From the Nairobi Climate Change Conference to the Bali UN FCCC: *An African preface to an Asian mandate*

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The United Nations Framework Conference on Climate Change (UN FCCC) met in Kenya, Nairobi November 6-17, 2006. This meeting was the Conference of the Parties serving as the Meeting of the Parties (COP12 and COP/MOP2) in its second session. The 189 countries that have ratified the Kyoto Protocol constituted the Member of the Parties to the Protocol (MOP). In all, the conference gathered 5,900 participants.

There have been events in the history of climate change discourse that have proven pivotal for the future of the framework conference. The Nairobi conference may well be such an event. Because of Nairobi, the Kyoto Protocol continues to be the most significant on-going reference for renewal, redress and review of strategies for emissions reduction. Nairobi managed to preserve continuity in the midst of contention. It managed to do this not by dramatic conference breakthroughs but by the measures which it managed to keep in place for the Bali December 3-14, 2007 UN FCCC deliberations.

Asia

Nairobi constitutes an African prologue to an Asian discourse of paramount importance. The Indonesian conference and the Japan Lake Toya G8 Summit will focus on both the causes and the emerging crises of climate change as significantly Asian in input and impact. The post Nairobi publication of the IPCC Fourth Assessment states the Asian critical indices of current and projected effects of climate change. Himalayan glacial melt, diminished fresh water availability, coastal area vulnerability and crop fluctuations are but a few of the projections cited in regard to Asia[i]. Such data will help frame the December Bali agenda and its efforts to put in place the necessary commitments to avoid the most dangerous effects of climate change.

Among the regional meetings focused on climate change,[ii] the Asian Pacific Economic Cooperation (APEC) group in its September 6-7 Sydney meeting attempted to forge a new consensus on how to tackle climate change. It proposed "aspirational" goals over-against Protocol mandates. At Sydney, China clearly reiterated its commitment to the Kyoto Protocol. President Hu Jintao stated: "We should within the context of sustainable development, uphold the United Nations Framework Convention on Climate Change and the Kyoto Protocol as the core mechanism and main avenue of cooperation."[iii] The European Union is unequivocal in its support for the Kyoto process.

Before presenting the main themes that were advanced at the Nairobi conference, it might be helpful to turn to the ambiance of East Africa. It speaks volumes of the capacity of the human to respond to circumstances critical for survival.

Africa: Common ancestry and common task

In the climate change crisis, we deal with the survival of the human in the world as we have come to know it. The conference venue was proximate to the Great Rift environ.[iv] This place in Africa is central in the journey of the human. It is within this milieu that we might best ponder our place and presence in the earth process

This vast land-depression of deep lakes rimmed by volcanic peaks is a seismic terrain trembling with millennia of life-emergence. The movement of tectonic plates created this context out of which human consciousness emerged. We are aware only in part of the narrative of human origins. Its earliest known transitions are recorded in this African cleft of earth-partition.

The fossil record was early on interpreted as "an evolution driven by violence."[v] It was over against this proclivity to interpret the human solely in terms of competitive struggle that South Africa's President Thabo Mbeki spoke when he referred to Africa as the "cradle of humanity." He went on to say: "There is a need for us to demonstrate to the billions of people we lead that we are committed to the vision and practice of human solidarity, that we do not accept that human society should be constructed on the basis of a savage principle of the survival of the fittest."[vi]

The naturalist essayist Loren Eisley would find in this evolutionary process a creature whose evolving capacities would produce a more reflective and even a contemplative presence. "A slow continental up thrust which had been a part of the early Age of Flowers had cooled the world's climates. … The great ice age herds were destined to vanish. And when they did so, another hand that grasped the stone by the river long ago would pluck a handful of grass seed and hold it contemplatively."[vii]

The earliest archeological record of African ancestry may well attest to the human capacity to celebrate life in symbolic language.[viii] It is now cogently argued that when early modern humans went out of Africa to people the ends of the earth, a hint of Eden – the capacity to perceive their connection to the natural world as a participation in the mystery of things – accompanied them on their journey. Our common legacy may well be found in an impulse toward the transcendent.

If the "inconvenient truth" of climate change is not primarily a political issue but a moral issue, we well might hope that the capacities of the human to respond to our current crises are rooted in the deeper strains of our African inheritance – something more profound then the dynamic of the survival of the fittest and the competition for world resources.

Nairobi and forward

The Nairobi conference as the second MOP was mandated to a Protocol review. After an all night session that went to 12:40 a.m. Friday, November 17, delegates in the High-Level Session had not come to a consensus on agenda item 11: the review of the Kyoto Protocol under article 9. This discussion found itself in contention and it was destined for deferred compromise.

At the heart of this impasse stood the "common but differentiated responsibilities" that divide the industrialized Annex 1 powers and their mandatory emission reductions from the status of developing nations. This contention was best represented by one developing nation. "India said [that] several key Annex 1 countries had failed in their Protocol commitments, and described calls for developing countries to take on emissions commitments post-2012 as 'shrill,' 'surreal,' and 'a threat to poverty alleviation efforts.'"[ix]

The session did pass the agenda. It opted for a minimal review in Nairobi with a mandated second, comprehensive review in 2008. It acknowledged that the emissions

reductions provisions for the first commitment period were not adequate. It stipulated that the second review will be informed by the IPCC Fourth Assessment Report. It looked forward to the December 2007 Bali conference to give full effect to these provisions.

Because of this acceptance of the review-mandate, the Nairobi conference provided the hinge on which the Protocol process continues. The Protocol is clearly the fulcrum on which the needed consensus must turn to avoid the weighty consequence of further political delay.

The Nairobi clarifications

The Intergovernmental Panel on Climate Change Fourth Assessment Report (FAR) and the Stern Review on the Economics of Climate Change inform our reading of the Nairobi processes and determinations. The FAR states: "Warming of the climate system is unequivocal." It concludes that human activity is central in climate change.[x] The Stern Review (SR) states: "The effects of our actions … in the next 10 or 20 years can have a profound effect … [T]he benefits of strong, early action considerably outweigh the costs.[xi]

- **The state of the issue:** The global temperature shift is having an impact on vital earth processes. The Central American cloud forests retreat to higher altitudes. The Himalayan glaciers melt. Arctic ice diminishes.[xii] Projections even warm of the disappearance of extant climate zones.[xiii] The Earth record is clear. Due to GHG accumulations in the atmosphere and due to the inertia of the climate response system, warming changes are projected to play an even greater role in our immediate future.
- **The real task:** We have a relatively short window of opportunity to stabilize GHG atmospheric concentrations and to avoid a temperature rise of no more than two degrees Celsius above pre-industrial levels We should be as clear as possible on this point. If we stabilized concentrations below 450 ppm, there is a three to one likelihood that we can keep the temperature increase below two. This target may be a reasonable projection but it is not a certainty. It may even be fairly irresponsible when we consider the projected consequences of global temperature rising between one and three degrees Celsius.
- **The timing:** Stabilization at 450 ppm does not only depend on the emissions within the next 10 years, but also depends on the emission levels from the next decades. The later we stop the emission growth, the more we will have to do in a following decade. If we are too slow in the next 10 years but good at reducing emissions in the following 20 years, we may stay within the limit of 450 ppm. This target may be a reasonable projection but it is not a certainty. It may even be fairly irresponsible when we consider the projected consequences of global temperature rising between one and three degrees.

If concentrations go above 500 ppm, the likelihood is already less that 50 percent that we can keep the temperature increase below 2°C. One might compare this eventuality to "taking a chance." Would you step into a plane if there were a less than 50 percent chance that it would arrive safely? When it comes to avoiding the most dangerous affects of climate change, it is a matter of a destination and whether humanity will "get there."

The Stern Review states: "Stabilisation at 450 ppm CO2e is already *almost* out of reach, given that we are likely to reach this level within 10 years…Efforts to reduce emissions rapidly

are likely to be very costly. … An important corollary [in this report] is that there is a high price to delay. … Weak action in the next 10-20 years would put stabilisation even at 550ppm C02e beyond reach – and this level is already associated with significant risks." [xiv]

Recent presentations regarding the two-degree limit are troubling. The five-year research program by Britain's MetOffice entitled "Climate Research at the Met Office Hadley Centre: Informing Government Policy into the Future" concludes that the world will probably exceed this global warming limit. The Potsdam Institute for Climate Impact disagrees with the Hadley assessment. However, the trend in projections makes worrisome the probability of keeping atmospheric warming below two degrees.

The November 16, 2007 IPCCC fourth and final *Summary for Policymakers of the Synthesis Report (SPSR) of the IPCC Fourth Assessment Report* further details the magnitude and momentum of climate change. It has been an often stated IPCC position that in the long term, the effects of unmitigated climate change would outstrip our capacities to respond. This Synthesis Report indicates that climate change may bring "abrupt and irreversible" impacts.[xv] Climate change risks cited in its first three reports may be larger in their effects and may occur at lower temperatures. However, this report also states with "high agreement" and "much evidence" that stabilization levels can be achieved if effective incentives are put in place.[xvi] The Bali negotiations loom on the horizon as critical and timely.

Deforestation

The Nairobi conference renewed focus on deforestation, and continued the task to create the architecture for deforestation mitigation measures within the Kyoto process. Most of the world's terrestrial carbon is stored in forests. It is a conservative[xvii] estimation that 18 percent of annual emissions come from deforestation. Former studies would surmise deforestation to have released on the order of 15-35 percent of the annual fossil fuel emissions.

The highest rates of deforestation take place in tropical areas. Tropical forests sequester fifty percent more carbon than other stands.[xviii] The most recent research points to the enhanced role of tropical forests in forming clouds which reflect solar energy back into space.[xix] Scientists now fear that the rise in the temperature and the increasing lodging and land use change in forested areas are releasing carbon in a process that could trigger "feedback" cycles of even more warming.

At the 2005 Montreal Conference, Papua New Guinea (PNG) proposed compensation for forest preservation. All would benefit from the efforts to prevent deforestation. The challenge was and is to determine a fair-market value for forest conservation and the effort to shield forests from activities such as unsustainable logging. At the time of PNG's proposal, Prime Minister Michael Somare noted, "In the rural areas of my nation, where 80 percent of the people live, the only real options for economic growth often require the destruction of natural forests … "

In June 2006, the "Indonesian government … signed a deal … that will level much of the remaining tropical forest in an area [Long Alongo] so vital it is sometimes called the lungs of Southeast Asia. … [T]he deal is a double bounty: the wood from the forest … and in its place will grow vast plantations for palm oil … Only about half of Borneo's original forests remain. Those forests that do remain, like the magnificent stands here in Mr. Anyie's part of the

highlands, are ever pressed, ever prized and ever more valuable…" [xx] In this one instance, the "need" to give up irreplaceable forest resource for "development" is well presented. The pernicious incentive to cut down forests and to replace them with monoculture crops is operative. The Bali conference must address this concern that has profound Asian implications.

Carbon capture and storage

Since Montreal 2006, the proposal of carbon capture and storage (CCS) with particular reference to enhanced-oil-recovery (CO2-EOR) and deep-seabed CO2 sequestration has loomed large on the conference horizon. This notion of CCS first appeared at the April 1998 Columbia University conference: "From Kyoto to Buenos Aires: Technology Transfer and Emissions Trading."[xxi] Since then geological storage technology has become a focus for research in America and Europe and Japan.[xxii]

The storing of CO2 in geological formations under the sea floor is best illustrated by Norway's Sleipner North Sea project that has operated since 1996. It injects carbon from gas production into the Utsira sandstone formation. The project is being observed to note the safety and permanence of storage.[xxiii] By 2005 more than 7Mt CO2 had been injected into the aquifer. A precautionary stance would alert us to the effects on sea ecology and to the sea-carbon retention period due to the interface of climate change and ocean temperatures.

Canada's Weyburn CO2-EOR project injects carbon from the Dakota Gasification Company into its oil reservoir forcing out remnant oil and storing carbon in the underground chamber. Currently 1,000 tonnes per day are sequestered. To date[xxiv] there has been no indication of CO2 leakage. *However, there is currently no CCS project that delivers what is needed: a whole circle project that includes capturing, transporting and storing CO2 from a large coal power plant.* Coal plants loom as the most significant GHG emitters in the near future.

Questions continue to center on the permanence of storage and its environmental impacts. According to the 2006 published opinion of the German Advisory Council on Global Change (WBGU) the general application of this technology "can only be an emergency solution for a transitional period"[xxv] Nairobi Conference has judged such technology as presently not a "mature means." Many support CCS as a method for "buying time" at this critical period. The most recent EU proposal[xxvi] is committed to set up 12 large scale plants to test sustainable fuel technologies and to test and promote carbon capture and storage by 2015.

The fossil fuel industries highly recommend CCS technologies as "sure and positive." Such profitable projects[xxvii] so confidently presented could well enter into a carbon trading scheme. Yet at every UN FCCC and SUBSTA presentation, the industry insists that public monies must build such facilities and governments must be responsible for long-term liability for storage sites. In the final analysis, CCS must be evaluated against direct climate mitigation of GHG at their source and renewable energy investment and implementation.

Equity and the Kyoto Protocol

Inequity within the climate change regime can be defined as imposed vulnerability. The IPCC April 6, 2007 "Climate Change Impacts, Adaptation and Vulnerability" informs us that the most affected peoples are often inhabitants of the forest, mountain-watershed, ocean and

arctic bioregions which are far from the centers of industrialized development. Those most affected by climate change are those least responsible for GHG emissions.

Current emission trends would insure that the average global temperature will rise by 2-3 degrees within the next 50 years. Should GHG emissions reach above current rates, the IPCC study states: "In the course of the century, water supplies stored in glaciers and snow cover are projected to decline, reducing water availability in regions … where more than one-sixth of the world population currently live."[xxviii] Glacier melt in the Himalayas is projected to affect water resources within the next two or three decades.[xxix] We are informed that "[u]nmitigated climate change would, in the long term, be likely to exceed the capacity of natural, managed and human systems to adapt"[xxx]

Equity and adaptation

We deal with trends that can only be addressed by both mitigation and adaptation. For the poorest societies, the capacity for adapting to climate change is a present need to address near-term impacts. Adaptation is a matter of equity. The hope for such equity rests in part on the Adaptation Fund (AF). At Nairobi, the committee to implement the Adaptation Fund was finally secured. The AF will operate under the authority and guidance of the COP/MOP. The majority of its governing board will not be drawn from Annex 1 or developed countries. Decisions will follow a one-country-one vote rule.

The AF secures it monies through the Clean Development Mechanisms (CDM). If industrialized countries venture through well-monitored CDM projects to generate resources to help developing countries grow while reducing their carbon footprint, this Adaptation Fund would be a key instrument in fostering climate change mitigation and sustainable development.

Equity and funding for development

Equity for the developing countries may well hinge on social carbon. In a regulated "cap and trade" system, entities would be required to cap their carbon emissions at a certain level. Should they produce emissions below their limit, they could sell their deficit. Those who exceed their limit would have to buy carbon credits from non-polluters[xxxi].

Cap and trade solutions must be guided by the right principles. There is significant literature which argues that carbon trading as presently orchestrated is counterproductive. Such carbon trading allows companies to buy pollution credits from projects in developing countries that claim to be emitting less greenhouse gases than they would have without the carbon market investment. The technological exchange needed for clean development is often not a priority in such investments. This is a most pivotal issue. It goes to the matter of whether procedures can be put in place to exclude "carbon offsets" that merely delay the structural changes needed to prevent global warming.

Larry Lohmann, the editor of *Carbon Trading: A Critical Conversation on Climate Change, Privatisation and Power* has stated: "Carbon trading dispossesses ordinary people in the South of their lands and futures without resulting in appreciable progress toward alternative energy." The record is voluminous on projects which exclude local community participation. The LULUCF Good Practices adapted at Milan specifically gives the local community the right to have an environmental impact study conducted.

With particular regard to RED [xxxii] project-by-project accreditation best considers the social and economic factors affecting the local community.

For those who would look to market mechanism to provide equity, there are the following assessments. The Nairobi Earth Negotiations Bulletin quoted the three "ifs" of Mr. Yvo De Boer, UNFCCC Executive Secretary: "If industrialized countries reduce emission by 60-80 percent by the middle of the century; if they buy carbon credits from developing countries for half that amount; and if carbon prices sit at around US$10/tonne, a carbon finance flow worth some US$100 billion a year could be generated. That would go some way towards 'greening' the massive energy portfolio projected by the International Energy Agency for developing countries in the coming years."[xxxiii]

In regard to such prospective funding, an article entitled "Cost of Stemming Climate Change Should Not Fall on the Poor," World Bank President Paul Wolfowitz cited that carbon trading could generate resource flows on the order of US$100 billion for developing countries. In putting this amount into perspective, Wolfowitz writes, "*It exceeds what is currently spent on official development assistance by all the bilateral and multilateral institutions*. But it is dwarfed by what the world spends every year on fossil fuels. It is only seven percent of the $1.5 trillion that the world spends each year just on oil alone, not to mention gas and coal."[xxxiv]

The Bali agenda must continue to hammer out measures that will make the Kyoto Protocol mechanisms coincident with a pro-active preservation of forests and land resources in developing nations and with the implementation of projects that will insure a non-carbonized path to development in the project host countries. In effect, to put in place a system that will verify that carbon trading does mitigate climate change.

Summary reflection

Forest conservation, carbon sequestration and equity implementation are but three subjects selected from the vital on-going UN FCCC negotiations. As the evidence of climate change mounts and the time margins for effective human response narrows, it is clear that they are all comprehensive problems that can no longer be approached by partial solutions.

The main obstacle to effective Protocol implementation is an entrenched commitment to carbon-intensive economies and to their consumption values over against the value of human-earth accord and the fulfillment of needs in a design of more equitable distribution. Although one may wonder how long nations and their espoused economic systems can pursue development that undermines the very nature of the earth systems upon which they are based, the lure of intense carbon-committed growth is ominously clear.[xxxv]

We had started this writing with the journey of humankind out of Africa. The main impulse for such diaspora and sojourns in so widely differentiated global communities is open to a myriad of interpretations. It is abundantly clear however that the key to human settlement and survival in the various contexts in which life was cultivated and celebrated was due to a close attentiveness to the earth itself. Whether as hunter-gatherings or transformers of grain, the human community depended on a keen awareness of the intimate intricacies of the natural world. We have been astounded by ancient calendars in which winter and summer solstice are noted by the strike of the sun's rays on etched stone carvings.[xxxvi] The basic harmonies found in

the order of things defined the time for planting and recorded human wonder in deferential decipher, a reading of the voice of the earth.

On July 24, 2007, Pope Benedict XVI addressed the clergy from the Dioceses of Belluno-Feltre and Treviso in a wide ranging-conversation. With regard to environmental matters, the Holy Father spoke of a required "obedience to the voice of the earth."

"Today we all see that man could destroy the foundations of his existence, the earth, and so we cannot just simply do with our earth, in reality entrusted to us, whatever we want and whatever appears useful and promising at a given moment. We must respect the internal laws of creation of this earth, learn these laws and also obey thee laws, if we wish to survive. Therefore, this obedience to the voice of the earth, to life, is more important for our future happiness than the voices of the moment, the desires of the moment. To sum up, this is the first criterion to learn that life itself, our earth speaks to us and we must listen if we wish to survive and decipher this message of the earth. And if we must be obedient to the voice of the earth, this is even more so for the voice of human life. Not only must we heal the earth but we must respect each other, all others."

It has become increasingly clear that climate change is having an impact on the processes of the earth that sustain life. Humanity must recover its place as an attentive presence to the natural world from which it has been alienated in only its most recent period of development. The task is none other than to accept life on the bases on which life has been granted to us. The perceived benefits derived from an uncritical positive regard for an industrialized lifestyle can only be balanced and reformed by our sense of the sacred.

Necessarily, much thought and attention has been and continues to be given to economical and political solutions. Yet from a faith perspective in which creation mirrors the goodness of God, politics and economics are beyond the political and economical in their dynamism. They are rooted in the dynamics of the earth. Human efforts at environmental resolution are best served in these and related fields of endeavor by an appeal to an intimate and absolute presence.

Pierre Teilhard de Chardin spoke of the vicissitudes of the human encounter with the inevitabilities of the phenomenal world, the creative capacity of human response. He finds that this engagement reveals an essential disposition toward the sacred most at home in a faith that espouses matter as revelatory. He points to what would inspire and impel our acceptance of natural dependency on and an accord with the order of creation.

"There is no point, here, in seeking a new name for which to designate the super-eminent nature of that dependence, where all that is most flexible in human combinations and all that is most intransigent [uncompromising] in organic structures, merge harmoniously in a moment of final incandescence. We will continue to call it by the name that has always been used: *mystical* union." [xxxvii]

So perceived, this sense of "mystical union" is fundamental to the task of the human in finding its true place in the wider contexts of things. It may well be taken as a reflection by a paleontologist on the profound potential of that creature who along the way and millennia ago left evidence that a "hand that grasped the stone by the river…would pluck a handful of grass seed and hold it contemplatively." It may also be seen as an insight into the depths of our

endowed gifts out of which we are presently called to respond to ensure the continued journey of the human.[xxxviii]

The thought tradition of the Church has much to offer all peoples in their noblest task: to preserve the earth as their common origin and shared inheritance and to find in this effort a collective destiny.

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[i] Climate Change 2007: Impacts, Adaptation and Vulnerability--Working Group II of the IPCC Fourth Assessment Report, Summary for Policymakers, pp. 8-9.

[ii] "Asia-Pacific nations plan forest expansion," *The Japan Times* November 11, 2007. p. 1.

[iii] "China opposes efforts to deviate from Kyoto," *International Herald Tribune/ Asahi Shimbun* September 7, 2007 p.6.

[iv] "The Great Rift is an ocean being born as parts of East Africa pull away from the rest of the continent leaving a sinking basin in their wake." johnhawks.net/weblog/ *Posted at 21:16 on 01/23/2005* The main section of the valley in Africa continues from the Red Sea SW across Ethiopia and S across Kenya. It divides the entire length of Kenya.

[v] The 1924 Bechuanaland discovery of *Australopithecus africanus* by Raymond Dart was followed by his surmise that our human evolution was driven by violence, contrasting interpretations by later paleo-anthropologists who found that the Tuang Child showed clear of being attacked by other species. The attack could not be attributed to other humans. Yet a dominant cord had been struck. Thereafter, human evolution was often and primarily perceived as a mastery of tooth and claw.

[vi] Mr. Thabo Mbeki made these remarks as the President of the Johannesburg 2002 World Summit of Sustainable Development.

[vii] Loren Eiseley, *The Immense Journey* (New York: Random House, 1957) pp. 76.

[viii] "Abstract Engravings Show Modern Behavior Emerged Earlier Than Previously Thought," *Science:* January 11, 2002. Christopher Henshilwood… found abstract representations of two pieces of ochre… dated to at least 70,000 years ago. The objects, dated to at least 70,000 years ago, were recovered from the Middle Stone Age layers at Blombos Cave, a site on the southern Cape shore of the Indian Ocean 180 miles east of Cape Town, South Africa. "These finds demonstrate that ochre use…was not exclusively utilitarian and, arguably, the transmission and sharing of the meaning of the engravings relied on fully syntactical language." News of the Week—Archaeology: "Oldest Beads Suggest Early Symbolic Behavior," Constance Holden. **"**Two recently announced finds reported in *Science* 16 April 2004 may strengthen the argument that humans were well on their way to complex, symbolic thinking by 75,000 years ago--long before the "creative explosion' of painting and jewelry began 40,000 years ago in Europe. In terms of cultural continuity, it is of interest to know that in Southwest France excavated evidence attests to the use of ornamental beads and red ochre in what appears have been early burial rites."

[ix] Earth Negotiations Bulletin, Friday, 17 November 2006--Vol. 12 No. 317. www.iisd.ca/climate/cop12

[x] The FAR states: "Warming of the Climate System is Unequivocal…The linear warming trend over the last 50 years…is nearly twice that for the last 100 years." It states with *very high confidence* that "the globally averaged net effect of human activities since 1750 has been one of warming…and *very likely* unprecedented in more than 10,000 years." "Global atmospheric concentrations [of greenhouse gases] have increased markedly as a result of human activities…determined from ice cores spanning many thousand of years." FAR Summary for Policymakers, p 2.The report specifies data gleaned from air bubbles trapped in the chambers of ice columns spanning the years since the beginning of the industrial phase of human development .

[xi] The Stern Review (SR) states: "The effects of our actions…in the next 10 or 20 years can have a profound effect on the climate in the second half of this century and in the next. …Our actions over the coming few decades could

create risks of major disruptions to economic and social activity…similar to those associated with the great wars and the economic depression of the first half of the 20th century."

[xii] Decreases in snow cover, mountain glaciers, and Arctic sea ice, and a rise in the mean sea level is noted in 2001 IPCC, B, Chapter Five of "Climate Change 2001: the Scientific Basis," p.2. See also *Impacts of a Warming Arctic ACIA Executive Summary*, p.14

[xiii] "Projected distributions of novel and disappearing climates by 2100 AD, " John W. Williams et alia, The Proceedings of the National Academy of Sciences Early edition on–line

[xiv] Nicholas Stern, *The Economics of Climate Change-Executive Summary*, (UK: Cambridge U. Press October 2006) p. xv.

[xv] "Anthropogenic warming could lead to some impacts that are abrupt and irreversible, depending upon the rate and magnitude of the climate change." SPSR, p. 13. This may be quite significant because of the history of climate change projections associated with the framework conferences. It was at the 1998 Buenos Aires UN FCCC that a side event presented in part by Michael Molitor and Stefan Rahmstort offered evidence that atmospheric processes may be vulnerable to abrupt rather than to gradual change. This initiated keen and critical debate over the concept of tipping points or "thresholds" which when passed would initiate sudden responses. It is significant that the IPCC would consider the current evidence of climate change and its effect so critical and possibly precipitous that it ventured toward wording that might enkindle that debate yet again.

[xvi] "There is *high agreement* and *much evidence* that all stabilisation levels assessed can be achieved by deployment of a portfolio of technologies that are either currently available or expected to be commercialised in coming decades, assuming appropriate and effective incentives are in place for their development, acquisition, deployment and diffusion and addressing related barriers." SPSR, p.22.

[xvii] Paulo Moutinho, ed., *Tropical Deforestation and Climate Change* (Brazil: Amazon Institute for Environmental Research, 2005), p. 13.

[xviii] Paulo Moutinho, ed., *Tropical Deforestation and Climate Change* (Brazil: Amazon Institute for Environmental Research, 2005) p. 13-15.

[xix] Bala et. Al. *Proceedings of the National Academy of Sciences*, April 2007; "Combined climate and carbon-cycle effects of large-scale deforestation" www.pnas.org/cgi/doi/10.1073/pnas.0608998104

[xx] Jane Perlez, "Asian Forests Fall to Prosperity's Ax," *The New York Times* (Large print weekly) June 5, 2006, pp. 3-4.

[xxi] Dr. Taro Takhashi, a Doherty Senior Research Scientist proposed that carbon which solidifies at certain depths could be stored in the oceans forming lakes of liquid CO2 near the seabed. A graduate student asked the effect of such infusion on the aquatic life systems and ventured further to ask the effect of warming oceans on such sea storage and the possible consequential carbon release into the atmosphere. Neither of these questions received a response. The CO2 forcing/storage into oil excavation sites was also presented. By Roger Anderson, a Senior Research Scientist. Another student stated that the siphoning out of trace oil only continued the problems associated with fossil fuel use. Professor Anderson responded that the real world functions this way. Today, a precautionary stance would alert us that CO2 introduction into sea water would pose unknown affects on sea ecology and offer an unknown retention period due to the interface of climate change and ocean temperatures.

[xxii] "Japan Tries to Bury CO2 Emission Problem," Tomomi Miyazaki, *The Asahi Shimbun* August 30, 2007, p. 2. There is a high cost to capture and collect CO2, i.e., 7,300 yen per ton entails 4,200 yen for capturing and collecting. The ideal location for such storage is one in which a mudstone formation sits on tip of the sandstone bed. However, sites in Japan that lack the all-sealing cap structure are also considered for storage. It is calculated that 146.1 billion tonnes of CO2 could be stored in such cap-less sites. New technologies also focus on the use of gas-separating

membranes and presently the task of using only oxygen in the burning of coal would more simply separate carbon from other gasses.

[xxiii] Renate Schubert, *The Future Oceans—Warming Up, Rising High, Turning Sour* (Berlin: Wissenschaftlicher Beirat der Bundesregierung Globale Umweltveranderungen (WBGU,) 2006) p.81.

[xxiv] White, 2005; Strutt et alia, 2003.

[xxv] Renate Shubert, op. cit., p. 3.

[xxvi] On March 9, The 27 nation European Union meeting in Brussels reached an agreement of new targets, objectives and deadlines …Most extraordinary was its commitment to set up 12 large scale plants to test sustainable fuel technologies and to test and promote carbon capture and storage by 2015

[xxvii] At the Weyburn EOR currently 10,063 barrels per day of incremental oil are produced.

[xxviii] IPCC WGII Fourth Assessment Report, p. 7.

[xxix] Ibid., p.10

[xxx] IPCC WGII Fourth Assessment Report "Climate Change Impacts, Adaptation and Vulnerability," p. 20.

[xxxi] "Utilities to up Emissions Credit Buys," The Daily Yomiuri, October 8, 2007, pg. 1

[xxxii] It is also clear that RED "Reduced Emissions from Deforestations" and AD "Avoid Deforestation" projects in present negotiations favor national and regional schemes over-against project by project evaluation. Successful projects must take into account social and economic factors affecting the indigenous forest peoples. These considerations are more easily addressed in a project by project mode of implementation.

[xxxiii] Earth Negotiations Bulletin, Vol. 12, no. 318, p.19

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[xxxiv] Paul Wolfowitz, "Cost of stemming climate change should not fall on poor," *Daily Yomiuri* April 6, 2007, p. 13.

[xxxv] At all UNFCCC, the high ministerial level of the conference takes place during the second week of negotiations. The fact that most of African leaders were spending the first week of the Nairobi UN FCCC at trade negotiations in Beijing in contrast to the scenarios of emissions reduction negotiations to which their delegates were concurrently engaged gave a new twist to the "business as usual" scheme of things commensurate with an entrenched commitment to carbon-intensive economic growth.

Apparently the African-Beijing November negotiations went well. As early as February 26, the government of the Gabon in the person of its President Omar Bongo, Africa's longest serving ruler was able to announce that the Belinga Deposit reported to have proven iron ore reserves of more than 500 million tones had been negotiated with the Chinese government. "Beijing Makes a Deal for Iron Ore in Gabon" February 27, 2007 *International Herald Tribune,* p 11.

[xxxvi] "Sun Dagger an Ancient Celestial Calendar," *New York Times*, July 16, 1982.

[xxxvii] Pierre Teilhard de Chardin, *Divine Milieu* (New York: Harper and Row-Torch Books, 1957) p. 58.

[xxxviii] "The Great Ice Age herds were destined to vanish. When they did so, another hand like the hand that grasped the stone by the river long ago would pluck a handful of grass seed and hold it contemplatively. In that moment, the golden towers of man, his swarming millions, his turning wheels, the vast learning of his packed libraries, would glimmer dimly there in the ancestor of wheat, a few seeds held in a muddy hand…" Loren Eisley, op.cit., pp 76-77.