



Info on Human Development

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Among Ourselves

Climate Change, Mindset Change and Lifestyle Change?

There is a growing awareness among many people and countries of the importance of Climate Change and Global Warming. We have therefore in this issue of the *Info on Human Development* begin with a simple overview of Climate Change so as to have a better understanding of the phenomenon, a brief outline of the growth in our historical and religious perspectives and realities, as well as the teachings of the Church. We have also reprinted a copy of the Kyoto Protocol that defines Climate Change and the corresponding responsibilities of Nations and the Global Community.

We are all aware that for almost two decades, the United Nations has sponsored annual global talks, the United Nations Framework Convention on Climate Change, an international treaty signed nearly 200 countries to cooperatively discuss global climate change and its impact. The conferences operate on the principle of consensus, meaning that any of the participating nations can hold up an agreement. The conflicts and controversies discussed as pointed out in the accompanying article are monotonously familiar: the differing obligations of industrialized and developing nations, the question of who will pay to help poor nations adapt, the urgency of protecting tropical forests and the need to rapidly develop and deploy clean energy technology.

In spite of a total lack of total consensus in all matters there is at least the emergent common understanding that Climate Change is caused by human activity, as opposed to changes in climate that may have resulted as part of Earth's natural processes (also referred to as natural variability). In this sense, especially in the context of environmental policy, the term *climate change* has become synonymous with anthropogenic global warming. Within scientific journals, *global warming* refers to surface temperature increases while *climate change* includes global warming and everything else that increasing greenhouse gas levels will affect.

This clarity of definition thus put the onus on the human factor and the corresponding responses that entail human responsibility. This growing awareness and consensus about the global nature of climate change thus calls for the widest possible cooperation by all countries and their participation in an effective and appropriate international response. This will be in accordance with their common but differentiated responsibilities and respective capabilities and their social and economic conditions.

This mounting global concern must also be primary to our consciousness. It is for this reason that we have included a review of our Christian history and Climate Change and the related ecological issues. In this framework, it is interesting to note the radicalism of Saint Francis of Assisi in proposing his belief in the virtue of humility—not merely for the individual but for man as a species. Francis tried to depose man from his monarchy over creation and set up a democracy of all God's creatures. This insight gives a new dimension to the discussions on our current ecologic crisis and the accompanying debate whether there is an alternative Christian view of nature and man's relation to it. St. Francis tried to substitute the idea of the equality of all creatures, including man, for the idea of man's limitless rule of creation. It is obvious that Christians today need to continue of theological dialogue among ourselves and the people of other religions. At the same time to continue our political dialogue with individual nations, the global community and all people of goodwill. It is interesting to note the comment: "We must rethink and refeel our nature and destiny".

This is possible when we at the same time draw new insights from the teachings of the Universal Church as articulated in the Compendium of the Social Doctrine of the Church, namely Chapter Ten on Safeguarding the Environment, which we have included here. With a deeper understanding of this phenomenon and our firm commitment, the Church in Asia has to take up one of the greatest challenges related to Climate Change namely: to work towards the Common Good of All in the sharing of our resources and goods and also logically to make effective changes to our mentality leading to the adoption of new lifestyles.

The Seminar on Climate Change that was co-organized by Misereor and the FABC is one of the concrete programmes and steps by the Church in Asia in responding to the problems of Climate Change. The seminar was held in Bangkok on October 19 - 20, 2011.

We hope we can continue to make this new concern known and to harness the energies of the People of God in Asia to promote an authentic solidarity of worldwide dimensions. It is clear that Climate Change is part of Change of Mind and Heart, Changes for the Common Good and Change in Lifestyle.

Editorial Consultant

GLOBAL WARMING & CLIMATE CHANGE

Global warming has become perhaps the most complicated issue facing world leaders. Warnings from the scientific community are becoming louder, as an increasing body of science points to rising dangers from the ongoing buildup of human-related greenhouse gases — produced mainly by the burning of fossil fuels and forests.

Global emissions of carbon dioxide were at a record high in 2011 and were likely to take a similar jump in 2012, scientists reported in early December 2012 — the latest indication that efforts to limit such emissions are failing.

Over all, global emissions jumped 3 percent in 2011 and are expected to jump another 2.6 percent in 2012, researchers reported.

The new figures show that emissions are falling, slowly, in some of the most advanced countries, including the United States. That apparently reflects a combination of economic weakness, the transfer of some manufacturing to developing countries and conscious efforts to limit emissions, like the renewable power targets that many American states have set. The boom in the natural gas supply from hydraulic fracturing is also a factor, since natural gas is supplanting coal at many power stations, leading to lower emissions.

But the decline of emissions in the developed countries is more than matched by continued growth in developing countries like China and India, the new figures show. Coal, the dirtiest and most carbon-intensive fossil fuel, is growing fastest, with coal-related emissions leaping more than 5 percent in 2011, compared with the previous year.

Emissions continue to grow so rapidly that an international goal of limiting the ultimate warming of the planet to 3.6 degrees, established three years ago, is on the verge of becoming unattainable, said researchers affiliated with the Global Carbon Project, a network of scientists that tracks emissions.

Yet nations around the world, despite a formal treaty pledging to limit warming — and 20 years of negotiations aimed at putting it into effect — have shown little appetite for the kinds of controls required to accomplish that goal.

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protecting tropical forests and the need to rapidly develop and deploy clean energy technology.

Background

Scientists learned long ago that the earth's climate has powerfully shaped the history of the human species — biologically, culturally and geographically. But only in the last few decades has research revealed that humans can be a powerful influence on the climate, as well.

A growing body of scientific evidence indicates that since 1950, the world's climate has been warming, primarily as a result of emissions from unfettered burning of fossil fuels and the razing of tropical forests. Such activity adds to the atmosphere's invisible blanket of carbon dioxide and other heat-trapping "greenhouse" gases. Recent research has shown that methane, which flows from landfills, livestock and oil and gas facilities, is a close second to carbon dioxide as an impact on the atmosphere.

That conclusion has emerged through a broad body of analysis in fields as disparate as glaciology, the study of glacial formations, and palynology, the study of the distribution of pollen grains in lake mud. It is based on a host of assessments by the world's leading organizations of climate and earth scientists.

In the last several years, the scientific case that the rising human influence on climate could become disruptive has become particularly robust.

Some fluctuations in the earth's temperature are inevitable regardless of human activity — because of decades-long ocean cycles, for example. But centuries of rising temperatures and seas lie ahead if the release of emissions from the burning of fossil fuels and deforestation continues unabated, according to the Intergovernmental Panel on Climate Change, a group that shared the 2007 Nobel Peace Prize with former Vice President Al Gore.

In addition, a report released by the I.P.C.C. in November 2011 predicted that global warming will cause more dangerous and "unprecedented extreme weather" in the future.

Despite the scientific consensus on these basic conclusions, enormously important details remain murky. That reality has been seized upon by some groups and scientists disputing the overall consensus and opposing changes in energy policies.

For example, estimates of the amount of warming that would result from a doubling of greenhouse gas concentrations (compared to the level just before the Industrial Revolution got under way in the early 19th century) range from 3.6 degrees to 8 degrees Fahrenheit. The intergovernmental climate panel said it could not rule

out even higher temperatures. While the low end could probably be tolerated, the high end would almost certainly result in calamitous, long-lasting disruptions of ecosystems and economies, a host of studies have concluded. A wide range of economists and earth scientists say that level of risk justifies an aggressive response.

Other questions have persisted despite a century-long accumulation of studies pointing to human-driven warming. The rate and extent at which sea levels will rise in this century as ice sheets erode remains highly uncertain, even as the long-term forecast of centuries of retreating shorelines remains intact. Scientists are struggling more than ever to disentangle how the heat building in the seas and atmosphere will affect the strength and number of tropical cyclones. The latest science suggests there will be more hurricanes and typhoons that reach the most dangerous categories of intensity, but fewer storms overall.

Steps Toward a Response

The debate over climate questions pales next to the fight over what to do, or not do, in a world where fossil fuels still underpin both rich and emerging economies.

With the completion of the United Nations Framework Convention on Climate Change at the Earth Summit in 1992, the world's nations pledged to avoid dangerously disrupting the climate through the buildup of greenhouse gases, but they never defined how much warming was too much.

Nonetheless, recognizing that the original climate treaty was proving ineffective, all of the world's industrialized countries except for the United States accepted binding restrictions on their greenhouse gas emissions under the Kyoto Protocol, which was negotiated in Japan in 1997. That accord took effect in 2005 and its gas restrictions expire in 2012. The United States signed the treaty, but it was never submitted for ratification in the face of overwhelming opposition in the Senate because the pact required no steps by China or other fast-growing developing countries.

It took until 2009 for the leaders of the world's largest economic powers to agree on a dangerous climate threshold: an increase of 2 degrees Celsius (3.6 degrees Fahrenheit) from the average global temperature recorded just before the Industrial Revolution kicked into gear. (This translates into an increase of 1.3 degrees Fahrenheit above the Earth's current average temperature, about 59 degrees.)

The Group of 8 industrial powers also agreed in 2009 to a goal of reducing global emissions 50 percent by 2050, with the richest countries leading the way by cutting

their emissions 80 percent. But they did not set a baseline from which to measure that reduction, and so far firm interim targets — which many climate scientists say would be more meaningful — have not been defined.

At the same time, fast-growing emerging economic powerhouses, led by China and India, opposed taking on mandatory obligations to curb their emissions. They said they will do what they can to rein in growth in emissions — as long as their economies do not suffer.

In many ways, the debate over global climate policy is a result of a global "climate divide." Emissions of carbon dioxide per person range from less than 2 tons per year in India, where 400 million people lack access to electricity, to more than 20 in the United States. The richest countries are also best able to use wealth and technology to insulate themselves from climate hazards, while the poorest, which have done the least to cause the problem, are the most exposed.

2010 U.N. Conference: Cancún

The 2010 United Nations Framework Convention on Climate Change in Cancún, Mexico, produced only modest achievements but ended with the toughest issues unresolved. The package that was approved, known as the Cancún Agreements, set up a new fund to help poor countries adapt to climate changes, created new mechanisms for transfer of clean energy technology, provided compensation for the preservation of tropical forests and strengthened the emissions reductions pledges that came out of the U.N. climate change meeting in Copenhagen in 2009.

The conference approved the agreement over the objections of Bolivia, which condemned the pact as too weak. But those protests did not block its acceptance. Delegates from island states and the least-developed



countries warmly welcomed the pact because it would start the flow of billions of dollars to assist them in adopting cleaner energy systems and adapting to inevitable changes in the climate, like sea rise and drought.

But where the promised aid from wealthy nations — \$100 billion — would come from was left unresolved.

2011 U.N. Conference: Durban

At the 2011 conference delegates from about 200 nations gathered together in Durban, South Africa. One of the issues left unresolved was the future of the Kyoto Protocol, the 1997 agreement that requires major industrialized nations to meet targets on emissions reduction but imposes no mandates on developing countries, including emerging economic powers and sources of global greenhouse gas emissions like China, India, Brazil and South Africa.

The United States is not a party to the protocol, having refused to even consider ratifying it because of those asymmetrical obligations. Some major countries, including Canada, Japan and Russia, have said they will not agree to an extension of the protocol next year unless the unbalanced requirements of developing and developed countries are changed. That is similar to the United States' position, which is that any successor treaty must apply equally to all major economies.

Expectations for the meeting were low, and it ended with modest accomplishments: the promise to work toward a new global treaty in coming years and the establishment of a new climate fund.

The deal on a future treaty renewed the Kyoto Protocol for several more years. But it also began a process for replacing the protocol with something that treats all countries — including the economic powerhouses China, India and Brazil — equally. The future treaty deal was the most highly contested element of a package of agreements that emerged from the extended talks among the nations here.

The expiration date of the protocol — 2017 or 2020 — and the terms of any agreement that replaces it will be negotiated at future sessions.

The delegates also agreed on the creation of a fund to help poor countries adapt to climate change — though the precise sources of the money have yet to be determined — and to measures involving the preservation of tropical forests and the development of clean-energy technology. The reserve, called the Green Climate Fund, would help mobilize a promised \$100 billion a year in public and private financing by 2020 to assist developing countries in adapting to climate change and converting to clean energy sources.

2012 U.N. Conference: Doha

In December 2012, delegates from 190 countries around the world met in Doha, Qatar, for the annual United Nations forum on climate change. The agenda was modest,

after disappointing sessions in previous years, and so was the outcome. The delegates agreed to extend the increasingly ineffective Kyoto Protocol a few years and to commit to more ambitious — but unspecified — actions to reduce emissions of climate-altering gases.

Wealthy nations put off for a year resolution of the dispute over providing billions of dollars in aid to countries most heavily affected by climate change. Industrial nations have pledged to secure \$100 billion a year by 2020 in public and private financing to help poor countries cope with climate change, but have been vague about what they plan to do before then.

Only a handful of countries, not including the United States, have made concrete financial pledges for adaptation aid over the next few years.

The participants noted with “grave concern” the widening gap between what countries have promised to do to reduce emissions and the growing concentration of greenhouse gases in the atmosphere. They declared it unlikely that on the current path the world would be able to keep global temperatures from rising more than two degrees Celsius (3.6 degrees Fahrenheit) from pre-industrial times, a central goal of the United Nations process.

But the group left for future years any plan for addressing the mismatch between goals and reality, merely stating an intention to “identify and explore in 2013 options for a range of actions to close the pre-2020 ambition gap.” The plan to be adopted by 2020 would be fundamentally different from Kyoto, as it would require action by all nations, not just rich countries — leaving behind a longstanding division of nations into industrialized perpetrators and developing-world victims.

Study Links Climate Change and Ozone Loss

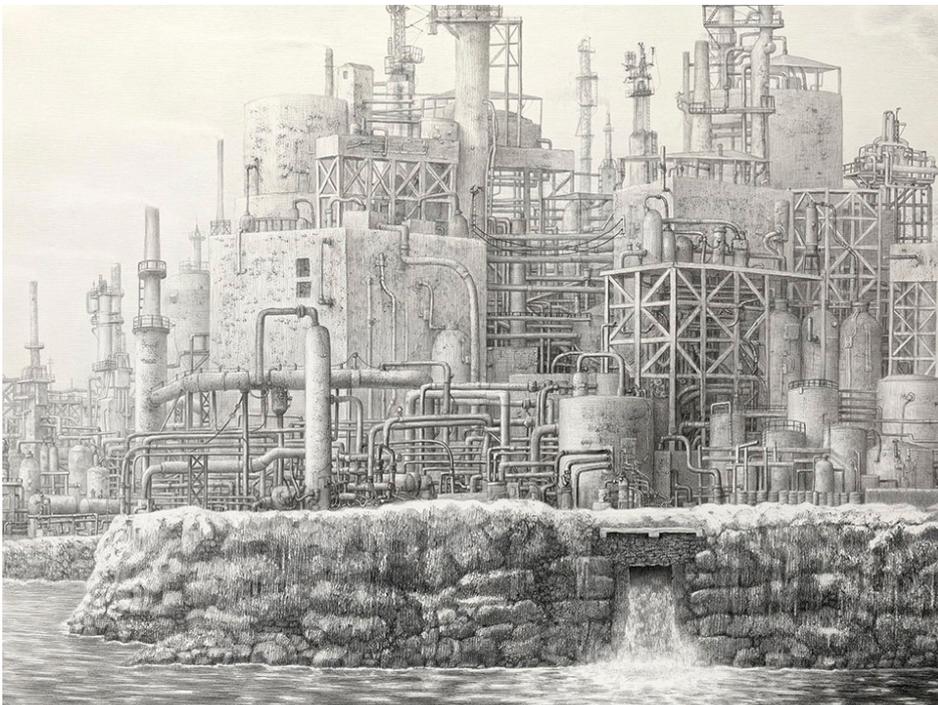
According to a study published in July 2012, strong summer thunderstorms that pump water high into the upper atmosphere pose a threat to the protective ozone layer over the United States, drawing one of the first links between climate change and ozone loss over populated areas.

In the study, from the journal *Science*, Harvard University scientists reported that some storms send water vapor miles into the stratosphere — which is normally drier than a desert — and showed how such events could rapidly set off ozone-destroying reactions with chemicals that remain in the atmosphere from CFCs, the now-banned refrigerant gases.

The risk of ozone damage, scientists said, could increase if global warming leads to more such storms.

“It’s the union between ozone loss and climate change that is really at the heart of this,” said James G. Anderson, an atmospheric scientist and the lead author of the study.

For years, Dr. Anderson said, he and other atmospheric scientists were careful to keep the two concepts separate. “Now, they’re intimately connected,” he said.



Ozone helps shield people, animals and crops from damaging ultraviolet rays from the sun. Much of the concern about the ozone layer has focused on Antarctica, where a seasonal hole, or thinning, has been seen for two decades, and the Arctic, where a hole was observed last year. But those regions have almost no population.

A thinning of the ozone layer over the United States during summers could mean an increase in ultraviolet exposure for millions of people and a rise in the incidence of skin cancer, the researchers said.

The findings were based on sound science, Dr. Anderson and other experts said, but much more research is needed, including direct measurements in the stratosphere in areas where water vapor was present after storms.

Carbon Credits Gone Awry Raise Output of Harmful Gas

When the United Nations wanted to help slow climate change, it established what seemed a sensible system. Greenhouse gases were rated based on their power to warm the atmosphere. The more dangerous the gas, the more that manufacturers in developing nations would be compensated as they reduced their emissions.

But where the United Nations envisioned environmental reform, some manufacturers of gases used in air-conditioning and refrigeration saw a lucrative business opportunity. They quickly figured out that they could earn one carbon credit by eliminating one ton of carbon dioxide, but could earn more than 11,000 credits by simply destroying a ton of an obscure waste gas normally released in the manufacturing of a widely used coolant gas.

That is because that byproduct has a huge global warming effect. The credits could be sold on international markets, earning tens of millions of dollars a year. That incentive has driven plants in the developing world not only

to increase production of the coolant gas but also to keep it high — a huge problem because the coolant itself contributes to global warming and depletes the ozone layer. That coolant gas is being phased out under a global treaty, but the effort has been a struggle.

So since 2005 the 19 plants receiving the waste gas payments have profited handsomely from an unlikely business: churning out more harmful coolant gas so they can be paid to destroy its waste byproduct. The high output keeps the prices of the coolant gas irresistibly low, discouraging air-conditioning companies from switching to less-damaging alternative gases. That means, critics say, that United Nations subsidies intended to improve the environment are instead creating their

own damage.

The United Nations and the European Union, through new rules and an outright ban, are trying to undo this unintended bonanza. But the lucrative incentive has become so entrenched that efforts to roll it back are proving tricky, even risky.

China and India, where most of the 19 factories are, have been resisting mightily. The manufacturers have grown accustomed to an income stream that in some years accounted for half their profits. The windfall has enhanced their power and influence. As a result, many environmental experts fear that if manufacturers are not paid to destroy the waste gas, they will simply resume releasing it into the atmosphere.

Arctic Sea Ice Sets a New Low

The drastic melting of Arctic sea ice has finally ended for 2012, scientists announced on Sept. 19, but not before demolishing the previous record — and setting off new warnings about the rapid pace of change in the region.

The apparent low point for the year was reached on Sept. 16, according to the National Snow and Ice Data Center, which said that sea ice that day covered about 1.32 million square miles, or 24 percent, of the surface of the Arctic Ocean. The previous low, set in 2007, was 29 percent.

When satellite tracking began in the late 1970s, sea ice at its lowest point in the summer typically covered about half the Arctic Ocean, but it has been declining in fits and starts over the decades.

Scientists consider the rapid warming of the region to be a consequence of the human release of greenhouse gases, and they see the melting as an early warning of big changes to come in the rest of the world.



Some of them also think the collapse of Arctic sea ice has already started to alter atmospheric patterns in the Northern Hemisphere, contributing to greater extremes of weather in the United States and other countries, but that case is not considered proven.

The sea ice is declining much faster than had been predicted in the last big United Nations report on the state of the climate, published in 2007. The most sophisticated computer analyses for that report suggested that the ice would not disappear before the middle of this century, if then.

Now, some scientists think the Arctic Ocean could be largely free of summer ice as soon as 2020. But governments have not responded to the change with any greater urgency about limiting greenhouse emissions. To the contrary, their main response has been to plan for exploitation of newly accessible minerals in the Arctic, including drilling for more oil.

A prime concern is the potential for a large rise in the level of the world's oceans. The decline of Arctic sea ice does not contribute directly to that problem, since the ice is already floating and therefore displacing its weight in water.

But the disappearance of summer ice cover replaces a white, reflective surface with a much darker ocean surface, allowing the region to trap more of the sun's heat, which in turn melts more ice. The extra heat in the ocean appears to be contributing to an accelerating melt of the nearby Greenland ice sheet, which does contribute to the rise in sea level.

Source: <http://topics.nytimes.com/top/news/science/topics/globalwarming/index.html>

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the ultimate gesture of cosmic humility, assumed flesh, lay helpless in a manger, and hung dying on a scaffold.

I am not suggesting that many contemporary Americans who are concerned about our ecologic crisis will be either able or willing to counsel with wolves or exhort birds. However, the present increasing disruption of the global environment is the product of a dynamic technology and science which were originating in the Western medieval world against which Saint Francis was rebelling in so original a way. Their growth cannot be understood historically apart from distinctive attitudes toward nature which are deeply grounded in Christian dogma. The fact that most people do not think of these attitudes as Christian is irrelevant. No new set of basic values has been accepted in our society to displace those of Christianity. Hence we shall continue to have a worsening ecologic crisis until we reject the Christian axiom that nature has no reason for existence save to serve man.

The greatest spiritual revolutionary in Western history, Saint Francis, proposed what he thought was an alternative Christian view of nature and man's relation to it; he tried to substitute the idea of the equality of all creatures, including man, for the idea of man's limitless rule of creation. He failed. Both our present science and our present technology are so tinctured with orthodox Christian arrogance toward nature that no solution for our ecologic crisis can be expected from them alone. Since the roots of our trouble are so largely religious, the remedy must also be essentially religious, whether we call it that or not. We must rethink and refeel our nature and destiny. The profoundly religious, but heretical, sense of the primitive Franciscans for the spiritual autonomy of all parts of nature may point a direction. I propose Francis as a patron saint for ecologists.

THE HISTORICAL ROOTS OF OUR ECOLOGICAL CRISIS

Lynn White, Jr.

A conversation with Aldous Huxley not infrequently put one at the receiving end of an unforgettable monologue. About a year before his lamented death he was discoursing on a favorite topic: Man's unnatural treatment of nature and its sad results. To illustrate his point he told how, during the previous summer, he had returned to a little valley in England where he had spent many happy months as a child. Once it had been composed of delightful grassy glades; now it was becoming overgrown with unsightly brush because the rabbits that formerly kept such growth under control had largely succumbed to a disease, myxomatosis, that was deliberately introduced by the local farmers to reduce the rabbits' destruction of crops. Being something of a Philistine, I could be silent no longer, even in the interests of great rhetoric. I interrupted to point out that the rabbit itself had been brought as a domestic animal to England in 1176, presumably to improve the protein diet of the peasantry.

All forms of life modify their contexts. The most spectacular and benign instance is doubtless the coral polyp. By serving its own ends, it has created a vast undersea world favorable to thousands of other kinds of animals and plants. Ever since man became a numerous species he has affected his environment notably. The hypothesis that his fire-drive method of hunting created the world's great grasslands and helped to exterminate the monster mammals of the Pleistocene from much of the globe is plausible, if not proved. For 6 millennia at least, the banks of the lower Nile have been a human artifact rather than the swampy African jungle which nature, apart from man, would have made it. The Aswan Dam, flooding 5000 square miles, is only the latest stage in a long process. In many regions terracing or irrigation, overgrazing, the cutting of forests by Romans to build ships to fight Carthaginians or by Crusaders to solve the logistics problems of their expeditions, have profoundly changed some ecologies. Observation that the French landscape falls into two basic types, the open fields of the north and the bocage of the south and west, inspired Marc Bloch to undertake his classic study of medieval agricultural methods. Quite unintentionally, changes in human ways often affect nonhuman nature. It has been noted, for example, that the advent of the automobile eliminated huge flocks of sparrows that once fed on the horse manure littering every street.

The history of ecologic change is still so rudimentary that we know little about what really happened, or what the results were. The extinction of the European aurochs as late as 1627 would seem to have been a simple case of overenthusiastic hunting. On more intricate matters it often is impossible to find solid information. For a thousand years or more the Frisians and Hollanders have been pushing back

the North Sea, and the process is culminating in our own time in the reclamation of the Zuider Zee. What, if any, species of animals, birds, fish, shore life, or plants have died out in the process? In their epic combat with Neptune



have the Netherlanders overlooked ecological values in such a way that the quality of human life in the Netherlands has suffered? I cannot discover that the questions have ever been asked, much less answered.

People, then, have often been a dynamic element in their own environment, but in the present state of historical scholarship we usually do not know exactly when, where, or with what effects man-induced changes came. As we enter the last third of the 20th century, however, concern for the problem of ecologic backlash is mounting feverishly. Natural science, conceived as the effort to understand the nature of things, had flourished in several eras and among several peoples. Similarly there had been an age-old accumulation of technological skills, sometimes growing rapidly, sometimes slowly. But it was not until about four generations ago that Western Europe and North America arranged a marriage between science and technology, a union of the theoretical and the empirical approaches to our natural environment. The emergence in widespread practice of the Baconian creed that scientific knowledge means technological power over nature can scarcely be dated before about 1850, save in the chemical industries, where it is anticipated in the 18th century. Its acceptance as a normal pattern of action may mark the greatest event in human history since the invention of agriculture, and perhaps in nonhuman terrestrial history as well.

Almost at once the new situation forced the

crystallization of the novel concept of ecology; indeed, the word ecology first appeared in the English language in 1873. Today, less than a century later, the impact of our race upon the environment has so increased in force that it has changed in essence. When the first cannons were fired, in the early 14th century, they affected ecology by sending workers scrambling to the forests and mountains for more potash, sulphur, iron ore, and charcoal, with some resulting erosion and deforestation. Hydrogen bombs are of a different order: a war fought with them might alter the genetics of all life on this planet. By 1285 London had a smog problem arising from the burning of soft coal, but our present combustion of fossil fuels threatens to change the chemistry of the globe's atmosphere as a whole, with consequences which we are only beginning to guess. With the population explosion, the carcinoma of planless urbanism, the now geological deposits of sewage and garbage, surely no creature other than man has ever managed to foul its nest in such short order.

There are many calls to action, but specific proposals, however worthy as individual items, seem too partial, palliative, negative: ban the bomb, tear down the billboards, give the Hindus contraceptives and tell them to eat their sacred cows. The simplest solution to any suspect change is, of course, to stop it, or better yet, to revert to a romanticized past: make those ugly gasoline stations look like Anne Hathaway's cottage or (in the Far West) like ghost-town saloons. The "wilderness area" mentality invariably advocates deep-freezing an ecology, whether San Gimignano or the High Sierra, as it was before the first Kleenex was dropped. But neither atavism nor prettification will cope with the ecologic crisis of our time.

What shall we do? No one yet knows. Unless we think about fundamentals, our specific measures may produce new backlashes more serious than those they are designed to remedy.

As a beginning we should try to clarify our thinking by looking, in some historical depth, at the presuppositions that underlie modern technology and science. Science was traditionally aristocratic, speculative, intellectual in intent; technology was lower-class, empirical, action-oriented. The quite sudden fusion of these two, towards the middle of the 19th century, is surely related to the slightly prior and contemporary democratic revolutions which, by reducing social barriers, tended to assert a functional unity of brain and hand. Our ecologic crisis is the product of an emerging, entirely novel, democratic culture. The issue is whether a democratized world can survive its own implications. Presumably we cannot unless we rethink our axioms.

The Western Traditions of Technology and Science

One thing is so certain that it seems stupid to verbalize it: both modern technology and modern science are distinctively Occidental. Our technology has absorbed

elements from all over the world, notably from China; yet everywhere today, whether in Japan or in Nigeria, successful technology is Western. Our science is the heir to all the sciences of the past, especially perhaps to the work of the great Islamic scientists of the Middle Ages, who so often outdid the ancient Greeks in skill and perspicacity: al-Razi in medicine, for example; or ibn-al-Haytham in optics; or Omar Khayyam in mathematics. Indeed, not a few works of such geniuses seem to have vanished in the original Arabic and to survive only in medieval Latin translations that helped to lay the foundations for later Western developments. Today, around the globe, all significant science is Western in style and method, whatever the pigmentation or language of the scientists.

A second pair of facts is less well recognized because they result from quite recent historical scholarship. The leadership of the West, both in technology and in science, is far older than the so-called Scientific Revolution of the 17th century or the so-called Industrial Revolution of the 18th century. These terms are in fact outmoded and obscure the true nature of what they try to describe—significant stages in two long and separate developments. By A.D. 1000 at the latest—and perhaps, feebly, as much as 200 years earlier—the West began to apply water power to industrial processes other than milling grain. This was followed in the late 12th century by the harnessing of wind power. From simple beginnings, but with remarkable consistency of style, the West rapidly expanded its skills in the development of power machinery, labor-saving devices, and automation. Those who doubt should contemplate that most monumental achievement in the history of automation: the weight-driven mechanical clock, which appeared in two forms in the early 14th century. Not in craftsmanship but in basic technological capacity, the Latin West of the later Middle Ages far outstripped its elaborate, sophisticated, and esthetically magnificent sister cultures, Byzantium and Islam. In 1444 a great Greek ecclesiastic, Bessarion, who had gone to Italy, wrote a letter to a prince in Greece. He is amazed by the superiority of Western ships, arms, textiles, glass. But above all he is astonished by the spectacle of waterwheels sawing timbers and pumping the bellows of blast furnaces. Clearly, he had seen nothing of the sort in the Near East.

By the end of the 15th century the technological superiority of Europe was such that its small, mutually hostile nations could spill out over all the rest of the world, conquering, looting, and colonizing. The symbol of this technological superiority is the fact that Portugal, one of the weakest states of the Occident, was able to become, and to remain for a century, mistress of the East Indies. And we must remember that the technology of Vasco da Gama and Albuquerque was built by pure empiricism, drawing remarkably little support or inspiration from science.

In the present-day vernacular understanding, modern science is supposed to have begun in 1543, when both Copernicus and Vesalius published their great works. It is

no derogation of their accomplishments, however, to point out that such structures as the *Fabrica* and the *De revolutionibus* do not appear overnight. The distinctive Western tradition of science, in fact, began in the late 11th century with a massive movement of translation of Arabic and Greek scientific works into Latin. A few notable books—Theophrastus, for example—escaped the West’s avid new appetite for science, but within less than 200 years effectively the entire corpus of Greek and Muslim science was available in Latin, and was being eagerly read and criticized in the new European universities. Out of criticism arose new observation, speculation, and increasing distrust of ancient authorities. By the late 13th century Europe had seized global scientific leadership from the faltering hands of Islam. It would be as absurd to deny the profound originality of Newton, Galileo, or Copernicus as to deny that of the 14th century scholastic scientists like Buridan or Oresme on whose work they built. Before the 11th century, science scarcely existed in the Latin West, even in Roman times. From the 11th century onward, the scientific sector of Occidental culture has increased in a steady crescendo.

Since both our technological and our scientific movements got their start, acquired their character, and achieved world dominance in the Middle Ages, it would seem that we cannot understand their nature or their present impact upon ecology without examining fundamental medieval assumptions and developments.

Medieval View of Man and Nature

Until recently, agriculture has been the chief occupation even in “advanced” societies; hence, any change in methods of tillage has much importance. Early plows, drawn by two oxen, did not normally turn the sod but merely scratched it. Thus, cross-plowing was needed and fields tended to be squarish. In the fairly light soils and semiarid climates of the Near East and Mediterranean, this worked well. But such a plow was inappropriate to the wet climate and often sticky soils of northern Europe. By the latter part of the 7th century after Christ, however, following obscure beginnings, certain northern peasants were using an entirely new kind of plow, equipped with a vertical knife to cut the line of the furrow, a horizontal share to slice under the sod, and a moldboard to turn it over. The friction of this plow with the soil was so great that it normally required not two but eight oxen. It attacked the land with such violence that cross-plowing was not needed, and fields tended to be shaped in long strips.

In the days of the scratch-plow, fields were distributed generally in units capable of supporting a single family. Subsistence farming was the presupposition. But no peasant owned eight oxen: to use the new and more efficient plow, peasants pooled their oxen to form large plow-teams, originally receiving (it would appear) plowed strips in

proportion to their contribution. Thus, distribution of land was based no longer on the needs of a family but, rather, on the capacity of a power machine to till the earth. Man’s relation to the soil was profoundly changed. Formerly man had been part of nature; now he was the exploiter of nature. Nowhere else in the world did farmers develop any analogous agricultural implement. Is it coincidence that modern technology, with its ruthlessness toward nature, has so largely been produced by descendants of these peasants of northern Europe?

This same exploitive attitude appears slightly before A.D. 830 in Western illustrated calendars. In older calendars the months were shown as passive personifications. The new Frankish calendars, which set the style for the Middle Ages, are very different: they show men coercing the world around them—plowing, harvesting, chopping trees, butchering pigs. Man and nature are two things, and man is master.

These novelties seem to be in harmony with larger intellectual patterns. What people do about their ecology depends on what they think about themselves in relation to things around them. Human ecology is deeply conditioned by beliefs about our nature and destiny—that is, by religion. To Western eyes this is very evident in, say, India or Ceylon. It is equally true of ourselves and of our medieval ancestors.

The victory of Christianity over paganism was the greatest psychic revolution in the history of our culture. It has become fashionable today to say that, for better or worse, we live in the “post-Christian age.” Certainly the forms of our thinking and language have largely ceased to be Christian, but to my eye the substance often remains amazingly akin to that of the past. Our daily habits of action, for example, are dominated by an implicit faith in perpetual progress which was unknown either to Greco-Roman antiquity or to the Orient. It is rooted in, and is indefensible apart from, Judeo-Christian theology. The fact that Communists share it merely helps to show what can be demonstrated on many other grounds: that Marxism, like Islam, is a Judeo-Christian heresy. We continue today to live, as we have lived for about 1700 years, very largely in a context of Christian axioms.

What did Christianity tell people about their relations with the environment? While many of the world’s mythologies provide stories of creation, Greco-Roman mythology was singularly incoherent in this respect. Like Aristotle, the intellectuals of the ancient West denied that the visible world had a beginning. Indeed, the idea of a beginning was impossible in the framework of their cyclical notion of time. In sharp contrast, Christianity inherited from Judaism not only a concept of time as nonrepetitive and linear but also a striking story of creation. By gradual stages a loving and all-powerful God had created light and darkness, the heavenly bodies, the earth and all its plants, animals, birds, and fishes. Finally, God had created Adam and, as an afterthought, Eve to keep man from being lonely.

Man named all the animals, thus establishing his dominance over them. God planned all of this explicitly for man's benefit and rule: no item in the physical creation had any purpose save to serve man's purposes. And, although man's body is made of clay, he is not simply part of nature: he is made in God's image.

Especially in its Western form, Christianity is the most anthropocentric religion the world has seen. As early as the 2nd century both Tertullian and Saint Irenaeus of Lyons were insisting that when God shaped Adam he was foreshadowing the image of the incarnate Christ, the Second Adam. Man shares, in great measure, God's transcendence of nature. Christianity, in absolute contrast to ancient paganism and Asia's religions (except, perhaps, Zoroastrianism), not only established a dualism of man and nature but also insisted that it is God's will that man exploit nature for his proper ends.

At the level of the common people this worked out in an interesting way. In Antiquity every tree, every spring, every stream, every hill had its own *genius loci*, its guardian spirit. These spirits were accessible to men, but were very unlike men; centaurs, fauns, and mermaids show their ambivalence. Before one cut a tree, mined a mountain, or dammed a brook, it was important to placate the spirit in charge of that particular situation, and to keep it placated. By destroying pagan animism, Christianity made it possible to exploit nature in a mood of indifference to the feelings of natural objects.

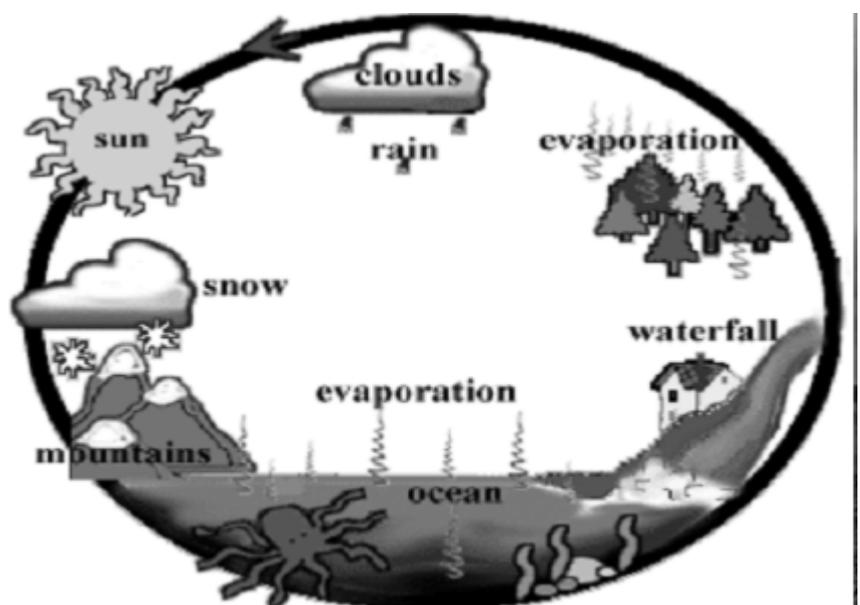
It is often said that for animism the Church substituted the cult of saints. True; but the cult of saints is functionally quite different from animism. The saint is not in natural objects; he may have special shrines, but his citizenship is in heaven. Moreover, a saint is entirely a man; he can be approached in human terms. In addition to saints, Christianity of course also had angels and demons inherited from Judaism and perhaps, at one remove, from Zoroastrianism. But these were all as mobile as the saints themselves. The spirits in natural objects, which formerly had protected nature from man, evaporated. Man's effective monopoly on spirit in this world was confirmed, and the old inhibitions to the exploitation of nature crumbled.

When one speaks in such sweeping terms, a note of caution is in order. Christianity is a complex faith, and its consequences differ in differing contexts. What I have said may well apply to the medieval West, where in fact technology made spectacular advances. But the Greek East, a highly civilized realm of equal Christian devotion, seems to have produced no marked technological innovation after the late 7th century, when Greek fire was invented. The key to the contrast may perhaps be found in a difference in the tonality of piety and thought which students of comparative

theology find between the Greek and the Latin Churches. The Greeks believed that sin was intellectual blindness, and that salvation was found in illumination, orthodoxy—that is, clear thinking. The Latins, on the other hand, felt that sin was moral evil, and that salvation was to be found in right conduct. Eastern theology has been intellectualist. Western theology has been voluntarist. The Greek saint contemplates; the Western saint acts. The implications of Christianity for the conquest of nature would emerge more easily in the Western atmosphere.

The Christian dogma of creation, which is found in the first clause of all the Creeds, has another meaning for our comprehension of today's ecologic crisis. By revelation, God had given man the Bible, the Book of Scripture. But since God had made nature, nature also must reveal the divine mentality. The religious study of nature for the better understanding of God was known as natural theology. In the early Church, and always in the Greek East, nature was conceived primarily as a symbolic system through which God speaks to men: the ant is a sermon to sluggards; rising flames are the symbol of the soul's aspiration. The view of nature was essentially artistic rather than scientific. While Byzantium preserved and copied great numbers of ancient Greek scientific texts, science as we conceive it could scarcely flourish in such an ambience.

However, in the Latin West by the early 13th century natural theology was following a very different bent. It was ceasing to be the decoding of the physical symbols of God's communication with man and was becoming the effort to understand God's mind by discovering how his creation operates. The rainbow was no longer simply a symbol of hope first sent to Noah after the Deluge: Robert Grosseteste, Friar Roger Bacon, and Theodoric of Freiberg produced startlingly sophisticated work on the optics of the rainbow, but they did it as a venture in religious understanding. From the 13th century onward, up to and including Leibnitz and Newton, every major scientist, in effect, explained his motivations in religious terms. Indeed,



if Galileo had not been so expert an amateur theologian he would have got into far less trouble: the professionals resented his intrusion. And Newton seems to have regarded himself more as a theologian than as a scientist. It was not until the late 18th century that the hypothesis of God became unnecessary to many scientists.

It is often hard for the historian to judge, when men explain why they are doing what they want to do, whether they are offering real reasons or merely culturally acceptable reasons. The consistency with which scientists during the long formative centuries of Western science said that the task and the reward of the scientist was “to think God’s thoughts after him” leads one to believe that this was their real motivation. If so, then modern Western science was cast in a matrix of Christian theology. The dynamism of religious devotion shaped by the Judeo-Christian dogma of creation, gave it impetus

An Alternative Christian View

We would seem to be headed toward conclusions unpalatable to many Christians. Since both science and technology are blessed words in our contemporary vocabulary, some may be happy at the notions, first, that viewed historically, modern science is an extrapolation of natural theology and, second, that modern technology is at least partly to be explained as an Occidental, voluntarist realization of the Christian dogma of man’s transcendence of, and rightful master over, nature. But, as we now recognize, somewhat over a century ago science and technology—hitherto quite separate activities—joined to give mankind powers which, to judge by many of the ecologic effects, are out of control. If so, Christianity bears a huge burden of guilt.

I personally doubt that disastrous ecologic backlash can be avoided simply by applying to our problems more science and more technology. Our science and technology have grown out of Christian attitudes toward man’s relation to nature which are almost universally held not only by Christians and neo-Christians but also by those who fondly regard themselves as post-Christians. Despite Copernicus, all the cosmos rotates around our little globe. Despite Darwin, we are not, in our hearts, part of the natural process. We are superior to nature, contemptuous of it, willing to use it for our slightest whim. The newly elected Governor of California, like myself a churchman but less troubled than I, spoke for the Christian tradition when he said (as is alleged), “when you’ve seen one redwood tree, you’ve seen them all.” To a Christian a tree can be no more than a physical fact. The whole concept of the sacred grove is alien to Christianity and to the ethos of the West. For nearly 2 millennia Christian missionaries have been chopping down sacred groves, which are idolatrous because they assume spirit in nature.

What we do about ecology depends on our ideas of

the man-nature relationship. More science and more technology are not going to get us out of the present ecologic crisis until we find a new religion, or rethink our old one. The beatniks, who are the basic revolutionaries of our time, show a sound instinct in their affinity for Zen Buddhism, which conceives of the man-nature relationship as very nearly the mirror image of the Christian view. Zen, however, is as deeply conditioned by Asian history as Christianity is by the experience of the West, and I am dubious of its viability among us.

Possibly we should ponder the greatest radical in Christian history since Christ: Saint Francis of Assisi. The prime miracle of Saint Francis is the fact that he did not end at the stake, as many of his left-wing followers did. He was so clearly heretical that a General of the Franciscan Order, Saint Bonaventura, a great and perceptive Christian, tried to suppress the early accounts of Franciscanism. The key to an understanding of Francis is his belief in the virtue of humility—not merely for the individual but for man as a species. Francis tried to depose man from his monarchy over creation and set up a democracy of all God’s creatures. With him the ant is no longer simply a homily for the lazy, flames a sign of the thrust of the soul toward union with God; now they are Brother Ant and Sister Fire, praising the Creator in their own ways as Brother Man does in his.

Later commentators have said that Francis preached to the birds as a rebuke to men who would not listen. The records do not read so: he urged the little birds to praise God, and in spiritual ecstasy they flapped their wings and chirped rejoicing. Legends of saints, especially the Irish saints, had long told of their dealings with animals but always, I believe, to show their human dominance over creatures. With Francis it is different. The land around Gubbio in the Apennines was ravaged by a fierce wolf. Saint Francis, says the legend, talked to the wolf and persuaded him of the error of his ways. The wolf repented, died in the odor of sanctity, and was buried in consecrated ground.

What Sir Steven Ruciman calls “the Franciscan doctrine of the animal soul” was quickly stamped out. Quite possibly it was in part inspired, consciously or unconsciously, by the belief in reincarnation held by the Cathar heretics who at that time teemed in Italy and southern France, and who presumably had got it originally from India. It is significant that at just the same moment, about 1200, traces of metempsychosis are found also in western Judaism, in the Provencal Cabbala. But Francis held neither to transmigration of souls nor to pantheism. His view of nature and of man rested on a unique sort of pan-psychism of all things animate and inanimate, designed for the glorification of their transcendent Creator, who, in

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CLIMATE CONCERNS AND THE SOCIAL IMPACTS OF FOOD SECURITY IN BANGLADESH

Bishop Theotonius Gomes CSC

Climate concerns and the social impacts of food security in Bangladesh

A. Bangladesh situation vis-à-vis Food security

The history and geography of Bangladesh is marked by a long culture based on fertile land, water, vegetation, agriculture and a population marked by much poverty, a civilization of great deal of simplicity of extensive rural living, reflected in a general poetical and religious sense of life. This is true of many similar nations and peoples all over the world, an extensive global reality, which we often fail to take of in proper measure. There is much unjust depressive poverty to the extent of dire lack of food; but there is also much “evangelical poverty” in Bangladesh and all over the world, in which the smallest available food and material good is handled so gently and with care. It seems that a culture based on agriculture is conducive to poetic, religious and simple life, and results in a culture of “evangelical poverty”.

Something specific of Bangladesh is that much of its land extending to the south has risen out of the sea as result of age-long silting of rich soil from up-stream. To lose a good bit of that land into the sea as result of climate disaster would be a counter-sign to its long endearing geography and history. Another factor is that with very high population density an alarmingly large number of people will become climate change refugees, and climate change disasters will affect the extensive agriculture and food production involvement of its very large rural geography and rural population.

With a population so large, food for all is the simple basic daily concern, a concern for development indeed. There is lack of the “daily bread” for great many, great food insecurity. Simply said, when there is food for all, any land is at ease. It is more so for Bangladesh, and the basic achievement of any government here lies in providing food security, and also for NGOs, organizations, society and family. Other achievements are to be seen as otherwise added to it. Food is the most simple daily blissful desire and joy of all creature and mankind; we cannot afford to miss on this point.

B. Food as a theological and spiritual concern

All creation needs to food before and above anything else. One essential aspect of the mystery of the human person is its union of the earthly body and the heavenly

soul, a union on earth destined into eternity. On earth the earthly food is needed to keep “the body and soul together” toward the fulfillment of this mystery of the human person. Food security is hardly a merely earthly affair; it has eternal overtures. On earth the body has to be a true home for the eternal spirit; in eternity the soul has to be home of the risen body.

The Lord’s Prayer, the “Our Father”, is no common prayer of petition, but the prayer for the final times, the time of fulfillment, of the coming of the Kingdom of God. In it we pray as the only earthly need for the “daily bread”, the food of the poor for everyday, leading to the eternal bread of Tomorrow. In considering Food Security we are dealing with a matter of achievements for the final times of creation and human life on earth. The human civilization has to be truthfully grounded on “daily bread”.

Food on earth: food is about the only earthly need to which Scripture refers with constant diligence: at creation no other earthly need except food is indicated (Gen 1: 27-28); in the time of trial in the wilderness of Sinai daily bread has been provided (Ex.); food is an issue of temptation of Jesus in the desert (Mt 4:1-4), a temptation to confuse the inner purpose of food for humanity, a temptation unto our times as well; the multiplication of bread (Jn 6) indicates the mystery of immense “sufficiency and plenitude” of the limited earthly food, and of mankind’s mission to provide it for all; the bread of the Eucharist points to the inner holiness and beauty of this earthly gift as it is offered for all in immolation, a purposeful perennial sacrament for the earth to continue the visible incarnation of the Word of God under the lasting sign of food, and to show that our life, indeed life of all creation, achieves fulfillment in the giving and receiving of one another as food for the body and the spirit.

All created things, and the human person too, has the natural destiny to pass away in death: Jesus has redeemed that natural passing away into its lasting spiritual gain by making it a sacrificial giving for others as food for life. Life is not to be taken away; but life can be given away as life-giving nourishment. The inner destiny of all creation is to be food for others, as is the destiny of God in the Incarnate Son.

Food has a practically spiritual purpose for humanity in as much as it keeps our soul and spirit living in the body on earth; and our body secured by daily bread is in a secure position to let God's spirit function in the body toward resurrection into eternal life.

Lack of food for the poor, especially large numbers dying for lack of food, is the most "un-eucharistic" situation on earth. This is a very simple but grossly humiliating sinfulness of humanity in our advanced times, darkness on human civilization. We need to act bravely, locally, nationally and internationally, to address this "un-eucharistic" darkness, in order to foster good Eucharistic culture in humanity and in creation for the daily life.

Fasting is penance toward partaking food and other earthly goods in the spirit of "the poor" in "satisfaction", fostering the desire for sharing these with the poor, to which the rich are called. We may devour food lustfully in greed; we can eat it normal way and "be filled"; we are to taste it carefully to see "how good" it is. We need to inculcate a culture of tasting our food, to understand the taste of the food of the poor.

Food and the poor: The poor partake of food under the sign of "fasting", shunning away from devouring it, attentive to tasting the goodness thereof. Food is the simple joyful need of the simple people for a simple civilization on earth. In all ages, and even to our times of great industrial and technological advances, great numbers of peoples live in an ambient of soil, air, water and vegetation, for an agriculture concerned with security in food. The many poor on earth belong to and are restful and secure in a food based agricultural ambience; the rich in fact take this food-based agricultural gift as granted. Secured on that primary base for food, all other cultures and developments can flourish rightfully and harmoniously.

The foundational task in the face of the present crisis of adverse and unjust situations of climate change is to settle properly on secured food-based agriculture, providing the gentle assurance for all other cultural advances. The inner flaw in the present overwhelmingly industrial and technological revolution has been in this that it forgets in the process the primacy of food security as the "demo-metric" foundation of civilization. If democracy is the political culture we desire, the demo-metric simple living in the ambient of land, air, water, vegetation, food and the "poor" is what we need to affirm as humanity's lasting civilization. It is the de facto situation on our earth. We may not run away from it.

C. Endeavors for Food and Food Security in Bangladesh

Given the natural rural and "poverty"-based situation of the country it is natural to opt for large rural type of

food security agenda for the country, which the Government is inclined to adopt.

The Catholic Church in Bangladesh is noting the primacy of creation and food issues for its pastoral planning; and Caritas Bangladesh is greatly concerned with it.

Some main endeavors for food security in Bangladesh

1. Public intervention and multilateral cooperation in food sector.

- **Food, especially production, consumption and distribution of rice dominates social, political, economic and cultural life of Bangladesh.**
- **Over the last 40 years Bangladesh achieved three times higher food (mainly rice) production maximizing agricultural technological advancement.**
- Successive governments since the independence of Bangladesh have attached food production and availability of food as their key priority issue.
- **Present government is about to launch a scheme called "one house one farm" which essentially focuses on attaining food security at households' level.**
- Bi-lateral and multilateral funds are increasingly being channeled towards enhancing food security of the ultra poor [those earns less than 1 \$ a day] group. (DFID, USAID, European Union are all focusing on food related short and long term schemes.
- A rapid assessment carried out by the Food Planning and Monitoring Unit (FPMU) of the government of Bangladesh in early December/10 suggested that *aman* [rain fed] production this year would be about 5% higher than that of last year.
- The same department predicts that if the production targets of *boro* [irrigated] and wheat, as set by the Department of Agriculture Extension (DAE), are achieved, total food grain production in FY2010-11 would be 35.26 mmt, 6% higher than last year's actual production.
- According to official statistics during the July-December/10 period, a total of 2.16 mmt of food grains was imported, of which 0.51 mmt was rice and 1.65 mmt was wheat.
- **In view of the high price of food grains in the market, the government has strengthened**

distribution through OMS and Fair Price Card (FPC) channels to address poor people's hardship.

- **Current focus of government in terms of increasing food production is towards south and southwestern part of the country as large quantity of land remains unutilized through out the year due to predominantly *aman* cultivation. Crop rotation and crop diversification is emphasized.**

2. Caritas Initiatives in Food Production and addressing food security

Principles:

- **Priority towards ultra poor households and towards the indigenous community.**
- **Organic farming practices and respect to environment and bio-diversity**
- **Promotion of Safe food and food security.**
- **Conservation and judicious use of natural resources.**
- **Promotion of Farmer to Farmer/community to community learning.**
- **Collective effort in accessing into natural resources.**
- **Capacity building of the program participants and improvisation of indigenous knowledge and technology**

a. Food Security Program (FSP) for Chittagong Hill Tracts Indigenous People.

This program is dedicated towards enhancing food production and securing food for the remotely residing indigenous communities in the Chittagong Hill Tract [Bandarban, Alikadam, Lama upazila]. A total of 2400 households are engaged in the program. Key interventions are: training on slop cultivation, inputs support, market linkage and linkage with public and private service providers related with agriculture and food. As on June 2010 program participants produced:

- Vegetable 389,627 kgs
- Cash Crop 562,740 kgs
- Fruit : 647,075 kgs

b. Improved Food and Livelihood Security in the context of DRR and Climate Change (IFLS)

This program focuses on the coastal areas [Rampal, Mongla, Sharonkhola, Dacop, Morelgong upazila] of Bangladesh and involves 2,252 households. **Key component of the program is capacity building of program participants on rice-shrimp cultivation, acquiring adaptive skill in farming and livestock management in the wake of climate change.** As on February 2011 production records reveals that program

participants produced vegetable —28,938 kgs (produced by 100 households).

c. Improvement of Livelihood through Sustainable Agriculture (ILSA)

This program is implemented in the northern zone (Nachol, Porsha, Potnitola and Dhamoirhat) of Bangladesh where the land is high and dry [Barind tract]. A total of 2000 household are engaged with the program of which more than 50% are indigenous people. **Major program components are: water shed management, access into open water bodies collectively, capacity building on drought prone farming and agricultural practices.** As on July 2010 vegetable plots holders produced 3,890 kgs of vegetable. Wheat, rice and pulse seeds were also distributed and we are yet to get the production report.

d. Enhance Food Security through promotion of Sustainable Agriculture and Adaptive Capacity to Climate Change

This program involves 600 Adivasi (indigenous) Women farmers who are share-croppers and live on leased land. Aim of the program is to enhance household level food security and asset building. Production data as on March 2011 is as under

- Wheat: 30,237 kgs (produced by 71 farmers)
- Vegetables: 1,325 kgs (produced by only 9 farmers)
- Potato: 6,984 kgs 9produced by 14 farmers)
- *Boro* rice: 41 farmers cultivated *boro* rice and are expecting to get 38,610 kgs of rice productions.

e. Natural Resources Management Program, Ecology based NRM and Climate mediated NRM

These programs largely focus on awareness building on judicious use of natural resources and enhancing adaptive capacity of the program participants through small-scale technology development of rural poor community. Natural Resources Management Program is implemented in all Caritas working area while ENRM and CNRM programs are specific to north and south climate and ecological variations.

f. Building Resilience to Climate Change Through Strengthening Adaptive Small Scale Farming System in Rain fed areas in Bangladesh, India and Nepal.

This program is a regional multi-country **agricultural research initiative towards understanding small scale farming system to ensure food security.** This is new initiative and the program started only in March 2011.

Climate Change 2007 - The Synthesis Report

The AR4 Synthesis Report draws together and integrates up to date policy-relevant scientific, technical and socio-economic information on climate change. The Report is intended to assist governments and other decision-makers in the public and private sector in formulating and implementing appropriate responses to the threat of human-induced climate change.

Responding to climate change

Societies can respond to climate change both by reducing the rate and magnitude of change by reducing GHG emissions (mitigation), and by adapting to its impacts. Many impacts can be avoided, reduced or delayed by mitigation, but adaptation will be necessary to address impacts resulting from the warming which is already unavoidable due to past emissions.

The capacity to adapt and mitigate is dependent on socio-economic and environmental circumstances and the availability of information and technology. However, much less information is available on the costs and effectiveness of adaptation measures than about mitigation measures.

Adaptation options:

- Adaptation can reduce vulnerability, both in the short and the long term;
- Vulnerability to climate change can be exacerbated by the presence of other stresses, arising for example from current climate hazards, poverty, unequal access to resources, food insecurity, trends in economic globalisation, conflict and incidence of diseases such as HIV/AIDS;
- Adaptation will be required at regional and local levels to reduce the adverse impacts of projected climate change and variability, regardless of the scale of mitigation undertaken;
- A wide array of adaptation options is available, but more extensive adaptation than is currently occurring is required to reduce vulnerability to future climate change. There are barriers, limits and costs, but these are not fully understood;
- Adaptive capacity is intimately connected to social and economic development, but it is not evenly distributed across and within societies.

Mitigation options:

- There is substantial economic potential for the

mitigation of global GHG emissions over the coming decades, that could offset the projected growth of global emissions or reduce emissions below current levels (high agreement and much evidence);

- In all analysed world regions, near-term health co-benefits from reduced air pollution, as a result of actions to reduce GHG emissions, can be substantial and may offset a substantial fraction of mitigation costs (high agreement and much evidence);
- There may be effects from Annex I countries. action on the global economy and global emissions, although the scale of carbon leakage remains uncertain (high agreement, medium evidence);
- Changes in life style and behaviour patterns can contribute to climate change mitigation across all sectors. Management practices can also have a positive role (high agreement, medium evidence);
- Policies that provide a real or implicit price of carbon could create incentives for producers and consumers to significantly invest in low-GHG products, technologies and processes;
- A wide variety of national policies and instruments are available to governments to create the incentives for mitigation action (high agreement and much evidence). Their applicability depends on national circumstances and an understanding of their interactions, but experience from implementation in various countries and sectors shows there are advantages and disadvantages for any given instrument.

Relationship between adaptation and mitigation options and with sustainable development

There is growing understanding of the possibilities to choose and implement climate response options in several sectors to realise synergies and avoid conflicts with other dimensions of sustainable development. Both synergies and trade-offs exist between adaptation and mitigation options.

Source: http://www.ipcc.ch/publications_and_data/ar4/wg3/en/spmssp-d.html

Compendium of the Social Doctrine of the Church

CHAPTER TEN

SAFEGUARDING THE ENVIRONMENT

I. BIBLICAL ASPECTS

451. *The living experience of the divine presence in history is the foundation of the faith of the people of God: “We were Pharaoh’s slaves in Egypt, and the Lord brought us out of Egypt with a mighty hand” (Deut 6:21).*

The faith of Israel is lived out in the space and time of this world, perceived not as a hostile environment, nor as an evil from which one must be freed, but rather as the gift itself of God, as the place and plan that he entrusts to the responsible management and activity of man.

452. The relationship of man with the world is a constitutive part of his human identity. This relationship is in turn the result of another still deeper relationship between man and God. The Lord has made the human person to be a partner with him in dialogue.

453. *The definitive salvation that God offers to all humanity through his own Son does not come about outside of this world. While wounded by sin, the world is destined to undergo a radical purification (cf. 2 Pet 3:10) that will make it a renewed world (cf. Is 65:17, 66:22; Rev 21:1), finally becoming the place where “righteousness dwells” (2 Pet 3:13).*

In his public ministry, Jesus makes use of natural elements. Not only is he a knowledgeable interpreter of nature, speaking of it in images and parables, but he also dominates it (cf. the episode of the calming of the storm in Mt 14:22-33; Mk 6:45-52; Lc 8:22-25; Jn 6:16-21). The Lord puts nature at the service of his plan of redemption. He asks his disciples to look at things, at the seasons and at people with the trust of children who know that they will never be abandoned by a provident Father (cf. Lk 11:11-13).

454. The entrance of Jesus Christ into the history of the world reaches its culmination in the Paschal Mystery, where nature itself takes part in the drama of the rejection of the Son of God and in the victory of his Resurrection (cf. Mt 27:45,51, 28:2).

455. *Not only is the inner man made whole once more, but his entire nature as a corporeal being is touched by the redeeming power of Christ. The whole of creation*

participates in the renewal flowing from the Lord’s Paschal Mystery, although it still awaits full liberation from corruption, groaning in travail (cf. Rom 8:19-23), in expectation of giving birth to “a new heaven and a new earth” (Rev 21:1) that are the gift of the end of time, the fulfillment of salvation. In the meantime, nothing stands outside this salvation.

II. MAN AND THE UNIVERSE OF CREATED THINGS

456. *The biblical vision inspires the behaviour of Christians in relation to their use of the earth, and also with regard to the advances of science and technology.* The Second Vatican Council affirmed that man “judges rightly that by his intellect he surpasses the material universe, for he shares in the light of the divine mind”[946].

457. *The results of science and technology are, in themselves, positive.* In this regard, the Magisterium has repeatedly emphasized that the Catholic Church is in no way opposed to progress[953], rather she considers “science and technology are a wonderful product of a God-given human creativity, since they have provided us with wonderful possibilities, and we all gratefully benefit from them”[954].

458. *The Magisterium’s considerations regarding science and technology in general can also be applied to the environment and agriculture.* For this reason, “it is necessary to maintain an attitude of prudence and attentively sift out the *nature, end and means* of the various forms of applied technology”. [959] Scientists, therefore, must “truly use their research and technical skill in the service of humanity”, [960] being able to subordinate them “to moral principles and values, which respect and realize in its fullness the dignity of man”[961].

459. A central point of reference for every scientific and technological application is respect for men and women, which must also be accompanied by a necessary attitude of respect for other living creatures. Even when thought is given to making some change in them, “one must take into account the nature of each being and of its mutual connection in an ordered system”. [962]

460. *Man, then, must never forget that “his capacity to transform and in a certain sense create the world through*

his own work ... is always based on God's prior and original gift of the things that are". [965]

If man intervenes in nature without abusing it or damaging it, we can say that he "intervenes not in order to modify nature but to foster its development in its own life, that of the creation that God intended. While working in this obviously delicate area, the researcher adheres to the design of God. God willed that man be the king of creation".[968] In the end, it is God himself who offers to men and women the honour of cooperating with the full force of their intelligence in the work of creation.

III. THE CRISIS IN THE RELATIONSHIP BETWEEN MAN AND THE ENVIRONMENT

461. The biblical message and the Church's Magisterium represent the essential reference points for evaluating the problems found in the relationship between man and the environment.[969] The underlying cause of these problems can be seen in man's pretension of exercising unconditional dominion over things, heedless of any moral considerations which, on the contrary, must distinguish all human activity.

The tendency towards an "ill-considered" [970] exploitation of the resources of creation is the result of a long historical and cultural process. "

462. *Nature appears as an instrument in the hands of man, a reality that he must constantly manipulate, especially by means of technology.*

Such attitudes do not arise from scientific and technological research but from scientism and technocratic ideologies that tend to condition such research. With the progress of science and technology, questions as to their meaning increase and give rise to an ever greater need to respect the transcendent dimension of the human person and creation itself.

463. *A correct understanding of the environment prevents the utilitarian reduction of nature to a mere object to be manipulated and exploited. At the same time, it must not absolutize nature and place it above the dignity of the human person himself.*

The Magisterium finds the motivation for its opposition to a concept of the environment based on ecocentrism and on biocentrism in the fact that "it is being proposed that the ontological and axiological difference between men and other living beings be eliminated, since the biosphere is considered a biotic unity of undifferentiated value.

464. *A vision of man and things that is sundered from any reference to the transcendent has led to the rejection*

of the concept of creation and to the attribution of a completely independent existence to man and nature. There is a need to place ever greater emphasis on the intimate connection between environmental ecology and "human ecology".[976]

465. *The Magisterium underscores human responsibility for the preservation of a sound and healthy environment for all.[977]*

IV. A COMMON RESPONSIBILITY

a. The environment, a collective good

466. *Care for the environment represents a challenge for all of humanity. It is a matter of a common and universal duty, that of respecting a common good,[979] destined for all, by preventing anyone from using "with impunity the different categories of beings, whether living or inanimate — animals, plants, the natural elements — simply as one wishes, according to one's own economic needs".[980]*

This perspective takes on a particular importance when one considers, in the context of the close relationships that bind the various parts of the ecosystem, *the environmental value of biodiversity*, which must be handled with a sense of responsibility and adequately protected, because it constitutes an extraordinary richness for all of humanity. All individuals as well as institutional subjects must feel the commitment to protect the heritage of forests and, where necessary, promote adequate programs of reforestation.

467. *Responsibility for the environment, the common heritage of mankind, extends not only to present needs but also to those of the future. This is a responsibility that present generations have towards those of the future,[985] a responsibility that also concerns individual States and the international community.*

468. *Responsibility for the environment should also find adequate expression on a juridical level.* It is important that the international community draw up uniform rules that will allow States to exercise more effective control over the various activities that have negative effects on the environment and to protect ecosystems by preventing the risk of accidents.

The juridical content of "*the right to a safe and healthy natural environment*" [987] is gradually taking form, stimulated by the concern shown by public opinion to disciplining the use of created goods according to the demands of the common good and a common desire to punish those who pollute.

469. *The authorities called to make decisions concerning health and environmental risks sometimes find themselves facing a situation in which available scientific data are contradictory or quantitatively scarce. It may then be appropriate to base evaluations on the “precautionary principle”, which does not mean applying rules but certain guidelines aimed at managing the situation of uncertainty.* This shows the need for making temporary decisions that may be modified on the basis of new facts that eventually become known. Such decisions must be proportional with respect to provisions already taken for other risks. The circumstances of uncertainty and provisional solutions make it particularly important that the decision-making process be transparent.

470. Programs of economic development must carefully consider “the need to respect the integrity and the cycles of nature” [989] because natural resources are limited and some are not renewable. The present rhythm of exploitation is seriously compromising the availability of some natural resources for both the present and the future.[990]

An economy respectful of the environment will not have the maximization of profits as its only objective, because environmental protection cannot be assured solely on the basis of financial calculations of costs and benefits.

Particular attention will have to be reserved for the complex issues surrounding *energy resources*. [994] The use of energy, in the context of its relationship to development and the environment, calls for the political responsibility of States, the international community and economic actors. Such responsibility must be illuminated and guided by continual reference to the universal common good.

471. The relationship of indigenous peoples to their lands and resources deserves particular attention, since it is a fundamental expression of their identity.[996] The rights of indigenous peoples must be appropriately protected.[999] These peoples offer an example of a life lived in harmony with the environment that they have come to know well and to preserve.[1000] Their extraordinary experience, which is an irreplaceable resource for all humanity, runs the risk of being lost together with the environment from which they originate.

b. The use of biotechnology

472. *In recent years pressing questions have been raised with regard to the use of new forms of biotechnology in the areas of agriculture, animal farming, medicine and environmental protection. The new possibilities offered by current biological and biogenetic techniques are a source of hope and enthusiasm on the one hand, and of alarm and hostility on the other.*

473. *The Christian vision of creation makes a positive judgment on the acceptability of human intervention in nature, which also includes other living beings, and at the same time makes a strong appeal for responsibility.*[1002] *The acceptability of the use of biological and biogenetic techniques is only one part of the ethical problem:* as with every human behaviour, it is also necessary to evaluate accurately the real benefits as well as the possible consequences in terms of risks. In the realm of technological-scientific interventions that have forceful and widespread impact on living organisms, with the possibility of significant long-term repercussions, it is unacceptable to act lightly or irresponsibly.

474. *Modern biotechnologies have powerful social, economic and political impact locally, nationally and internationally. They need to be evaluated according to the ethical criteria that must always guide human activities and relations in the social, economic and political spheres.*[1003] *Above all the criteria of justice and solidarity must be taken into account.*

475. *In a spirit of international solidarity, various measures can be taken in relation to the use of new biotechnologies.* In the first place, *equitable commercial exchange, without the burden of unjust stipulations,* is to be facilitated. It is indispensable to foster *the development of a necessary scientific and technological autonomy* on the part of these same peoples, promoting *the exchange of scientific and technological knowledge and the transfer of technologies to developing countries.*

476. *Solidarity also means appealing to the responsibility of developing countries, and in particular of their political leaders, for promoting trade policies that are favourable to their peoples and the exchange of technology that can improve the conditions of their food supply and health.*

477. Scientists and technicians involved in the field of biotechnology are called to work intelligently and with perseverance in seeking the best solutions to the serious and urgent problems of food supply and health care. They must not forget that their activity concerns material — both living and inanimate — that belongs to the patrimony of humanity and is destined also to future generations.

478. *Entrepreneurs and directors of public agencies involved in the research, production and selling of products derived from new biotechnologies must take into account not only legitimate profit but also the common good.* This principle, which holds true for every type of economic activity, becomes particularly important for activities that deal with the food supply, medicine, health care and the environment.

479. Politicians, legislators and public administrators are responsible for evaluating the potentials benefits and possible risks connected with the use of biotechnologies. Public authorities must also encourage a correctly informed public opinion and make decisions that are best-suited to the common good.

480. Leaders in the information sector also have an important task, which must be undertaken with prudence and objectivity. Society expects information that is complete and objective, which helps citizens to form a correct opinion concerning biotechnological products, above all because this is something that directly concerns them as possible consumers.

c. The environment and the sharing of goods

481. As regards the ecological question, the social doctrine of the Church reminds us that the goods of the earth were created by God to be used wisely by all. They must be shared equitably, in accordance with justice and charity. This is essentially a question of preventing the injustice of hoarding resources: greediness, be it individual or collective, is contrary to the order of creation.[1005]

482. The environmental crisis and poverty are connected by a complex and dramatic set of causes that can be resolved by the principle of the universal destination of goods, which offers a fundamental moral and cultural orientation.

Countless numbers of these poor people live in polluted suburbs of large cities, in make-shift residences or in huge complexes of crumbling and unsafe houses (*slums, bidonvilles, barrios, favelas*). In cases where it is necessary to relocate them, in order not to heap suffering upon suffering, adequate information needs to be given beforehand, with choices of decent housing offered, and the people directly involved must be part of the process.

483. The close link that exists between the development of the poorest countries, demographic changes and a sustainable use of the environment must not become a pretext for political and economic choices that are at variance with the dignity of the human person. In developed countries there is a “drop in the birth-rates, with repercussions on the aging of the population, unable even to renew itself biologically”.[1006] The situation is different in the developing countries where demographic changes are increasing. Although it is true that an uneven distribution of the population and of available resources creates obstacles to development and a sustainable use of the environment, it must nonetheless be recognized that demographic growth is fully compatible with an integral and shared development.[1007]

484. The principle of the universal destination of goods also applies naturally to water, considered in the Sacred Scriptures as a symbol of purification (cf. *Ps 51:4; Jn 13:8*) and of life (cf. *Jn 3:5; Gal 3:27*). For a suitable solution to this problem, it “must be set in context in order to establish moral criteria based precisely on the value of life and the respect for the rights and dignity of all human beings”.[1010]

485. By its very nature water cannot be treated as just another commodity among many, and it must be used rationally and in solidarity with others. *The right to water*,[1011] as all human rights, finds its basis in human dignity and not in any kind of merely quantitative assessment that considers water as a merely economic good. Without water, life is threatened. Therefore, the right to safe drinking water is a universal and inalienable right.

d. New lifestyles

486. Serious ecological problems call for an effective change of mentality leading to the adoption of new lifestyles,[1012] “in which the quest for truth, beauty, goodness and communion with others for the sake of the common good are the factors that determine consumer choices, savings and investments”.[1013] These lifestyles should be inspired by sobriety, temperance, and self-discipline at both the individual and social levels. The ecological question must not be faced solely because of the frightening prospects that environmental destruction represents; rather it must above all become a strong motivation for an authentic solidarity of worldwide dimensions.

487. The attitude that must characterize the way man acts in relation to creation is essentially one of gratitude and appreciation; the world, in fact, reveals the mystery of God who created and sustains it. The world presents itself before man’s eyes as evidence of God, the place where his creative, providential and redemptive power unfolds.

Source: Telling the Story of the God of Love in Asia, *The Concise Compendium of the Social Doctrine of the Church*, Manila, 2007.

KYOTO PROTOCOL

The Parties to this Convention,

Acknowledging that change in the Earth's climate and its adverse effects are a common concern of humankind,

Concerned that human activities have been substantially increasing the atmospheric concentrations of greenhouse gases, that these increases enhance the natural greenhouse effect, and that this will result on average in an additional warming of the Earth's surface and atmosphere and may adversely affect natural ecosystems and humankind,

Noting that the largest share of historical and current global emissions of greenhouse gases has originated in developed countries, that per capita emissions in developing countries are still relatively low and that the share of global emissions originating in developing countries will grow to meet their social and development needs,

Aware of the role and importance in terrestrial and marine ecosystems of sinks and reservoirs of greenhouse gases,

Noting that there are many uncertainties in predictions of climate change, particularly with regard to the timing, magnitude and regional patterns thereof,

Acknowledging that the global nature of climate change calls for the widest possible cooperation by all countries and their participation in an effective and appropriate international response, in accordance with their common but differentiated responsibilities and respective capabilities and their social and economic conditions,

Recalling the pertinent provisions of the Declaration of the United Nations Conference on the Human Environment, adopted at Stockholm on 16 June 1972,

Recalling also that States have, in accordance with the Charter of the United Nations and the principles of international law, the sovereign right to exploit their own resources pursuant to their own environmental and developmental policies, and the responsibility to ensure that activities within their jurisdiction or control do not cause damage to the environment of other States or of areas beyond the limits of national jurisdiction,

Reaffirming the principle of sovereignty of States in international cooperation to address climate change,

Recognizing that States should enact effective environmental legislation, that environmental standards, management objectives and priorities should reflect the environmental and developmental context to which they apply, and that standards applied by some countries may be inappropriate and of unwarranted economic and social cost to other countries, in particular developing countries,

Recalling the provisions of General Assembly resolution 44/228 of 22 December 1989 on the United Nations Conference on Environment and Development, and resolutions 43/53 of 6 December 1988, 44/207 of 22 December 1989, 45/212 of 21 December 1990 and 46/169 of 19 December 1991 on protection of global climate for present and future generations of mankind,

Recalling also the provisions of General Assembly resolution 44/206 of 22 December 1989 on the possible adverse effects of sea-level rise on islands and coastal areas, particularly low-lying coastal areas and the pertinent provisions of General Assembly resolution 44/172 of 19 December 1989 on the implementation of the Plan of Action to Combat Desertification,

Recalling further the Vienna Convention for the Protection of the Ozone Layer, 1985, and the Montreal Protocol on Substances that Deplete the Ozone Layer, 1987, as adjusted and amended on 29 June 1990,

Noting the Ministerial Declaration of the Second World Climate Conference adopted on 7 November 1990,

Conscious of the valuable analytical work being conducted by many States on climate change and of the important contributions of the World Meteorological Organization, the United Nations Environment Programme and other organs, organizations and bodies of the United Nations system, as well as other international and intergovernmental bodies, to the exchange of results of scientific research and the coordination of research,

Recognizing that steps required to understand and address climate change will be environmentally, socially and economically most effective if they are based on relevant scientific, technical and economic considerations and continually re-evaluated in the light of new findings in these areas,

Recognizing that various actions to address climate change can be justified economically in their own right and can also help in solving other environmental problems,

Recognizing also the need for developed countries to take immediate action in a flexible manner on the basis of clear priorities, as a first step towards comprehensive response strategies at the global, national and, where agreed, regional levels that take into account all greenhouse gases, with due consideration of their relative contributions to the enhancement of the greenhouse effect,

Recognizing further that low-lying and other small island countries, countries with low-lying coastal, arid and semi-arid areas or areas liable to floods, drought and desertification,

and developing countries with fragile mountainous ecosystems are particularly vulnerable to the adverse effects of climate change,

Recognizing the special difficulties of those countries, especially developing countries, whose economies are particularly dependent on fossil fuel production, use and exportation, as a consequence of action taken on limiting greenhouse gas emissions,

Affirming that responses to climate change should be coordinated with social and economic development in an integrated manner with a view to avoiding adverse impacts on the latter, taking into full account the legitimate priority needs of developing countries for the achievement of sustained economic growth and the eradication of poverty,

Recognizing that all countries, especially developing countries, need access to resources required to achieve sustainable social and economic development and that, in order for developing countries to progress towards that goal, their energy consumption will need to grow taking into account the possibilities for achieving greater energy efficiency and for controlling greenhouse gas emissions in general, including through the application of new technologies on terms which make such an application economically and socially beneficial,

Determined to protect the climate system for present and future generations,

Have agreed as follows:

ARTICLE 1 DEFINITIONS*

For the purposes of this Convention:

1...."Adverse effects of climate change" means changes in the physical environment or biota resulting from climate change which have significant deleterious effects on the composition, resilience or productivity of natural and managed ecosystems or on the operation of socio-economic systems or on human health and welfare.

2...."Climate change" means a change of climate which is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and which is in addition to natural climate variability observed over comparable time periods.

3...."Climate system" means the totality of the atmosphere, hydrosphere, biosphere and geosphere and their interactions.

4...."Emissions" means the release of greenhouse gases and/or their precursors into the atmosphere over a specified area and period of time.

5...."Greenhouse gases" means those gaseous constituents of

the atmosphere, both natural and anthropogenic, that absorb and re-emit infrared radiation.

6...."Regional economic integration organization" means an organization constituted by sovereign States of a given region which has competence in respect of matters governed by this Convention or its protocols and has been duly authorized, in accordance with its internal procedures, to sign, ratify, accept, approve or accede to the instruments concerned.

7...."Reservoir" means a component or components of the climate system where a greenhouse gas or a precursor of a greenhouse gas is stored.

8...."Sink" means any process, activity or mechanism which removes a greenhouse gas, an aerosol or a precursor of a greenhouse gas from the atmosphere.

9...."Source" means any process or activity which releases a greenhouse gas, an aerosol or a precursor of a greenhouse gas into the atmosphere.

* Titles of articles are included solely to assist the reader.

ARTICLE 2 OBJECTIVE

The ultimate objective of this Convention and any related legal instruments that the Conference of the Parties may adopt is to achieve, in accordance with the relevant provisions of the Convention, stabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system. Such a level should be achieved within a time-frame sufficient to allow ecosystems to adapt naturally to climate change, to ensure that food production is not threatened and to enable economic development to proceed in a sustainable manner.

ARTICLE 3 PRINCIPLES

In their actions to achieve the objective of the Convention and to implement its provisions, the Parties shall be guided, INTER ALIA, by the following:

1....The Parties should protect the climate system for the benefit of present and future generations of humankind, on the basis of equity and in accordance with their common but differentiated responsibilities and respective capabilities. Accordingly, the developed country Parties should take the lead in combating climate change and the adverse effects thereof.

2....The specific needs and special circumstances of developing country Parties, especially those that are particularly vulnerable to the adverse effects of climate change, and of those Parties, especially developing country Parties, that would have to bear a disproportionate or abnormal burden under the Convention, should be given full consideration.

3....The Parties should take precautionary measures to anticipate, prevent or minimize the causes of climate change and mitigate its adverse effects. Where there are threats of serious or irreversible damage, lack of full scientific certainty should not be used as a reason for postponing such measures, taking into account that policies and measures to deal with climate change should be cost-effective so as to ensure global benefits at the lowest possible cost. To achieve this, such policies and measures should take into account different socio-economic contexts, be comprehensive, cover all relevant sources, sinks and reservoirs of greenhouse gases and adaptation, and comprise all economic sectors. Efforts to address climate change may be carried out cooperatively by interested Parties.

4....The Parties have a right to, and should, promote sustainable development. Policies and measures to protect the climate system against human-induced change should be appropriate for the specific conditions of each Party and should be integrated with national development programmes, taking into account that economic development is essential for adopting measures to address climate change.

5....The Parties should cooperate to promote a supportive and open international economic system that would lead to sustainable economic growth and development in all Parties, particularly developing country Parties, thus enabling them better to address the problems of climate change. Measures taken to combat climate change, including unilateral ones, should not constitute a means of arbitrary or unjustifiable discrimination or a disguised restriction on international trade.

ARTICLE 4 COMMITMENTS

1....All Parties, taking into account their common but differentiated responsibilities and their specific national and regional development priorities, objectives and circumstances, shall:

(a)....Develop, periodically update, publish and make available to the Conference of the Parties, in accordance with Article 12, national inventories of anthropogenic emissions by sources and removals by sinks of all greenhouse gases not controlled by the Montreal Protocol, using comparable methodologies to be agreed upon by the Conference of the Parties;

(b)....Formulate, implement, publish and regularly update national and, where appropriate, regional programmes containing measures to mitigate climate change by addressing anthropogenic emissions by sources and removals by sinks of all greenhouse gases not controlled by the Montreal Protocol, and measures to facilitate adequate adaptation to climate change;

(c)....Promote and cooperate in the development, application and diffusion, including transfer, of

technologies, practices and processes that control, reduce or prevent anthropogenic emissions of greenhouse gases not controlled by the Montreal Protocol in all relevant sectors, including the energy, transport, industry, agriculture, forestry and waste management sectors;

(d)....Promote sustainable management, and promote and cooperate in the conservation and enhancement, as appropriate, of sinks and reservoirs of all greenhouse gases not controlled by the Montreal Protocol, including biomass, forests and oceans as well as other terrestrial, coastal and marine ecosystems;

(e)....Cooperate in preparing for adaptation to the impacts of climate change; develop and elaborate appropriate and integrated plans for coastal zone management, water resources and agriculture, and for the protection and rehabilitation of areas, particularly in Africa, affected by drought and desertification, as well as floods;

(f)....Take climate change considerations into account, to the extent feasible, in their relevant social, economic and environmental policies and actions, and employ appropriate methods, for example impact assessments, formulated and determined nationally, with a view to minimizing adverse effects on the economy, on public health and on the quality of the environment, of projects or measures undertaken by them to mitigate or adapt to climate change;

(g)....Promote and cooperate in scientific, technological, technical, socio-economic and other research, systematic observation and development of data archives related to the climate system and intended to further the understanding and to reduce or eliminate the remaining uncertainties regarding the causes, effects, magnitude and timing of climate change and the economic and social consequences of various response strategies;

(h)....Promote and cooperate in the full, open and prompt exchange of relevant scientific, technological, technical, socio-economic and legal information related to the climate system and climate change, and to the economic and social consequences of various response strategies;

(i)....Promote and cooperate in education, training and public awareness related to climate change and encourage the widest participation in this process, including that of non- governmental organizations; and

(j)....Communicate to the Conference of the Parties information related to implementation, in accordance with Article 12.

2....The developed country Parties and other Parties included in Annex I commit themselves specifically as provided for in the following:

(a)....Each of these Parties shall adopt national policies

and take corresponding measures on the mitigation of climate change, by limiting its anthropogenic emissions of greenhouse gases and protecting and enhancing its greenhouse gas sinks and reservoirs. These policies and measures will demonstrate that developed countries are taking the lead in modifying longer-term trends in anthropogenic emissions consistent with the objective of the Convention, recognizing that the return by the end of the present decade to earlier levels of anthropogenic emissions of carbon dioxide and other greenhouse gases not controlled by the Montreal Protocol would contribute to such modification, and taking into account the differences in these Parties' starting points and approaches, economic structures and resource bases, the need to maintain strong and sustainable economic growth, available technologies and other individual circumstances, as well as the need for equitable and appropriate contributions by each of these Parties to the global effort regarding that objective. These Parties may implement such policies and measures jointly with other Parties and may assist other Parties in contributing to the achievement of the objective of the Convention and, in particular, that of this subparagraph;

(b)...In order to promote progress to this end, each of these Parties shall communicate, within six months of the entry into force of the Convention for it and periodically thereafter, and in accordance with Article 12, detailed information on its policies and measures referred to in subparagraph (a) above, as well as on its resulting projected anthropogenic emissions by sources and removals by sinks of greenhouse gases not controlled by the Montreal Protocol for the period referred to in subparagraph (a), with the aim of returning individually or jointly to their 1990 levels these anthropogenic emissions of carbon dioxide and other greenhouse gases not controlled by the Montreal Protocol. This information will be reviewed by the Conference of the Parties, at its first session and periodically thereafter, in accordance with Article 7;

(c)...Calculations of emissions by sources and removals by sinks of greenhouse gases for the purposes of subparagraph (b) above should take into account the best available scientific knowledge, including of the effective capacity of sinks and the respective contributions of such gases to climate change. The Conference of the Parties shall consider and agree on methodologies for these calculations at its first session and review them regularly thereafter;

(d)...The Conference of the Parties shall, at its first session, review the adequacy of subparagraphs (a) and (b) above. Such review shall be carried out in the light of the best available scientific information and assessment on climate change and its impacts, as well as relevant technical, social and economic information. Based on this review, the Conference of the Parties shall take appropriate action, which may include the adoption of amendments to the commitments in subparagraphs (a) and (b) above. The Conference of the Parties, at its first session, shall also

take decisions regarding criteria for joint implementation as indicated in subparagraph (a) above. A second review of subparagraphs (a) and (b) shall take place not later than 31 December 1998, and thereafter at regular intervals determined by the Conference of the Parties, until the objective of the Convention is met;

(e)...Each of these Parties shall :

i)...Coordinate as appropriate with other such Parties, relevant economic and administrative instruments developed to achieve the objective of the Convention; and

(ii)...Identify and periodically review its own policies and practices which encourage activities that lead to greater levels of anthropogenic emissions of greenhouse gases not controlled by the Montreal Protocol than would otherwise occur;

(f)...The Conference of the Parties shall review, not later than 31 December 1998, available information with a view to taking decisions regarding such amendments to the lists in Annexes I and II as may be appropriate, with the approval of the Party concerned;

(g)...Any Party not included in Annex I may, in its instrument of ratification, acceptance, approval or accession, or at any time thereafter, notify the Depositary that it intends to be bound by subparagraphs (a) and (b) above. The Depositary shall inform the other signatories and Parties of any such notification.

3...The developed country Parties and other developed Parties included in Annex II shall provide new and additional financial resources to meet the agreed full costs incurred by developing country Parties in complying with their obligations under Article 12, paragraph 1. They shall also provide such financial resources, including for the transfer of technology, needed by the developing country Parties to meet the agreed full incremental costs of implementing measures that are covered by paragraph 1 of this Article and that are agreed between a developing country Party and the international entity or entities referred to in Article 11, in accordance with that Article. The implementation of these commitments shall take into account the need for adequacy and predictability in the flow of funds and the importance of appropriate burden sharing among the developed country Parties.

4...The developed country Parties and other developed Parties included in Annex II shall also assist the developing country Parties that are particularly vulnerable to the adverse effects of climate change in meeting costs of adaptation to those adverse effects.

5...The developed country Parties and other developed Parties included in Annex II shall take all practicable steps to promote, facilitate and finance, as appropriate, the transfer of, or access

to, environmentally sound technologies and know-how to other Parties, particularly developing country Parties, to enable them to implement the provisions of the Convention. In this process, the developed country Parties shall support the development and enhancement of endogenous capacities and technologies of developing country Parties. Other Parties and organizations in a position to do so may also assist in facilitating the transfer of such technologies.

6....In the implementation of their commitments under paragraph 2 above, a certain degree of flexibility shall be allowed by the Conference of the Parties to the Parties included in Annex I undergoing the process of transition to a market economy, in order to enhance the ability of these Parties to address climate change, including with regard to the historical level of anthropogenic emissions of greenhouse gases not controlled by the Montreal Protocol chosen as a reference.

7....The extent to which developing country Parties will effectively implement their commitments under the Convention will depend on the effective implementation by developed country Parties of their commitments under the Convention related to financial resources and transfer of technology and will take fully into account that economic and social development and poverty eradication are the first and overriding priorities of the developing country Parties.

8....In the implementation of the commitments in this Article, the Parties shall give full consideration to what actions are necessary under the Convention, including actions related to funding, insurance and the transfer of technology, to meet the specific needs and concerns of developing country Parties arising from the adverse effects of climate change and/or the impact of the implementation of response measures, especially on:

- (a)....Small island countries;
- (b)....Countries with low-lying coastal areas;
- (c)....Countries with arid and semi-arid areas, forested areas and areas liable to forest decay;
- (d)....Countries with areas prone to natural disasters;
- (e)....Countries with areas liable to drought and desertification;
- (f)....Countries with areas of high urban atmospheric pollution;
- (g)....Countries with areas with fragile ecosystems, including mountainous ecosystems;
- (h)....Countries whose economies are highly dependent on income generated from the production, processing and export, and/or on consumption of fossil fuels and associated energy-intensive products; and
- (i)....Land-locked and transit countries.

Further, the Conference of the Parties may take actions, as appropriate, with respect to this paragraph.

9....The Parties shall take full account of the specific needs and special situations of the least developed countries in their actions with regard to funding and transfer of technology.

10....The Parties shall, in accordance with Article 10, take into consideration in the implementation of the commitments of the Convention the situation of Parties, particularly developing country Parties, with economies that are vulnerable to the adverse effects of the implementation of measures to respond to climate change. This applies notably to Parties with economies that are highly dependent on income generated from the production, processing and export, and/or consumption of fossil fuels and associated energy-intensive products and/or the use of fossil fuels for which such Parties have serious difficulties in switching to alternatives.

ARTICLE 5 RESEARCH AND SYSTEMATIC OBSERVATION

In carrying out their commitments under Article 4, paragraph 1(g), the Parties shall:

- (a)....Support and further develop, as appropriate, international and intergovernmental programmes and networks or organizations aimed at defining, conducting, assessing and financing research, data collection and systematic observation, taking into account the need to minimize duplication of effort;
- (b)....Support international and intergovernmental efforts to strengthen systematic observation and national scientific and technical research capacities and capabilities, particularly in developing countries, and to promote access to, and the exchange of, data and analyses thereof obtained from areas beyond national jurisdiction; and
- (c)....Take into account the particular concerns and needs of developing countries and cooperate in improving their endogenous capacities and capabilities to participate in the efforts referred to in subparagraphs (a) and (b) above.

ARTICLE 6 EDUCATION, TRAINING AND PUBLIC AWARENESS

In carrying out their commitments under Article 4, paragraph 1(i), the Parties shall:

- (a)....Promote and facilitate at the national and, as appropriate, subregional and regional levels, and in accordance with national laws and regulations, and within their respective capacities:

 - (i)....The development and implementation of

educational and public awareness programmes on climate change and its effects;

(ii)....Public access to information on climate change and its effects;

(iii)....Public participation in addressing climate change and its effects and developing adequate responses; and

(iv)....Training of scientific, technical and managerial personnel.

(b)....Cooperate in and promote, at the international level, and, where appropriate, using existing bodies:

(i)....The development and exchange of educational and public awareness material on climate change and its effects; and

(ii)....The development and implementation of education and training programmes, including the strengthening of national institutions and the exchange or secondment of personnel to train experts in this field, in particular for developing countries.

ARTICLE 7 CONFERENCE OF THE PARTIES

1....A Conference of the Parties is hereby established.

2....The Conference of the Parties, as the supreme body of this Convention, shall keep under regular review the implementation of the Convention and any related legal instruments that the Conference of the Parties may adopt, and shall make, within its mandate, the decisions necessary to promote the effective implementation of the Convention. To this end, it shall:

(a)....Periodically examine the obligations of the Parties and the institutional arrangements under the Convention, in the light of the objective of the Convention, the experience gained in its implementation and the evolution of scientific and technological knowledge;

(b)....Promote and facilitate the exchange of information on measures adopted by the Parties to address climate change and its effects, taking into account the differing circumstances, responsibilities and capabilities of the Parties and their respective commitments under the Convention;

(c)....Facilitate, at the request of two or more Parties, the coordination of measures adopted by them to address climate change and its effects, taking into account the differing circumstances, responsibilities and capabilities of the Parties and their respective commitments under the Convention;

(d)....Promote and guide, in accordance with the objective and provisions of the Convention, the development and periodic refinement of comparable methodologies, to be agreed on by the Conference of the Parties, inter alia, for preparing inventories of greenhouse gas emissions by sources and removals by sinks, and for evaluating the effectiveness of measures to limit the emissions and enhance the removals of these gases;

(e)....Assess, on the basis of all information made available to it in accordance with the provisions of the Convention, the implementation of the Convention by the Parties, the overall effects of the measures taken pursuant to the Convention, in particular environmental, economic and social effects as well as their cumulative impacts and the extent to which progress towards the objective of the Convention is being achieved;

(f)....Consider and adopt regular reports on the implementation of the Convention and ensure their publication;

(g)....Make recommendations on any matters necessary for the implementation of the Convention;

(h)....Seek to mobilize financial resources in accordance with Article 4, paragraphs 3, 4 and 5, and Article 11;

(i)....Establish such subsidiary bodies as are deemed necessary for the implementation of the Convention;

(j)....Review reports submitted by its subsidiary bodies and provide guidance to them;

(k)....Agree upon and adopt, by consensus, rules of procedure and financial rules for itself and for any subsidiary bodies;

(l)....Seek and utilize, where appropriate, the services and cooperation of, and information provided by, competent international organizations and intergovernmental and non-governmental bodies; and

(m)....Exercise such other functions as are required for the achievement of the objective of the Convention as well as all other functions assigned to it under the Convention.

3....The Conference of the Parties shall, at its first session, adopt its own rules of procedure as well as those of the subsidiary bodies established by the Convention, which shall include decision-making procedures for matters not already covered by decision-making procedures stipulated in the Convention. Such procedures may include specified majorities required for the adoption of particular decisions.

4....The first session of the Conference of the Parties shall be convened by the interim secretariat referred to in Article 21 and shall take place not later than one year after the date of

entry into force of the Convention. Thereafter, ordinary sessions of the Conference of the Parties shall be held every year unless otherwise decided by the Conference of the Parties.

5....Extraordinary sessions of the Conference of the Parties shall be held at such other times as may be deemed necessary by the Conference, or at the written request of any Party, provided that, within six months of the request being communicated to the Parties by the secretariat, it is supported by at least one third of the Parties.

6....The United Nations, its specialized agencies and the International Atomic Energy Agency, as well as any State member thereof or observers thereto not Party to the Convention, may be represented at sessions of the Conference of the Parties as observers. Any body or agency, whether national or international, governmental or non-governmental, which is qualified in matters covered by the Convention, and which has informed the secretariat of its wish to be represented at a session of the Conference of the Parties as an observer, may be so admitted unless at least one third of the Parties present object. The admission and participation of observers shall be subject to the rules of procedure adopted by the Conference of the Parties.

ARTICLE 8 SECRETARIAT

1....A secretariat is hereby established.

2....The functions of the secretariat shall be:

(a)....To make arrangements for sessions of the Conference of the Parties and its subsidiary bodies established under the Convention and to provide them with services as required;

(b)....To compile and transmit reports submitted to it;

(c)....To facilitate assistance to the Parties, particularly developing country Parties, on request, in the compilation and communication of information required in accordance with the provisions of the Convention;

(d)....To prepare reports on its activities and present them to the Conference of the Parties;

(e)....To ensure the necessary coordination with the secretariats of other relevant international bodies;

(f)....To enter, under the overall guidance of the Conference of the Parties, into such administrative and contractual arrangements as may be required for the effective discharge of its functions; and

(g)....To perform the other secretariat functions specified in the Convention and in any of its protocols and such other functions as may be determined by the Conference of the Parties.

3....The Conference of the Parties, at its first session, shall designate a permanent secretariat and make arrangements for its functioning.

ARTICLE 9 SUBSIDIARY BODY FOR SCIENTIFIC AND TECHNOLOGICAL ADVICE

1....A subsidiary body for scientific and technological advice is hereby established to provide the Conference of the Parties and, as appropriate, its other subsidiary bodies with timely information and advice on scientific and technological matters relating to the Convention. This body shall be open to participation by all Parties and shall be multidisciplinary. It shall comprise government representatives competent in the relevant field of expertise. It shall report regularly to the Conference of the Parties on all aspects of its work.

2....Under the guidance of the Conference of the Parties, and drawing upon existing competent international bodies, this body shall:

(a)....Provide assessments of the state of scientific knowledge relating to climate change and its effects;

(b)....Prepare scientific assessments on the effects of measures taken in the implementation of the Convention;

(c)....Identify innovative, efficient and state-of-the-art technologies and know-how and advise on the ways and means of promoting development and/or transferring such technologies;

(d)....Provide advice on scientific programmes, international cooperation in research and development related to climate change, as well as on ways and means of supporting endogenous capacity-building in developing countries; and

(e)....Respond to scientific, technological and methodological questions that the Conference of the Parties and its subsidiary bodies may put to the body.

3....The functions and terms of reference of this body may be further elaborated by the Conference of the Parties.

ARTICLE 10 SUBSIDIARY BODY FOR IMPLEMENTATION

1....A subsidiary body for implementation is hereby established to assist the Conference of the Parties in the assessment and review of the effective implementation of the Convention. This body shall be open to participation by all Parties and comprise government representatives who are experts on matters related to climate change. It shall report regularly to the Conference of the Parties on all aspects of its work.

2....Under the guidance of the Conference of the Parties, this body shall:

(a)....Consider the information communicated in accordance with Article 12, paragraph 1, to assess the overall aggregated effect of the steps taken by the Parties in the light of the latest scientific assessments concerning climate change;

(b)....Consider the information communicated in accordance with Article 12, paragraph 2, in order to assist the Conference of the Parties in carrying out the reviews required by Article 4, paragraph 2(d); and

(c)....Assist the Conference of the Parties, as appropriate, in the preparation and implementation of its decisions.

ARTICLE 11 FINANCIAL MECHANISM

1....A mechanism for the provision of financial resources on a grant or concessional basis, including for the transfer of technology, is hereby defined. It shall function under the guidance of and be accountable to the Conference of the Parties, which shall decide on its policies, programme priorities and eligibility criteria related to this Convention. Its operation shall be entrusted to one or more existing international entities.

2....The financial mechanism shall have an equitable and balanced representation of all Parties within a transparent system of governance.

3....The Conference of the Parties and the entity or entities entrusted with the operation of the financial mechanism shall agree upon arrangements to give effect to the above paragraphs, which shall include the following:

(a)....Modalities to ensure that the funded projects to address climate change are in conformity with the policies, programme priorities and eligibility criteria established by the Conference of the Parties;

(b)....Modalities by which a particular funding decision may be reconsidered in light of these policies, programme priorities and eligibility criteria;

(c)....Provision by the entity or entities of regular reports to the Conference of the Parties on its funding operations, which is consistent with the requirement for accountability set out in paragraph 1 above; and

(d)....Determination in a predictable and identifiable manner of the amount of funding necessary and available for the implementation of this Convention and the conditions under which that amount shall be periodically reviewed.

4....The Conference of the Parties shall make arrangements to implement the above- mentioned provisions at its first session,

reviewing and taking into account the interim arrangements referred to in Article 21, paragraph 3, and shall decide whether these interim arrangements shall be maintained. Within four years thereafter, the Conference of the Parties shall review the financial mechanism and take appropriate measures.

5....The developed country Parties may also provide and developing country Parties avail themselves of, financial resources related to the implementation of the Convention through bilateral, regional and other multilateral channels.

ARTICLE 12 COMMUNICATION OF INFORMATION RELATED TO IMPLEMENTATION

1....In accordance with Article 4, paragraph 1, each Party shall communicate to the Conference of the Parties, through the secretariat, the following elements of information:

(a)....A national inventory of anthropogenic emissions by sources and removals by sinks of all greenhouse gases not controlled by the Montreal Protocol, to the extent its capacities permit, using comparable methodologies to be promoted and agreed upon by the Conference of the Parties;

(b)....A general description of steps taken or envisaged by the Party to implement the Convention; and

(c)....Any other information that the Party considers relevant to the achievement of the objective of the Convention and suitable for inclusion in its communication, including, if feasible, material relevant for calculations of global emission trends.

2....Each developed country Party and each other Party included in Annex I shall incorporate in its communication the following elements of information:

(a)....A detailed description of the policies and measures that it has adopted to implement its commitment under Article 4, paragraphs 2(a) and 2(b); and

(b)....A specific estimate of the effects that the policies and measures referred to in subparagraph

(a) immediately above will have on anthropogenic emissions by its sources and removals by its sinks of greenhouse gases during the period referred to in Article 4, paragraph 2(a).

3....In addition, each developed country Party and each other developed Party included in Annex II shall incorporate details of measures taken in accordance with Article 4, paragraphs 3, 4 and 5.

4....Developing country Parties may, on a voluntary basis, propose projects for financing, including specific technologies, materials, equipment, techniques or practices that would be

needed to implement such projects, along with, if possible, an estimate of all incremental costs, of the reductions of emissions and increments of removals of greenhouse gases, as well as an estimate of the consequent benefits.

5...Each developed country Party and each other Party included in Annex I shall make its initial communication within six months of the entry into force of the Convention for that Party. Each Party not so listed shall make its initial communication within three years of the entry into force of the Convention for that Party, or of the availability of financial resources in accordance with Article 4, paragraph 3. Parties that are least developed countries may make their initial communication at their discretion. The frequency of subsequent communications by all Parties shall be determined by the Conference of the Parties, taking into account the differentiated timetable set by this paragraph.

6...Information communicated by Parties under this Article shall be transmitted by the secretariat as soon as possible to the Conference of the Parties and to any subsidiary bodies concerned. If necessary, the procedures for the communication of information may be further considered by the Conference of the Parties.

7...From its first session, the Conference of the Parties shall arrange for the provision to developing country Parties of technical and financial support, on request, in compiling and communicating information under this Article, as well as in identifying the technical and financial needs associated with proposed projects and response measures under Article

4. Such support may be provided by other Parties, by competent international organizations and by the secretariat, as appropriate.

8...Any group of Parties may, subject to guidelines adopted by the Conference of the Parties, and to prior notification to the Conference of the Parties, make a joint communication in fulfilment of their obligations under this Article, provided that such a communication includes information on the fulfilment by each of these Parties of its individual obligations under the Convention.

9...Information received by the secretariat that is designated by a Party as confidential, in accordance with criteria to be established by the Conference of the Parties, shall be aggregated by the secretariat to protect its confidentiality before being made available to any of the bodies involved in the communication and review of information.

10...Subject to paragraph 9 above, and without prejudice to the ability of any Party to make public its communication at any time, the secretariat shall make communications by Parties under this Article publicly available at the time they are submitted to the Conference of the Parties.

ARTICLE 13 RESOLUTION OF QUESTIONS REGARDING IMPLEMENTATION

The Conference of the Parties shall, at its first session, consider the establishment of a multilateral consultative process, available to Parties on their request, for the resolution of questions regarding the implementation of the Convention.

ARTICLE 14 SETTLEMENT OF DISPUTES

1...In the event of a dispute between any two or more Parties concerning the interpretation or application of the Convention, the Parties concerned shall seek a settlement of the dispute through negotiation or any other peaceful means of their own choice.

2...When ratifying, accepting, approving or acceding to the Convention, or at any time thereafter, a Party which is not a regional economic integration organization may declare in a written instrument submitted to the Depositary that, in respect of any dispute concerning the interpretation or application of the Convention, it recognizes as compulsory ipso facto and without special agreement, in relation to any Party accepting the same obligation:

(a)...Submission of the dispute to the International Court of Justice, and/or

(b)...Arbitration in accordance with procedures to be adopted by the Conference of the Parties as soon as practicable, in an annex on arbitration.

A Party which is a regional economic integration organization may make a declaration with like effect in relation to arbitration in accordance with the procedures referred to in subparagraph (b) above.

3...A declaration made under paragraph 2 above shall remain in force until it expires in accordance with its terms or until three months after written notice of its revocation has been deposited with the Depositary.

4...A new declaration, a notice of revocation or the expiry of a declaration shall not in any way affect proceedings pending before the International Court of Justice or the arbitral tribunal, unless the parties to the dispute otherwise agree.

5...Subject to the operation of paragraph 2 above, if after twelve months following notification by one Party to another that a dispute exists between them, the Parties concerned have not been able to settle their dispute through the means mentioned in paragraph 1 above, the dispute shall be submitted, at the request of any of the parties to the dispute, to conciliation.

6...A conciliation commission shall be created upon the request of one of the parties to the dispute. The commission shall be composed of an equal number of members appointed by each party concerned and a chairman chosen jointly by the members

appointed by each party. The commission shall render a recommendatory award, which the parties shall consider in good faith.

7....Additional procedures relating to conciliation shall be adopted by the Conference of the Parties, as soon as practicable, in an annex on conciliation.

8....The provisions of this Article shall apply to any related legal instrument which the Conference of the Parties may adopt, unless the instrument provides otherwise.

ARTICLE 15 AMENDMENTS TO THE CONVENTION

1....Any Party may propose amendments to the Convention.

2....Amendments to the Convention shall be adopted at an ordinary session of the Conference of the Parties. The text of any proposed amendment to the Convention shall be communicated to the Parties by the secretariat at least six months before the meeting at which it is proposed for adoption. The secretariat shall also communicate proposed amendments to the signatories to the Convention and, for information, to the Depositary.

3....The Parties shall make every effort to reach agreement on any proposed amendment to the Convention by consensus. If all efforts at consensus have been exhausted, and no agreement reached, the amendment shall as a last resort be adopted by a three-fourths majority vote of the Parties present and voting at the meeting. The adopted amendment shall be communicated by the secretariat to the Depositary, who shall circulate it to all Parties for their acceptance.

4....Instruments of acceptance in respect of an amendment shall be deposited with the Depositary. An amendment adopted in accordance with paragraph 3 above shall enter into force for those Parties having accepted it on the ninetieth day after the date of receipt by the Depositary of an instrument of acceptance by at least three fourths of the Parties to the Convention.

5....The amendment shall enter into force for any other Party on the ninetieth day after the date on which that Party deposits with the Depositary its instrument of acceptance of the said amendment.

6....For the purposes of this Article, "Parties present and voting" means Parties present and casting an affirmative or negative vote.

ARTICLE 16 ADOPTION AND AMENDMENT OF ANNEXES TO THE CONVENTION

1....Annexes to the Convention shall form an integral part thereof and, unless otherwise expressly provided, a reference

to the Convention constitutes at the same time a reference to any annexes thereto. Without prejudice to the provisions of Article 14, paragraphs 2(b) and 7, such annexes shall be restricted to lists, forms and any other material of a descriptive nature that is of a scientific, technical, procedural or administrative character.

2....Annexes to the Convention shall be proposed and adopted in accordance with the procedure set forth in Article 15, paragraphs 2, 3 and 4.

3....An annex that has been adopted in accordance with paragraph 2 above shall enter into force for all Parties to the Convention six months after the date of the communication by the Depositary to such Parties of the adoption of the annex, except for those Parties that have notified the Depositary, in writing, within that period of their non-acceptance of the annex. The annex shall enter into force for Parties which withdraw their notification of non-acceptance on the ninetieth day after the date on which withdrawal of such notification has been received by the Depositary.

4....The proposal, adoption and entry into force of amendments to annexes to the Convention shall be subject to the same procedure as that for the proposal, adoption and entry into force of annexes to the Convention in accordance with paragraphs 2 and 3 above.

5....If the adoption of an annex or an amendment to an annex involves an amendment to the Convention, that annex or amendment to an annex shall not enter into force until such time as the amendment to the Convention enters into force.

ARTICLE 17 PROTOCOLS

1....The Conference of the Parties may, at any ordinary session, adopt protocols to the Convention.

2....The text of any proposed protocol shall be communicated to the Parties by the secretariat at least six months before such a session.

3....The requirements for the entry into force of any protocol shall be established by that instrument.

4....Only Parties to the Convention may be Parties to a protocol.

5....Decisions under any protocol shall be taken only by the Parties to the protocol concerned.

ARTICLE 18 RIGHT TO VOTE

1....Each Party to the Convention shall have one vote, except as provided for in paragraph 2 below.

2....Regional economic integration organizations, in matters

within their competence, shall exercise their right to vote with a number of votes equal to the number of their member States that are Parties to the Convention. Such an organization shall not exercise its right to vote if any of its member States exercises its right, and vice versa.

ARTICLE 19 DEPOSITARY

The Secretary-General of the United Nations shall be the Depositary of the Convention and of protocols adopted in accordance with Article 17.

ARTICLE 20 SIGNATURE

This Convention shall be open for signature by States Members of the United Nations or of any of its specialized agencies or that are Parties to the Statute of the International Court of Justice and by regional economic integration organizations at Rio de Janeiro, during the United Nations Conference on Environment and Development, and thereafter at United Nations Headquarters in New York from 20 June 1992 to 19 June 1993.

ARTICLE 21 INTERIM ARRANGEMENTS

1....The secretariat functions referred to in Article 8 will be carried out on an interim basis by the secretariat established by the General Assembly of the United Nations in its resolution 45/212 of 21 December 1990, until the completion of the first session of the Conference of the Parties.

2....The head of the interim secretariat referred to in paragraph 1 above will cooperate closely with the Intergovernmental Panel on Climate Change to ensure that the Panel can respond to the need for objective scientific and technical advice. Other relevant scientific bodies could also be consulted.

3....The Global Environment Facility of the United Nations Development Programme, the United Nations Environment Programme and the International Bank for Reconstruction and Development shall be the international entity entrusted with the operation of the financial mechanism referred to in Article 11 on an interim basis. In this connection, the Global Environment Facility should be appropriately restructured and its membership made universal to enable it to fulfill the requirements of Article 11.

ARTICLE 22 RATIFICATION, ACCEPTANCE, APPROVAL OR ACCESSION

1....The Convention shall be subject to ratification, acceptance, approval or accession by States and by regional economic integration organizations. It shall be open for accession from the day after the date on which the Convention is closed for

signature. Instruments of ratification, acceptance, approval or accession shall be deposited with the Depositary.

2....Any regional economic integration organization which becomes a Party to the Convention without any of its member States being a Party shall be bound by all the obligations under the Convention. In the case of such organizations, one or more of whose member States is a Party to the Convention, the organization and its member States shall decide on their respective responsibilities for the performance of their obligations under the Convention. In such cases, the organization and the member States shall not be entitled to exercise rights under the Convention concurrently.

3....In their instruments of ratification, acceptance, approval or accession, regional economic integration organizations shall declare the extent of their competence with respect to the matters governed by the Convention. These organizations shall also inform the Depositary, who shall in turn inform the Parties, of any substantial modification in the extent of their competence.

ARTICLE 23 ENTRY INTO FORCE

1....The Convention shall enter into force on the ninetieth day after the date of deposit of the fiftieth instrument of ratification, acceptance, approval or accession.

2....For each State or regional economic integration organization that ratifies, accepts or approves the Convention or accedes thereto after the deposit of the fiftieth instrument of ratification, acceptance, approval or accession, the Convention shall enter into force on the ninetieth day after the date of deposit by such State or regional economic integration organization of its instrument of ratification, acceptance, approval or accession.

3....For the purposes of paragraphs 1 and 2 above, any instrument deposited by a regional economic integration organization shall not be counted as additional to those deposited by States members of the organization.

ARTICLE 24 RESERVATIONS

No reservations may be made to the Convention.

ARTICLE 25 WITHDRAWAL

1....At any time after three years from the date on which the Convention has entered into force for a Party, that Party may withdraw from the Convention by giving written notification to the Depositary.

2....Any such withdrawal shall take effect upon expiry of one year from the date of receipt by the Depositary of the

notification of withdrawal, or on such later date as may be specified in the notification of withdrawal.

3....Any Party that withdraws from the Convention shall be considered as also having withdrawn from any protocol to which it is a Party.

**ARTICLE 26
AUTHENTIC TEXTS**

The original of this Convention, of which the Arabic, Chinese, English, French, Russian and Spanish texts are equally authentic, shall be deposited with the Secretary- General of the United Nations.

IN WITNESS WHEREOF the undersigned, being duly authorized to that effect, have signed this Convention.

DONE at New York this ninth day of May one thousand nine hundred and ninety- two.

ANNEX I AND ANNEX II COUNTRIES

Annex I

- Australia
- Austria
- Belarus a/
- Belgium
- Bulgaria a/
- Canada
- Czechoslovakia a/
- Denmark
- European Economic Community
- Estonia a/
- Finland
- France
- Germany
- Greece
- Hungary a/
- Iceland
- Ireland
- Italy
- Japan
- Latvia a/
- Lithuania a/
- Luxembourg
- Netherlands
- New Zealand
- Norway
- Poland a/
- Portugal
- Romania a/
- Russian Federation a/
- Spain
- Sweden
- Switzerland

- Turkey
- Ukraine a/
- United Kingdom of Great Britain and Northern Ireland
- United States of America

a/ Countries that are undergoing the process of transition to a market economy.

Annex II

- Australia
- Austria
- Belgium
- Canada
- Denmark
- European Economic Community
- Finland
- France
- Germany
- Greece
- Iceland
- Ireland
- Italy
- Japan
- Luxembourg
- Netherlands
- New Zealand
- Norway
- Portugal
- Spain
- Sweden
- Switzerland
- Turkey
- United Kingdom of Great Britain and Northern Ireland
- United States of America

The Kyoto Protocol is an international agreement linked to the United Nations Framework Convention on Climate Change, which commits its Parties by setting internationally binding emission reduction targets. Recognizing that developed countries are principally responsible for the current high levels of GHG emissions in the atmosphere as a result of more than 150 years of industrial activity, the Protocol places a heavier burden on developed nations under the principle of “common but differentiated responsibilities.” The Kyoto Protocol was adopted in Kyoto, Japan, on 11 December 1997 and entered into force on 16 February 2005. The detailed rules for the implementation of the Protocol were adopted at COP 7 in Marrakesh, Morocco, in 2001, and are referred to as the “Marrakesh Accords.” Its first commitment period started in 2008 and ended in 2012.

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