

SPECIAL FEATURE

GLOBAL CLIMATE CHANGE - GREENHOUSE EFFECT

*Paper delivered by Professor Attard
to the 43rd World Medical Assembly, Malta Hilton, 8th November 1991.*

Mr. Chairman, Distinguished Participants,

May I start by thanking the World Medical Association, its Organizing Committee and its Maltese Branch for inviting me to share with you my thoughts, views and ideals on a subject which, I feel, is intimately related to humankind's very survival. It is indeed a great privilege to be able to address such an august body of representatives from the international medical fraternity. The decision to accept the invitation was not easy knowing full well that I, a lawyer, would be addressing men and women of science on a subject which is substantially of a scientific nature.

Having accepted, I feel it is prudent to briefly explain my credentials. I would neither describe myself as environmentalist nor as a climatologist or scientist but a lawyer and a diplomat who is genuinely concerned about the lack of effective international regime to protect and preserve the threatened global climate. I must also make the traditional disclaimer in that I am speaking today in my personal capacity.

Some 300 years before the birth of Christ, Ecclesiastes wrote:

"One generation passes and another comes,
but the world forever stays".

(Chapter 1)

This pregnant observation could - in my view - be defended for over twenty centuries. On the other hand developments over the past few decades force us to question the correctness of this ancient wisdom. For hundreds of years, the apparent sheer magnitude of our planet and its resources led the human race to think of the earth as an indestructible abode which could satisfy the endless demands of human growth. So firm was humankind's belief in the sustainable support of the earth, that right up to the very 16th century - prior to the Copernican revolution - the earth was perceived as the very centre of the Universe. Indeed it took another four centuries before humanity was fully able to witness earth of the 20th Century that we were first able to see our planet from outer space, majestically and silently orbiting through the cosmos. The image of this sparkling jewel glowing with life contrasts with its dark, lifeless surroundings. It is a spectacular sight which conjures up awe. What previously seemed infinite and inexhaustible, now appears visibly finite and precious.

As the lifeless faces of Mars and Venus hit our screens, they evoke in the human mind greater appreciation and gratitude for the image of mother Earth - its face beaming with life, and covered by a fragile, luxurious, and exquisite blend of colours reflecting clouds, oceans, land surfaces and greenery. It is the very relationship of these elements with the atmosphere that produces the global climate system which involves the interaction - over vast time-scales - of the atmosphere, oceans, land surface (including vegetation) and cryosphere. It is a system which over the millennia has been influenced by the forces of nature such as the variations of the sun's intensity, the earth's tilt, and the cooling of its core.

The development of the global climate has until this century been an evolutionary process which has spread over vast time scales allowing nature to cope with the shifts of climate change. This delicate and intricate ecological balance is now being seriously threatened by humanity itself. What humankind thought was inconceivable - the destruction of all life on earth - has become conceivable. A reality which stares cruelly in our faces.

Ironically, it is the human urge to develop and improve that is tampering with the global climate upon which the nurture of all life ultimately depends. The activities of the some 5000 million humans that inhabit earth risk disrupting irreparably the formidable and unique elasticity of the climate system. They are producing catalytic changes in the global climate over a period which - on a cosmic time-scale - is equivalent to the mere wink of an eyelid. Humanity has replaced nature as the catalyst of change. Unfortunately, it has done so without demonstrating the care and patience of nature.

The problem of climate change was considered in 1988 by the Toronto Conference on the Changing Atmosphere, which was attended by 300 scientists and policymakers from some 46 states: these include that "Humanity is conducting an unintended, uncontrolled, globally pervasive experiment whose ultimate consequences could be second only to a global nuclear war".

One of the main problems caused by climate change is the "greenhouse effect". In brief, a certain number of human activities emit into the atmosphere the so-called greenhouse gases - such as carbon dioxide which is produced through fossil fuel burning. These gases absorb the earth's radiation, forcing the earth's temperature - like that of a greenhouse - to rise.

The problem of stratospheric ozone depletion is intimately related to the climate change phenomenon. Our planet is surrounded by a delicate and formidable layer of ozone, which at sea-level pressure and temperature, would have a thickness of about 3 mm. This layer, which lies about 16 kilometres above the Earth's surface, absorbs some of the sun's ultraviolet radiation and separates humankind from total extinction. On the 22nd October 1991, the UNEP Ozone Trends Panel reported that ground-based and satellite observations indicate that for the first time Ozone Layer depletion is occurring not solely over the Antarctica - where incidentally it has increased - but at all latitudes except in the tropical belt. The Panel confirms that the ozone losses are largely due to the increased build up in the atmosphere of man-made compounds such as chlorofluorocarbons which are widely used as coolants in refrigerators and air conditioners.

According to the U.S. Environmental Protection Agency, for every percentage point of ozone depletion, the number of skin cancer cases increases by 5 to 7 percent. Ozone depletion is also known to have other detrimental effects such as that of on crop yields.

Since 1977, there has been an upsurge in the scientific

research relating to anthropogenic climate change. Important work had been carried out by WMO, UNEP, IOC and other UN bodies. This formidable research is complemented by the work of other reputable scientific organizations such as the International Council of Scientific Unions and the Beijer Institute in Stockholm.

In this international effort, there have been two major deficiencies. The lack of effective co-ordination meant (A) that limited resources were not efficiently utilized and (B) that there was no universal participation in climate research which would only succeed if it covered the whole global climate system. Particularly lacking was the involvement of scientists from developing States. Furthermore, there was a lack of any effective discussion on the matter in the political fora.

It was clear that no progress could be made unless there was more cooperation amongst States, coupled with a political determination to take protective measures.

I had been studying and worrying about this problem for some time, before I asked for a meeting to discuss the matter with our Prime Minister Dr. Edward Fenech Adami. At this meeting held on August 12, 1988 I explained the problem and urged him to take the matter to the U.N. His reaction was very positive and he agreed to consider the matter in consultation with his Foreign Affairs Minister, who is now H.E. The President of the Republic, Dr. Censu Tabone.

Never did I foresee the consequences of my decision to meet the Prime Minister. Ten days after our meeting, on August 22, 1988 the Malta Government agreed to my proposal and requested the U.N. Secretary General to include an item on climate change in the agenda of the 43rd UNGA session. Our request, unfortunately was made after the statutory deadline. Consequently we were informed that U.N. rules only allow such a request to be accepted if it is 'urgent and important'. As it turned out, this procedural problem was not only surmounted but we even managed to convince enough States to convene a Plenary Meeting for the General Assembly to discuss the issue of climate change, before it was delegated to the Second Committee of the Assembly which considers economic and environmental matters. Such a procedure had only been adopted once before, to discuss the Report of the World Commission on Environment and Development.

Whilst the Maltese initiative received widespread appreciation and support, there were U.N. members that looked at this move with apprehension, if not astonishment and suspicion. Some State representatives wondered whether the General Assembly should further burden its agenda with an

issue which, at best, was surrounded by scientific uncertainty, and which - at worst - verged on science fiction. Others wondered what were Malta's motives? Who was behind this initiative? Certain members of the international scientific community feared that by involving the General Assembly, a political forum, the issue would become embroiled in endless debate, thereby encouraging further indecision and inaction.

As the debate at the U.N. proceeded, appreciation for the Malta initiative grew further. The eventual general and widespread support for the Maltese position is reflected in the historic 1988 Resolution 43/53 entitled "Protection of global climate for present and future generations of mankind" which was unanimously accepted by the General Assembly. Briefly, this Resolution characterized climate change as a "common concern of mankind" and proposed an organizational, scientific and legal strategy to counter climate change.

The organizational and scientific strategy culminated in the 1990 First Assessment Report of a specially constituted Intergovernmental Panel on Climate Change. This panel, established under WMO and UNEP, was composed of over 300 leading scientists from over 50 States. Prior to this report, the level of scientific knowledge and certainty relating to climate change was extremely controversial. The Panel's deliberations have assisted in the establishment of a consensus on a series of authoritative statements summarising their findings. This is not to say that uncertainty no longer exists. The Panel, in fact, qualified its findings under four categories of confidence:

"1. We are certain that, 2. We calculate with confidence that, 3. We predict that, 4. Our judgment is that"

In their Report, the world scientists declare they are certain that "emissions resulting from human activities are substantially increasing the atmospheric concentrations of greenhouse gases" In their view, if the current rate of such gases continue at present levels the global temperature will rise by a full degree celsius (nearly 2 degrees Fahrenheit) within a very short period of 30 years.

A rise of a full degree may not sound impressive at all, but this is a global average temperature and its significance becomes clearer when you bear in mind that the records of past climate show that such an average has never risen so fast before. If the current rate of greenhouse gas emissions continue, within less than 50 years we shall face average temperatures which civilized man has never faced before. Furthermore, the scientists make it clear that their assessment is likely to be an underestimate. This view is reflected in the Conclusions of the 1990 Second World Climate Conference, attended by 120 States, which reviewed the

remaining scientific uncertainties. It was stated that "Feedback processes are poorly understood, but it appears likely that as climate warms, these feedbacks will lead to an overall increase in greenhouse gas concentrations". In other words these uncertainties would probably mean a hotter world than the averages predicted by the models, rather than a cooler one.

The ramifications of global warming are astounding and traumatic. All aspects of human life will be effected. Human settlement, agriculture, health, industry, transport and tourism are just a few of the areas of human activity which will be influenced by the expected rise in temperature. The IPCC Report contains a comprehensive and authoritative analysis of the climate change impacts on humanity. I shall very briefly review some of them.

Global warming would lead to a rise in the global mean sea-level due to thermal expansion of the waters. Furthermore, glaciers will melt at a remark rate, as will the Greenland ice cap. The IPCC scientists projected a 10-30 cms rise by 2030 and 30-100 cms rise by 2100. Such a rise is about 2 to 6 times faster than the rate over the last century and poses very serious problems for low lying States and communities living in coastal zones. The Maldives, for example, with the highest point above sea-level of only two metres, would have large parts of its territory submerged. Already, one of its islands has been divided into two. Tuvalu and Kiribati will face similar problems. A sea-level rise of 1 metre would flood 15 per cent of Bangladesh, and some 12-15 percent of Egypt's arable land displacing the lives of some 8 million people which would have to seek refuge. Indeed, the same would occur to large number of coastal communities - it is estimated that some 1.4 billion human beings live within 60 kms of a coastline; those who would have to seek refuge on high grounds, leading to human migration as millions are displaced by shoreline erosion, coastal flooding and severe drought. Many areas to which they flee are likely to have insufficient health and other support services to accommodate the new arrivals. Epidemics may sweep through refugee camps and settlements, spilling over into surrounding communities. In addition, resettlement often causes psychological and social strains, and this may affect the health and welfare of displaced populations.

Coastal areas of such industrialised nations as the United States and Japan will also be threatened, although these nations are expected to have the requisite resources to cope with this challenge. The Netherlands has demonstrated how a small country can effectively marshal resources to deal with such a threat.

There is sufficient evidence to suggest that changes of climate would have a negative impact on the agricultural

production in regions of high present-day vulnerability that are least able to adjust. These include Brazil, Peru, the Sahel Region of Africa, Southeast Asia, the Asian region of the U.S.S.R. and China. Cereal production would decrease in W. Europe, Southern U.S., parts of S. America and Western Australia. It is however expected to increase in N. Europe. These shifts in agricultural patterns would bring about dramatic changes in international agricultural trade.

Natural terrestrial ecosystems could face significant consequences. Projected changes in temperature and precipitation suggest that climate zones could shift several hundred kilometres towards the poles over the next fifty years. Temperate winters might become wetter and summers drier. The tropics would also become wetter, but the sub-tropics, already dry, could become drier still. Tropical climate could spread, bringing illnesses not generally found in formerly temperate zones. Millions of hectares of forests could be destabilized and replaced with grassland. An increase of 1 degree celsius would move the forest-to-grassland transitions in the northern hemisphere 60-100 miles north. Flora and fauna would find themselves in different climatic regimes. Some species could be lost owing to incurred stress leading to a reduction in global biodiversity.

Besides flooding of coastal areas, human settlement may be jeopardised by drought, which could impair food supplies and the availability of water resources. Water shortages caused by irregular rainfall may especially affect developing countries, as seen in the case of the Zambezi river basin. Biomass is the principal source of energy for most of the countries of sub-Saharan Africa, and changed moisture conditions in some areas, reducing this biomass, could pose grave problems for domestic energy production and construction of shelter.

The response strategies to climate change are numerous ranging from development of new technologies to reforestation. One of the more challenging and controversial - particularly in view of the high economic costs involved - is the current effort to control the emissions of greenhouse gases into the atmosphere. The three main greenhouse gases - Carbon Dioxide, Methane and the CFCs - account for more than 90 per cent of additional radiative-heating in the decade up to 1990, and this situation will continue over the next century.

It is the energy business which will generate at least two thirds of the greenhouse gases in the future. Carbon dioxide is mostly a product of the burning of fossil fuels, but in much smaller measures it is released by deforestation in temperate zones and tropics, since cutting down forests removes part of the major sink for absorbing this gas. Unfortunately, we currently destroy some 11 million hectares of tropical

forests every year. At this rate alone, every 30 years, we destroy an area comparable to the size of India.

At the 1990 Second World Climate Conference, it was decided that to stabilize atmospheric carbon dioxide concentrations by the middle of the 21st Century at a level which would be about 50 per cent above pre-industrial concentrations, a continuous world-wide reduction of net carbon dioxide emission by 1 to 2 per cent per year starting from now is necessary. A number of industrialized States are prepared to stabilize or even reduce their carbon dioxide emissions. Developing States, however, are reluctant to do so on the grounds that it would stultify their growth. In their view, those States that have developed and polluted cannot now expect developing States to reduce their economic growth.

Clearly, there is a tremendous cost entailed in reducing carbon dioxide emissions. The U.S. administration, for example, calculated that when in 2005 most programmes under its 1990 Clean Air Act will be in place, they will cost the nation an extra 20,000 million dollars a year. It is difficult to see how the already burdened economies of developing States can muster these costs, particularly as they already face tremendous population growth increasing further the pressures for faster development. Population projections indicate an increase in global population from 5 billion in 1987 to 8.2 billion by 2025. More than 90% of this increase is expected to occur in the developing world.

In view of the catastrophe which may be passed on to future generations, it is imperative that humanity achieves a balance between the necessities of economic development and the need to protect the global climate. It should be stressed that underdevelopment cannot be used to justify the abuse of our environment. On the other hand, developed States should recognize that they have a responsibility in assisting developing States to grow and at the same time meet their environmental obligations. This responsibility emerges from two realities. The developed States have in many cases grown at the expense of the environment. Their development has produced adverse environmental effects which the international community is still facing today. This degradation occurred when some members of the international community were not even States. It was not unknown for States to undertake their hazardous activities in distant colonial territories. The development of the nuclear States is littered with such occurrences.

Furthermore, the developed States have the resources and the technological capabilities to develop environmentally benign technologies. It is significant that the Second World Climate Conference noted that technological efficiency would allow any industrialized country to stabilize carbon

dioxide emissions and subsequently to reduce such emissions by 20 per cent by the year 2005. These opportunities include: vehicle efficiency improvements, regulation of appliance efficiency, conservation of electricity through more efficient lighting and industrial motors, better insulation, greater use of solar, hydro and wind energy, and many others.

There should be channels for the transfer and financing of technologies, which are feasible and cost-effective, towards the developing countries.

The problems relating to the protection of climate change are further complicated by the fact that current international law is inadequate to provide effective protection to the global climate system. Put simply, the law has to be developed. It has also to be recalled that any formulation of international legal principles is influenced by the fundamental rule that States are sovereign and independent. A corollary of this rule is the requirement that their consent or acquiescence is necessary before a norm of international law can evolve. This rule generally explains the often lengthy process of establishing rules of international law.

The desperate need to develop and codify international rules relating to the protection of climate was the basis of the third goal of the 1988 Maltese Climate initiative - the development of a legal strategy. Malta was the first State to propose to the UNGA the need to adopt an international Convention dealing with climate change. The idea eventually received widespread support at various international fora. In its Resolution 45/212 of 21 December 1990, the UNGA decided that negotiations should start through the establishment of the Intergovernmental Negotiating Committee for a framework on the Convention on Climate Change. Its first meeting was held in Washington last February. It is hoped that this Committee - which is open to all U.N. members - will prepare a draft treaty, containing appropriate commitments, for adoption at the June 1992 U.N. Conference on Environment and Development.

If an effective solution to the problem of climate change is to be secured, it is important that certain human activities - such as fossil-fuel burning - are regulated. These activities usually occur within a State's boundary. It is therefore reasonable to expect - at least for the time being - that any internationally accepted regulation would generally depend largely on the national enforcement of limitations, standards and measures. A major international problem could occur when a State allows the unregulated conduct of activities - within its national jurisdiction - which cause, or are likely to cause climate change resulting in significant environmental damage beyond its boundaries. Furthermore, the global nature of climate requires that protective measure should

enjoy general application if they are to be truly effective. States (or even a State), which refuse to adopt internationally agreed measures, could not only cause transboundary harm but also render futile the international community's efforts to protect the global climate.

It is my view that the cornerstone of a successful and effective Convention must be the creation of a mechanism which will achieve a viable balance between the sovereign right of States to exploit their natural resources and the right of the international community to protect and conserve climate for the benefit of humankind.

The legal basis for such a mechanism can be found in the unanimous recognition by the UNGA that climate change is a "common concern of mankind, since climate is an essential condition which sustains life on earth." The concept of the "common concern of mankind" - first proposed by Malta in 1988 - has also received support in other international fora such as the UNEP Governing Council, the Commonwealth, the Non-Aligned Movement, the Noordwijk Conference on Atmospheric Pollution and Climate Change, and the Second World Climate Conference.

This concept should develop into a principle of international law allowing the international community to act on matters which are of common interest. In the case of climate, the international community would be entitled to concern itself with activities which cause climate change, even when such activities occur within a State's boundaries. The principle of domestic jurisdiction can no longer be allowed to be used as a defence when global environmental well-being is at stake.

The legal implications of the common concern of mankind concept have been the subject of widespread attention and examination. The American Society of International Law in its authoritative journal (Vol. 84 No. 2; 1990) commented editorially as follows:

"..... the recognition of climate change as a common concern of mankind is to be welcomed. In the long term, the most efficient mechanism will be an international body functioning on premises maximally scientific and minimally political, with its own standing to protect climate stability. Malta's initiative contemplates that eventuality, but it has also given states a potentially useful instrument in the interim".

Last December the UNEP Executive Director convened a Meeting of Legal Aspects to examine the concept in relation to global environmental issues. The Meeting - attended by members of the International Court of Justice, the International Law Commission, the United Nations Environment

Programme and Government advisers - decided that all countries shared a common concern for the protection of the global environment and all countries had to contribute to the achievement of that protection: equitable sharing of burdens meant however that often some countries were to give greater contributions to that effect than others.

Despite the immensity of the task in tackling the global problem of climate change, significant progress has been made. It is my view however that the deliberations on the question will go on for years beyond June 1992. Crucial matters such as emission targets, reforestation, the role of the oceans, dispute settlements, enforcement and financing are just a few of the matters that still have to be settled. Useful models already exist in the 1985 Vienna convention for the Protection of the Ozone Layer and the related 1987 Montreal Protocol on Substances that Deplete the Ozone Layer.

These instruments set up a realistic legal framework wherein the protection of the ozone layer can be protected. Further significant progress was made at a 1990 Meeting held in London which tightened further the controls envisaged under the said instruments. The agreed measures were coupled with the establishment of a 240 million U.S. dollar fund which will be used to convert factories producing CFCs and other ozone-depleting substances in developing countries to ozone-friendly chemicals, to train people, and to carry out country studies in order to address the full panorama of the needs of developing nations.

Distinguished participants, I would like to conclude by seeking your pardon if I have painted too gloomy and dark a picture. For billions of years nature itself has been the driving force in our planet's climatic changes. Today it is the billions of earth's inhabitants that have become the machine of change. In 1988, Prime Minister Brundtland considered the problem of climate change as more drastic for mankind than any other challenges except for nuclear war. It would be ironic if in this decade which has seen the collapse of the cold war and the upsurge in the process of nuclear disarmament that humanity would not be able to face the challenge of climate change.

The copyright of this article belongs to the Editorial Board of the Malta Medical Journal. The Malta Medical Journal's rights in respect of this work are as defined by the Copyright Act (Chapter 415) of the Laws of Malta or as modified by any successive legislation.

Users may access this full-text article and can make use of the information contained in accordance with the Copyright Act provided that the author must be properly acknowledged. Further distribution or reproduction in any format is prohibited without the prior permission of the copyright holder.

This article has been reproduced with the authorization of the editor of the Malta Medical Journal (Ref. No 000001)