengineering options investigated by the ETC Group include:

- blasting sulfate particles into the stratosphere from artillery cannons or high-altitude balloons to reflect the sun's rays, simulating a volcanic eruption;
- dumping iron particles into the oceans to nurture CO_2-absorbing plankton;
- firing silver iodide into clouds to produce rain;
- building 16 trillion space sunshades to deflect sunlight 1.5 million kilometres from Earth – to divert 10% of the sunlight falling on the planet;
- launching 5,000-30,000 ships with turbines to propel salt spray to whiten clouds to deflect sunlight;
- dropping limestone into the ocean to change its acidity so that it can soak up extra CO^2;
- covering deserts with white plastic to reflect sunlight;
- covering snowpack or glaciers in the Arctic with insulating material or a nano-film to reflect sunlight and prevent melting;
- genetically-engineering crops so their foliage can better reflect sunlight or make plants drought or heat resistant;
- engineering communities of synthetic microbes and algae to sequester higher levels of CO_2, either for altering ocean communities or for use in closed ponds.[34]

One of the biggest difficulties with these geoengineering proposals is the likelihood that they will have unintended consequences on weather patterns including precipitation patterns crucial to agriculture. They could damage crops, fisheries, the ozone layer and whole ecosystems. A disruption of marine ecosystems threatens the entire food chain dependent on plankton.

If sunscreens are successful, many plant varieties and solar collectors would be less productive. If these technologies malfunction or are suddenly removed the consequences could be very rapid temperature increases further accelerating climate change. Any proposal that favours more human experimentation on the natural world in contrast to dealing with the underlying cause of climate change – human dependency on fossil fuels – flies in the face of the precautionary principle.

F) Carbon Capture and Storage (CCS)

Technologies aimed at capturing CO_2 and storing it underground are directed toward prolonging rather than curtailing the use of fossil fuels. In *The Costs and Risks of Carbon Capture and Storage* (November 2009), we document how estimates of the costs of CCS have risen constantly to the point where additional federal and provincial subsidies worth up to $3 billion a year will be needed to make CCS viable in Canada. While it is technically possible to capture CO_2 at a coal-fired power plant, CCS is not suited for the tar sands where extraction facilities are widely dispersed, except for upgraders that turn bitumen into synthetic oil.

This Briefing Paper shows how capturing and compressing CO_2 also consumes a lot of energy with the result that plants equipped with CCS have to be at least a third larger than conventional ones. Mark Jacobson, an engineering professor at Stanford University, estimates that new coal-fired plants fitted with carbon capture devices will still emit 60 to 110 times more carbon and air pollution than wind turbines. Moreover, CCS has no impact on the emissions associated with coal mining and transport.

Our investigation concludes that CCS cannot deliver meaningful emission reductions on time to avert climate chaos. GHG emissions must peak by 2015 and decline thereafter if we are to avert catastrophic climate change. Under even the most optimistic scenarios a significant level of carbon capture would not occur until well past 2015.

What carbon offsets, REDD, biochar, some geoengineering options and Carbon Capture and Storage all have in common is that they represent a concerted effort on the part of industrialized nations and southern elites to continue the status quo and delay any serious response to climate change.

IV. Climate Finance – A Central Issue at Cancún

In addition to the six measures just discussed, much of the debate at Cancún will involve how to deliver financial assistance to developing countries for mitigation and adaptation measures. The Copenhagen Accord is entirely inadequate in this regard. It offers only US$30 billion over the years 2010-2012, while making a vague promise that up to US$100 billion in financing might be available by 2020.

Just before the last round of pre-Cancún UNFCCC negotiations in Tiajin, China, then Environment Minister Jim Prentice announced that Canada would contribute $400 million in climate change financing for the 2010-2011 fiscal year as part of Canada's support for the Copenhagen Accord. While the Minister did not say that Canadian financing would only be available to countries

that sign on to the Accord, the priorities identified by Environment Canada are clearly in line with its approach:

- The largest amount, $285.7 million, will go to the International Finance Corporation (IFC), the World Bank agency that assists private investors through concessional loans for projects in developing countries.
- Canada's contribution will also support projects in developing countries which are essential to laying the groundwork for global action on Reducing Emissions from Deforestation and Forest Degradation (REDD).

For small island states whose very existence is being threatened by climate change, offers of future financing are no alternative to genuine commitments by industrialized countries to reduce their own emissions. As Ian Fry, the negotiator for the South Pacific island state of Tuvalu, declared in Copenhagen: "In biblical terms it looks like we are being offered 30 pieces of silver to betray our future and our people … our future is not for sale."[35]

Instead of viewing climate finance for developing countries as a lever to induce them to sign on to the Copenhagen Accord, it should be viewed as reparations or restitution of our ecological debt.

Acknowledge the Global North's Climate Debt

Canadian ecumenical bodies seeking to restore right relations with the Earth and with the poorest communities of the global South have recognized that those who appropriate a disproportionate share of the Earth's natural wealth owe "ecological debt."[36] Ecological debt refers to debt Northern peoples and corporations owe to the peoples of the global South on account of their appropriation of natural resources, the resulting environmental damages, and the commandeering of ecological space to deposit wastes such as greenhouse gases. Climate change has further contributed to this ecological debt. Climate debt is owed to the Earth itself and to all living creatures whose habitat is threatened. It is also owed to low-income people who are carbon creditors since they use less than their fair share of the carbon absorption capacity while being among those who will suffer the most from floods, droughts, severe weather and rising sea levels brought on by climate change.

Industrialized countries that have historically contributed most to greenhouse gas emissions have a particular responsibility for paying the climate debt. One-quarter of the CO_2 that was emitted 500 years ago at the start of the industrial era is still in the atmosphere. Canada and the US are responsible for 30% of historical emissions while industrial countries as a whole emitted 77% of what remains in the atmosphere. Canada remains a very high per capita emitter as 33 million Canadians are responsible for as many emissions as one billion of the world's poorest people.[37]

KAIROS partners include demands for financial reparations in the form of the cancellation of developing countries' financial debts as part of the necessary repayment of ecological debts. They also emphasize that "genuine reparations must entail first and foremost bold and decisive cuts in the levels of emissions within the Northern countries themselves, recognizing both their historic responsibility for global warming and the unsustainability of current modes of their production and consumption."[38]

The Group of Developing Countries participating in the UN talks says they will need US$600 billion a year to pay for adaptation and mitigation measures.

One of the best ways to raise funds for mitigation and adaptation expenses in developing countries would be through some form of a Financial Transaction Tax (FTT). A global FTT on all equity, bond, derivative and foreign exchange trades at a rate of 0.05% could raise annual revenues of approximately US$650 billion. A less ambitious tax on currency trading alone could still raise approximately US$33 billion annually to assist developing countries to adapt to climate change. (See *An Idea Whose Time Has Come: Adopt a Financial Transactions Tax*. April 2010.)

The growing evidence of the devastating effects of climate change on life-sustaining ecosystems confirms that we are indeed living through a *kairos* moment and that God is calling us to decisive action. Climate change, perhaps more than any other issue, demonstrates how we are indeed one community under God. There is no escaping the global effects of rising sea levels, the spread of disease, increased droughts and low crop yields, increased famines, the sinking of island states and coastlines, impending conflicts and forced migration over scarce resources. These are real outcomes of climate change and they are happening now. Canadians are not immune. There are solutions. We can mitigate the worst effects of climate change and adapt to that which is beyond our control. We can contribute to a world in which God's justice is the criteria of our actions.

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KAIROS: Canadian Ecumenical Justice Initiatives unites eleven churches and religious institutions in work for social justice in Canada and around the globe.

Endnotes

[1] Gulli, Cathy. "Extreme Weather Warning." *Macleans.* August 30, 2010.

[2] Stephen Leahy. "*Russia's Agony a 'Wake-Up Call' to the World*." IPS. August 11, 2010.

[3] For a video presentation on the pace of glacier ice melting see James Balg: Time-lapse proof of extreme ice loss.

[4] National Oceanic and Atmospheric Administration. *The State of the Climate 2009: Highlights*. NOAA: July 29, 2010.

[5] See KAIROS *Media Advisory*. November 18, 2010.

[6] *Climate Prosperity*. Ottawa: National Round Table on the Environment and the Economy. 2010. Page 3.

[7] See A Climate Change Primer, accessed on November 2, 2010.

[8] James Hansen. *Storms of My Grandchildren: The Truth about the Coming Climate catastrophe and Our Last Chance to Save Humanity*. New York: Bloomsbury 2009. Page 88.

[9] Ibid. Page 74.

[10] James Hansen *Tipping Point: Perspective of a Climatologist.* Introductory chapter to the book *State of the Wild 2008-2009* from the Wildlife Conservation Society. 2008. Page 9.

[11] Volker Mrasek. "Point of No Return for the Arctic Climate?" *Spiegel on line*. Dec. 4, 2008.

[12] "Exeter scientists publish climate change warning." *Mid Devon Star*. October 1, 2010.

[13] See Re-energizing the Future: Faith and Justice in a Post-Petroleum World. KAIROS. 2007.

[14] See "Copenhagen Accord or Discord?" *KAIROS Policy Briefing Paper* No. 23. February 2010.

[15] Lisa Friedman. "Negotiations: No help for $100 billion fund without developing country commitments – Todd Stern." *Environment & Energy Climate Wire*. Washington. September 30, 2010.

[16] "Accord in line with 3.9 degree warming, say US researchers." *SUNS Bulletin #6862*. February 12, 2010.

[17] James Hansen. *Storms of My Grandchildren*. Page 50.

[18] Cited in Joyce Nelson. "Canada's preparedness for oil spill crisis sadly lacking." *The CCPA Monitor*. September 2010. Page 12.

[19] Nathan Vanderklippe. "Court puts a halt to Arctic tests over Inuit fears of impact on sea life." *The Globe and Mail.* August 9, 2010.

[20] William Dillon. "Gas (Methane) Hydrates – A New Frontier." U.S. Geological Survey. September 1992.

[21] William Pentland. "Methane hydrates: Energy's most dangerous game." *Forbes.com*. October 14, 2008.

[22] Cited in Patrick Bond "From False to Real Solutions for Climate Change." *MRZine*. June 1, 2008.

[23] See Pricing Carbon: A Primer on how "cap-and-trade" systems have largely failed to achieve their goal of reducing GHG emissions. KAIROS Policy Briefing Paper No. 20. November 2009.

[24] Patrick Bond. "*Africa and the climate finance controversy*." Pambazuka.org. October 14, 2010.

[25] Point Carbon. Carbon Market News. September 29, 2010.

[26] Copenhagen Accord. Paragraph 6.

[27] Evo Morales, President of Bolivia, "Nature, Forests and Indigenous Peoples are Not for Sale." Letter to Indigenous Peoples. La Paz. September 28, 2010.

[28] Cited by Andrea Hardin in a blog from Copenhagen. December 15, 2009.

[29] See Ricardo Carrere and Larry Lohman. Pulping the South.

[30] Mae-Wan Ho, et al. "Green Energies 100% Renewables by 2050." Institute of Science in Society and Third World Network. 2009.

[31] See George Monbiot. "Woodchips with Everything." *The Guardian*. March 24, 2009.

[32] See Diana Bronson, et al. Retooling the Planet: Climate Change in the Geoengineering Age. Report prepared by the ETCGroup for the Swedish Society for Nature Conservation. 2009.

[33] Cited in Ibid. page 14.

[34] Adapted from Ibid.

[35] Cited in Spratt, David and Lawson, Damien. "*A climate con: Analysis of the 'Copenhagen Accord'*".

[36] "Ecological Debt: South Tells North 'Time to Pay Up'." *Economic Justice Report* Volume XI, Number 3. Toronto: Ecumenical Coalition for Economic Justice. October 2000.

[37] Stéphane Dion. "Mexico on the Road to COP16." Notes for address to the Tecnológico de Monterrey. Mexico City. September 6, 2010. Page 7.

[38] See Jubilee South. "NO MORE DEBTS: for human rights and the rights of nature!" 2010 at *www.jubileesouth.org*.