

2007/2008 HUMAN DEVELOPMENT REPORT - FIGHTING CLIMATE CHANGE: HUMAN SOLIDARITY IN A DIVIDED WORLD

STEAMY PLANET

In 2008, heat-trapping gases sent to the atmosphere will stay there until 2018 and beyond





Chairman
RAMON R. DEL ROSARIO JR.

Vice-Chairmen
ROBERTO F. DE OCAMPO
JAIME AUGUSTO ZOBEL DE AYALA II

Treasurer
CORAZON S. DE LA PAZ

Trustees
DAVID L. BALANGUE
CESAR A. BUENAVENTURA
JOSE L. CUISIA JR.
DORIS MAGSAYSAY-HO
AURELIO R. MONTINOLA III
RIZALINO S. NAVARRO
RICARDO J. ROMULO

Executive Director
ALBERTO A. LIM

Deputy Director
MARC P. OPULENCIA

Research Director
ERIC O. ALVIA

Managing Editor
ROXANNE V. LU

Research Associates
KAREN B. BITAGUN
PATRICK P. CHUA
EDWARD C. GACUSANA
ISABEL A. LOPA
MICHAEL B. MUNDO
KATHERINE J. SANTOS

Design & Layout
CHRISTIAN V. CRUZ

Consultant
NONETTE C. CLIMACO

MBC Research Report is published by the Makati Business Club. Materials appearing in this publication may not be reproduced in any form or by any means without the prior consent of the Club. Permission must be requested in writing from the editors. Unless expressly stated, the views and opinions found here reflect the sentiments of the MBC Research and Information Group.

Copyright 2007
MAKATI BUSINESS CLUB
2nd Floor, AIM Conference Center
Benavidez corner Trasierra Streets
Legaspi Village, Makati City, Philippines
Tel. nos.: 751-1134 to 45
Fax nos.: 750-7405 / 750-7406
E-mail: makatibusinessclub@mbc.com.ph
Website: www.mbc.com.ph

STEAMY PLANET

In the latest Human Development Index 2007/2008 Report entitled **“Fighting Climate Change: Human Solidarity in a Divided World,”** the United Nations Development Programme (UNDP) explains the detrimental impacts of dangerous climate change to both the present world and future generations. It provides scientific evidence on how humans are overloading the Earth’s carrying capacity for greenhouse gas (GHG) emissions that could lead to the stalling and eventual reversal of progress that the world has worked many generations to attain. It also enumerated the pressing challenges brought about by climate change and highlights the collective action and agreements by both the developing and highly developed countries to address this global phenomenon.

A NOT-SO-GOOD CHANGE

Climate Change is perhaps the only global issue that concerns every country in the world today. It is an event arising from long term, large-scale changes in weather patterns spanning from weeks to decades. In the current scenario, the Earth’s climate change relates to an accelerated warming of the planet’s atmosphere at dangerously high levels. Studies have proven that this is caused by high emissions of greenhouse gases, namely water vapor, carbon dioxide (CO₂), methane, nitrous oxide, and ozone, which trap heat in the atmosphere making the planet extremely warm. This phenomenon is known as global warming.

Carbon dioxide is the most important anthropogenic greenhouse gas. The Intergovernmental Panel on Climate Change (IPCC) reports that, between 1970 and 2004, annual emission of CO₂ grew about 80%. High concentration of CO₂ had been observed at the onset of the industrial revolution in the late 1800s when power industries began utilizing fossil fuels. For this reason, people believe that reducing CO₂ emission could have a detrimental impact on the growth of economies largely dependent on fossil fuels.

A GLOBAL CONCERN

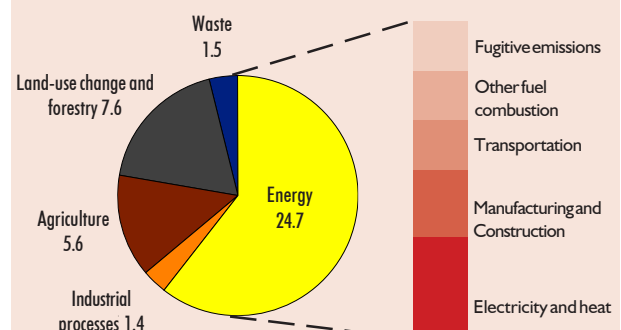
Since the advent of the industrial era, the world’s temperature increased by around 0.7°C and today continues to climb at a faster rate. The signs of its impact are not just confined to a few areas in the planet. It is evident all over the world where snowcaps are melting, and flood and drought occur.

A 1990 study conducted by the United Nations Environment Programme (UNEP) revealed an increasing progression of CO₂ levels even in the remote site of Mauna Loa Mountain, Hawaii. Meanwhile, satellite data show that since the late 1960s the extent of snow cover decreased by 10%, and the annual duration of lake and river ice cover in the Northern Hemisphere have been reduced by about two weeks. The most glaring signs, however, are the ones being felt by the people, especially the poor. They are the ones more exposed to drought, intense storms, floods and environmental stress which further erode their already limited freedom and choice.

The threat of climate change not only confronts the world’s poor but also the yet faceless and voiceless future inhabitants of this planet: our children, grandchildren and grandchildren’s children. They will defi-

LETTING OUT THE GAS

Figure 1: Sectoral distribution of current GHG emissions, 2000



Source: Figure from HDI Report 2007/2008, data from WRI 2007a

nately face the catastrophic and unpredictable events brought about by global warming if the present generation does not act aggressively to prevent climate change. But even the stringent mitigation measures do not take immediate effect on average temperature changes. That is why the Report emphasizes that political leaders must have the will and the sense of urgency to make things happen. A year of delay in reaching an agreement to cut emissions adds to greenhouse gas stocks in the atmosphere, further locking the future into a higher temperature.

ON THE REVERSE

The HD Report identified five key transmission mechanisms through which dangerous climate change could stall then reverse human progress. It states that the threat lies on agricultural production and food security, water stress and water insecurity, rising sea levels and exposure to climate disasters, ecosystems and biodiversity, and on human health.

AGRICULTURE PRODUCTION AND FOOD SECURITY

The Report first points out that climate shocks will consign the poorest 40% of the world's population, some 2.6 billion people, to diminished opportunities as majority of the poorest people depends on agriculture for a living. A breakdown in the agricultural systems, caused by climate shock exposure, could leave 600 million more people to face malnutrition by 2080 and over. It adds that sub-Saharan Africa faces the danger of potential productivity losses of 25% by 2060. Twenty more years after that and an additional 1.8 billion people will be suffering from water stress.

In Asia, climate scenario exercises suggest that Pakistan will experience agricultural yield losses of 6-9 percent for wheat with a 1°C increase in temperature, while a 4°C temperature increase in Bangladesh could reduce its rice and wheat production by 30% and 50%, respectively.

Meanwhile, projections on the impact of temperature changes, soil moisture content and rainfall in Indonesia's agricultural produce are no more encouraging. Climate simulation models reveal that yield may fall by 4% for rice and 50% for corn.

WATER STRESS AND WATER INSECURITY

Glaciers store water in the form of ice and release them during the summer. This natural flow sustains the river systems that is the lifeblood of vast ecological and agricultural systems. Today, the largest glacial abode, the Himalayas, is shrinking at a rate of 10-15 meters a year at an uneven pace. The Gangotri glacier, a major water reservoir for 500 million people living in the Ganges basin, is shrinking by 23 meters a year, while two-thirds of China's glaciers will disappear by 2060.

The retreat of these and other glaciers are seen to accelerate as climate change exceeds the 2°C threshold. When glaciers melt, new lakes are formed and existing ones expand at an alarming rate, as in the case of Tsho Rolpa Lake, which increased more than seven-fold in the last 50 years. The Study points the immediate danger of melting ice, which will lead to the formation of larger glacial lakes, increasing the risk of flooding, avalanches, mudslides and the bursting of dams.

The threshold for dangerous climate change is an increase of 2°C, but it is seen that in the course of 21st century, average global temperature could increase by more than 5°C. Going beyond the threshold, however, will change the distribution of the world's water resource. The Report states that the accelerated glacial melt in the Himalayas would initially cause floods in northern China, India and Pakistan before reducing water flow to major river systems critical for irrigation. By 2080, about 1.8 billion people would face water scarcity because of climate change.

The telling signs of water stress are seen with the collapse of river systems in northern China, the rapidly falling groundwater levels in South Asia and the Middle

East, and the mounting conflicts over access to water. Rapid population growth, industrial development, urbanization, and the need for irrigation water to feed a growing population bring about these scenarios. The Study predicts that the incremental effects of climate change will add to this pressure within countries and will eventually create tensions over water flowing between countries.

RISING SEA LEVELS AND EXPOSURE TO CLIMATE DISASTERS

Accelerated ice sheet disintegration will lead to the rapid rise of sea levels. An increase in temperature of above 2°C will also warm the seas, which may trigger violent tropical cyclones and hurricanes. Research studies reveal that oceans absorb over 80% of the increased heat generated by global warming, locking the world into continued thermal expansion.

Flooding and tropical storm activities are seen to displace up to 332 million people in coastal and low-lying areas. It was projected that over 70 million Bangladeshis, 22 million Vietnamese, and six million Egyptians could be affected by global warming-related flooding. Meanwhile, many countries with large populations living in coastal areas, river deltas, urban slums and drought-prone regions are highly vulnerable to climate-related risks. Asia, for example, has more than half of the world's slum population and the makeshift

homes of slum dwellers are vulnerable to floods and landslides.

ECOSYSTEMS AND BIODIVERSITY

Climate change is making a huge impact on the world's ecological systems. It is fast becoming a major factor in the loss of mangrove swamps, coral reefs, forests and wetlands, all of which provide wide ranging services to all living creatures in the planet. Wetlands, for example, harbor biodiversity, provide agricultural, timber and medicinal products, and sustain fish stocks. It also buffers coastal and riverside areas from floods, protecting humans residing along riverbanks and seashores.

But the world's ecosystems are rapidly being destroyed. The Millennium Ecosystem Assessment found that 60% of all ecosystem services were either degraded or being used unsustainably, with agricultural activities, population growth, and industrial development degrading the environmental resource base. And now, humans, animals and plants are at a risk with the threat of climate change. But while humans are the only species that has the ability to quickly adjust to temperature changes, animals and plants adapt by moving. However, some species are in danger of facing extinction, especially those in polar climates, because it is harder for them to find a place to relocate. In a prediction by the IPCC, 20-30% of plant and animal species is likely to be at increased risk of extinction if global average temperature increases exceed 1.5-2.5°C.

HARD-HITTING

Table 1: Social and economic impacts of rising sea levels

Magnitude of sea level rise (m)	Land area	Population	GDP	Urban area	Agricultural area	Wetland area
1	0.3	1.3	1.3	1.0	0.4	1.9
2	0.5	2.0	2.1	1.6	0.7	3.0
3	0.7	3.0	3.2	2.5	1.1	4.3
4	1.0	4.2	4.7	3.5	1.6	6.0
5	1.2	5.6	6.1	4.7	2.1	7.3

Source: HDI Report 2007/2008; Dasgupta et al. 2007

HUMAN HEALTH

The spread of diseases during extreme weather events is another major concern. There is a high possibility of malaria, cholera and diarrhea outbreak, which will particularly affect children and the impoverished. Studies also reveal that climate change can increase the number of dengue cases, a highly climate-sensitive disease largely confined in urban areas. Climate impact assessments also projects the

occurrence of higher summer-season temperatures, which will likely result to heat stress morbidity, particularly among the elderly poor.

Furthermore, the Report projects that climate change would contribute indirectly to at least three classes of wider health problems. These include the rising incidence of certain vector-borne diseases, the prevalence of water-borne diseases, and the increase of photochemical air pollution. The Report warns developed countries to take responsibility for the threats that confront the world and not turn a blind eye to the risks and vulnerabilities that the poor, the children, and the elderly face.

OFF TRACK

Most of the temperature swings recorded decades ago have been attributed to astronomical and natural factors, such as the shifting of the earth’s orbit every several thousands of years, changes in solar irradiance, presence of stratospheric aerosols from volcanic eruptions. But human activity also played a big and significant role in the sudden heat rush.

It has been observed that there has been a rapid increase in global atmospheric CO₂ concentration at the onset of the industrial revolution. World temperature is said to have increased since then by around 0.7°C, and is still climbing at a faster rate. Mainstream scientific prognosis believes that this sudden jump in CO₂ will lead to temperature increases that range from 1.4 to 5.8°C. At this rate, the carbon budget for the entire 21st century could expire as early as 2032.

To address this growing global concern, more than 170 countries met in Kyoto and agreed to reduce the world’s emissions of carbon dioxide and five other GHG against 1990 levels by 2010-2012. This is known as the Kyoto Protocol made under the United Nations Framework Convention on Climate Change (UNFCCC). However, setting targets do not mean that results automatically happen. As 2012 approaches, many countries are still off-track in delivering their commitments, while other major

FALLING SHORT

Table 2: Status of selected developed countries of their Kyoto commitments

Country	Preliminary Outcomes
United States	<ul style="list-style-type: none"> · Signed the Kyoto Protocol but has not yet ratified the treaty. · Overall emissions have increased by 16%. By 2010 project emissions are 1.8 Gt above 1990 levels on a rising trend.
European Union	<ul style="list-style-type: none"> · Committed to make an average emission reduction of 8% in Kyoto. · Actual cuts amounted to 2%. Large increases in renewable energy supply will be required to meet the Kyoto targets but the EU is falling short of investments required to meet its own 20% target by 2020.
United Kingdom	<ul style="list-style-type: none"> · Surpassed its Kyoto target of 12% reduction, but is off track to meet a national target to reduce emissions by 20% against 1990 levels. · Most of the reduction was achieved before 2000, until 2005 and 2006 when it switched from natural gas and nuclear to coal.
Japan	<ul style="list-style-type: none"> · In 2005, its carbon emission was 8% above 1990 levels, and has targeted 6% cut under the Kyoto Protocol. · It is projected that Japan will miss its target by 14%. · Large increases in emission have been registered from the transportation and residential sectors.
Australia	<ul style="list-style-type: none"> · Similar with the U.S., Australia did not ratify the Kyoto Protocol. · High levels of dependence on coal-fired power generation contributed to large increases in the energy sector, with carbon dioxide emissions rising by over 40%.

Source: HDI Report 2007/2008

economies have yet to ratify the treaty. (see Table 2) The Kyoto Protocol experience has brought learning in terms of how we can avoid dangerous climate change. The first lesson is that the level of ambition matters. Many of the proposed targets by developed countries are very modest, averaging only around 5 percent. Some targets are also set against “current levels” as reference year instead of the 1990 levels. According to the Report, this can obscure under-ambition in target setting, as there is a huge difference between carbon emissions in 1990 and the present year levels.

Another concern highlighted in the Report is the current carbon accounting systems applied for under the Kyoto Protocol. Aviation and shipping industries are excluded from international inventories of GHG despite the fact that, since 1990, emissions of CO₂ from aviation fuel alone have increased from 331 Mt CO₂ annually to 480 Mt CO₂, representing 2% of global emissions.

The commitments made in Kyoto should also be treated as binding targets backed by strong political action reflected in policy reforms. The Report suggests that developed countries cut their greenhouse gas emission by at least 80% to 2050 and 30% by 2020 from 1990 levels, while developing countries should cut emissions by 20% to 2050 from 1990 levels.

MITIGATION MEASURES AT HOME

1. Installation of low-cost lighting sources such as compact fluorescent lamps.

World lighting represents 10% of global electricity demand and generates 1.9 Gt CO₂ every year. Using low-cost lighting sources would reduce total lighting energy use by 38%.

2. Using more energy efficient appliances, cars and other products.

Research groups have validated the huge impact of improved energy standards in reducing CO₂ emission by households and businesses. It is also an effective way of cutting energy costs, resulting in a win-win situa-

CARBON FOOTPRINTS

Table 3. Total carbon dioxide emissions of selected countries, 1990 and 2004

Country	Total CO ₂ in 1990 (Mt CO ₂)	Total CO ₂ in 2004 (Mt CO ₂)
United States	4,818.3	6,045.8
China	2,398.9	5,007.1
Russian Federation	1,984.1	1,524.1
Japan	1,070.7	1,257.2
Canada	415.8	639.0
United Kingdom	579.4	586.9
Mexico	413.3	437.8
Indonesia	213.8	378.0
Thailand	95.7	267.9
Malaysia	55.3	177.5
Vietnam	21.4	98.6
Philippines	43.9	80.5
Singapore	45.1	52.2

Source: HDI Report 2007/2008

tion for the end users. Some products, such as those from Japan and the United States, contain labels and energy efficiency information for consumer guidance, but this practice is yet to be adopted by other countries.

3. Favor high fuel-efficiency vehicles

Road transport is the biggest source of rising emission, and as domestic transport demand increase with the growth of economies, GHG levels may be 30% above the 1990 levels by 2010. The Report suggests that in order for countries to reduce CO₂ emissions from transport their governments must set stronger fuel efficiency standards, introduce taxation in aviation, and increase financing and incentives for the development of breakthrough technologies. Major automobile companies are lobbying against passing regulatory measures in fear that it will affect the competitiveness of the industry. However, it was reported that several companies have already lost out in fast-expanding markets for low-emission vehicles because they have failed to raise their cars' efficiency standards.

UNDP RECOMMENDATIONS

The UNDP recommends the following actions in fighting climate change:

Stronger regulatory standards

One of the points emphasized by the Report is the importance of governments to adopt and enforce tougher standards on products such as transportation, buildings and electrical appliances. Measures that are aligned with this objective are found to not only reduce emissions but also saves electricity and cut costs for households and national economies.

Supporting the development of low carbon energy provision

Reducing the world's level of carbon emissions requires unparalleled cooperation and political action from national leaders. Ban Ki-moon, Secretary-General of the United Nations, stresses that the world urgently needs to step up on its actions to mitigate greenhouse gas emission, such as by tapping the potential for renewable energy, and learn to adapt with breakthrough technologies that could help combat climate change.

International cooperation on finance and technology transfer

The UNDP study suggests developing international cooperation to reduce dependence on biomass, the primary source of energy for about 2.5 billion people. It adds that the developing countries must strengthen their energy sector reforms with the assistance of developed nations through financing and technology transfer under a Climate Change Mitigation Facility (CCMF). The CCMF shall be created to mobilize US\$25-30 billion annually to support low-carbon transitions in developing countries. The study also suggests extending carbon financing to land-use programs such as forest conservation and grasslands restoration, that will offer benefits for the poor.

Pricing Carbon

The Report suggests that countries should develop a carbon pricing structure such as putting a price on carbon through taxation or adopting a cap-and-trade scheme. As example, it states that taxation be imposed at a level of \$10-20/t CO₂ in 2010, rising in annual increments of \$5-10/t CO₂. For the cap-and-trade system, governments sets an overall emissions cap and issues tradeable allowances that grant business the right to emit a set amount. The European Union's Emissions Trading Scheme (ETS) is an example of this, although the existing cap emissions have been set too high.

The current commitment period under the Kyoto Protocol will expire in 2012. Overall, the Report finds the current state of international cooperation and multilateralism on climate change weak and unfitting. Specific and binding quantitative commitments in the medium- and long-term periods must be set in order for agreements to be credible, which the Report finds to be lacking in the Kyoto Protocol.

Research by

MA. ROXANNE V. LU

Senior Researcher

Tel. No. 751-1140

e-mail: roxanne.lu@mbc.com.ph