

Environmental challenges in the 21st century: UN's role

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Global environmental challenges have posed new dangers and concern to the safety of our planet in the contemporary era. International environmental issues are integrally related to each other and have critical economic, human rights, and security repercussions. The increased incidence of floods, storms, droughts, water shortage, and rising sea-levels worldwide are very disturbing for the whole world community. Changes in agricultural yields, glacier retreat, species disappearance and increase in ranges of disease vectors are the effects of increase in the average global temperature. Threats to wildlife; loss of biodiversity; ecosystem deprivation; climate change/global warming and Ozone diminution have emerged as major environmental challenges for nations today.

These threats are so critical that they have the potential of destroying our civilization. At present when the whole international community is worried because of the changings taking place in our environment, so are international organizations, particularly the UN. The UN is at the forefront of the international efforts to combat environmental challenges and is playing a vital role in this regard. Though the UN Charter itself contains no mention of environmental protection, the UN - sponsored conferences have filled a critical gap in the evolution of environmental governance. The UN Environment Programme (UNEP), UN Framework Convention on Climate Change (UNFCCC) and other UN initiatives related to environment and development issues have played a significant role by providing credible and up-to-date scientific information on the global environment outlook and related issues. Also, the UN Secretary General, Ban Ki-moon, made “climate change”, one of the critical environmental challenges facing the world today, one of his top priorities in the UN's 2008 agenda.

This study seeks to analyze the following points: Major global environmental challenges in the 21st century with a special focus on the loss of biodiversity; global warming/climate change, and ozone diminution. How these challenges distinguish from the past environmental challenges. What substantial efforts the UN has made regarding environmental protection. How UN can be more effective in helping the nations to combat global environmental degradation.

Environment

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Environment is the natural world within which people, animals and plants live. It includes some most important components:

- Complete ecological units that function as natural systems without massive human intervention, including all vegetation, animals, microorganisms, rocks, atmosphere and natural phenomena that occur within their boundaries.
- Universal natural resources and physical phenomena that lack clear-cut boundaries, such as air, water and climate, as well as energy, radiation, electric charge and magnetism, not originating from human activity.¹

A healthy natural environment is critical to the development, wellbeing and survival of the people living on the earth. It is central to the accomplishment of the eight UN Millennium Development Goals (MDGs) in the following way:²

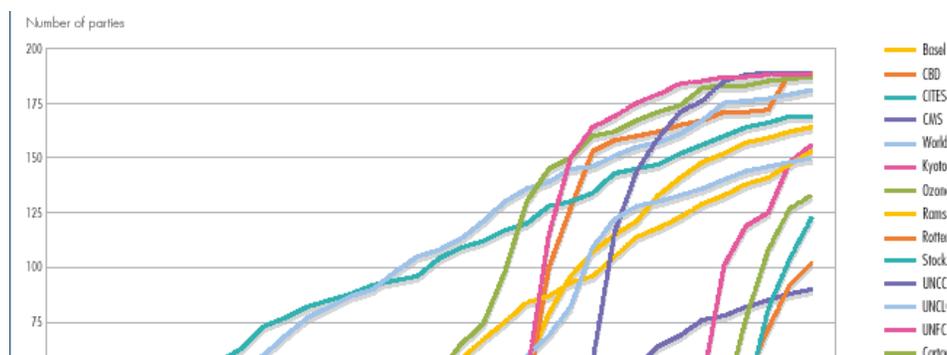
Millennium Development Goals	Selected Environmental Links
Eradicate extreme poverty.	Livelihood strategies and food security of the poor often depend directly on healthy ecosystems and the diversity of goods and ecological services they provide. Climate change affects agricultural productivity. Ground-level ozone damages crops.
Achieve universal primary education.	Cleaner air will decrease the illnesses of children due to exposure to harmful air pollution. As a result, they will miss fewer days of school. Water-related diseases cost about 443 million school days each year and diminish learning potential.
Promote gender equality, empower women	Indoor and outdoor air pollution is responsible for more than two million premature deaths annually, Poor women are particularly vulnerable to respiratory infections, as they have high levels of exposure to indoor air pollution. Women bear the brunt of collecting water and fuelwood, tasks made harder by environmental degradation, such as water contamination and deforestation.
Reduce child mortality.	Pneumonia kills more children under the age of five than any other illness. Environmental factors like indoor air pollution may increase children's susceptibility to pneumonia. Water-related diseases such as diarrhoea have become the second biggest killer of children.
Improve maternal health.	Indoor air pollution and carrying heavy loads of

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	water and fuel wood adversely affects women health, and can make women less fit for childbirth and at greater risk of complications during pregnancy. Provision of clean water reduces the incidence of diseases that undermine maternal health and contribute to maternal mortality.
Combat major diseases.	Up to 20 per cent of the total burden of disease in developing countries may be associated with environmental risks factors. Preventive health measures are vital and at times more cost-effective than health treatment. New bio diversity-derived medicines hold promises for fighting major diseases.
Ensure environmental sustainability.	The current trend in environmental degradation must be revised in order to sustain the health and productivity of the world's ecosystems.
Develop a global partnership for global development.	Poor countries and regions are forced to exploit their natural resources to generate revenue and make huge debt repayments. Unfair global practices export their harmful side-effects to countries that often do not have effective governance regimes.

Environmental challenges in the 21st century

The environmental conditions have changed dramatically as the 21st century begins. The overall state of the global environment continues to worsen and has emerged as one of the major challenges for states in the current era. It will not be wrong to call the 21st century an “environmental distress syndrome” century. The problems of the environment the world is facing are vast and diverse, comprising climate change, stratospheric ozone depletion, loss of biodiversity, changes in hydrological systems and the supplies of fresh water, land degradation and stresses on food-producing systems. They are posing serious threats to human health, physical security, material needs and social cohesion. To deal with these problems, the UN has adopted several multilateral environmental agreements and many countries have ratified them. Here is a figure of ratification of major environmental agreements by states from 1972 to-date:



Source: Global Environment Outlook (GEO 4); Environment for Development, Published by UN Environment Programme (UNEP); 2007, pg. 41. www.unep.org/geo/geo4/report/01_Environment_for_Development.pdf

All the environmental challenges should be addressed instantly, but the loss of biodiversity, Ozone depletion, and climate change are the most critical of environmental issues of the current century, prompting both the international community and the UN to confront them without further ado in a skilful and insightful way.

a. Loss of Biodiversity

The UN has defined biodiversity as the “variability among living organisms from all sources, including terrestrial, marine, and other aquatic ecosystems and the ecological complexes of which they are part. It includes diversity within species (genetic diversity), between species (species diversity), and between ecosystems (ecosystem diversity).”³ Biodiversity is not equally distributed over the earth’s surface. There are probably five to 30 million species of animals and plants across the globe, each genetically unique. Most remain unidentified. Some 1.4 million animal species alive today have been named and described. Named plant species are far fewer, numbering around 400,000. The tropics cover 42 per cent of all land but contain two-thirds of all animal species. Rain-forests cover six per cent of all land but contain two-fifths of all plant and animal species.

Biodiversity is of great value to humankind. It provides goods (like timber and medicinal products) and essential services (like carbon cycling and storage, clean water, climate and natural hazards mitigation). A total of about 3,000 plant species, 200 of which have been domesticated, are used worldwide as a food source. However, just 20 of these plants provide more than 80 per cent of our

food. In order to maintain the high level of production such consumption demands, plant breeders frequently turn to the wild relatives of domestic crops in search of desirable genetic traits such as resistance to disease or drought: wild plants are a valuable reservoir of genetic diversity.

A smaller number of animal species provide human food, but the scale is often enormous. In addition to food, many of our drugs and raw materials for manufacturing also originate from either plants or animals. Globally, 3.5 billion people rely on plant-based medicine for primary health care. Many industrial materials, such as fibers, resins, dyes, waxes, pesticides, lubricants and perfumes derive from plant or animal sources. Trees provide more than 3.8 million cubic meters of wood annually for use as fuel, timber or pulp. More to the point, biodiversity also has its contribution in providing free environmental services like nutrient cycling, soil formation, watershed protection, waste disposal, pollination, oxygen production, carbon sequestration and climate regulation.⁴

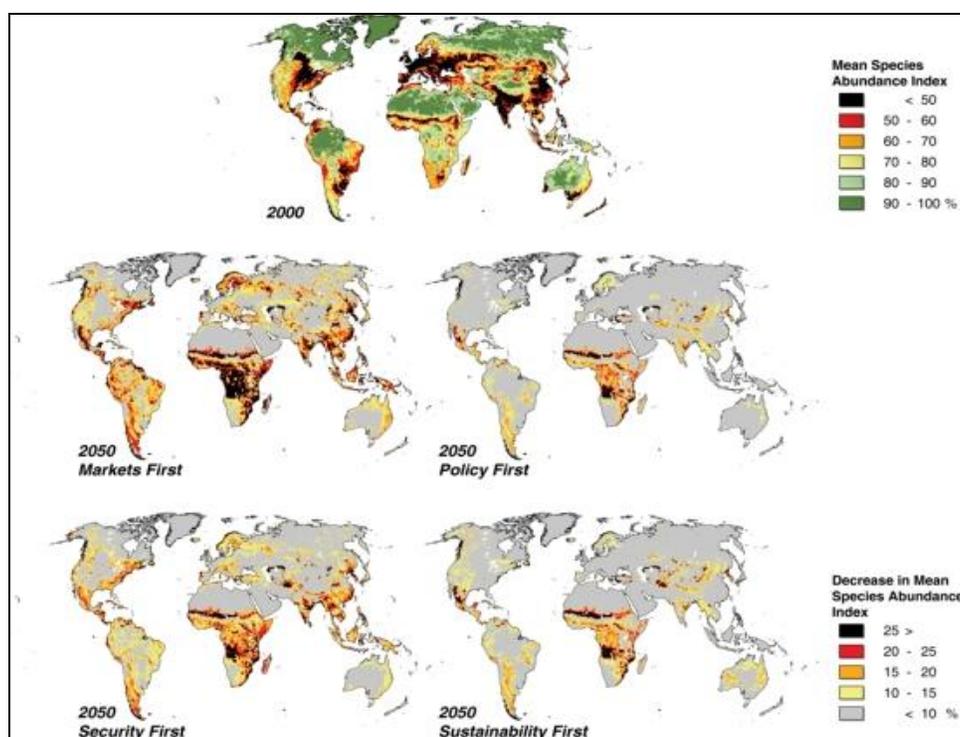
Nonetheless, we the human beings in our desire to make our lifestyle better have caused serious threats to the survival of much of biodiversity. Increase in global human population (the Population Division of the United Nations predicts that the world's population will increase from 6.23 billion people in 2000 to 9.3 billion people in 2050) and its consumption of already half of the entire food, crops, medicines, and other useful items produced by earth's organisms, has endangered biodiversity. Unequal distribution, overexploitation and consumption of natural resources and other forms of wealth on the planet is another factor that is greatly putting biodiversity at risk.

The impact of this significant loss in biodiversity through human activity and meddling has in consequence led to the loss and fragmentation of natural habitats, which includes clearing forests for timber or plantations, overgrazing, draining wetlands and the flattening of grasslands and coral reefs. Additionally, excessive exploitation has pushed some species to the verge of extinction, including tiger, giant panda, black rhinoceros, cod and several whale species. Also, biodiversity loss is bringing about negative and adverse effects as far as human well-being (involving food security, vulnerability to natural disasters, energy security, access to clean water and raw materials, and health) itself is concerned. Depleted fish stocks, declining soil fertility, the collapse of pollinator species, the damage done by invasive species and the loss of potentially valuable genetic resources, all are in one way or another affecting the economic well-being of people worldwide.

The UN Millennium Ecosystem Assessment Report, released in January 2006, stated that many animal and plant populations have declined in numbers as well as in geographical spread. For instance, it said that a quarter of mammal species are currently threatened by extermination. Also, according to the report's findings, biodiversity on the whole is decreasing, as some rare species are lost and common ones spread to new areas. GLOBIO consortium for UN

Environment Programme (UNEP's) Global Environment Outlook 4, in its report entitled; "*Biodiversity Loss: State and Scenarios 2006 and 2050*", has envisioned that global biodiversity continues to be threatened. All regions continue to experience declines in terrestrial biodiversity in each of the scenarios. The greatest losses are seen in "markets first" (where market considerations shape environmental policy), followed by "security first" (where conflicts and inequality lead to strong socioeconomic boundaries between rich and poor), "policy first" (under which a range of actions is undertaken by governments to balance social equity and environmental concerns) and "sustainability first" (would require a value system change, favouring sustainability) for most regions.

Africa Latin America and the Caribbean experience the greatest losses of terrestrial biodiversity by 2050 in all four scenarios, followed by Asia and the Pacific. The differences among the regions are largely a result of broad-scale land-use changes, especially increases in pastureland and areas dedicated to biofuel production. The overall changes in terrestrial biodiversity, though, are influenced by a number of other factors, including infrastructure development, pollution and climate change, as well as public policy and conflict. Here is a map that outlines the predicted biodiversity loss: state and scenarios 2006 and 2050:⁵



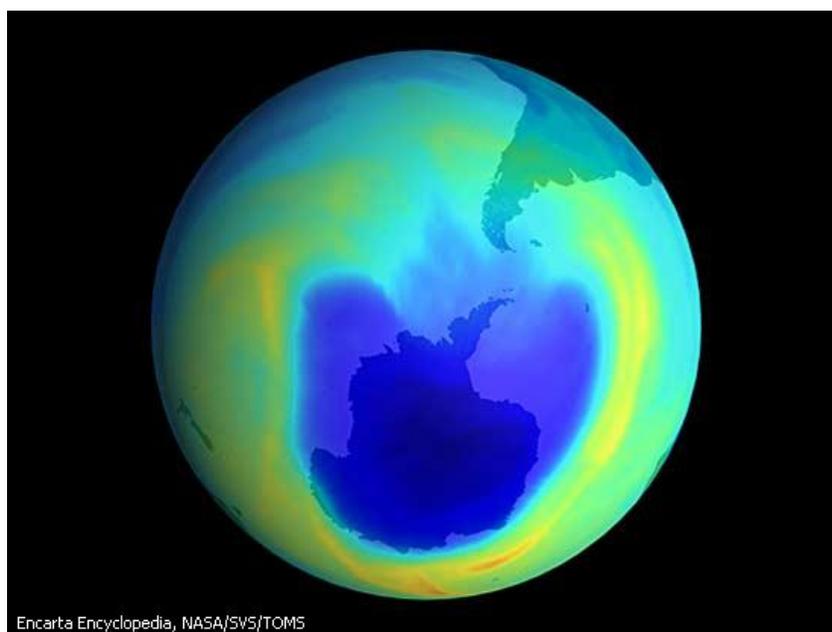
Source: UNEP: *Biodiversity Loss: State and Scenarios 2006 and 2050*.

<http://maps.grida.no/go/graphic/biodiversity-loss-state-and-scenarios-2006-and-2050>

b. *Ozone Depletion*

Ozone is a special molecular form of oxygen. In the stratosphere (19 to 48 km above earth's surface), it is formed by the action of sunlight on oxygen. The thickness of the ozone layer varies seasonally and geographically. Scientists believe that over the history of earth, the ozone concentration in the stratosphere, although small, has been relatively stable due to naturally occurring nitrogen compounds in the atmosphere. Ozone in the stratosphere is important to life processes on earth. Absorbing some of the ultraviolet radiation (UV-B) light reaching the earth from the sun, it acts as a regulator of the amount of UV-B light reaching the earth's surface.⁶ The stratosphere ozone layer is like a protective shield, a natural sunscreen for the planet.

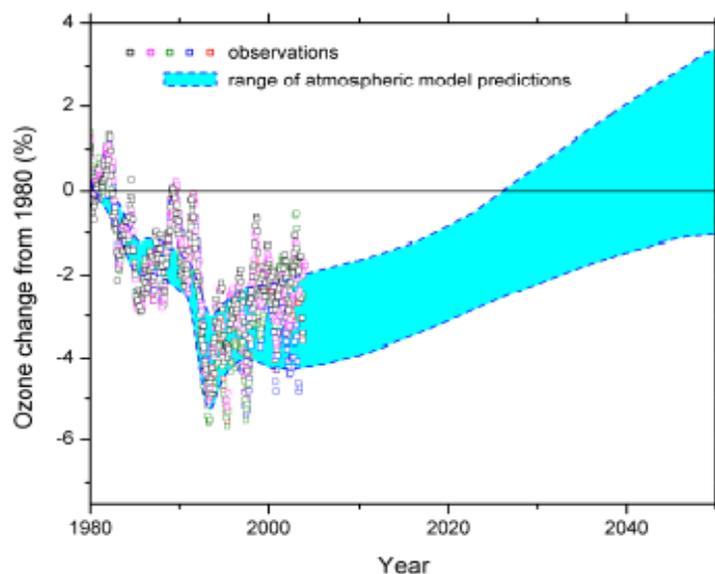
Scientific evidence has confirmed that ozone depletion speaks of the damage done to the ozone layer through human-made chemicals comprising chlorofluorocarbons (CFCs), hydrochlorofluorocarbons (HCFCs), halons, carbon tetrachloride, methyl chloroform, and methyl bromide. These chemicals are used in refrigeration, air conditioning equipment, aerosol sprays, fire extinguishers, foamed plastics, industrial processes and pesticides. Chemical reactions involving the bromine and chlorine molecules in these substances destroy ozone. A single molecule of chlorine and bromine has the ability to destroy thousands of ozone molecules.



The ozone hole over the South Pole is evident in this false-colour image taken by a satellite in October 1999. Low levels of ozone are shown in blue.

According to scientists, ozone depletion (UV-B radiation) has the ability to smash up our environment and human health as well. UV-B causes sunburn, skin cancer and cataracts; the greater a person's exposure to UV-B, the greater the

effect. As far as environmental dent is concerned, UV-B affects terrestrial, aquatic plant photosynthesis and disease resistance as well. In addition, some of ozone depleting substances entitled CFCs and Halons are powerful greenhouse gases that have influence over earth's climate (circulation, temperature, and composition).⁷ Intergovernmental Panel on Climate Change (IPCC) and (TEAP) in its report on "Safeguarding the ozone layer and the global climate system: 2005," predicted ozone depletion from 1980 to 2040 in the following chart:



Source: IPCC/TEAP Special Report: *Safeguarding the Ozone Layer and the Global Climate System; Issues related to HFCs and PFCs; Global Ozone Depletion*, 2005, Bonn, Germany. <http://www.ipcc.ch/pdf/presentations/briefing-bonn-2005-05/safeguarding-ozone-layer.pdf>

Ozone depletion from the anthropogenically-produced nitrogen oxides is likely to be more important in the future as concentrations of atmospheric chlorine decline. Larger amounts of chlorofluorocarbons (CFCs) than previously estimated are restricted in existing products, and a large proportion of these CFCs may eventually be released in atmosphere, where they will continue to destroy ozone.

c. Climate Change

Climate change refers to any change in the climate over time, whether due to natural variability or as a result of human activity. The climate change issue has emerged as one of the most serious environmental issues of the 21st century. It is the defining human development issue of our generation. Many climate scientists believe that human activity is responsible for climate change. They attribute the main cause of climate change to the burning of fossil fuels which increases the

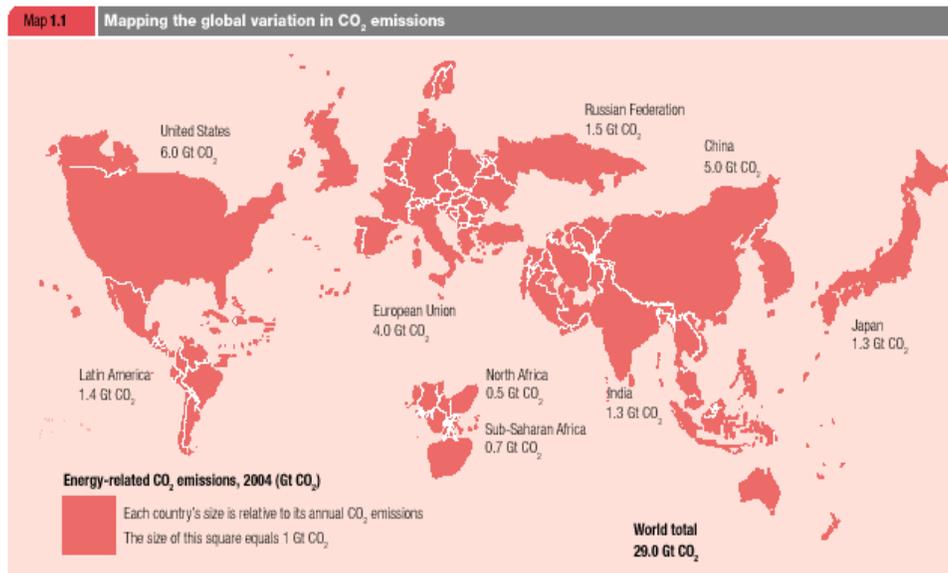
concentration of carbon dioxide (CO₂) gas in the atmosphere. Carbon dioxide warms the atmosphere through a process known as the atmospheric greenhouse effect. The atmospheric greenhouse effect is caused by certain gases in our atmosphere, called greenhouse gases, selectively absorbing and emitting infrared radiation, or heat energy.

The two most plentiful greenhouse gases are water vapour (H₂O) and carbon dioxide (CO₂). Other less plentiful (and hence less important) greenhouse gases include nitrous oxide (N₂O), methane (CH₄), and chlorofluorocarbons (CFCs). A greenhouse gas is like a filter; it allows the shorter wavelengths of radiant energy (such as visible light) to pass through, but absorbs some of the longer wavelengths of radiant energy (such as infrared radiation). Visible sunlight readily passes through the greenhouse gases to reach the earth's surface, where it warms the surface. The earth's surface, which is much cooler than the sun, emits radiant energy in the form of longer infrared waves. The greenhouse gases absorb some of these infrared waves emitted by the earth's surface. When greenhouse gases absorb infrared energy, they share this energy with other gases and the atmosphere warms.

The greenhouse gases also emit infrared radiation. Some of the emitted radiation travels back to the earth's surface, where it warms the earth again. By preventing the rapid escape of infrared energy to space, greenhouse gases act as an insulating layer around the earth, keeping its surface much warmer than it would be if these gases were not present. The atmospheric greenhouse effect is a natural effect that has been occurring for billions of years. Indeed, without it, the earth would be a frozen planet with an average temperature of about -18° C. Due to the greenhouse effect, the earth's average surface temperature is a comfortable 15° C (about 59° F).

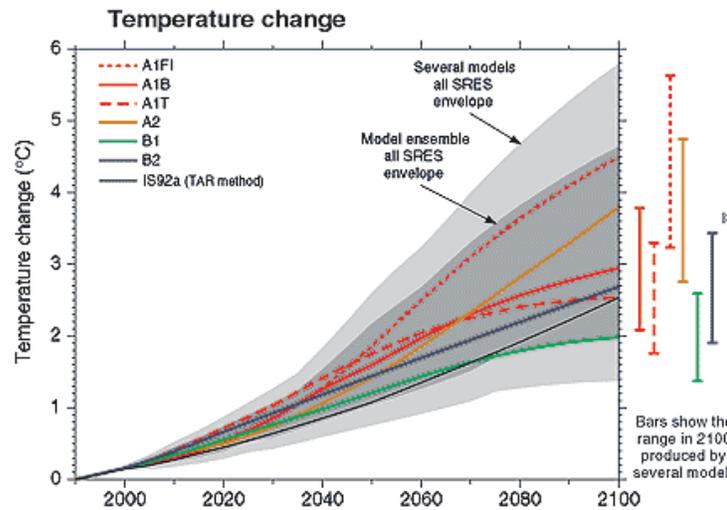
It is not the greenhouse effect that concerns scientists, but the enhancement of the greenhouse effects by human-induced increases (anthropogenic) in the levels of greenhouse gases. Fossil fuel burning such as coal and petroleum has produced about three-quarters of the increase in CO₂ from human activity over the past 20 years. Other contributing factors in climate change process include: aerosols (particular matter in the atmosphere), which exert a cooling effect; cement manufacturing; land-use change, in particular deforestation; and ozone depletion.⁸ According to the "*IPCC Climate Change Report: 2007*," the levels of carbon dioxide had risen to a record high of 379 ppm and are increasing an average of 1.9 ppm per year. Surprisingly, with just 15 per cent of the world population, rich countries account for 45 per cent of CO₂ emissions, Sub-Saharan Africa accounts for just two per cent, while, low-income countries account for seven per cent.⁹

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Source: Human Development Report 2007/2008; *Fighting Climate Change: Human Solidarity in a Divided World*; pg.57, Published for UNDP by Palgrave Macmillan Houndmills, Basingstoke, Hampshire RG21 6XS and 175 fifth Avenue, New York, NY10010. http://www.undp.org.za/docs/GHDR_2007.pdf

Nonetheless, if the foretold increase in greenhouse gas concentrations is converted into temperature change, then a global temperature increase of between one and 5.5 degrees centigrade is expected by 2100. The average predicted temperature increase over the next 100 years is around three degrees centigrade. This compares to an increase of about one degree centigrade due to the previous man-made greenhouse gas emissions.



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Source: "Climate Change, Fact, Argument, Policy, and Theory; Predictions", *GreenHouse Gas Online (GHG)*. <http://www.ghgonline.org/predictions.htm>

A1, A2, B1, and B2 are 4 SRES Scenarios. SRES refers to the scenario described in the IPCC Special Report on Emission Scenarios (SRES: 2000). The SRES scenarios (A1, A2, B1, and B2) explore alternative development pathways, covering a wide range of demographic, economic, and technological driving forces and resulting Green House Gases (GHG) emissions. The emission projections are widely used in the assessment of future climate change, and then underlying assumptions with respect to socio-economic, demographic, and technological changes serve as inputs to many current climate change vulnerability and impact assessments.

The A1 assumes a world of very economic growth, a global pollution that peaks in mid-century and rapid introduction of new and efficient technologies. A1 I divided into three groups that explains alternative directions of technological change fossil alternative (A1F1), non-fossil energy sources (A1T), and a balance across all sources (A1B). B1 explains a convergent world with the same global population as A1, but with more rapid changes in economic structures toward a service and information economy. B2 describes a world with intermediate population and economic growth, emphasizing local solutions to economic, social, and environmental sustainability. A2 describes a very heterogeneous world with high population growth, slow economic development and slow technological change.

In case the global temperature rises to the extent that is predicted, there will be a sharp rise in sea-level as well as in the intensity of extreme weather. Other effects include changes in agricultural yields, trade routes, glaciers retreat, and species extinction. Sea level rise, through the thermal expansion of water and ice melt around the world, will pose a very serious threat to millions of people. The impact of such sea level rise would likely to be greatest in low lying countries, like Bangladesh, as they are least able to adapt to the sea level rise by building expensive sea defences. Here is a projected global average surface warming and sea level rise by the end of the 21st century:

Case	Temperature change (C at 2090-2099 relative to 1980-1999)		Sea level rise (m at 2090-2099 relative to 1980-1999)
	Best estimate	Likely range	Model-based range Excluding future rapid dynamical changes in ice flow
Constant year 2000 concentrating	0.6	0.3-0.9	Not available

B 1 scenario	1.8	1.1-2.9	0.18-0.38
A 1 scenario	2.4	1.4-3.8	0.20-0.45
B2 scenario	2.4	1.4-3.8	0.20-0.43
A 1B scenario	2.8	1.7-4.4	0.21-0.48
A 2 scenario	3.4	2.0-5.4	0.23-0.51
A 1F1 scenario	4.0	2.4-6.4	0.26-0.59

Source: "Climate Change: 2007; Synthesis Report", *IPCC*, pg. 23, http://www.ipcc.ch/pdf/assessment-report/ar4/syr/ar4_syr.pdf

Contrast between the Environmental Challenges of the Past and the Current Decade

Historical environmental changes are considered to be the result of natural causes and variations, but the trend of the current changes emerging in our environment demonstrates the human influence. Human-induced impacts on our environment have elevated the environmental threat to our planet more than ever before in human history. Over the past few decades, humans have become the dominant agents of change; for example, through modification of atmospheric composition by fossil fuel burning and land-use changes, and through direct alteration of both the physical and ecological environments. The human transformation of the earth's surface threatens our environment in as destructive a way as any of the past cataclysmic physical disasters.

UN Role in Addressing Environmental Challenges

Given the global dimension of the issue and the moral authority the organization possesses, the role of UN in environmental protection cannot be overlooked. The UN has played a significant role in creating environmental awareness among the public and policymakers through its scientific and technical research reports and proceedings of the UN-sponsored conferences on environment published by its different specialized agencies and programmes like UNEP and Commission on Sustainable Development (CSD). The UN has helped the international community in understanding the complexity of this issue and forcing them to negotiate an international agreement to address the environmental issue in a doable way. Here is a figure of the 'environmental DNA' of the UN system:

Environmental issues are firmly on the UN agenda, and the global body has made significant progress in mobilising the international community, governments, and major groups as far as the environmental protection issue is concerned. The UN's specifically-mandated environmental programme; the UNEP, has encouraged international efforts on environmental degradation. It has coordinated international negotiations on ozone depletion and on the biodiversity issue. The UN Environment Programme (UNEP) and the World Meteorological Organization (WMO) have been instrumental in highlighting the damage caused to the earth's ozone layer. As a result of a treaty known as the Montreal Protocol, there has been a global effort to reduce chemical emissions of substances that have caused the depletion of the ozone layer.

This UN effort has spared millions of people from the increased risk of contracting cancer due to additional exposure to ultraviolet radiation. Moreover, it has forged partnerships with the WMO to advance the climate change debate and created the "Intergovernmental Panel on Climate Change (IPCC)" to evaluate the emerging scientific evidence that increased burning of fossil fuels was changing climate. Then again, in the 1992 Rio Earth Summit, the "Conventions covering Biological Diversity; Desertification" and UN Framework Convention on Climate Change" were agreed. A \$3 billion funding mechanism, the "Global Environment Facility (GFC)", was established to assist developing countries meet the environmental and sustainability challenge.

Also, the Kyoto Protocol was adopted in December 1997 in order to limit the emissions of carbon dioxide and other so-called greenhouse gases. However, the protocol entered into force in February 2005. As of November 2007, 175 parties have ratified this protocol which is an important landmark for the UNFCCC as to some extent it remains successful in making states realise the dire consequences if they failed to take action at present. The Kyoto Protocol asked 38 industrialized nations to reduce their emissions by an average of 5.2 per cent below the 1990 levels by 2012. It will expire in 2012. The United States, which currently emits more than 20 per cent of the world's carbon dioxide from fossil fuels, agreed to a seven per cent cut below the 1990 level, while 15 nations of the EU committed themselves to an eight per cent reduction. Japan agreed to a six per cent cut. The pact does not require any binding emission reductions for developing countries.

The Kyoto Protocol has been facing a fierce debate in recent times. Some public policy experts see Kyoto as a scheme to either slow the growth of the world's industrial democracies or to transfer wealth to the third world countries. Also, there are claims that the protocol would not be able to curb greenhouse emissions. Environmental economists think that the cost of the Kyoto Protocol is dominating the benefits. Further, there is controversy surrounding the use of 1990 as a base year, as well as not using per capita emissions as a basis. Countries had different achievements in energy efficiency in 1990. For example, the former Soviet Union and in current times Russia and eastern European

countries, did little to tackle the problem and their energy efficiency was at its worst level in 1990; the year just before their communist regimes fell. Japan, as a big importer of natural resources, on the other hand, had to improve its efficiency after the 1973 oil crisis and its emissions level in 1990 was better than most developed countries.

According to the defenders of the Kyoto Protocol, though the initial greenhouse gas cuts may have little effect, it set the political precedent for bigger and more effective cuts in the future.¹⁰ By missing the opportunity presented in the form of the Kyoto Protocol, the international community would put its future generations in deep trouble. Acting now to set up real changes could lead to a future in which human interference with the climate is minimized and energy resources are truly sustainable. The process begun at Kyoto has provided an opportunity that must not be squandered away. Nonetheless, other important landmarks for the global body in the 21st century so far are as follows:

- ***UN-sponsored Conferences/Summits on Environment in the 21st Century***

1. *Rio-plus; johannesberg summit: 2002*

The UN World Summit on Sustainable Development, Rio-Plus 10, was convened in order to execute the ambitious agenda of Rio Conference 1992. In this summit, the south wanted more aid for economic growth; the Europeans wanted targets and timetables, whereas the U.S. found targets unnecessary. The major outcome of this summit was the Plan of Implementation, comprising some targets to be achieved: access to clean water and proper sanitation and restoration of fisheries by 2015, reduction of biodiversity loss by 2010, and better use of chemicals by 2020, as well as more use of renewable energy without any target or plan specified.¹¹

2. *Un world summit in 2005*

In the 2005 World Summit, the participants admitted that climate change is a serious and long-term challenge. They also reiterated their liability to the ultimate objective of the Convention: to stabilize greenhouse gas concentrations in the atmosphere at a level that prevents dangerous anthropogenic interference with the climate system. Moreover, they acknowledged that global nature of climate change calls for the widest possible cooperation and participation in an effective and appropriate international response, in accordance with the principles of the Convention. They agreed to take further action through practical international cooperation. It was decided to encourage innovation, clean energy, energy efficiency, and conservation; improve policy, regulatory, and financing frameworks; and accelerate the deployment of cleaner technologies.

Furthermore, they agreed to enhance private investments, transfer of technologies and capacity-building measures to developing countries, as called

for in the Johannesburg Plan of Implementation. Additionally, the participants agreed on assisting the developing countries to improve their resilience and integrate adaptation goals into their sustainable development strategies, given that adaptation to the effects of climate change due to both natural and human factors is high priority for all nations.

Regarding biodiversity, it was decided in the summit that the States parties to the Convention on Biological Diversity and its Cartagena Protocol on Biosafety should back the implementation of the Convention and the protocol. The States would continue to negotiate within the framework of Convention on Biological Diversity. All states would fulfil commitments and significantly reduce the rate of loss of biodiversity by 2010. Other commitments related to the environmental issue involving water degradation, hazardous wastes, oceans and seas, the global environment facility, and natural disasters, etc., were also made.¹²

3. The UN Climate Change Conference In Bali, Indonesia: December 2007

The UN Climate Change Conference was held from December 3 to 15, 2007, in Bali, Indonesia. Representatives from over 180 countries attended, together with observers from intergovernmental and non-governmental organisations. Negotiations on a successor to the Kyoto Protocol dominated the conference. The following are some key elements of the roadmap agreed to in Bali:

Cutting Emissions:

The Bali Summit acknowledged that any further delay in reducing emissions would increase the risks of severe climate change impacts. It also called for deep cuts in global emissions in order to avert a dangerous climate change. It was also agreed to look at a long-term global goal for emission reductions. It urged the developed nations to take on commitments that are measurable, reportable and verifiable, and nationally appropriate. It asked the developing nations on the other hand, to take on commitments that are measurable, reportable and verifiable actions in the context of sustainable development supported by technology and enabled by financing and capacity-building. It refers to only western support in this regard.

Forests:

It vowed to consider policy approaches and positive incentives to lessen deforestation and conserve forest cover. It also promised funds to the World Bank for starting a pilot project under the title of reducing emissions from deforestation in developing countries.

Adaptation:

It recommended cooperation to support urgent implementation of measures to protect poorer countries against climate change impacts. The summit also agreed that economic diversification can build flexibility.

Technology Transfer:

Participants at the Bali summit decided to think over the possibilities as to how to remove obstacles to, and the provision of, financial and other incentives for scaling up the transfer of clean energy technologies from industrialized nations to the developing world. They also concurred to restore an expert group on technology transfer to counsel developing countries.

Timescales:

It was also decided that a subsidiary body would start work on the Bali roadmap immediately. Also, further review meetings were scheduled; the process to complete at the 2009 UN summit in Copenhagen, Denmark.

The Bali outcome created huge expectations for strengthened international action on climate change by 2009. Hence, in order to conform to those expectations, it is necessary that the negotiations on a UN climate protection agreement should be concluded by the end of 2009.¹³

4. Bangkok Climate Change Talks: 2008

The Bangkok climate change talks were held from March 31 to April 4, 2008. It was the first meeting since last December's landmark UN Climate Change Conference in Bali, Indonesia. The Bangkok talks did well in devising a schedule for negotiations on a new global climate change agreement to succeed the Kyoto Protocol – set to expire in 2012. The meeting also mapped out the focus of the next major climate change conference, to be held in December 2009 in Poznan, Poland, which will address the issue of risk management and risk reduction strategies, technology and the key elements of a shared long-term vision for joint action in combating climate change, including a long-term target to reduce greenhouse gas emissions.¹⁴

These UN environmental conferences have played a vital role in addressing environment challenges by establishing UN agencies specifically dealing with different environmental issues. For example, the UN created a “UN Environment Programme (UNEP)” in 1972, the designated authority of the UN system in environmental issues at the global and regional level. Furthermore, in 1988, the UN along with the cooperation of World Meteorological Organization (WMO)

created the “Intergovernmental Panel on Climate Change”, a panel of more than 200 earth scientists to study climate change.

- UN Environment Programme

The mandate of the UN Environment Programme is to coordinate the development of an environmental policy consensus by keeping the global environment under review and bringing emerging issues to the attention of governments and the international community for action. UNEP has had significant success in the development of global and regional instruments. Along with the cooperation of UNDP, it is also busy in building the capacity of developing countries to share funds and projects flowing from the clean development mechanism (CDM), while advancing adaptation or climate proofing agenda. UNEP has made important contribution in addressing environmental challenges involving biodiversity loss, ozone depletion, and the climate change issue by publishing reports on different environmental issues in the current era. The following are two important UNEP reports published in 2007 and 2008:

- a. *UNEP's Global Environment Outlook Report: 2007*

UN Environment Programme's “Global Environment Outlook: Environment for Development (GEO-4) Report: 2007” is the latest in UNEP's series of flagship reports. It is the most comprehensive UN report on the environment. The report was published 20 years after the Brundtland Commission produced its seminal report, “Our Common Future”. The report warned that the major threats to the planet like climate change, the rate of extinction of species, and the challenge of feeding a growing population are among the many that remain unresolved, which in turn are putting humanity at risk. The report evaluated the current state of the global atmosphere, land, water and biodiversity, described the changes since 1987, and identified priorities for action. The report recognized the world progress in dealing with some relatively straightforward problems. The report stated that over the past 20 years, the world community had cut, by 95 per cent, the production of ozone layer damaging chemicals; created a greenhouse gas emission reduction treaty along with innovative carbon trading and carbon offset markets; suspended a rise in terrestrial protected areas to cover roughly 12 per cent of the earth and devised several important instruments covering issues from biodiversity and desertification to the trade in hazardous wastes and living modified organisms.

Regarding climate change, the report said that the threat required immediate large cuts in greenhouse gases by mid-century. GEO-4 also warned that we are living far beyond our means. It said that the climate change issue was a “global priority” demanding political will and leadership. The human population growth rate is increasing at a high rate, whereas the amount of resources needed to sustain it exceeds what is available. Humanity's footprint (environmental demand) is 21.9 hectares per person; while the earth's biological capacity is, on

average, only 15.7 hectares per person. The report warned that the well-being of billions of people in the developing world is at great risk.

With respect to biodiversity, the report said that the current changes are the fastest in human history. Species are becoming extinct a hundred times faster than the rate shown in the fossil record. About 60 per cent of the ecosystem services are being used unsustainably. Over half the world's 6,000 languages are dying out, and some believe upto 90 per cent of all languages may not survive this century.

As far as water is concerned, the report stated that irrigation already takes away about 70 per cent of available water; yet meeting the MDG on hunger will mean doubling food production by 2050. Fresh water is declining; by 2025, water use is predicted to rise by 50 per cent in developing countries and by 18 per cent in the developed world. It also said that the escalating burden of water demand will become intolerable in water-scarce countries. Globally, contaminated water remains the greatest single cause of human disease and death.

It is also the first GEO report in which all seven of the world's regions highlighted the potential impacts of climate change. In Africa, land degradation and desertification are threats; per capita food production has reduced to 12 per cent since 1981. Asia and the Pacific will face urban air quality, fresh water crisis, degraded ecosystems, agricultural and land use threats. Europe's rising incomes and growing numbers of households are leading to unsustainable production and consumption, higher energy use, poor urban air quality problems. Also, biodiversity, land-use change and freshwater are matter of concerns for Europe. Latin America and the Caribbean face urban growth, biodiversity threats, coastal damage and marine pollution, and vulnerability to climate change. North America faces climate change threats. West Asia is struggling to address the freshwater stresses, degradation of land, coasts and marine ecosystems, urban management, and peace and security. The Polar Regions are feeling the impacts of climate change. The food security and health of indigenous people are at risk. The ozone layer is expected to take another half century to recover.

The GEO-4 report said that the only way the international community can be successful in dealing with these environmental challenges is to move the environment from the periphery to the core of decision-making: environment for development, not development to the loss of environment. It also said that our common future depends on our actions today, not tomorrow or some time in the future.¹⁵

b. UNEP Year Book: 2008

The UNEP Year Book 2008 (formerly, the Global Environmental Outlook Year Book) is the fifth annual report on the changing environment produced by the United Nations Environment Programme in collaboration with many world

environmental experts. The Year Book 2008 highlighted the increasing complexity and interconnections of climate change, ecosystem integrity, human well-being, and economic development. It put emphasis on fast emerging “green economies” It stated that as the climate change continues to alter the global environment, it is also changing the mind-sets and actions of corporate heads, financiers and entrepreneurs.

The report underlined that the important leaders of the private sector are increasingly recognizing climate change as a financial opportunity rather than a burden, hence driving the technological innovation that will provide a backbone for the emerging green economy. According to the Year Book, the world is experiencing new invention and imagination on a scale perhaps not witnessed since the industrial revolution of more than two centuries ago. Here are a few key findings from the UNEP Yearbook: 2008:

- Corporate Social Responsibility (CSR) reporting, including environmental concerns, is now found among corporations in over 90 countries with the number of such statements mushrooming from virtually zero in the early 1990s to well over 2,000 now.
- The Investor Network on Climate Change, launched in November 2003, now has some 50 institutional investors with assets of over \$3 trillion.
- The Principles for Responsible Investment, jointly facilitated by UNEP's Finance Initiative and the UN Global Compact in 2006, now has 275 institutions with \$13 trillion of assets.
- A survey of companies in six sectors ranging from mining and energy to food and media indicates that those with pioneering environmental, social and governance strategies are out-performing the general stock market by 25 per cent.
- Cutting greenhouse gas emissions and boosting energy efficiency ranked number one among 54 per cent of those questioned, followed by recycling, 52 per cent, and waste reduction, 27 per cent.
- Some of the world's most carbon-intensive industries are leading the way in publicly disclosing their carbon footprint under an eight-year-old initiative called the Carbon Disclosure Project. Close to 80 per cent of the *Financial Times* 500 corporations are disclosing their carbon performance. And, over three-quarters of these are also reducing their greenhouse gas emissions, up from nearly half the year before.
- Among those most effectively reducing their emissions are electric power companies in North America; international automobile manufacturers and metals and mining companies. But, other sectors appear to be either treading water or seeing emissions continue to rise, including oil and gas and chemicals.
- The Clean Development Mechanism (CDM), which allows industrialized countries to offset some of their domestic emissions via cleaner and renewable energy schemes alongside afforestation and reforestation projects in developing countries, has been widely used. As of November 2007, over

850 projects had been registered in nearly 50 countries worth just over \$1 billion. A further \$1.4 billion are in the pipeline and the CDM could, if fully exploited, eventually trigger investment flows for some \$100 billion from North to South.

The policy recommendations include:

- Action to remove fossil fuel subsidies. That could reduce CO₂ emissions by five to six per cent annually. Currently, fossil fuel subsidies amount up to \$200 billion a year versus support for low-carbon technologies of an estimated \$33 billion annually.
- In order to stabilize CO₂ at no more than 550 parts per million, support for innovation needs to rise from just over \$30 billion to \$90 billion by 2015 and to \$160 billion by 2025, some experts believe.
- Global targets for improvements in energy need to increase to 2.5 per cent annually. Those should be supported by stronger energy- saving building codes for new and existing structures and penalties or disincentives for builders to choose the cheapest, least energy efficient designs and materials.
- Utility pricing that favours energy efficiency should be adopted to promote combined heat and power and improve energy savings in existing power plants and electricity transmission infrastructure.
- Policies that increase the uptake of renewables may include laws that guarantee a fixed price for each unit of renewable electricity generated; regulations that boost access to the grid and incentives for second generation biofuel.¹⁶

In addition to these reports, the UNEP, together with the World Conservation Monitoring Centre (WCMC), prepared a “*World Atlas of Biodiversity: Earth's Living Resources for the 21st Century*” in 2002. According to the atlas, plants are vanishing so quickly that the earth is losing one major drug to extinction every two years. The atlas graphically gives a picture of humankind's alteration of the natural world. According to it, during the past 150 years, humans have directly impacted close to 47 per cent of the global land area. It stated that biodiversity will be threatened on almost 72 per cent of earth's land area by 2032. Southeast Asia, the Congo Basin and parts of the Amazon are predicted to suffer the greatest losses of biodiversity. As much as 48 per cent of these areas will become converted to agricultural land, plantations and urban areas, compared with 22 per cent today, suggesting wide depletions of biodiversity.¹⁷

Also, the UN, in order to address the problems of loss of biodiversity, adopted the Cartagena Protocol, also known as the Biosafety Protocol, in January 2000, but it came into force in 2003. The Biosafety Protocol seeks to protect biological diversity from the potential risks posed by living modified organisms resulting from modern biotechnology. The Biosafety Protocol makes clear that products from new technologies must be based on the precautionary principle and allow developing nations to balance public health against economic benefits.

It will, for example, let countries ban imports of a genetically modified organism if they feel there is not enough scientific evidence the product is safe, and requires exporters to label shipments containing genetically altered commodities such as corn or cotton.¹⁸

Furthermore, In April 2002, the member countries attending the sixth meeting of the Conference of the Parties (COP) to the “Convention on Biological diversity (CBD)” committed themselves to achieve by 2010 a significant reduction of the current rate of biodiversity loss at the global, regional and national level as a contribution to poverty alleviation and to the benefit of all life on earth. This target was subsequently approved by the World Summit on Sustainable Development and the United Nations General Assembly at the 2005 World Summit and was incorporated as a new target under the Millennium Development Goals. The 2010 Biodiversity Target is one of the four new targets being incorporated into the Millennium Development Goals, as proposed by the UN Secretary General in his report to the UN General Assembly’s 61st session.

To assess progress in achieving the goals of the 2010 Biodiversity Target, and to help communicate the state of this progress to the public, the parties agreed on a framework of focal areas to guide action. The seven focal areas adopted at the 2004 conference are:

- Reducing the rate of loss of the components of biodiversity, including: (I) biomes, habitats and ecosystems;(ii)species and populations; and (iii) genetic diversity;
- Promoting sustainable use of biodiversity;
- Addressing the major threats to biodiversity, including those arising from invasive alien species, climate change, pollution, and habitat change;
- Maintaining ecosystem integrity, and the provision of goods and services provided by biodiversity in ecosystems, in support of human well-being;
- Protecting traditional knowledge, innovations and practices;
- Ensuring the fair and equitable sharing of benefits arising out of the use of genetic resources; and
- Mobilizing financial and technical resources, especially for developing countries, in particular least developed countries and small island developing states among them, and countries with economies in transition, for implementing the Convention and the Strategic Plan.¹⁹

For each of the seven focal areas of the framework, the conference identified indicators for assessing biodiversity status and trends, and outcome-oriented goals and targets, which act as sub-targets to the overall 2010 Biodiversity Target. Such clear, stable, long-term targets, relating to concrete outcomes, can help shape expectations and create the conditions under which all actors, whether governments, the private sector, or civil society, have the motivation to develop solutions for meeting agreed-upon challenges. These targets also form the core of the United Nations’ Millennium Development Goals, providing a commonly

agreed focus for activities by all countries and stakeholder groups to meet the needs of the world's poorest people.

- *Intergovernmental Panel On Climate Change (Ippc) Report*

The IPCC has played an important role in creating awareness among the international community about the changes occurring in climate by providing scientific data related to climate change about every five years. In its third assessment report, released in January 2001, it envisaged a sharp increase in global average surface temperature. According to the report, it predicted a global average surface temperature rise of 1.4-5.8C (2.5 to 10.4F) over the period of 1900 to 2100. The IPCC report for the first time identified human activity as the primary cause of global warming. The IPCC has released its latest report in February 2007, in Paris, France, with its strongest warning yet that those human activities are causing a global warming that may bring more drought, heat waves and rising seas. The key conclusions were:

- Warming of the climate system is explicit.
- Most of the observed increase in globally averaged temperatures since the mid-20th century is very likely due to the observed increase in anthropogenic (human) greenhouse gas concentrations.
- Anthropogenic warming and sea level rise would continue for centuries due to the timescales associated with climate processes and feedbacks, even if greenhouse gas concentrations were to be stabilized, although the likely amount of temperature and sea level rise varies greatly depending on the fossil intensity of human activity during the next century.
- The probability that this is caused by natural climatic processes alone is less than 5 per cent.
- World temperatures could rise by between 1.1 and 6.4 °C (2.0 and 11.5 °F) during the 21st century, and that:
 - Sea levels will probably rise by 18 to 58 cm (7.08 to 23.22 in).
 - There is a confidence level of 90 per cent that there will be more frequent warm spells, heat waves and heavy rainfall.
 - There is a confidence level of 66 per cent that there will be an increase in droughts, tropical cyclones, and extreme high tides.
- Both past and future anthropogenic carbon dioxide emissions will continue to contribute to warming and sea level rise for more than a millennium.
- Global atmospheric concentrations of CO₂, methane, and NO₂ have increased markedly as a result of human activities since 1750 and now far exceed pre-industrial values over the past 650,000 years.²⁰

Future Recommendations

The UN reports and conferences have contributed to a great extent in attracting the world community's attention to the most threatening issue of the 21st century: environmental degradation. The UN is the only multilateral

organization that is universal in its membership and global in its scope. And, the environmental problems facing the international community have a global reach; ecologically, economically, and politically. It is difficult to think of an environmental issue with global relevance or an environmental agreement with universal membership, which is not in some way governed primarily under the auspices of some part of the UN. However, there is a growing feeling that the UN's capacity and legitimacy are in decline as far as the environmental issue is concerned. Therefore, the UN needs to overcome the existing weakness in addressing the environmental challenges in a more effective way.

- The UN must oblige its member states to implement an effective work plan at three levels; domestic, regional and global; in order to cope with these increasing environmental threats.
- The UN Security Council (UNSC) should reform its efforts as far as global environmental threats are concerned. It has the legitimate and legal authority, acting under the provisions of Chapter VII, Article 41 of the UN Charter, to impose measures to counter regional and global threats to the environment which pose a great threat to human life and living conditions. By using this right, the UNSC should be practical in its efforts and put sanctions against any state or nation whose actions could put the whole environment at risk.
- The UN needs to better coordinate and synchronize the environment and sustainable development objectives within the UN system in the geographical context. The UNEP resides in Nairobi, the Commission for Sustainable Development is in New York, the Global Environmental Facility is based in Washington, D.C., whereas the secretariats for various conventions are scattered; that of the Convention of Biological Diversity is based in Montreal, Canada, and of the Climate Change Convention is in Bonn, Germany.
- The member states have agreed to different UN multilateral environmental agreements. However, their determination and commitments to these UN multilateral environmental agreements and principles are just in theory instead of in practice, which the UN should seriously take up. The political interests of its member states, especially of the powerful amongst them, have made things difficult for the UN in executing its environment-related agreements. Hence, the world body needs to ensure that those agreements are effective in their provisions and implementation by negotiating a legal agreement that will force the member states to respect the environmental agreements in practice.
- Also, the UN has to develop solid environmental assessment methodologies and policies in order to improve environmental assessment for its different environmental specialized agencies and programmes like UNEP, etc.
- The UN needs to create public consciousness over environmental protection issues. That can be done by launching environmental awareness programmes for a common man with the help of the media in different languages. Environmental challenges entail a global grassroots public awareness

campaign to focus political pressure and keep environmental issues at the forefront of public consciousness.

- The UN should encourage the development of regional agencies in the management of environmental concerns and seek to integrate them into its institutional structure for implementing global conventions as well as managing region-specific problems.

Conclusion

Environmental challenges are global challenges. To understand them, to cope with them and to try to keep them from getting worse, demands the entire international community to be united against the environmental challenges. The world is heading towards unprecedented losses of biodiversity, which is mounting in many regions. Biodiversity loss needs to be addressed urgently because biodiversity is important to combat hunger. The climate change scenarios are pointing in worrying directions as per scientific assessments. It is among a host of new challenges that is making it increasingly difficult for the world's poorest people to escape from hunger and poverty. Ozone depletion is also another worrying phenomenon for us. Environmental problems need innovative policies both at global and individual state level. Also, there is a need for fundamental reorientation of public and private policies on environmental issues.

The UN has to some extent been able to expose the environmental issues through debates, holding conferences, and reports, but it has not yet been able to force the states, especially the industrialized ones, to fully comply with its environment-related agreements, such as the Kyoto Protocol, due to weak the organizational framework and the many veto power. It is time now that finger-pointing between nations is stopped. There is an urgent need of finding workable solutions for the emerging environmental problems before they reach irreversible turning points. That can be achieved only if the member states cooperate with the UN as it's a global forum and provides the best platform to its member states to sit together and sort out practical solution without delay on environmental issues.

Notes

¹ Natural Environment, http://en.wikipedia.org/wiki/Natural_environment

² 'Global Environment Outlook (GEO 4)'; *Environment for Development*, Published by UN Environment Programme (UNEP); 2007, pg. 43.
http://www.unep.org/geo/geo4/report/01_Environment_for_Development.pdf

³ 'Environment-Biodiversity and Nature',
http://ec.europa.eu/environment/nature_biodiversity/index_en.htm

⁴ Dr. John Sale, 'Biodiversity Loss', <http://www.jri.org.uk/brief/biodiversity.htm>

⁵ GLOBIO 3 analysis, by MNP, UNEP-WCMC and UNEP/GRID-Arendal, published in: UNEP. 2007. Global Environment Outlook 4 - Environment for Development. Nairobi, Kenya: UNEP. <http://maps.grida.no/go/graphic/biodiversity-loss-state-and-scenarios-2006-and-2050>

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- ⁶ Larry Parker, 'Stratospheric Ozone Depletion: Implementation issues', *CRS Report*, July 12, 2000, <http://www.nceonline.org/NLE/CRSreports/stratospheric/strat-5.cfm>
- ⁷ David Suzuki, *Introduction: Two of the Most Urgent Global environmental Challenges in Human History*, <http://www.davidsuzuki.org/files/Ozone.pdf>
- ⁸ 'Climate Change/Global Warming', http://encarta.msn.com/encyclopedia_761567022/Global_Warming.html
- ⁹ Human Development Report 2007/2008; *Fighting Climate Change: Human Solidarity in a Divided World*; pg.57, Published for UNDP by Palgrave Macmillan Houndmills, Basingstoke, Hampshire RG21 6XS and 175 fifth Avenue, New York, NY10010. http://www.undp.org.za/docs/GHDR_2007.pdf
- ¹⁰ "Kyoto Protocol", http://en.wikipedia.org/wiki/Kyoto_protocol
- ¹¹ Margaret P. Karens and Karen A. Mingst, *International Organisations: The Politics and Processes of Global Governance*, (New Delhi: Viva Books Limited, Edition. 2005), p. 468.
- ¹² "2005 World Summit Outcome", *UN General Assembly, Sixtieth Session; Items 48 and 121 of the Provisional Agenda*, September 15, 2005. <http://www.who.int/hiv/universalaccess2010/worldsummit.pdf>
- ¹³ 'At a Glance: Bali Climate Deal', *BBC News*, December 15, 2007, <http://news.bbc.co.uk/2/hi/science/nature/7146132.stm> .
- ¹⁴ "Bangkok climate change talks good start, but 'huge' task lays ahead", *UN News*, April 10, 2008, <http://www.un.org/apps/news/story.asp?NewsID=26279>.
- ¹⁵ "Planet's Tougher Problem Persist", *Global Environment Outlook: Environment for Development (GEO-4)*, October 25, 2007, www.unep.org/Documents.Multilingual/Default.asp?l=en&ArticleID=5688&DocumentID=519
- ¹⁶ UNEP Year Book: 2008; 'An Overview of Changing Environment, Breaking Down the Barriers to a green Economy', February 20, 2008, Monaco. www.unep.org/Documents.Multilingual/Default.asp?DocumentID=528&ArticleID=5748&l=en,
- ¹⁷ 'UN Atlas of Biodiversity Maps'; Human Impact, Cambridge, England, August 1, 2002. <http://www.ens-newswire.com/ens/aug/2002/2002-08-01-01.asp>.
- ¹⁸ Christopher Bill, Robert Falker, and Helen Marquard, *The Cartagena Protocol: Reconciling Trade in biotechnology with Environment and Development*, (London: Earth Scan Publishers, July 2002), p. 5, http://books.google.com.pk/books?id=JNgV8LcRXvQC&printsec=titlepage&dq=the+biosafety+protocol+makes+clear+that+products+from+new+technologies+must+be+based+on+the+precautionary+principle&psp=1&source=gbs_toc_s&cad=1#PPR5,M1
- ¹⁹ Rashid Hassan, Robert Scholes, Neville Ash, 'Ecosystems and Human Well-being: Current State and Trends'; Volume 1, *Biodiversity*, (Washington, Island Press, 2005) p. 112, [http://books.google.com.pk/books?id=UFVmiSAr-okC&pg=PA112&lpg=PA112&dq=%E2%80%A2%09Reducing+the+rate+of+loss+of+the+components+of+biodiversity,+including:+\(I\)+biomes,+habitats+and+ecosystems%3B\(ii\)species+and+populations%3B+and+\(iii\)+genetic+diversity%3B+&source=web&ots=I6ADTVUXUo&sig=_-vUDE_uGKQDNEzY78G06xEQBJg&hl=en](http://books.google.com.pk/books?id=UFVmiSAr-okC&pg=PA112&lpg=PA112&dq=%E2%80%A2%09Reducing+the+rate+of+loss+of+the+components+of+biodiversity,+including:+(I)+biomes,+habitats+and+ecosystems%3B(ii)species+and+populations%3B+and+(iii)+genetic+diversity%3B+&source=web&ots=I6ADTVUXUo&sig=_-vUDE_uGKQDNEzY78G06xEQBJg&hl=en).
- ²⁰ 'The evidence for human-caused global warming is now unequivocal', *UNEP/GRID Newsroom*, February 2, 2007, <http://www.grida.no/Newsroom.aspx?m=54&pressReleaseItemID=1050>