

Ambiguous Futures: Global Warming and the Third World

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Our loyalties are to the species and to the planet. We speak for earth.

Carl Sagan

Abstract

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The increasing global warming of the earth has been at the foreground of scientific and political debate, leading to international agreements such as The Kyoto Protocol in 1997. While there are some promising signs that the international community is taking the reality of global warming seriously, the limited objectives for diminishing the amount of greenhouse gases are insufficient. If scientific predictions are correct, global warming will have an adverse effect on biodiversity and global health. Many countries in the Third World which have been responsible for emitting the least amount of greenhouse gases will bear the brunt of climate change. This article is a philosophic response to the possible realities of global warming and its social implications.

Key words: Global warming, Climate change, Deforestation, Pandemics, Ethics

Preface: Historical Events Leading to Global Warming

Increasing global warming of the planet has been at the foreground of much scientific and political debate, leading to the Kyoto Summit in 1997. While many countries have invested technological know how to diminishing greenhouse gases, the objectives of the Kyoto Protocol have yet to be achieved. Moreover, many countries in the third world which are responsible for emitting the least amount of greenhouse gases are predicted to face serious pandemics and negative climatic conditions in the 21st century.

Global warming demands new ways of dealing with ensuing climate change as a matter of

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necessity. As the planet heats up weather patterns will become increasingly unpredictable. The prescience of meteorologists will diminish, catastrophes will become commonplace. The ingenious technologies which have propelled us as masters of the planet will be unable to protect us. As we are entering a new global age there is a restive movement calling for a retrieval of bioethical issues. It has been long coming. While human tenure of the earth has been brief it has had a dramatic impact on the earth's evolution.¹ The modern period has witnessed dramatic changes to the natural world as a consequence of human encroachment. Like Aldous Huxley's *Brave New World* (1932) our future world is being engineered by our present actions.

Similarly, the present world is being shaped by powerful global market forces which are supplanting cultural heterogeneity and traditional social structures. Globalism's promise of economic opulence is bound up to a "technology of violence" and moral purposes which justifies human domination of nature (Ross 1998). This "moral egocentricism" has its origins in the post-Renaissance period with the European discovery of the new world. As history reveals, European encroachment on these new worlds was invariably marked by widespread human rights violations.²

Concomitant with European colonisation was a paradigm shift in viewing nature as an economic commodity. The predominance of Cartesianism from the 17th century onwards and 18th century neo-enlightenment's appraisal of rationality set the stage for the systematic domination and exploitation of nature. In Foucauldian terms the 20th century was marked by new regimes of bio-power. According to Foucault (1980: 143), biopower "brought life and its mechanisms into the realm of explicit calculations and made knowledge-power an agent of transformation of human life". Achkar (2002: 65), declares that the richer and more affluent a civilisation is, the "deadlier its barbarism". The "industrialised genocide" of the Nazis was the epitome of 20th century savagery, conflating totalitarian ideology with Orwellian technology (Achkar 2002: 64). Nearly sixty years later, the excesses of Nazism have not been jettisoned but have re-emerged in modern cultures' disposition for collective destruction (Carrol 2002: 3-4). From an ecological viewpoint such knowledge/power has led to the commodification of nature. Nature has been transformed into a utilitarian symbol, stripped of its biologic and spiritual dimensions. The growing awareness of global warming in the last twenty years has led scientists to question the global market and social models which have informed western societies. Consequently, scientific and philosophic debates have paid increasing attention to bioethical considerations of global warming.³

Probably, nowhere is the relationship between global warming and the disastrous consequences of modern economic practices more evident than in the "south" nations.⁴ Many of these nations are characterised by systemic poverty, unstable governments, "debt servicing difficulties," high levels of corruption, poor infrastructures and large scale illiteracy. Table 1 indicates of the world's wealthiest countries (all representative of the "north") in 1997, which account for 60% of the World's GNP.

While the "north" countries are considered to have the highest accumulation of the world's GNP, four out of five countries (representing the "south") are the world's most populated.

While being the world's most populated countries, the four representative countries of the "south" are also major culprits of environmental degradation. China for

Table 1: The world's wealthiest countries in 1997

Country	Share of global GNP	Cumulated share
United States	27	27
Japan	16	43
Germany	8	50
France	5	56
United Kingdom	4	60

Source: Michel-Louis Levy (1999)

Table 2: The world's most populated countries in 1999 (in %)

Country	Share of the world's population	Cumulated share
China	21	21
India	16	37
United States	5	42
Indonesia	4	46
Brazil	3	48

Source: Michel-Louis Levy (1999)

instance, is notorious for its poor environmental regulations, while Brazil and Indonesia, home to the world's largest rainforests are continuing to deforest them at alarming rates, as I will discuss in the next section.

The promises of economic development have invariably meant ecological degradation. In her book *Stolen Harvests: The Hijacking of the Global Food Supply* (2000), Vandana Shiva argues that even conscientious people have been pressured to use the environment in an unsustainable manner (Shah 2001). In order to comprehend the inequity of debt relief, the organization Christian Aid states that, "industrialized nations should be owing over 600 billion dollars to the developing nations – three times as much as the conventional debt that developing countries owe the developed ones" (Shah 2001).

The problem here is the way in which development has been propped up by global market forces. Globalisation ensures that there is no equal playing field between nations, but rather is maintained by a predatorial market regime which favours wealthier nations and impoverishes poorer ones (Muradian 2004). For example, open economies such as Mexico showed a GDP growth of only 1% in the 1990's, while Nicaragua and Venezuela per capita rates were lower than in the 1970's (Muradian 2004). Nearly all Latin American countries are now facing higher levels of poverty and inequality (ECLAC 2004). A similar scenario is also evident in most African nations and parts of Asia and the Middle-East.

Secondly, globalisation's economic machine is vulnerable to periodic "instability in financial markets" that stymies sustainable environmental among poorer nations. The lack of suitable economic models which place an onus on environmental care in combination with the uneven pace of economic development has led to a "global governance gap" (Muradian 2004). In short, there is a lack of an international framework

for regulating environmental practices.

Actions and tasks for the global governance of environmental issues are currently scattered in different institutions, with, on the whole, significantly lower budget and political influence than similar bodies dealing with economic issues. (Muradian 2004).

Again, Latin America is notable for its lack of environmental regulations. A working group report states that nearly all Latin American countries are experiencing higher rates of pollution, brought on by poor governmental regulations as well as displacement of traditional agricultural practices for "modern, chemical-intensive practices" (Schalatek 2004). Muradian (2004) also cites that unfair global trade practices are also likely to impinge on biodiversity of traditional crops. For instance, traditional agricultural practices in Mexico have been unable to compete "with the agrochemical-intensive, genetically modified and subsidised American maize" (Wise & Nadal 2004).

While "economic globalisation" is a dynamic and volatile process, it has been unable to implement long term environmental management practices in the south (Shin 2004), and has expedited "irreversible environmental degradation" on the pretext of economic development. (Fearnside 2001; Gfissler & Penot 2000). However, from the aforementioned, economic development has not ensured economic equity. Poor economic performance also has the effect of marginalising south nations. Marginalisation increases the likelihood of further social inequity and ecological degradation spurred by globalisation (Muradian 2004).

Critical writers like Edward Said have eloquently discussed the global processes of marginalisation and social inequity via the term "orientalism" to mean a way in which western nations have constructed the non-west during the previous three centuries (1979). Accordingly, the "orient" and its inhabitants are viewed as being inherently inferior, carnal, barbaric, volatile, and irrational. Said took pains to elucidate orientalism as a popular paradigm which continues to inform western people about Third World people. Here, affluent nations confer themselves the right to dictate how developing nations are to progress.

Said's analysis is exemplified by the north/south distinction which has dictated monetary development policies in the Third World during the post World War Two. One can cite here the World Bank's record on developing nations. From 1984 to 1990 World Bank policies engineered a transfer of \$178 billion dollars from developing nations to "Western commercial banks" as part of debt repayment (Ismi 1998). The capital drain of money from the south fuelled increasing poverty and "decimated health and education sectors" in developing nations (Ismi 1998). The channelling of money away from the south was so devastating that one former bank director declared: "Not since the conquistadors plundered Latin America has the world experienced such a flow in the direction we see today" (Ismi 1998). While the world's poorest nations have been shelling out debt repayments totalling \$550 billion over the last three decades, these nations are still more than \$520 billion in debt (Shah 2005).

For Shah (2005), debt repayments and the environment are inter-related issues; the more developing nations are overcome in debt the more will these nations exploit their environments for hard cash. Consequently, debt repayment inevitably diminishes

the importance of the environment while cutting back on environmental conservation and health programs. The devastation caused to Nicaragua and Honduras by Hurricane Mitch and the widespread flooding of Mozambique and Madagascar exemplify this problem (Shah 2005). Included here was the catastrophic tidal wave which wreaked havoc in South-East Asia, India, Sri Lanka and Eastern Africa on December 26, 2005. This event highlighted how susceptible humankind is in relation to environmental change. While developing nations cannot break out of their systemic poverty in the short term, they have emphasized "that ecological interdependence is asymmetrical," as well as, indicating that affluent nations pay a major share of the costs for environmental damage caused by greenhouse gases (Williams 2005: 61). On this point Williams (2005: 62) contends:

Therefore, if the largest share of historical and current emissions is the responsibility of rich countries, they should therefore be the major contributors to solving the problem and have a moral responsibility to take the lead in combating climate change and its adverse effects.

Human Activities and Future Climate Change

New scientific evidence suggests that dangerous levels "anthropogenic interference" have resulted in climate change, a trend which will continue throughout this century and beyond (Stott 2001; Karoly 2003; Zwiers & Zhang 2003). Homo sapiens are the only known species which have had such an indelible effect on the world's climate. The IPCC Third Assessment Report 2001 notes that anthropogenic greenhouse gases (i.e., carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O)," reached their optimal levels in the 1990's primarily caused by the burning of fossil fuels, agriculture, "and land changes" (IPCC 2001). "The IPCC emission scenarios" declare a steady rise of CO₂ by the year 2100 from 540 ppm to 970 ppm. This is compared to 2000 levels of about 368 ppm, and 280 ppm in the pre-industrial period (IPCC 2001). Furthermore, increasing surface temperature in the Northern Hemisphere in the 20th century is greater than in the last one thousand years. Climate models predict a rise in the global surface temperature of 1.4°C to 5.8°C from 1990 to 2100 (Kovats & Haines 2005). Global temperatures peaked in the 1990's which had "9 of the 11 hottest years in the 20th century" (Haines, McMichael & Epstein 2000).

Based on paleoclimate data the present rate of global warming has been unprecedented in the last 10,000 years (IPCC 2001). Predicted climate change "will have beneficial and adverse effects on both environmental and socio-economic systems" (IPCC 2001). Adverse effects of climate change will be incremental in the tropics and subtropics where the highest levels of biodiversity exist (IPCC 2001).

Destruction of natural habitats in the form of deforestation, widespread chemical pollution and the introduction of foreign species are threatening biodiversity loss. In relation to deforestation, "In April 1999, the World Commission on Forests", concluded that the original forests of 76 countries had disappeared, and that 3.6 billion hectares of forests remained from the earth's "original forest cover of 6 billion hectares" (Devall 2001: 29, World Commission on Forests 1999).⁵

A poignant example of the relationship between economic policies, deforestation

Table SPM-1	20th century changes in the Earth's atmosphere, climate, and biophysical system.
<i>Indicator</i>	<i>Observed changes</i>
Global mean surface temperature	Increased by $0.6 \pm 0.2^\circ\text{C}$ over the 20th century; land areas warmed more than the oceans (<i>very likely</i>).
Northern Hemisphere surface temperature	Increase over the 20th century greater than during any other century in the last 1,000 years; 1990s warmest decade of the millennium (<i>likely</i>).
Diurnal surface temperature range	Decreased over the years 1950 to 2000 over land: nighttime minimum temperatures increased at twice the rate of daytime maximum temperatures (<i>likely</i>).
Hot days / heat index	Increased (<i>likely</i>).
Cold / frost days	Decreased for nearly all land areas during the 20 th century (<i>very likely</i>).
Continental precipitation	Increased by 5–10% over the 20th century in the Northern Hemisphere (<i>very likely</i>), although decreased in some regions (e.g., north and west Africa and parts of the Mediterranean).
Heavy precipitation events	Increased at mid- and high northern latitudes (<i>likely</i>).
Frequency and severity of drought	Increased summer drying and associated incidence of drought in a few areas (<i>likely</i>). In some regions, such as parts of Asia and Africa, the frequency and intensity of droughts have been observed to increase in recent decades.

Box SPM-1**Confidence and likelihood statements.**

Where appropriate, the authors of the Third Assessment Report assigned confidence levels that represent their collective judgment in the validity of a conclusion based on observational evidence, modelling results, and theory that they have examined. The following words have been used throughout the text of the Synthesis Report to the TAR relating to WGI findings: *virtually certain* (greater than 99% chance that a result is true); *very likely* (90–99% chance); *likely* (66–90% chance); *medium likelihood* (33–66% chance); *unlikely* (10–33% chance); *very unlikely* (1–10% chance); and *exceptionally unlikely* (less than 1% chance). An explicit uncertainty range (\pm) is a *likely* range. Estimates of confidence relating to WGII findings are: *very high* (95% or greater), *high* (67–95%), *medium* (33–67%), *low* (5–33%), and *very low* (5% or less). No confidence levels were assigned in WGIII.

and climate change is Brazil. In 2000, Brazil was the "world's biggest debtor, owing \$180 billion" (Shah 2001). Consequently, the IMF introduced "stringent austerity" measures which sharply cut environmental programs and social services to the poor (Shah 2001). At the 1992 Earth Summit in Rio de Janeiro the world's nations agreed to fund a \$250 million project to protect the Amazon rainforest. However, due to IMF program cuts, Brazil "was forced to withdraw its tiny 10% contribution" (Shah 2001).

Lean's recent report on the rate of illegal deforestation to the Amazon rainforest and its implications for world climate change is particularly disturbing. Thus far, one fifth of the Amazon rainforest has disappeared and 22% has been encroached. While illicit logging practices have decreased to 2001 rates, they are still double the logging rates of ten years earlier (Lean 2006). Moreover, climate models predict that the Amazon's "tipping point" will happen a lot sooner than 2050. This is bad for the planet. Deforestation increases drying of the Amazon forest floor, disrupting the evaporation cycle which "draws in the wet north-east winds," which in turn controls the temperature of the Atlantic ocean. Consequently, warm water which would otherwise sink in the Atlantic remains on the surface fuelling hurricanes. In addition, less moisture in the trade winds intensifies drought to the Amazon rainforest (Lean 2006).

While scientists are not crediting Hurricane Katrina to climate change, they did report a connection "between global warming and increased storm strength." (Source Watch 2005). Recent articles in *Nature* and *Science Magazine*, (September 2005) suggest a strong correlation between human caused warming of the Earth's oceans. Their findings corroborate "an earlier article in *Science Magazine* (8 July 2005) reporting clear evidence of human-caused global warming in the Earth's oceans" (Source Watch 2005).

The article in Nature shows a strong correlation between sea temperature and annual hurricane power in three different hurricane basins, the North Atlantic and two in the Pacific.(Source Watch 2005).

The second issue related to loss of biodiversity and climate change is the introduction of foreign species. Various types of animals such as rodents are influenced by climate fluctuations (Haines, McMichael & Epstein 2000). Long-term droughts reduce rodent predators ("owls, snakes and coyotes), whereas rains provide new food supplies" (Haines, McMichael & Epstein 2000). Epstein (1995: 169) suggests the possi-

bility of such a scenario in the south-western United States where six years of drought in the early 1990's allowed pine nuts and grasshoppers to increase, thereby giving deer mice an ample food source. A ten-fold increase in the population of natural hosts combined with selection pressures in the prey/predator ratio allowed for the amplification of an apparently new strain of Hantavirus which infected human beings (Epstein 1995: 169; Duchin *et al.* 1994). The 1993 "outbreak of hantavirus pulmonary syndrome in the south-western United States" (Epstein 1995: 169; Duchin *et al.* 1994) may have contributed to recent spate "of the disease in Argentina, Bolivia, Chile, Canada and Paraguay" (Haines, McMichael & Epstein 2000; Pini *et al.* 1998; Espinoza *et al.* 1998; Williams *et al.* 1997).

Climate models also intimate the likelihood that the increase in the Tick *Ixodes ricinus* is dependent on climatic variations at higher latitudes if the climate becomes milder. (Lindgren, Talleklint & Polfeld 2000).

This may in turn influence the spread and seasonal range of tickborne diseases in humans, such as tickborne encephalitis or Lyme diseases, in the northern parts of both Europe and North America (Lindgren, Talleklint & Polfeld 2000).

(Lindgren, Talleklint & Polfeld (2000) also suggest that the incidence of TBE in the human population in the 1990's was related to milder climatic conditions. Lyme disease which is found in deer populations could increase due to "overwintering of tick populations" which "could increase the range of the disease" (Haines, McMichael & Epstein 2000; Environment Canada 1993; Lindgren, Talleklint & Polfeld 2000). What these studies indicate is the link between disease and climatic conditions. While this is not novel it does reaffirm a greater potential in disease spread due to human generated factors. Biodiversity is both delicate and tenacious and has undergone five mass extinctions in the last six hundred million years (Kimball 2002: 79). David M. Raup (1991: 3), notes that "somewhere between five and fifty billion species have existed at one time or another." or between 76% and 96% of extant species have vanished (Kimball 2002: 78). Kimball's hypothesis is that over a period of twenty million years most species become extinct. "Extinction is the ultimate fate of all species," including humans, observes Eldridge (1991: 58; Kimball 2002: 79). Although, scientists have suggested a tie between climatic changes and mass extinctions in the past, it is still unknown to what extant future anthropogenic climate change will impact on biodiversity, especially in third world countries such as Brazil and Indonesia which are home to the greatest planetary biodiversity.

Global Warming, Rising Sea Levels, and Future Pandemics in the Third World

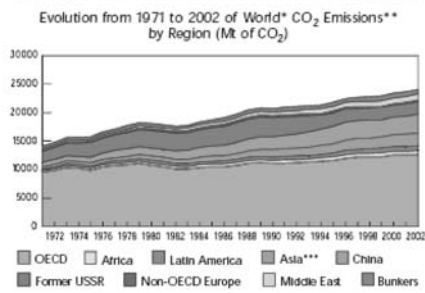
In arguing the case of global warming in the third world we need to examine it from the backdrop of colonialism. Colonialism informed the psyche of cultures of occupied peoples for centuries. We must understand that third world colonisation was an incredibly violent act which devastated local cultures. Smallpox and other diseases which Europeans brought with them decimated third world peoples. The spread of European diseases was conceived of by some colonised peoples as having supernatural origins, as in the case of the smallpox epidemic among the Aztec people during

Spanish colonisation. Aztecs deemed smallpox as a supernatural affliction as it preferred to inflict them rather than the conquistadors (Michael, 1998: 210). Moreover, the conquistador's apparent immunity from smallpox was viewed by the Aztec as a sign of their superiority (Michael 1998: 210).

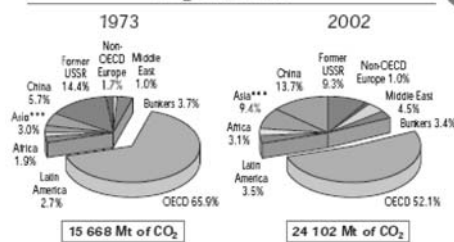
Arguably, the threat of global warming will produce a new kind of colonialism which will impact on the Third World. Lets see how this new kind of colonialism may take shape. As stated earlier, climatologists predict that the global surface temperature will rise between 1.4°C to 5.8°C by 2100. The steady rise in the world's surface temperature will have a major impact on the Third World. Ironically, those nations which have been responsible for emitting the least amount of greenhouse gases will be affected the most (Patz 2005). According to the IPCC 2001 report, in 2002 OECD countries totalled 52.1% of carbon dioxide emissions while the combined carbon dioxide emissions for Asia, Africa, Latin America and the Middle-East was 31.1%. With a population of 1.3 billion, China's 2002 carbon dioxide emissions was 13.7%, while Africa with a total population of approximately 680,000,000 people was only 3.1%. This is compared to the United States (highest population of OECD countries) which has approximately 295,000,000 people (5% of the world's population) accounting for nearly one quarter of worldwide carbon dioxide emissions (Buckley 2004).

These figures give some indication of the level of disparity in carbon dioxide emissions between the First World and the Third World. For Patz, the consumerist practices of mainly western nations is a bioethical dilemma since it will negatively effect many Third World peoples. Based on the United Nations Human Rights Charter, such infringement on Third World nations and the suffering which it will ensue equates to a serious breach of human rights since it will drastically lower the

CO₂ Emissions by Region



1973 and 2002 Regional Shares of CO₂ Emissions**



* World includes international marine bunkers and aviation bunkers, which are shown together as Bunkers. ** Calculated using IEA's Energy Balance Tables and the Revised 1996 IPCC Guidelines. CO₂ emissions are from fuel combustion only. *** Asia includes China.

ability for such nations to support their populations. "Given the uneven distribution of adaptive capacities" between affluent and developing nations the latter will require higher levels of preparedness to tackle "global environmental change" (Biermann & Dingwerth 2004: 3).

Concomitant with rise in global temperatures is the rise of global sea levels. Global mean sea levels are "projected to rise by 0.09 to 0.88 m between the years 1990 and 2100" (IPPC Report 2001). This rise is due primarily to the "thermal expansion of the oceans and melting of glaciers and ice caps" (Warrick et al). In the last century the "global mean sea level has risen 10-25 cm" (Warrick et al).

In two studies, (Velicogna & Wahr 2006; Chen *et al* 2006 found that the Greenland ice sheet "lost between 192 million and 258 million tonnes of ice each year between April 2002 and April 2006 (equivalent to a volume of 212–284 km)", which was higher than previous projections (Murray 2006).⁶ Furthermore, the rate loss for 2004–2006 was 2.5 times higher than the period 2002–2004 (Murray 2006).

By 2080, over 200 million people may be adversely affected by coastal flooding (Patz 2005). The rise in the global temperature will have a mainly adverse effect on human health. The widespread loss of native habitat (e.g. deforestation) may also be conducive to "unfamiliar health outcomes" and the "emergence of "new" disease agents" (Haines, McMichael & Epstein 2000; Patz, Epstein & Balbus 1996). Epidemiological studies indicate that thermal stresses (heat waves) may impact on human health (Haines, McMichael & Epstein 2000). Adverse climatic effects include the "transmission of vector-borne infectious diseases" such as malaria and dengue fever (Haines, McMichael & Epstein 2000). Alterations in water quality and precipitation patterns have the potential of decreasing agroecosystems systems and for displacing vulnerable populations which are reliant on agriculture (Haines, McMichael & Epstein 2000).

Computer projections indicate that warmer water temperatures have the potential in increasing the growth of toxic algal blooms in coastal waters and estuaries, especially where increased sea water temperature is combined with eutrophication (Haines, McMichael & Epstein 2000).⁷ This has significance for Asian regions where "upsurges are strongly correlated with the ENSO cycle" (Haines, McMichael & Epstein 2000).⁸ Haines et al (2000) and Colwell (1996) contend that there is a correlation with warmer sea temperatures and the transmission of cholera, and have suggested a link between toxic algal blooms and cholera outbreaks in Bangladesh.

Rising sea levels may also cause unprecedented damage to precious water resources. At present water resources in many parts of the world are experiencing depletion rates. "Approximately, 1.7 billion people live in water stressed countries" (Saniotis & Nazif 2006) "using more than 20% of renewable water supply" (Salam). In parts of the Africa and the Middle-East more than 50% of their water resources have been used while their populations are increasing (Marcoux 1996). "Changes in river flows and runoff and increasing rates of evaporation may" (Saniotis 2006) "contribute to the salinisation of irrigated agricultural lands," while "rising sea levels may result in saline intrusion in coastal aquifers" (Salam). Gleik (1991) and Homer-Dixon (1994, 1999) note the possibility of future "water wars" between nations. Postel reminds us that the 1967 Six Day War was the first modern water war which has led to

a "hydrological apartheid" between water needy Palestinians and water controlling Israelis (2006: 1046). In his book *When the Rivers Run Dry: Water – the Defining Crisis of the Twenty-First Century* (2006) Fred Pearce provides compelling evidence that the world's major fresh water sources are shrinking due to unsustainable irrigation practices.

With demands pressing against finite supplies ... rivers, lakes and other fresh water ecosystems receive an ever-shrinking residual slice of the water pie, often too little to sustain fisheries, biodiversity, wetlands ... and other vital services (Postel 2006: 1046).

Major river basins such as the Yellow, Ganges and the Mekong are "water stressed," forcing farmers to abandon millions of acres of land. As water dwindles making farming untenable, poor farmers gravitate to cities where they face unemployment and crime (Postel 2006: 1046).

Consequently, in 2000 thousands of Shandong farmers were involved in a mini-water war where they competed in siphoning water from a reservoir (Postel 2006: 1046). The Chinese government has declared that 96 million people from the northern rural provinces "lack sufficient drinking water" (Stone & Jia 2006: 1034). China's response has been to divert water "from three southern river basins to its populous and thirsty northern provinces", – an exercise which critics say will "endanger southern ecosystems" (Stone & Jia 2006: 1034).

One of the problems in presaging sea level rises and its social consequences is due to the ephemeral nature of nations. We have little knowledge to what degree the boundaries of nation states will change in the future and its effect on populations. What can be safely predicted is that sea level rises will have an indelible effect on human livelihood and culture. Evolutionary history discloses that *Homo sapiens* are prone to intra and intergroup violence over resources and as a result of social breakdown. In this equation civilian populations run the highest risk of cultural demise in a context of social collapse. The complexity of human societies and our dependency on governmental institutions and cybernetics means that sea level rises will pose unknown geographic and social constraints.

The problem facing the Third World reflects the present inequitable distribution of medical resources between the First World and the Third World. For instance, Selgelid 2005: 274) declares that less than "10 % of medical research" funding is spent on diseases "that account for 90% of the global burden of disease." Consequently, diseases affecting large populations in the Third World are treated with comparative indifference (Selgelid 2005: 274). One reason for this is the onus on medical profits which diverts funding "to the wants of a minority" of the global population rather than funding disease prevention and treatment for the world's majority (Selgelid 2005: 274). Keeping in mind that global warming will have a devastating effect on the health of many the world's inhabitants, the likelihood of funding for tackling possible pandemics in the Third World will be minimised as affluent nations will be stretched to resolve their own health problems. Call it a case of gunboat diplomacy, the fact remains that given the historic "10/90" divide, there is every likelihood that many Third World countries will be left much to their own devices in the future. Along this theme Selgelid (2005: 280), points out:

The fact that those who are already worse-off in virtue of their poverty thus have their misfortunes compounded – as they are more likely to fall victim to disease – will strike most of us as an injustice in itself.

Moreover, due to the demographic nature of much of the Third World, characterised by large and poor populations living in overcrowded cities, under developed socio-economic infrastructures, insubstantial resources and poor management strategies, many Third World nations will have difficulty to adequately respond to increasing health problems (Williams 2005: 61, Biermann & Dingwerth 2004: 4). As the IPCC's *Third Assessment Report* (2001), notes "those with the least resources have the least capacity to adapt and are the most vulnerable".

"Ecological Rankism" and Ethics

While the environmental and socio-cultural effects of global warming are yet unknown, many scientists have predicted that the 21st century will be watershed period of global disruption. For the first time in Earth's history has been a species able to influence climate change. One may deem such a phenomenon as being promethean or conversely purgatorial. By the middle of this century humanity will know for certain.

In his recent work, *The Revenge of Gaia: Why the Earth Is Fighting Back - and How We Can Still Save Humanity* (2006), James Lovelock compares global warming to a fever which will last for a thousand years. Like other eminent thinkers his analysis of global warming is stark. Human tenureship of the earth has been destructive; nature will drastically cull the human species in order to ensure planetary survival. Like Tertullian, Hardin claimed "that the earth provides a corrective to the problem of population through natural catastrophe" (Gardiner 2001: 389). The dwindling of earth's resources combined by a burgeoning human population may inevitably prove to be bioethically tenuous and logistically unfeasible. In a report outlining the aftermath of a nuclear attack on one American city, it revealed that the medical resources of the entire United States would be insufficient in treating the victims of such an event. And yet a nuclear attack on one city would be miniscule in comparison to the sheer scale of human resources needed to combat the adverse effects of climate change (Williams 2005: 62).

If global warming is principally caused by human economic processes, as Williams (2005: 62) et al claim, the question arises as to how the principles of economic equity can be implemented in underdeveloped nations. While industrialised nations have enjoyed unparalleled affluence for over fifty years, many underdeveloped nations have been embroiled in intractable conflicts, human-induced famines and endemic poverty and corruption, which have stymied economic progress. Even so, global warming will mean that those nations which are in need of economic development the most will have to curtail such activities as present levels of economic activity are unsustainable.

However, climate change is not only a natural phenomenon but is intrinsically tied to the socio-political affairs of the first and third worlds. As discussed earlier, the first world has embarked on a policy of "ecological rankism" in which it has dictated how environmental resources are to be used.⁹ In this schema, the first world has continually

exploited third world nations of their resources while generating a cycle of socio-economic inequity. Ecological rankism been fostered by the unchallenged growth of science and technology in the last two hundred years as well as by orientalist discourses which continue to inform first world nations of third world peoples.

For scientists like Paul Ehrlich modern *Homo sapiens'* dislocation from nature is a product of human biological and cultural default. The West's adherence to an Aristotelian worldview which places humankind at the centre of the universe is kernel to Ehrlich's notion of cultural default. Ehrlich claims that human beings are incapable in recognising "nature's services, thereby increasing the potential for ecological degradation (2000: 307). Simply put, human beings are poorly equipped to detect the level of environmental problems and pollution (2000:320). In contrast to "ecosystem people" ("forest dwellers, peasants, and nomadic herders") denizens from rich countries are "biosphere people" who "receive little feedback about the status of the resource stocks" and therefore, have minimal inclination in conserving them (Ehrlich 2000: 320; Bawa & Gadgil 1997).

Ehrlich's ethical solution is the incorporation of "slow reflexes" into our behavioural repertoire. Slow reflexes deal with the ability towards long term planning, nurturing of sound ecological practices, and the transformation of social constructions of nature from object to subject. The latter equates to a relational change cognate with Martin Buber's "I-It" to "I-Thou." This means interacting with nature on the basis of "mutuality and reciprocity" (Scott 2002).

How to implement Ehrlich's notion of slow reflexes will be a challenge. For instance, while the transference of first world technologies such as antibiotics, pesticides, and synthetic fertilisers have significantly curtailed mortality rates and increased the quality of life for third world people's they have the potential of creating serious health risks to future generations (Ehrlich 2000: 313). Possibly here we must recognise that while all societies share universal moral codes, ethical systems are not fixed but have the potential to be reinvented (Ehrlich 2000: 309). Ethical issues are often accompanied by misguided and archaic socio-political and religious accoutrements. The "conscious evolution" which Ehrlich insists needs to be realistically implemented and is inevitably limited due to the burgeoning world population, lack of socio-political will, and the magnitude of environmental disrepair. While international convocations such as the Rio and Kyoto Summits are a step in the right direction, conscious evolution needs to be accompanied by evolutionary learning. Evolutionary learning is a way of deconstructing "habituated" ways of thinking. Habituation, as Gregory Bateson purports is a kind of "internal incoherence" which de-sensitises and dislocates human beings from the environment (Bateson 2000: 273).

A way of circumscribing habituated thinking is through a process of correction, which is exemplified by creative "co-operative group interaction" (Montuori 1993). Saniotis (2006) avers that "the process of correction is also an ethical response to systems of knowledge that dissuade critical learning and perpetuate competition."

This may take the form of providing incentives for promoting environmental practices such as carbon sinks but also in suitable reforestation programs which promote bio-diversity and replenish aquifers. For example, grass roots movements in Rajasthan, India, have been successful in retrieving ancient river systems through eco-

logically driven farming practices (Postel 2006: 1047).

Co-operative evolutionary learning is also characterised by grass roots eco-movements which are tied to traditional cosmological systems. Proponents of this kind of syncretism have been Thai Buddhist monks via their tree ordination ceremonies (*buat ton mai*). These ecology monks (*phra nak anuraksa*) "see their religion as critical for providing practical as well as moral guidelines for ecological conservation" (Darlington 1998). From July 1991 ecology monks initiated Tree ordination ceremonies which promoted "economic alternatives to growing maize as a cash crop, and the establishment of protected community forests" which were overseen by village committees (Darlington 1998). The tree ordination ceremony employed Buddhist symbols stressing the spiritual basis of conservation (Darlington 1998). A tree ordination ceremony combined modified forms of traditional Buddhist rituals including the giving of forest robes (*thaut phaa paa*), offering of Buddha images, and offering and planting of tree seedlings by villagers (Darlington 1998).

A concomitant issue in the 21st century will be the need to delineate strategies for dismantling the various orientalisms which inform first world understandings of the third world. Thus far, the orientalism of the first world as characterised by its repressive monetary policies to the third world as well as its invasive Middle Eastern policies have created global distrust. International cynicism prevents the ability for nations to transfer technological knowledge and implement lasting environmental strategies.

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Notes

1. *Homo sapiens* (modern humans) left Africa approximately 100,000 years ago and made a dramatic journey of discovery and colonisation of the planet. Early human beings were based on hunting/gathering clans. At the end of the Ice Age human beings began to form rudimentary societies. These early social experiments spurred the way for civilisations about fifty five centuries ago. However, as McKibben (1989: 4) points out, the present day world developed during the European Renaissance (1450-1550) and was expedited by the Industrial Revolution two centuries later. McKibben goes to suggest that the world which we are presently experiencing dates back to World War Two with the advent of the Atomic Age. The present age referred to by some thinkers as the Post-Modern Period has been characterised in challenging earlier socio-religious paradigms while claiming that human societies are in a constant state of change.
2. Europeans' colonisation of the Americas is a case in point. The historian David Stannard (1993: 151), argues that "the destruction of the Indians of the Americas was far and away

the most massive act of genocide in the history of the world." Rummel (2005), estimates the genocide of American Indians as being between 2-15 million deaths. The democide Rummel (2005) created the "democide" to mean ("the murder of any person or people by a government, including genocide, politicide, and mass murder") Rummel (2005) of the American Indians was rivalled by the European slave trade which caused the deaths and dispossession of millions of Africans over three centuries. The democide of American Indians and Africans prefaced the global exterminations of the twentieth century which number approximately 268,000,000 deaths (Rummel 2005).

3. Influential scientists such as Carl Sagan eloquently explained that the earth was formed from primeval cosmic clouds many billions of years ago. As children of primordial "star stuff" human beings are intimately connected with the earth (Sagan 1985). As the consciousness of the earth, human loyalties should lie to the planet (Sagan 1985). Had Sagan lived he would have considered global warming to be an epochal event.
4. The north/south distinction is a regulative principle which is "based on ideological and historical differences, rather than specific interests or circumstances relative to climate change" (Depledge 2006: 3).
5. Verma (2006) ties the relationship between environmental over-exploitation and human societal collapse by citing the example of Easter Island. Three hundred years ago the Easter Island society collapsed "mainly due to deforestation" (Verma 2006: 77). As the forests declined the population increased leading to an "ecological suicide" or 'ecocide' (Verma, 2006: 77). Verma's analysis confronts us with an oncoming bioethical dilemma, which is the problem of overpopulation and dwindling resources. In the case of Rwanda, Tutsi politicians encouraged their tribespeople to annihilate the Hutu nation in 1994. Verma's point is when starvation is caused by insufficient land resources the killing of one's neighbour becomes a feasible option (Verma 2006: 77). As she notes: "is an ecological principle that, when the population size exceeds the carrying capacity of the habitat, a population crash is inevitable (vide supra). In an overcrowded cage rats may turn cannibalistic" Verma 2006: 77).
6. "This rate of ice loss is equivalent to a rise in sea level of 0.5 to 0.1 mm yr⁻¹, which is higher than many previous estimates" (Murray 2006)
7. See also Harvell et al (1999) and Valiela (1984).
8. See Hallegraef (1993).
9. My elaboration of "rankism" has been borrowed from Fuller (2003).

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