

CLIMATE CHANGE

ENVIRONMENT AND DEVELOPMENT

World leaders' viewpoints



WORLD METEOROLOGICAL ORGANIZATION

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Foreword

by Professor G. O. P. Obasi

Secretary-General World Meteorological Organization

In recent years, there has been growing public awareness of the important implications of the various issues relating to climate change. The World Meteorological Organization (WMO) is very pleased to have been instrumental in providing the necessary information which has helped promote this public awareness.



Indeed, climate change is one of the central areas of concern which is part of the current world-wide attention on the theme of environment and development. This theme is being increasingly addressed in the context of the United Nations Conference on Environment and Development (UNCED) held in Rio de Janeiro, Brazil, from 3 to 14 June 1992.

The quest for sustainable development is part and parcel of the considerations that will be made in UNCED. Climate and climate change will certainly have an effect on the future sustainable development of much of our planet's resources such as those relating to biodiversity, water, forests, land and oceans as well as in relation to various sectoral activities like agriculture and industry.

While climate changes have happened in the past, they did so at a much slower pace than what is now predicted to occur by the next century. In the earlier changes, the various forms of life usually had enough time to adapt. What is dramatic in the present situation is the unprecedented potential rapidity of the changes. Regular, meticulous scientific observations, carried out in a number of countries, provide ample evidence that the atmospheric concentrations of carbon dioxide, methane, nitrous oxide and various chlorofluorocarbons are continuously increasing at a very rapid rate. This is of great concern as it is known that these changes in the composition of the atmosphere will likely result in a warmer global climate. In turn, global warming may lead to a number of adverse consequences, such as sea-level rise, major shifts of precipitation belts and increasing pressure on diminishing freshwater resources.

Much of our knowledge on climate comes from global scientific and technical programmes co-ordinated by WMO. WMO has inherited an interest and involvement in the study of climate and climate change from its predecessor, the International Meteorological Organization (IMO) which was created as early as 1873. In 1929, it already had an active technical Commission on Climatology. On the establishment of WMO in 1950, the new Organization took over the responsibilities of IMO and continued to intensify actions on the international co-ordination of measurements of atmospheric composition including ozone, carbon dioxide and other greenhouse gases. In 1979, WMO convened in Geneva the First World Climate Conference in collaboration with some other organizations of the United Nations system and the International Council of Scientific Unions (ICSU). During the same year, the World Climate Programme was established by the WMO Congress, recognizing among others

'that there is an immediate need for nations to utilize existing knowledge of climate and climate variations in the planning of social and economic development'.

In 1988, the Intergovernmental Panel on Climate Change (IPCC) was established jointly by the WMO and the United Nations Environment Programme (UNEP) to study all aspects of possible climatic changes including the socio-economic implications. A further major action was the convening of the Second World Climate Conference (SWCC) in Geneva from 29 October to 7 November 1990. Both the Conference Statement and the Ministerial Declaration resulting from the SWCC acknowledged and endorsed the activities carried out within WMO's World Climate Programme and IPCC. They also called for urgent action, including the international negotiation of a Framework Convention on Climate Change with a view to the signing of such an agreement by the time of UNCED in June 1992.

Soon after the Second World Climate Conference, WMO conducted a number of interviews with several eminent world leaders because of the great interest demonstrated on that occasion by nations of the world, in particular by their Heads of State and Government. The interviews were published in a booklet entitled 'Climate Change, World Leaders' Viewpoints'. The booklet met with widespread interest and WMO has since received numerous proposals concerning the preparation of a similar booklet containing more interviews with some prominent personalities of the world, in the context of WMO activities related to the concerns of UNCED.

To contribute further to the understanding of the purposes of UNCED and also to disseminate the views of world leaders on some aspects of the related environmental issues, it was decided to conduct a new series of interviews with a selected number of the world's

statesmen and stateswomen from all over the world. This booklet contains the record of these interviews presented in alphabetical order of the names of the respondents' countries.


There is a wide range of topics covered in these interviews. These include the implications of climate change, ozone layer depletion, air pollution and other related issues, to the socio-economic development programme of some countries. There is mention of the spectrum of activities being undertaken or which are proposed to mitigate the potential adverse effects. The relationship between the dual themes of environment and development is also treated in some of the interviews.

Diverse as the backgrounds of the interviewees are, their words convey a common thread of hope, of aspirations, as well as a call for action and international co-operation. Their responses concerning their own expectations with respect to the outcome of UNCED make for interesting reading.

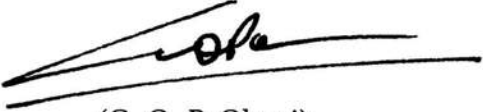
On behalf of the World Meteorological Organization, I wish to express my gratitude to each and every one of our eminent contributors for according the interviews. WMO is very much honoured by their participation. I thank Mr Boutros Boutros-Ghali, Secretary-General of the United Nations and Mr M. Strong, Secretary-General of UNCED, for their message and statement respectively, contained in this booklet.

I also thank Dr Hessam Taba who, in his capacity as a consultant to the Secretary-General of WMO, assisted in the preparation of these interviews and edited this booklet.

I wish to take this opportunity to reiterate WMO's commitment to assist its Members, particularly through their respective national Meteorological and Hydrological Services, to meet the challenges and to make use of the opportunities presented by the environment/development



issues in which WMO has a role to play. WMO also looks forward to the results of UNCED and to being an active participant in the programmes and projects emanating from UNCED, in the spirit of international co-operation for the benefit of the people of our planet Earth.



(G. O. P. Obasi)
Secretary-General

Message

from Dr Boutros Boutros-Ghali

Secretary-General of the United Nations

Threats to the global environment affect all nations, despite their manifest diversity. Although individual countries are endowed with different quantities of natural resources, and although they may use—or abuse—those resources in different ways, they will all suffer from global warming and the destruction of the ozone layer. The environment, in all its beauty and complexity, is a global resource that must be managed effectively for the benefit of all peoples, present and future.




Climate change affects the entire planet and must be managed through an equitable international regime. The effects of a global warming that would destroy the balance of nature would be truly disastrous. Increasing sea-levels would inundate low-lying coastal areas and obliterate entire island States. Rain-fall patterns would be altered, increasing the frequency of floods and drought. Famine levels would be pushed even higher than the already crisis proportions in sub-Saharan Africa. Tropical storms might become more frequent and more severe.

Despite uncertainty as to the rate of global warming, decisive precautionary measures are urgently needed. I therefore attach great importance to the ongoing negotiation of a framework convention on climate change, and look forward to wide agreement on an effective international instrument in time for the United Nations Conference on Environment and Development to be held in Brazil in June 1992. This first step towards an international climate regime should contain specific commitments for stabilizing and reducing greenhouse gas emissions, increasing energy efficiency, and conserving forests, as well as a recognition of the collective, while differentiated, responsibility of all States to work towards these aims. These commitments would, of course, have to be underpinned by a readiness on the part of industrialized countries to transfer additional financial resources and appropriate technology to developing countries to enable them to meet their commitments under the convention.

It is evident that prospects for sound management of the environment are greatly improved by economic development and the alleviation of poverty. Poor people in developing countries are often forced, for the sake of survival, to take actions that can be detrimental both to their long-term welfare and to the national and global environment. Assistance to them now can help them protect and develop their own resources so that they may develop them in a sustainable way in the future.

Let us not forget, however, that the global warming problem has been created by wasteful production and consumption. The solution cannot be the imposition of limits on the capacity of poor people to satisfy their needs and aspirations. If the requirements of the planet's ecology impose constraints on global material growth, then equity demands a redistribution of opportunities and of resources to those in need.



It is of critical importance for the Governments and peoples of the world to act urgently and responsibly to preserve and protect our natural environment. There must be global solidarity in this endeavour which is so crucial for human survival and human well-being. It is in this context that the United Nations Conference on Environment and Development will be a true test of world leadership and the will of the international community to change our fundamental attitudes towards the issues of environment and development.

Statement

by Mr Maurice F. Strong

Secretary-General

United Nations Conference on Environment and Development

It is on the qualities and composition of its atmosphere that the Earth's capacity to sustain and nourish life primarily depends. The atmosphere is the principal medium through which human activity is interacting to shape the conditions on which the future of life on the planet depends. Our behaviour has now reached a level at which it is affecting the balancing systems that



produce the conditions that make life on Earth possible. Protection of the atmosphere is, therefore, a most important environmental priority.

In recognition of this, the United Nations General Assembly specifically referred to the protection of the atmosphere by combating climate change, depletion of the ozone layer and transboundary air pollution when it drew up Resolution 44/228, establishing the mandate of the United Nations Conference on Environment and Development. It was decided further that nations will be represented at the Conference, to be held in Rio de Janeiro in June 1992, by their Heads of State or Government. This will make it the first ever 'Earth Summit'.

Environment and development

Resolution 44/228 stipulated that the Earth Summit is to be a conference on “environment and development” and that these must be dealt with on an integrated basis for every issue which is considered, from climate change to human settlements. The issues of environment and development are inextricably linked. It is primarily through the development process that we affect the environment. The failures and inadequacies of that process have produced the environmental degradation which threatens the future of the environment as well as the sustainability of the development process itself. Poverty and underdevelopment are closely linked to environmental deterioration. Poverty compels people in the interests of immediate survival to over-stress and destroy the resources on which their future development depends. It is a vicious circle in which human need and environmental deterioration re-enforce each other.

In other words, environmental impacts arise as a result of our economic behaviour and can only be addressed by changes in that behaviour. The main task of the 1992 Conference will be to move the environment issue into the centre of economic policy and decision-making.

There can be no issue that more conclusively demonstrates the integrated nature of environment and development than that of climate change. The symptoms of climate change are fundamentally environmental, but the key sources of global warming are developmental, such as the sectors using and converting fossil fuels. The WMO/UNEP Intergovernmental Panel on Climate Change (IPCC) has estimated that emissions from energy related activity contributed about half of the warming effect of human activities during the decade from 1980 to 1990. Measures to control anthropogenic climate change will call for some very fundamental changes in our economic behaviour: in energy, transport and industrial policies

and in the competitiveness of nations and of corporations. The issue of climate change is thus inevitably bound up with major concerns of development.

Not only are the causes of climate change rooted in the development process, but so are their effects. Climate change can contribute to the severity of other important environmental and developmental problems. It leads to increased temperatures, changes in precipitation patterns which in turn may affect forestry and agriculture, shifting the limiting conditions for a wide range of crops faster than they can migrate. Climate change therefore has profound implications for achieving the vital development need of food security.

Taking account of linkages

The natural processes that give rise to global warming are highly complex and systemic in nature. For example, the issue of climate change is closely connected to those of the oceans and forests as a major carbon sink. It is estimated that activities in the forestry sector leading to both deforestation and the conversion of forested areas to other uses contributed a quarter to a third of the warming effect of humans during the last decade.

The problems of climate change, ozone depletion and air pollution are also intimately and unavoidably linked together, by economic activities, by physical, chemical and biological processes, and by the impacts of policy decisions to reduce the risks of any one of these problems on the remaining two. Activities and policies directed towards one environmental issue will invariably have an effect upon others, whether directly or indirectly. Taking full account of the linkages between issues is consequently as important as an integrated approach to environment and development.

This leads to the conclusion that it is necessary to consider the larger context in which our common efforts to

protect the atmosphere from the kind of changes that would threaten human life take place. Any activities on climate change will need to deal with questions of forestry, and any work on forestry or biodiversity which is undertaken by the international community will also need to take into consideration climate change. The same is true for work on strategies related to sustainable agriculture and freshwater management. At the same time, legal agreements which may be produced on climate change and on other issues to be dealt with at the 1992 Conference will have to include provision for financing and transfer of technologies to permit the implementation of required measures, particularly by developing countries.

The different perspectives of developing and industrialized countries

It is ironic that the deterioration of the environment and depletion of natural resources that threaten the future of the planet have occurred largely as a result of the same processes that have produced such unparalleled levels of wealth and prosperity in the industrialized world. The gross imbalance that has been created by the concentration of economic growth in the industrialized countries and population growth in the developing countries is at the centre of the current dilemma. Redressing this imbalance will be the key to the future security of our planet in environmental and economic as well as traditional security terms. This will require fundamental changes in both our economic behaviour and our international relations. Effecting these changes peacefully and co-operatively is, without doubt, the principal challenge of our time.

In this important undertaking, co-operation can only be based on common interests. While there is widespread acknowledgement, at the level of principle, of the need to achieve a sustainable balance between environment and

development, it should be no surprise that the perspectives of developing countries on the issues differ substantially from those of industrialized countries.

Developing countries share fully in global environmental risks such as climate change; indeed, they are especially vulnerable to these risks and much less able to deal with them than are the more industrialized countries. Development remains their principal priority. Of special importance is a massive attack on the vicious circle of poverty in which so many millions of their people are caught up, driving them to meet their immediate survival needs by destroying the environmental and resource base on which their future survival and well-being depends and adding to global environmental risks.

Developing countries cannot be denied their right to grow; nor must this right be constrained by measures to reduce risks that have been created principally by the more industrialized countries which also enjoy the accumulated benefits of their own economic growth which has produced these risks. But their growing demands for energy and natural resources/materials will add considerably to global environmental pressures and risks unless they, too, can make the transition to more sustainable modes of development. They can neither afford nor be expected to do this unless they have access to the additional financial resources and technologies they require to integrate the environmental dimension into their development.

Common and shared responsibilities


Climate change is the primary truly global environmental problem we are facing. All human beings contribute, in one way or another, to the emissions of greenhouse gases that are the principal source of the problem. But the industrialized countries are by far the largest contributors. And,

while the impacts of climate change will also affect every one and these impacts will be unevenly distributed, developing countries bear a disproportionate share of the risks and lack the resources required to deal with them.

It is simply not realistic to consider that people of the developing countries and particularly the poorest of them can participate effectively in the actions required to deal with this global issue except as part of programmes in which their own needs for development and relief from poverty are also being met.

The South Commission recognized that the primary responsibility for the future of developing countries rests, of course, with them, and their success will depend largely on their own efforts. While there is much that the developing countries can and should do on their own to reduce their impacts, particularly through increased energy efficiency, they will need access to substantially increased flows of financial resources, strengthened scientific, technological, professional and related institutional capacities and the best available technologies to become full partners in achieving climatic security. They also deserve and require an international system that lends strong support to these efforts. This includes substantially increased financial assistance, and much better access to markets, private investment and technology to enable them to build stronger and more diversified economies, to effect the transition to sustainable development and to reduce their vulnerability to changes in the international economy. And in economic and environmental as well as in humanitarian terms it will be far less costly and more effective to act now than to postpone action.

The industrialized countries will need to take the first steps in terms of stabilizing and reducing their greenhouse gas emissions. In this regard, the initial step taken by the



member countries of the European Community to stabilize carbon dioxide emissions by the year 2000 is a welcome start, as is the recent decision of Japan to take similar action, and the proposals of the European Community and the Swiss government to introduce a carbon tax. These are all important steps in the right direction.

Incentives for sustainable behaviour

The system of incentives and penalties through which governments create the conditions that motivate our economic life must be re-examined and reoriented to provide the necessary incentives for the transition to sustainability in both our industrial life and individual behaviour. Operation of market forces can and must be a powerful ally in providing the incentives to change. It is, after all, fully consistent with market economy principles that every economic transaction and product must absorb the full costs to which it gives rise, including environmental costs. Ways must be found to incorporate the environmental costs of fossil fuel use into their price. While this will be difficult, we need to make a start. At the same time, we need to undertake major studies to quantify to the extent possible all costs and benefits in order to be able to reach agreement on proposals such as those for the introduction of a carbon tax.

The 3rd session of the UNCED Preparatory Committee agreed that the energy sector is a crucial element of any broad atmosphere strategy. Consequently, it agreed to propose a set of programme areas, as part of the Agenda 21 response to the protection of the atmosphere.

There must be two major areas of activity: programmes to increase energy efficiency and to encourage the transition to environmentally sound energy systems. The major programme areas accepted as a basis for negotiation are as follows:

A. PROMOTING THE ENERGY TRANSITION

- B. INCREASING ENERGY EFFICIENCY
- C. PROMOTING RENEWABLE ENERGY SOURCES
- D. PROMOTING SUSTAINABLE TRANSPORT SYSTEMS

In addition, programme areas relating to the impact of industry, agriculture and forestry on climate, consumption patterns and life styles and uncertainties with regard to the atmosphere were not considered in detail at the third session but will be taken up in the fourth session.

I very much hope that the 1992 Conference will provide the basis for a major programme of energy efficiency which would provide at the same time an important means of reducing CO₂ emissions. This should be accompanied by strong new measures to reduce the fossil fuels component of the energy mix and develop alternative energy sources.

Transport consumes a large part of the energy budget in industrialized countries and in the bigger cities of the developing world. Technical fixes to improve the efficiency of all vehicles; favouring public versus private transportation; non-fossil versus fossil-fuel based modes; all need to be vigorously pursued. Measures must be included to promote the use of alternatives to petroleum in motor vehicles. In this respect the requirements recently established in the city of Los Angeles to introduce alternative, less polluting fuel mixtures may well be a harbinger. In the longer-term, however, the whole concept of human settlements needs to be rethought including not only the design and efficiency of the means of transport themselves, but also the broader issues of land-use and urban planning. New ideas must be developed for the location of homes, work space, leisure, and for communications in general.

Technology and capacity building

The majority of these actions will require a certain level of technology development, and adaptation, as well as

their transfer on a fair and affordable basis to developing countries. They will also need to be supported by major programmes of information, education and training within all countries, and co-ordinated at the international level. Technologies will be needed for energy efficiency programmes, and for alternative, non- or low-greenhouse-gas supply options. One important element of this is the capacity of developing countries themselves to develop the technologies which are most appropriate to their needs.

Most developing countries are unable to obtain access to available information on the range of technologies and the experience of others in using them. Nor do they themselves have the resources necessary to establish networks to access such information.

Closely linked to the issue of technology is that of capacity building. It is essential to ensure that a sound infrastructure is put in place to implement, maintain and adapt the technologies that are available. Improving upon the strengths of the developing countries and reducing their vulnerabilities requires a quantum increase in support for the development of their human resources and related institutional capacities, particularly in the fields of science, technology, management and professional skills. The key to self-reliance is to foster a pool of indigenous talent that can adapt and innovate, in a world where knowledge is the primary basis of competitiveness. Human skills, institutions, information and analytical capabilities should be built up not only to assess and absorb desirable technology from outside, but also to develop it locally.

Conclusion

Many of the solutions we need to reduce the problem of climate change, are also needed, for other reasons; environmental as well as developmental. A strong programme of

energy efficiency will reduce local as well as transboundary air pollution; a less congested city is not only less polluted, but is also a better place to live; increased forest cover can act as a carbon dioxide sink, while also safeguarding biological diversity, and providing a source of economic wealth to future generations.

This is not to say that all the actions that we need to undertake belong to the above group. There will be actions which will require sacrifices from all, for the sake of the survivability of this planet. We must, however, proceed, at least with the "easy" ones as soon as possible. These, as well as other actions need to be brought together under a strategic action plan going well into the next century.

The broader common interest that all governments and people share for the future of our planet provides a powerful incentive to bridge these difficulties. For the evidence is compelling, if not yet definitive, that the risk of climate change poses the greatest threat ever to global security, a threat that can only be obviated through collaborative actions which must commence now before the scientific evidence is definitive. On an issue like this that affects the fate of the entire human community we simply cannot afford to take the chance of waiting too long. It is not feasible to wait for the post mortem on planet Earth to confirm our diagnosis. If there is ever an instance in which we must act in accordance with the precautionary principle, this surely is it.

It is my expectation that the UNCED process will produce this, and that the Governments present in Brazil in 1992 will adopt it as well as signing a convention. Together these will provide the basis for a more secure and hopeful future for our planet as a hospitable home for our species and the other forms of life with which we share it.

His Excellency Paul J. Keating

Prime Minister of the Government of Australia

The Ministerial Declaration of the Second World Climate Conference (Geneva, October/November 1990) confirmed that one of the prevailing problems of global environmental degradation was the emission of greenhouse gases. It went on to call for all industrialized countries to adopt targets and implement response measures. What was Australia's response to this call for action?



Australia is an active supporter of the need for timely and effective action to address the global emission of greenhouse gases.

The Australian Government also views targets as being a useful part of the global response to climate change. As an expression of our commitment to the early implementation of response measures, the Government adopted an interim planning approach to control greenhouse gas emissions. The decision allows the Government to review progress of negotiations on the climate change convention and provides sufficient scope to adopt response measures immediately provided they do not have net adverse economic impacts nationally or on Australia's trade competitiveness, pending an international consensus on action.

We are also working with all other levels of government to develop a National Greenhouse Response Strategy. The Strategy will include measures for controlling emissions of all greenhouse gases, for enhancing the absorptive capacity of Australian greenhouse sinks, adapting to climate change, for conducting further research and ensuring that the community understands the need for early action and the measures individuals could take.

Internationally, Australia has been an active participant in negotiations for the climate change convention and has sought strong and positive outcomes from this process. Again, we have continually urged the adoption of effective response measures in respect of all greenhouse gases, not just carbon dioxide. Australia is committed to continuing international dialogue on this important issue following UNCED.

How does Australia intend to make progress towards reductions in the level of greenhouse gas emissions indicated or desirable reductions sought in the Australian national interim planning response?

The Australian Government anticipates that the National Greenhouse Response Strategy will provide the basis for its long-term response to dealing with climate change. In the interim, we have proceeded with a range of immediate and low cost greenhouse response measures. Most importantly, my Government is overseeing a core research programme and contributing to a dedicated research fund to support further research into climate change. Other measures include national afforestation efforts through our One Billion Trees Programme and Landcare, the implementation of an energy efficiency package,

education and awareness raising programmes and a range of micro-economic reform measures which, although aimed more broadly, will produce positive spinoffs for climate change.

The enhanced greenhouse effect also underscores the compelling need for human activity to be made more ecologically sustainable. Efficiency in energy use and production are critical examples of where such efforts could be effective. To this end, my Government is also developing, in co-operation with State, Territory and local governments, a National Strategy for Ecologically Sustainable Development, which will complement the National Greenhouse Response Strategy.

Why has Australia chosen to address methane and nitrous oxide in addition to carbon dioxide emissions in responding to the climate change issue?

Australia has focused on a comprehensive approach to greenhouse gas emissions to ensure maximum flexibility and efficiency in establishing combinations of measures for the reduction of atmospheric concentrations of greenhouse gases.

The Intergovernmental Panel on Climate Change identified that the emissions of these other greenhouse gases are significant contributors to the enhanced greenhouse effect. In our view focusing emission reduction strategies only on one gas (such as carbon dioxide) does not maximize the opportunities for combating the enhanced greenhouse effect in a cost-effective way.

Furthermore, delays in establishing comprehensive measures are likely to increase the long-term environmental, economic and social cost. This is one

reason why Australia has promoted agreement by the global community to a comprehensive International Climate Change Convention.

Australia has been in the forefront of scientific research on the greenhouse effect since the 1970s. Can you tell us how Australia co-ordinates climate and climate change research efforts?

Australia's highly variable climate and our particular vulnerability to drought and flood have, therefore, given high priority to climate research in Australia for a long time. In addition to its long standing role in monitoring the behaviour of the Australian and more generally, southern hemisphere climate, the Australian Bureau of Meteorology, in collaboration with the Commonwealth Scientific and Industrial Research Organization (CSIRO), were instrumental in the establishment of the Cape Grim Baseline Air Pollution Station in Tasmania. This is one of the key stations in the WMO network which is making an important contribution to the global network of monitoring atmospheric constituents that may have an impact on climate.

The Bureau of Meteorology and the CSIRO have also collaborated closely since the late 1960s in developing a range of climate models aimed at understanding climate variability and change.

Australian scientists, through the special National Committee established under the auspices of the Australian Academy of Science and the Bureau of Meteorology to co-ordinate Australian input, have played a key role in the planning of the Global Atmospheric Research Programme and its successor the World Climate Research Programme (WCRP).

In early 1989 the Australian Government decided to strengthen further the Australian research effort on climate change. It did this through the funding of a special greenhouse modelling programme in CSIRO and the Bureau of Meteorology along with supporting research by university and other groups. We also established a National Greenhouse Advisory Committee (NGAC) in August 1989 with a significant funding base to, among other things, provide expert scientific advice to the Government on priority areas for further greenhouse research work.

Australia's primary role in the international research effort has been to apply our specialist expertise in the southern hemisphere climate and environmental research effort in order to take full account of the problems that we and our South Pacific neighbours have in addressing the greenhouse issue and other environmental problems. As part of this process we aim to support the international effort to strengthen existing monitoring and research programmes (such as the Global Environmental Monitoring System and the World Climate Research Programme) and to facilitate the development of the integrated global climate observing system called for by the Second World Climate Conference.

Support is also given to the International Geosphere Biosphere Programme, the UN Environment Programme (UNEP) Climate Impact Study, and the WMO/UNEP Intergovernmental Panel on Climate Change (IPCC) and we will continue to work through existing bodies such as the WMO, and the South Pacific Regional Environment Programme (SPREP).

As in many other countries the Australian community is concerned about environmental issues. There must be a growing

demand for reliable and up-to-date information on the enhanced greenhouse effect. What Australian educational and information programmes exist to meet this growing demand?

For a number of years we have attempted to achieve a balanced awareness of important environmental issues such as climate change and ozone depletion through the public information and education programmes of organizations such as the Bureau of Meteorology and the CSIRO. Several Australian universities have also become increasingly involved in this important climate education and information role.

We have more recently established a Greenhouse Education and Information Programme. Through this programme the Australian Government conducts a diverse range of national education and information activities with the main components being:

- A grants programme for community groups to undertake projects to raise community awareness of greenhouse issues, promote action to reduce the emission of greenhouse gases and contribute to the development of adaptation strategies;
- A professional and technical development programme to improve the knowledge base within professional groups and to improve their capacity to develop response measures;
- Local government programmes to improve their capacity to respond to greenhouse issues; and
- An information and education resources programme which includes the provision of reports, booklets, displays and other information resources.

Australia has an international reputation for its national and international conservation efforts such as the protection

and conservation of World Heritage Values. This has particular relevance given that two important sinks for removing carbon dioxide from the atmosphere are forests and oceans. Would you describe the actions being taken or proposed in Australia, for the conservation of the marine and forest ecosystems, and the prevention of the degradation of these environments?

Australia has many processes for conserving such environments. We protect and conserve such representative areas through:

- Developing environmental protection and enhancement programmes such as the revegetation and regeneration carried out by such projects as the One Billion Trees Programme and Greening Australia;
- Creating, amongst other conservation areas, National Parks and World Heritage areas;
- Providing incentives for appropriate environmentally sensitive activity;
- Protecting the environment by legislative arrangements which include penalties for causing specific kinds of environmental degradation;
- Contributing to the development of co-operative national and international arrangements and agreements for the protection and enhancement of the natural environment;
- Assessing the environmental impacts of development proposals; and
- Managing the commercial use of the natural environment through agreements between the State, Territory and Commonwealth Governments or through the Commonwealth Governments' environment impact assessment legislation.

As mentioned previously, a National Strategy for Ecologically Sustainable Development is being developed concurrently and will complement these efforts.

Competition for environmental aid is increasing to address a growing array of local, regional and global problems. Australia has taken steps to co-ordinate existing environmental related aid and is providing funds in many areas. Could you tell us about any specific activities directed towards climate change issues?

An important Australian initiative in the climate change area is a project run by our national aid agency AIDAB (the Australian International Development Assistance Bureau). In close collaboration with the WMO, AIDAB has supported a major study on the climate monitoring and climate impact assessment needs of the island nations of the South West Pacific. We hope that the conclusions and recommendations from this study will lead to substantial additional assistance to these nations, enabling them to equip themselves to confront the serious potential impacts of climate and climate change.

In addition, a significant part of our environment aid programme is the A\$30 million which Australia is contributing to the Global Environment Fund. As you know, this is a new international fund, run by the World Bank to assist developing countries to address problems of climate change, biodiversity, marine pollution, and to a lesser extent the depletion of atmospheric ozone.

It is clear that Australia places great significance on the United Nations Conference on Environment and

Development (UNCED). What will be Australia's objectives at UNCED and in particular, what is your greatest desire regarding the outcome of UNCED?

Australian involvement at UNCED is aimed at ensuring that agreement to adopt sustainable development practices can be made by all participating nations and that real action and co-operation continues into the next century. Accordingly, Australia's objectives at UNCED are:

- To promote and support outcomes of UNCED which are aimed at ensuring ecologically sustainable development at global, regional, sub-regional and national levels;
- Promote and support the development of the Climate Change and Biodiversity Conventions;
- Promote inclusion of regional, sub-regional, and southern hemisphere perspectives in UNCED work;
- Promote Australian capabilities in the fields of ecologically sustainable development, environmental management and nature conservation;
- Ensure that ecologically sustainable development priorities are reflected fully in the work of multilateral fora dealing with international economic issues; and
- Reinforce the trend towards more co-operative and practical approaches to the management of international economic issues.

I would like to see substantial progress on these objectives. In particular, I hope that the Biodiversity and Climate Change Conventions can be substantially progressed to the benefit of all the nations of the world. The global community must maximize the opportunity afforded by UNCED for the benefit of both present and future generations. I would also like to take this opportunity to acknowledge the great contribution which the WMO and various other UN agencies are making to these vitally important objectives.

Her Excellency Begum Khaleda Zia

Prime Minister of Bangladesh

In April 1991, Bangladesh was once again hit by tropical storms; one of the worst cyclones and tidal surges on record left behind death and devastation. What would be the consequences for the country if these natural events were amplified by atmospheric warming and adverse climate changes including those which could be due to human intervention?



Global warming may have very severe consequences for Bangladesh. If the sea-level should rise, as a result of global warming, by up to one metre by the turn of the next century, as is being predicted, between 10–17% of our total land mass will be submerged. More than ten million people, currently living in that area, would become ecological refugees. Forests, agriculture, infrastructure, coastal aquaculture and flora and fauna would be severely damaged. Among the other predicted consequences of global warming are a rise in the frequency and intensity of tropical cyclones, increase in flooding severity, and greater desertification in our northern districts.

The cyclone and tidal surge of April 1991 wrought havoc in parts of the country. More than 140 000 lives were


lost, and the total damage is estimated at over US \$2.4 billion. Such natural calamities are a set-back to our development efforts; what people in those areas had built up with years of hard work were set to nought almost overnight. We look forward to working with the world community in finding a solution to these problems, and in mitigating the consequences of such disasters.

As you know, industrial societies have been mainly responsible for the release of large quantities of greenhouse gases to the atmosphere. Do you believe that in countries such as Bangladesh it is possible to develop policies that address global warming without restraining economic development?

Scientists remind us that the industrialized countries account for three-quarters of the anthropogenic emissions of greenhouse gases that contribute to global warming. Yet, it is these very countries that are most able to take corrective measures and to assist others in doing the same.

For countries such as Bangladesh, economic development is a question of survival. A large segment of our population is surviving at the poverty level. Our priority is to meet the basic needs of our people. At the same time our resources are scarce. While we will certainly take every possible measure, within our limited resources, to address global warming issues, we can ill afford to sacrifice socio-economic development. Poverty alleviation is also one sure way of ensuring a sound environment.

Recent devastating floods and cyclones in Bangladesh have made it imperative that disaster management be an integral part of your development strategy. How do you expect to respond to this long-term need and do your development partners appreciate this?



Natural calamities are a reality of our geographic location. These disasters do not strike with regularity, nor is there adequate advance warning. On occasions, their magnitude is far beyond our capacity to cope with. No amount of planning can adequately prepare us for such cataclysmic events.

Over the years, we have developed an elaborate system to mitigate the consequences of such disasters. Furthermore, where possible, we are working on ways to prevent them. Our current flood protection studies are a part of the process of trying to combat the recurrent problem of flooding. Multi-purpose shelters are being constructed in coastal areas to protect people from cyclones and tidal surges. Our development partners are actively assisting us in this process.

The problems of environmental degradation and sustainable development are being given priority in your national programme. What are the major environmental problems in your country, in particular as regards the atmosphere, climate change, protection of freshwater resources and land degradation? What are your priorities in development?

Like other densely-populated developing countries, we are deeply concerned about the environment and its capability to sustain our socio-economic development programmes. Although we contribute very little to the anthropogenic emissions of greenhouse gases in the atmosphere, we have to suffer the consequences of the acts of others. At the same time, our population density implies that we have to make the maximum use of our limited resource base to provide sustenance to our people.

Within our limited means, we are taking measures to protect our environment. A new environment policy, currently being finalized, will highlight the importance we attach to this subject.

Recurrent floods are a major problem for your country. To what extent have international responses been forthcoming to join your own efforts to find a stable solution to this problem and what success have you had in this field?

Bangladesh is periodically inundated by monsoon floods, which cover 20% of the territory one year out of two, and 37% of the territory one year out of ten. The record was broken in 1987 and again in 1988, with 40% and 60% of the territory inundated, respectively.

The country has always lived and coped with floods, including catastrophic ones like in 1987 and in 1988. However, the difference now is that the country has a very high population density, one which has been doubling every thirty years. Thus, pressure on the limited land resource, the demand for food and the potential impact of flood damages are all increasing rapidly.

The Government of Bangladesh has embarked on a major initiative to combat the flood threat and create an environment for secure social and economic growth. Following a recent Flood Policy Study, financed by UNDP, and flood studies carried out in co-operation with our development partners, the Government has asked the World Bank to assist in developing and co-ordinating a five-year Flood Action Plan. Drawing on these studies as a first stage of a long-term flood-control programme, other measures would be implemented subsequently. The Government of Bangladesh has already set-up a Flood Plan Co-ordination Organization (FPCO) to conduct studies to find an enduring solution. So far, twenty-six studies have been commissioned and work is progressing on twenty-four of them.

Your country faces periodic droughts. The northern parts are already witnessing primary signs of desertification. What steps are being taken to face these serious climatic problems?

The pattern of agriculture in Bangladesh depends mainly on rainfall. Rainfall in this country is generated due to oceanic currents in the south-south-east part of the Bay of Bengal, water content in the existing rivers and bodies of water and, to some extent, on our trees and forests. Due to warming of the atmosphere and withdrawal of water upstream, the seasonal pattern in the northern part of Bangladesh is severely affected. The region has to depend mainly on the intensity of rain-fall and large-scale draw-down of aquifer in the lean period. This causes primary signs of desertification in this region.

The Government of Bangladesh decided to install large scale shallow and deep tube wells in the northern parts, mainly for irrigation in the dry season. However, due to low water levels in the aquifer, there are problems with these wells. Studies are underway to determine how best to use existing surface water for agriculture in the dry season. At the moment, no effective steps can be taken to curb the effects of desertification.

It is apprehended that a sea-level rise would bring parts of the land area of your country permanently under the water with serious consequences for the people and economy. Are these issues being given adequate consideration in Bangladesh?

Being a deltaic region, where one of the major river systems of the world drain into the sea, Bangladesh is naturally vulnerable to sea-level rise. Almost the whole country is only a few feet above the sea-level. In such circumstances, concern with the impact of sea-level rise is natural.

This is an issue in which the world community must act in concert. On the one hand, we must tackle jointly the causes that lead to global warming, as a consequence of which the sea-level may rise. On the other hand, we have to

take precautionary measures to mitigate the consequences if this should indeed occur. We look forward to continued co-operation with our development partners and the world community in this regard.

Due to the environmental degradation, the river networks in Bangladesh are facing a serious problem of siltation. Currently, a master plan on waterway development is being prepared in Bangladesh which incorporates large-scale flood control. Could you please provide some information about this plan?

Rivers in Bangladesh carry high silt-loads. Environmental degradation and soil conditions upstream have aggravated the siltation problem in most rivers flowing into the country. The geo-morphological characteristics of our country add further complications. A study on river characteristics, including determination of silt-load to be incorporated in large-scale flood-control measures, is being undertaken in the 'River Survey Programme' of the FPCO. Offers for this study have already been received and are being evaluated.

In order to observe and study the composition of the atmosphere, climatic changes, the ocean-atmosphere interactions and water-resources development, availability of data of high quality is essential. Is the Bangladesh Meteorological Department well equipped to face this challenge?

Our capability to investigate global or regional climate issues is limited, at present. Our Meteorological Department has developed expertise in several areas, including the forecasting of cyclones, floods, etc. We would like to develop the organization even further.

The developed and developing nations of the world have assembled in the hope of working out a charter for a safe and sustainable future for mankind. How do you think developing countries like Bangladesh can contribute towards materialization of that future human dream?

The developed and developing nations of the world are realizing that the world we call our home is fragile. Within this century, and the last, the nature of human activity on this planet has undergone momentous transformation. Perhaps our 'spaceship' may not be able to sustain, for long, the current pattern of industrialization and development.

We have been working with the international community in addressing our common concerns. By participating in the discussions on issues that affect us all, and by drawing up and implementing programmes that benefit us and the world at large, all countries can contribute to our common goals. At the same time, countries contributing most to global warming should consider the consequences of their actions on others.

Finally Your Excellency, what is your greatest desire as regards the outcome of UNCED?

In Bangladesh, our current priority is socio-economic development and improving the conditions of the common man. We have to provide the basic necessities to our people; food, clothing, shelter, education and healthcare. Although we will take every possible step to address our environmental concerns, everyone will acknowledge that, at this stage, it is practically impossible for us to divert resources for environmental protection alone. Only through socio-economic development can we truly address our environmental concerns.

We welcome the recognition by the world community of the relationship between environment and development. We hope that, through the UNCED, we will have a better comprehension of the issues that need to be addressed, and adopt a concrete programme based on this understanding.

**His Excellency
Li Peng**
**Premier of the State
Council of China**

In June 1991, the Government of the People's Republic of China hosted the Ministerial Conference on Environment and Development. Could you please explain what prompted the People's Republic to host the Conference and why the participation at the Conference was limited to Ministers from the developing countries?



The issue of global environment and development has attracted the widespread concern of the international community. To effectively solve such a problem, to attain the goal of sustaining development and to leave to the future generations a sound environment is the common desire of humanity, which requires the extensive participation and co-operation of all the countries in the world. The active participation of the developing countries whose population accounts for the world's majority is the prerequisite of the successful solution of such a problem. The Chinese Government has always attached great importance to environmental protection and also expects that the environmental problem facing the developing countries could win the due attention of the international community. In order to

provide the developing countries with more opportunities to discuss and co-ordinate on the issue of environmental protection and development so that they can play a better role in the international affairs relating to the environment and development, China hosted the Ministerial Conference on Environment and Development on the basis of adequate consultation with many other developing countries.

The Ministerial Conference on Environment and Development was not limited to the developing countries only. In addition to the representatives of 41 developing countries, representatives of eight developed countries including the United States of America and Canada, and 12 international organizations, were also invited as observers. Therefore, although it was the Ministerial Conference on Environment and Development of the Developing Countries, it was a joint effort aiming at promoting international co-operation on environment and development by both the developing and the developed countries as well as the international organizations. To some extent, the Conference created the conditions for the south-north dialogue on environment and development.

The Declaration of the Beijing Conference adopted by 41 countries calls upon the international community to support the efforts of the developing countries to strengthen their organizational, management and technical capabilities. It affirmed that environmental considerations should not be used as an excuse for interference in the internal affairs of the developing countries, nor should these be used to introduce any conditions on aid or financing, or to impose any trade barriers. In your opinion how can these proposals be implemented in reality?

I think that it is of paramount importance for the international community to fully realize the importance

of assisting the developing countries in strengthening their organizational, management and technical capabilities to the protection of the global environment. The environmental impacts are quite often transnational and transregional. The protection of the environment requires a joint effort on a global scale. But the implementation work will ultimately rely on the individual countries. Only through strengthening the organizational management and technological capabilities of the developing countries and assisting them in attaining sustainable social and economic development so as to enable them to protect their own environment, can the global environment be really protected. On the other hand, the environmental problems facing the developing countries were the result of their backwardness and insufficient development due to historical reasons. They are closely related to the existing irrational, unjust international economic relations and the barriers of trade protectionism. Therefore, only through establishing a new international economic order, drawing up a global development and environment co-operation programme, creating an international development and environmental protection co-operation fund and ensuring technology transfer on a favourable basis by the international community, can the developing countries obtain the necessary economic and technological capabilities to protect their own environment and to participate more effectively in the international co-operation on global environmental protection.

Many of the environmental problems are related to economic development and the exploitation of natural resources. These problems can only be solved when the sovereignty of countries over their own resources and their ways and paths of development are respected so as to enable them to undertake environmental protection measures that

are suited to their own conditions. Therefore, all international conventions and agreements relating to environment and development should guarantee the right of development of the developing countries in accordance with the principle of equality of states.

The Ministers at the Conference went on record as saying that the least developed countries, disaster-prone developing countries as well as islands and low-lying developing countries should be given special attention by the world community. Could you please describe what is meant by special attention?

The global environmental deterioration, especially global warming, will have profound impacts on the social and economic development of all the countries in the world. This impact will be even more serious on the least-developed countries, disaster-prone developing countries as well as islands and low-lying developing countries. One reason for that is the peculiar locations of their countries and the vulnerability of their countries' ecosystems. Thus, the threat of the global warming and sea-level rise is more serious for them. The second reason is their weak economic and technological capabilities to combat the environmental deterioration and natural disasters. It is hoped that through calling on the international community to pay special attention to these countries, the international community, in addition to making its effort to protect the global climate, could consider fully the special conditions and the difficulties of these countries in order to give priority consideration to their requests and to make the necessary arrangements accordingly.

One of the main achievements of the Second World Climate Conference (SWCC), which was chaired by Mr Zou Jingmeng,

the Administrator of the State Meteorological Administration of China, was to pave the way for the preparation of a Framework Convention on Climate Change. The Beijing Ministerial Declaration mentioned specifically that the framework convention must include firm commitments by developed countries towards the transfer of technology to developing countries. In your opinion which elements should comprise such a commitment and under what conditions?

In the last 200 years and more, the industrialized countries have emitted a large amount of greenhouse gases into the atmosphere that has aggravated the global climate change. Therefore, they have the main responsibilities in addressing the global climate change. Now they are capable of tackling such a problem in terms of funds and technology. But the developing countries, on the one hand, are suffering from the ill-effects of global environmental problems caused mainly by the developed countries and, on the other hand, are restrained by the level of their economic development, and are short of the means to combat such ill-effects and to protect the environment of their countries. Therefore, the framework convention should clearly state that the developed countries should lift the restraints on the developing countries and transfer environmentally sound technology to them on a favourable and non-commercial basis. This is essential in implementing the principle of justice and differentiations. It is also the prerequisite of basically improving the capabilities of the developing countries to address the unfavourable impacts of global climate change and to protect the environment.

Concerning the emission of the greenhouse gases, the Beijing Ministerial Meeting was very much concerned about the likelihood of a climate change and its repercussions on the developing

countries and low-lying islands. This concern was also expressed during the Second World Climate Conference (SWCC) held in Geneva in October/November 1990. In your opinion what action should be taken to highlight this important question during the United Nations Conference on Environment and Development (UNCED)?

We are very much concerned with the climate change caused by the increase of greenhouse gases in the atmosphere and its possible impact on the global ecosystem. We hope that the framework convention on climate change can confirm that the chief responsibilities for greenhouse gas emissions lie with the developed countries. The convention should also make clear that the developed countries have the responsibility to take the lead in reducing greenhouse gas emissions and urge them to make explicit promises to transfer technologies and provide funds to the developing countries. I hope that 'Agenda 21', that will be produced at the forthcoming United Nations Conference on Environment and Development, will be in conformity with the principles of the United Nations General Assembly resolutions and can be implemented so as to solve the environmental problems faced by the developing countries.

Of course, to protect the ecology and to forestall the unfavourable influence of climate change is also the responsibility of our developing countries and will be in our own interests. We, the developing countries, should also endeavour to co-ordinate our social economic development with ecological and environmental protection in accordance with the conditions of our countries so as to benefit our own people and to make due contributions to humanity. Therefore, to protect the environment and climate has been listed as one of our basic state policies. Although the greenhouse gas emissions per capita in China has not reached one-tenth of that of some developed countries, China, for many years, has been

devoted to promoting family planning, population control, afforestation, ecosystem improvements, energy frugality, energy-efficiency enhancement, energy-structure reformation and clean energy. China is also working hard to reduce the increase of greenhouse gas emissions so as to make its due contributions to the protection of global climate.

SWCC also supported the establishment of a Global Climate Observing System (GCOS) to integrate the present WMO World Weather Watch (WWW), the Global Ocean Observing System and the Global Atmosphere Watch. Could you please tell me what plans China has in this respect?

Research on climate change, analysis of the impact of climate change on society, economy and ecology, and the choice of response strategies in accordance with our economic capabilities, should all be based on the facts from climate monitoring. The idea of establishing a Global Climate Observing System by the international community is very important and significant. The Chinese Government fully supports this idea.

China is a large country with frequent occurrences of weather- and climate-related disasters. Therefore, we have always paid great attention to improving our capabilities for monitoring climate and climate change. The Chinese Government has decided to further improve our present weather and climate monitoring system during the eighth 'Five-Year Plan Period' (1991–1995). I think that this will be an input to the establishment of the Global Climate Observing System. China is now co-operating with the World Meteorological Organization, the United Nations Environment Programme, and the United Nations Development Programme to set up the world's first in-land Global Atmosphere Watch baseline station on the Qinghai-Tibetan

Plateau. Its establishment will be a large input to the global monitoring of greenhouse gas emissions and climate change and will be an important contribution of China to the protection of global environment.

The global climate change may have serious impacts on economy, especially on agriculture. Could you please explain the considerations of the Chinese Government on this problem?

China is a large developing country with a population of 1.1 billion and is raising 22% of the world's population on 7% of the world's arable land. In recent years, we have, on the whole, solved the food and clothing problem faced by the people; this is an important contribution of New China to humanity. But the availability of food per capita, especially of grain, in the country is still very low. Like other developing countries, China also experiences the increasing demand for food, fodder and other needs of the people due to the increase of population and improvement of living standards. At the same time, natural disasters are frequent in China.

Environmental problems such as drought, flood and waterlogging as well as grassland deterioration, soil erosion and desertification that are related to climate change, all restrain the sustainable development of agriculture. Therefore, climate protection and adaptation to climate change and the full exploitation of the agricultural climatic resources are very important to the agricultural development in China. Of course, climate change has favourable and unfavourable impacts on agriculture. We will do our best to exploit the favourable conditions of climate change to raise the agricultural output per unit. We will also pay more attention to the unfavourable impacts of climate change, intensify research on meteorology and the rules of disaster occurrences so as to improve our monitoring, forecast,

preparedness and combat capabilities and fully exploit the roles of meteorology in combating the disasters and in the relief effort.

China has taken many measures to develop agriculture, for example stepping up the harnessing of large rivers, undertaking large-scale capital construction projects on farmland, improving agricultural fields with low grain production and undertaking comprehensive agricultural cultivation projects. We will step up afforestation, protect and enlarge vegetation coverage, prevent soil erosion and intensify our efforts to harness desertification. We will use engineering and biological technologies to improve agricultural ecological environment. All these efforts will enhance our agricultural productivity and our capabilities of addressing climate change and forestalling natural disasters.

Could you please explain if deforestation and its consequential environmental effects have become serious problems in China? What actions have been taken to halt deforestation or encourage reforestation?


The forest is the ecological defence for agriculture and water conservation projects. It is important in ensuring stable and good harvest and the effective roles that can be played by the water conservation projects. Therefore, China has always paid great attention to the protection and development of forestry resources. With the promulgation of the forest law, China implements the policy of nationwide compulsory afforestation and strict cutting quotas and undertakes the construction of forest defence systems and desertification control projects. At present, the afforested areas increase by 4 million hectares per year and each year 3.5 million hectares of hillsides are closed to facilitate afforestation. In recent years, our forest coverage has steadily enlarged and

forest reserve is steadily increasing. We have eliminated forest deficit in China; forest coverage in China has increased from 8.6% in 1949 to the present 13.4%. Although in some places, over-felling of trees has caused environmental deterioration, a balance is maintained in the country between forest increase and consumption with the former slightly more than the latter. We are now working hard to increase our forest resources and to protect our ecological environment so as to strike a balance between environmental protection and economic development.

UNCED is being convened with the main objective of giving the highest priority to the impending global environmental problems. Mr Prime Minister, what is your greatest personal desire as regards the outcome of UNCED?

From the Conference on Human Environment in 1972 to the UNCED in 1992, the international community has made great progress in understanding the environment. It is now fully realized that the global environmental deterioration is closely related to the economic and social development. Only on the basis of a comprehensive and co-ordinated consideration of the relations between economic development and environmental protection can we ultimately find the way of solving the environmental problems. China actively participated in the international activities aimed at improving the environment.

China places great expectations on the UNCED and will dispatch a high-level delegation to the conference. We hope that, based on the spirit of 'only-one-earth' and 'people-in-the-same-boat-help-each-other', the international community will make concerted efforts to study the issues relating to environment and development, especially those restraining the developing countries from



achieving sustainable development, and recommend practical solutions. We hope that the Conference will be able to promote both the international co-operation on economic development and will be able to make due contributions to the establishment of a just and rational pattern for international co-operation.

**His Excellency
Helmut Kohl**

**Chancellor of the Republic
of Germany**

The Second World Climate Conference (Geneva, October/November 1990) was a resounding success. This was due to efforts invested by all participants in particular the national Meteorological and Hydrological Services. Among these, the contributions of the Deutscher Wetterdienst should receive special mention. Since environmental challenges such as climate change, ozone depletion, desertification and marine pollution, discussed by SWCC, are among problems requiring concerted international action, you may wish to express your personal views on these.



The Second World Climate Conference made a significant contribution towards setting in motion the international process to negotiate a framework convention on climate change. The scientists' warning that the greenhouse effect, ozone depletion in the stratosphere, desertification, drought and increasing water pollution were to be considered as global challenges led *inter alia* to the call made by the ministers at the Second World Climate Conference for negotiations on an international convention on climate change.

The ensuing establishment of the Intergovernmental Negotiating Committee for a Framework Convention on Climate Change by the UN General Assembly is one of the most important steps to meet the dangers facing our planet. I consider it essential that a framework convention on climate change be negotiated, as planned, in time for the UN Conference on Environment and Development to be held in Brazil in 1992.¹ We call for binding agreements to limit and reduce emissions of gases affecting the climate, particularly CO₂, as well as to preserve and increase forests, which store CO₂ and act as a sink. Mere declarations of intent are not enough if we want to carry through the necessary changes to protect the climate in the near future.

This conference is crucial. The guidelines for the environmental policy of the international community must be re-set. No single state or government is in a position to master global environmental problems such as the changing atmosphere, thinning of the stratospheric ozone layer, widespread desertification, destruction of forests and deterioration of land and water resources in many countries. It is worth preserving our planet's natural basis for life durably today for present and future generations. To do this, we need strengthened international collaboration between all countries, and especially a more firmly established partnership between developing and industrialized countries. This means that States should work together and be ready to introduce measures to deal with global environmental problems through jointly negotiated agreements and conventions.

In this context, technical co-operation and transfer of knowledge and environmentally sound technology are highly important to all parties to the convention, especially developing countries. The framework convention must provide for further research into, and scientific assessments of the causes of climate change, to improve our understanding of the

climate and atmospheric systems, as well as the impacts of climate change on man and his environment. International monitoring programmes, such as the Global Atmosphere Watch of the World Meteorological Organization are of significance here, as they play a fundamental role in the supply and international exchange of data.

In supporting the work of WMO/UNEP/IPCC, you have expressed the opinion that in the face of threats of irreversible environmental damage, lack of full scientific certainty should not be used as an excuse to postpone action. Yet as you know not all the nations of the world share this opinion. In other words there are those who prefer to delay concrete decision and action until such time as the scientific evidence is adequately convincing. In the face of this dilemma what can be done by the international community in order to make progress on the subject?

Protection of the Earth's atmosphere is considered world-wide as the biggest political challenge to date in the environmental domain. Unlike many previous environmental hazards, this is a world-wide threat. Considerable gaps still persist in model calculations as regards the extent of the impending climate change as well as its local and regional impacts. However, scientists are agreed, with only a few exceptions, on the estimate that the greenhouse effect will cause a climate change with enormous consequences, and this immediately requires far-reaching measures to be taken. The principle of prevention must also be applied in the international environment policy, since remedial action is more costly and less effective than prevention and the targeted control of root causes.

The understanding that, in the long run, social progress is only possible with a healthy environment was

also expressly emphasized in the declarations of the economic summits in Paris (1989) and London (1991).

You are a fervent proponent of negotiation of a framework convention on climate change which you hope will be ready by 1992. In this context, not all countries share the same approach. Some are in favour of a convention containing definite commitments and a protocol, while others speak of more general commitments, i.e. developing national emission inventories rather than specific targets and timetables. If the present situation continues do you believe that the EC Region will continue to follow their present course of action to stabilize their emissions of CO₂ by the year 2000 at the present level with further reduction later?

Together with the European Community, we have energetically emphasized the need for binding commitments and called upon all industrialized countries to help achieve the community stabilization target by the year 2000. The EFTA countries have already endorsed this fundamental position of the European Community. In order to meet their target, the European Community is currently developing a detailed plan of action. I am convinced that this target is attainable, especially considering that my country, like the EC Members, the Netherlands and Denmark, has already decided to reduce CO₂ emissions considerably.

You agree with the amendment of the Montreal Protocol to phase out the use of chlorofluorocarbons (CFCs) by the year 2000 and also wish to extend coverage of the Protocol to other ozone depleting substances. A number of countries have already adopted measures to reduce the use of CFCs, but the question arises as to whether these actions are sufficient. In

your opinion what further global measures, based on scientific knowledge, could be adopted in order to effectively protect the ozone layer?

In my opinion, there is a number of further global measures which can effectively support the protection of the ozone layer, such as further shortening of the deadlines for reducing emissions of substances regulated in the Montreal Protocol in accordance with the London Resolution of Members of the European Community. The latter provides for world-wide renunciation of CFC consumption and production by 1997. Germany has forged ahead with its CFC-halon ban, for example, and by 1995 CFCs and halon will no longer be produced and consumed. In my view, other ozone-depleting substances, such as the partially halogenated substances, should be inserted in the provisions of the Montreal Protocol. Furthermore, it is absolutely essential for the industrialized countries to make greater efforts towards the greatest possible involvement of the developing countries in the replacement of ozone-depleting gases through the transfer of improved technology.

You support the establishment of financial mechanisms to assist developing countries to tackle the problem of ozone depletion. In this context you refer perhaps to the multilateral fund of US \$240 million over a three-year period established under the Montreal Protocol. In the first instance, this sum seems to be very inadequate for assisting developing countries to acquire new technologies in refrigeration, air conditioning, electronics and so on. Could you propose some other possible sources to be used by developing nations to phase out CFC emissions?

It is important for country studies to be carried out in greater depth, in order to determine the specific and

frequently very different basic requirements of the developing countries, and achieve the conditions for effective introduction of technologies as quickly as possible.

As regards the sum you have mentioned, this is the accumulated amount resulting from the accession of India and China. Whether it will actually be sufficient can only be judged at the end of the three-year pilot phase of this fund. At the present time it is not possible to make any assessment.

In May 1990, Ministers from 34 countries in the EC Region met at Bergen, Norway on the occasion of the Regional Conference on 'Action for a Common Future'. The Ministers agreed to lead a global effort to address questions related to: (i) Energy efficiency; (ii) Energy conservation; and (iii) The use of environmentally sound and renewable energy sources. In your address to the Houston meeting you recognized the importance of nations working together to develop technologies to implement energy conservation and other measures to reduce carbon dioxide and other greenhouse gas emissions. Will the countries of the EC Region follow this matter?

Priority in reducing climate-related emissions from the energy sector must be given to measures aimed at energy saving, rational use of energy and the rapid development of the use of renewable energies. This result of the Bergen Conference in 1990 was, *inter alia*, confirmed and put in concrete form through the work of the IPCC and the German Bunderstag's survey commission on precautions to protect the Earth's atmosphere.

My Government has therefore already decided to aim for a 25–30% reduction in CO₂ emissions by the year 2005 in Germany and has developed for this purpose a compre-

hensive programme of measures for energy savings, increased energy efficiency and greater use of renewable energies. This also applies to the European Community and its decision to stabilize total EC CO₂ emissions by the year 2000. The limitation of emissions of other climate-related trace gases has already been partially addressed in EC decisions and within the framework of EEC agreements.

Without doubt, the industrialized countries bear the brunt of climate and environmental conservation measures. The Republic of Germany is also prepared for technological and financial collaboration with the developing countries as well as the countries within central and eastern Europe. I assume that my colleagues in the European Community share this position.

On several occasions the Government of Germany has shown its determination to protect the existing forests and increase forests when feasible. You have demonstrated interest in a new dialogue with developing countries to support their efforts; indeed, you have been implementing a project with the Government of Brazil to counteract the threat to tropical rain forests in that country. Has the German Government carried out similar projects elsewhere in the world?

The upkeep of the forests in the northern and temperate climate zones, as well as in tropical areas, is one of the special challenges facing the international community as regards global environmental protection. During my visit to Brazil in October 1991, I found that that country, which has the largest rain forests in the world, also regarded the problem from the standpoint of a sober assessment of common interests.

Because of their rich variety of species and products, the tropical forests not only form an essential basis for the

continued existence of those living in them, but also, in so far as non-destructive use is possible, they have considerable potential to further the development possibilities of the countries concerned, which will be undermined if they are destroyed. Similarly, the climatic and other environmental impacts of the destruction of tropical forests must be considered. The catastrophic consequences are felt not only in the country and region concerned, but also, in the long term, world-wide.

Programmes for the protection and careful use of tropical forests therefore have special priority in our co-operation for development. For example, we have set up programmes with Brazil for the upkeep of coastal forests and for establishing protected forest areas in the Amazon basin. On the basis of this experience, I suggested at the economic summit in Houston in 1990 that a comprehensive pilot programme be set up for the upkeep of the Brazilian rain forest with international participation which will be implemented step by step after thorough preparation.

The German Government is working with 50 developing countries on forest management and development. Over the last few years, it has expanded its support considerably. Some 300 million DM are allocated for such measures annually; my country is thus in the lead amongst donor countries.

Essentially, our collaboration is based on the national tropical forest action programmes set up between individual developing countries and the donor community. These make it possible to incorporate forest upkeep in an overall concept of economic development and thus give equal weight to economic and ecological interests.

The German Government is giving maximum support to an international convention on the management, upkeep

and development of forests. We are expecting steps to be taken in this direction by the Conference on Environment and Development in Brazil in 1992.

In recognizing that developing countries will benefit from increased financial and technological assistance to help to resolve their environmental problems, you have suggested that debt-for-nature swaps can play a useful role in protecting the environment. This proposal is extremely interesting and deserves further attention. Could you please expand on this?

Fundamentally, the German Government is of the opinion that there is a special need for financial support for countries with weak economies. We thus support the linkage of debt relief and environmental protection. So far, this linkage has been primarily applied in collaboration between private funding agencies and governments of indebted countries. I think that it should also be strengthened when steps are being taken between governments to cancel debts. My Government has agreed to cancel the debts of several countries and linked this with a requirement for increased environmental protection. We will consider this possibility in future cases of debt relief.

Finally Mr Chancellor, what is your greatest personal desire as regards the outcome of the United Nations Conference on Environment and Development (UNCED)—Brazil, 1992?

For my part, I would like the Conference on Environment and Development to result above all in a concrete agreement to protect our common environment and in a world-wide environmental partnership between

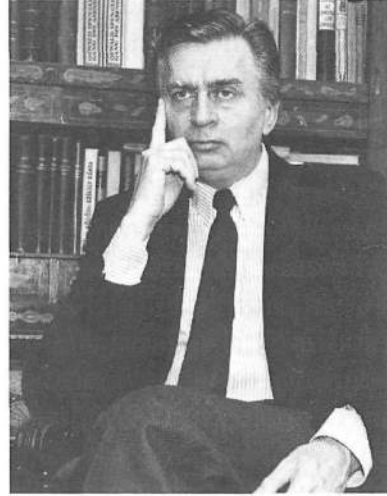
industrialized and developing countries. Only when we manage to achieve a clear agreement to protect our environment will we meet the challenges for future world-wide sustainable development. Without this partnership between industrialized and developing countries, this objective cannot be reached. Everyone must make whatever reasonable contribution he can to this partnership, in order to maintain our natural foundations of life.

Despite the different positions which have become clear during the preparatory conferences held to date, I maintain the view that, as a community of nations, we are in the same boat and destined for success. If we do not succeed in obtaining the necessary steps in Brazil, we will all be losers, whether industrialized or developing countries.

His Excellency József Antall

Prime Minister of Hungary

It is believed that the countries in Central and Eastern Europe are facing some special environmental problems. Could you please tell us about some of these problems, in particular those relevant to your own country? What do you think of the problem of the atmospheric pollution due to industrialization in Central and Eastern Europe? Are you concerned about the atmospheric warming due to greenhouse gas emissions?



The environmental problems of Hungary are not unique in the area, many of them are common with other countries of Central and Eastern Europe (for example considerable air, water and soil pollution, eroded land, underdeveloped infrastructure, and the environmental repercussions of earlier gigantic projects).

The situation in Hungary, however, is particularly precarious for two reasons. On the one hand most (96%) of our surface water resources originate from abroad. On the other hand, a very great part (nearly three-quarters) of our total land area is under agricultural use. The groundwater resources are overused, the agricultural chemicals pollute the surface- and sub-surface waters in a considerable part of the land area.

In Central and Eastern Europe, air pollution is largely a technological problem which could be substantially reduced through the introduction of more advanced technologies. Furthermore, in the whole area, transboundary air pollution is an acute problem. Due to their technological underdevelopment these countries contribute more to such pollution than what it would normally be in proportion to their gross national product.

What may be the consequences of possible climate change in your region and what national or international measures would you prefer in order to avoid such consequences?

For Hungary, climate change may be particularly harmful in several respects. Regional climate impact studies have indicated that climate warming—which can have beneficial effects too—would create a difficult situation in agriculture and water resources management, especially if accompanied by a substantial decrease of precipitation. I consider it quite important to continue the on-going climate impact assessments which may help a lot in foreseeing the possible problems in due time.

In view of the global character of many environmental issues such as transboundary pollution, broad international co-operation is required, primarily concerning exchange of know-how and technology. If external aid would be given to Hungary, to which areas would you give high priority?

Environmentally sound technologies have to be applied in the future to ensure sustainable social development. The radical change of economic structures taking place in our region gives also a possibility of providing a considerable

remedy to the environmental problems on both regional and global levels, therefore allowing for optimum expenditure of the external aid rendered for the introduction of environment-friendly, energy- and material-efficient technologies. This is a priority area in Central and Eastern Europe from the point of view of needs for external aid. In addition, it would be important to receive assistance in the field of monitoring of transboundary water and air pollution, i.e. in the field of environmental observations, data processing and analysis.

A free and unrestricted exchange of meteorological and hydrological data is essential for the monitoring of the physical, chemical and environmental processes which determine the state of the global environment. What is your opinion about this?

The unrestricted (and free of charge) exchange of environmental data and information is of decisive importance. Without such a data exchange the effectiveness of any international agreement on the protection of the environment could be queried.

The international exchange of meteorological data and information is one of the best examples of international co-operation based on mutuality which would be required in other fields too. It is a great merit of the World Meteorological Organization to have asserted the principle of the free and unrestricted international exchange of meteorological observational data and analysed products and to have maintained it undisturbed in spite of any complicated political situation.

According to the Intergovernmental Panel on Climate Change (IPCC), the question of possible climate change in Central and

Eastern Europe is precarious in particular with respect to water balance. The Hungarian Great Plain is frequently affected by droughts. In your opinion, what measures could be taken to reduce the threat of a warmer and drier climate for agriculture?

Due to climate change it is to be expected that our environmental problems would become more serious. In order to avoid possible disputes, new agreements on water-management regulations should be concluded with the neighbouring countries.

It is to be expected that, with increasing frequency and intensity of droughts, gradually the whole structure of agricultural production has to be changed which would require costly investments, for example installation of new types of agricultural machinery, plantation of new cultures, initiation of new training programmes, establishment of a new type of food-processing industry.

Water engineering has played an important role in the history of the Hungarian Great Plain, in particular from the end of the eighteenth century. In your opinion what lessons could be learned from this?

The regulation of waterways in Hungary, with a peak-activity in the nineteenth century, was one of the largest scale programmes of this kind in the world. This activity served very important economic purposes, but at the same time it led to radical alterations of the environmental conditions.

We have learned from this that any artificial modification of the environment may be followed by complex environmental consequences even in remote fields which could not have been foreseen. It is worthwhile to study the possible consequences very carefully with particular attention to irretrievable changes which may be caused.

The problem of river basins shared by two or more countries is an issue which requires a great deal of attention even at the political level. Do you believe that environmental diplomacy may become an important new activity?

The pollution of the environment, or any other modification which may affect the state of the environmental conditions in other countries, or may alter the global environment, cannot be an internal matter of any country. Hungary is in a very difficult situation in this respect as most of its surface water resources originate from abroad, and are already polluted to a certain degree.

It is our opinion that natural resources such as rivers, shared by several countries, should be utilized only in ways that do not disturb the environment and the ecological balance. In order to ensure this requirement, environmental diplomacy has to cope with increasing duties with the aim to possibly prevent or to regulate international disputes on environmental problems.

Mr Prime Minister, what is your greatest personal desire as regards the outcome of the United Nations Conference on Environment and Development, Brazil 1992?

If UNCED makes the nations of the world realize the fact of mutual interdependence in connection with the protection of the global environment, and makes them recognize the importance of co-operation in this field, it would be a considerable achievement for the Conference.

The relationship between man and nature, having been stable and quite peaceful for a long time, was disturbed by a demographical explosion, by industrialization and mass-production that followed these processes. In modern societies consumption and production—mutually impelling

one another—have become the instruments of destructing the environment. However, I hope, we are not all compelled now to repeat the faults made by others, the hard and sometimes even tragic consequences of which we can observe in some countries which are ahead of us in economic development. We wish to establish an environmentally sound social market economy.

A question may be raised: 'Is this objective a realistic one at the present time in Hungary?'. In my opinion, the contrary would be unrealistic. We could not possibly pursue an anti-production policy. In our present situation we even have to increase production, but with the smallest possible consumption of material and energy and with the least possible wastes. Only in this way can we hope to preserve a balance of the environment and production, and protect our natural resources, the atmosphere and our Earth.

The attitude of regarding the protection of the environment solely from the point of view of its costs can not be justified. With the introduction of material- and energy-efficient, environmentally sound technologies, the costs of production will certainly decrease and less expenditure will be required for repairing environmental damages. Thus the preservation of our environment may be seen as an integral part of production. Finally, we should remember: we are not only rational beings. We require harmony in our lives and for this we should maintain a balanced relationship with our environment. I trust UNCED will effectively promote these ideals all over the world.

His Excellency Soeharto

President of the Republic of Indonesia

The fifth Five-Year Development Plan (1989–1994) of Indonesia adopted the principle of sustainable development. Could you please define the concept of sustainable development in the context of your country?



From our vantage point the sustainability of development is essential not only in economic and environmental terms, but in the broader terms of achieving the best possible quality of life, shared by our people. Therefore our concept of sustainable development comprises:

- That sustainable development continues to be a foremost imperative for the developing countries in view of the persisting poverty and the low level of the quality of life in such countries.
- While the developing countries must achieve a minimum rate of development in response to population growth and in order to eradicate poverty, in the pursuit of growth and development all countries must heed and observe environmental constraints. Their development should be kept within parameters beyond which environmental and

eco-systemic deterioration becomes irreversible and the natural resource base becomes unsustainable and unrenowable. However, we are convinced that those environmental parameters can be expanded through co-operative efforts in the fields of both environment and development.

- Those co-operative efforts should be guided by the principle of equity. While safeguarding the global environment is a common responsibility, national shares in that responsibility must be equitably allocated. It would also be in accordance with the principle of equity to share development opportunities and options to enable developing countries to achieve self-sustained development. Thus the establishment of equity is an objective in itself as well as a means to attain other development and environmental objectives.

What are the main policies and strategies formulated by the Indonesian Ministry of State for Population and the Environment to promote Environmentally Sound and Sustainable Development (ESSD)?

Keeping in mind the principles of sustainable development as outlined above, the main policies of the State Ministry for Population and the Environment are derived from the need to integrate environment and development from the conviction that sustainability requires the proper management of the linkage between development, environment and population.

What is also required is a continuous monitoring of the state of the environment, of the state of our natural resources (and the rates of their utilization and renewal) as well as the population factors. This is to provide us with the most accu-

rate and most up-to-date information upon which to base policy-decisions. For such a purpose, the information must be assessed in economic terms, based on concepts that still need development and further refinement, together with new management tools and policy instruments.

The main policies are contained in the basic Law on the Management of the Environment which was enacted in 1982. An important aspect of that law is contained in a Government Regulation on Environmental Impacts (1986) which pertains to the application of environmental impact analyses (EIAs) made mandatory under the law.

Other legislative products are presently being prepared and the Government has submitted for enactment by the Indonesia Parliament, a draft law on population dynamics and family welfare, and another draft law on resource use and spatial planning.

In terms of institutionalization, in addition to the State Ministry for Population and the Environment there is now also the Agency for Environmental Impact Management. The Agency is charged with the implementation and enforcement of EIA regulations, pollution and waste management with special emphasis on aspects involving hazardous and toxic substances.

The Ministerial Session of the Second World Climate Conference (SWCC)—Geneva, November 1990, during which Professor Emil Salim of Indonesia served as Vice-Chairman, was very much concerned about the increase of the greenhouse gas emissions in the atmosphere and consequent environmental degradation. To what extent does this problem exist in Indonesia?

There is indeed great concern for the increase in greenhouse gas emissions as an issue that must be considered in a global

and in a national context. While we believe that the level of our local emissions has not yet exceeded the capabilities of our environment to serve as a sink for those emissions, we are certainly prepared to do our appropriate share in the context of global efforts. At the same time, we foresee that as the pace of development and industrialization in our country and in other developing countries steps up, our emission levels will increase in the future, though not at rates that have been experienced earlier by today's industrialized countries in the past. We believe that global efforts should be undertaken to offset the anticipated increases of emissions in the developing countries.

Deforestation is recognized as being one of the causes of the increase of atmospheric greenhouse gas concentration. In Indonesia a great deal of forest has been converted to agricultural land or affected by mass cutting. What actions have been taken to protect the country's forest resources?

It should first of all be remembered that with reference to Indonesia's total land area, the percentage of forested land is higher than in many other countries and in most of the developed countries. Our policy is to keep a portion of our forested land fully protected and another portion, designated as production forests, may be exploited provided sustainable yield methods are employed. A third portion will have to be converted to other uses. In addition, we also have reforestation programmes.

A major effect arising from deforestation is erosion of top-soils as well as breakdown of the absorptive capacity of watersheds leading to land slides. Have these problems already shown their appearance in your country?

Erosion problems have arisen in Indonesia and are to be countered through reforestation programmes, areal terracing and improved and appropriate agricultural methods. A rigorous application of our land-use and spatial planning provisions will hopefully prevent the problem from worsening.

There are those who contend that tropical rain forests belong to the world since forests are global lungs. If this is the case, do you agree that the burden of safeguarding the forests should also be shared fairly among the nations of the world?

While the burden of safeguarding forests should indeed be equitably shared among the nations of the world, it should also be pointed out that all forests of all climates, and not just tropical forests, perform global eco-systemic functions. Our concern should be directed towards global forests, and not only tropical rain forests.

The Ministers at the SWCC also recognized the impending problem of the sea-level rise resulting from the increase of greenhouse gas emissions. Do you consider the possibility of the sea-level rise and consequent reduction of the coastal areas an imminent threat?

We are certainly concerned about the potentially disastrous impacts of sea-level rise because, as an archipelagic country, Indonesia has the longest coastline of all nations in the world. Our perception of how imminent is the threat of sea-level rise depends mainly on the information and research findings extended to us by the world community. We are also concerned about the possible impacts of another aspect of climate change,

namely the change in weather patterns. Traditional agricultural methods, different from region to region, have evolved over generations in adaptation to the country's highly varied weather patterns which differ from region to region. Changes in those patterns will cause suffering and might require changes in life-styles and in agricultural methods which will be costly and difficult.

To what extent has Indonesia been the victim of drought? On the national level, do you consider the problems of drought and deforestation interconnected?

Indonesia has experienced droughts that occur cyclically but now those cycles seem to have changed in their regularity. Droughts have an immediate impact upon agricultural productivity in general and particularly upon our efforts to maintain food self-sufficiency. But droughts also have lingering impacts upon water supplies and it is in the context of conserving water that forests ought to be conserved. The interconnection between drought and deforestation is that during periods of droughts there is an increased danger of forest fires.

In many parts of the world there is the risk that population densities will outgrow the natural capacity of local areas to provide adequate stocks of fresh water. The problem will be even more compounded by atmospheric pollution, climatic changes and possible sea-level rise and salt water infusion in the coastal areas. To what extent have these problems been dealt with in the ESSD programme of Indonesia?

As stated earlier, we are well aware that sustainable development requires the consideration of environmental and

population factors. Our success in managing population growth rates has earned world-wide recognition and through human resource development programmes we will endeavour to improve the qualities, the skills and capability levels of our population. Guided by our land-use and spatial planning laws we will also endeavour to redistribute our population and redirect migratory patterns in line with environmental carrying capacities.

There is a universal agreement that the key to successful implementation of any environment and development plan, be it national or global, is the availability of data, depicting the state of the atmosphere and its composition at the surface of the earth as well as upper atmosphere, oceans, rivers and inland waters. For this, an extensive observational network is necessary. Are the Meteorological and Hydrological Services of Indonesia adequately prepared to face this important challenge?

Our meteorological, hydrological and other pertinent services need manpower skills and equipment as well as an adequate inflow of information from outside and access to international data. Strengthening institutional capabilities is another need that we face.

Finally, Mr President, what is your greatest desire as regards the outcome of the United Nations Conference on Environment and Development (UNCED)—Brazil 1992?

First, an increased global awareness and a global political will concerning the need to establish and enter into global cooperation of an unprecedented level in order to safeguard the environment and to secure for all of mankind a quality of life commensurate with human dignity.

Second, and above all, a commitment to pursue and uphold equity in the division of the benefits of human endeavours and the wealth of natural resources, and in the allocation of tasks and responsibilities in our common efforts to safeguard the environment and to secure a tomorrow that is better than today.

It is the establishment of equity within nations between nation and between generations that will enable us to reach the goal of harmony between humans, between humans and their physical and social environments, and between humans and their Creator.

His Excellency Kiichi Miyazawa

Prime Minister of Japan

The Ministerial Declaration drawn up by the Second World Climate Conference (SWCC)—Geneva October/November 1990—stated that the developed countries must take the lead and commit themselves to reducing their net emissions of greenhouse gases. An 'Action Programme to arrest Global Warming', a decision that was made by the Council of Ministers for Global Environment Conservation, was prepared in October 1990 by the Government of Japan with similar aims. Could you please indicate the most important issues in this Action Programme?



Global warming is a serious problem which may greatly affect the very existence of mankind, and nations of the world should urgently make efforts to limit the emission of greenhouse gases including emissions of carbon dioxide. Japan's per capita emission of carbon dioxide is now one of the lowest among the developed countries, as a result of efforts made by the government and private sectors to improve energy efficiency. Even so, Japan still emits a large amount of carbon dioxide, for which it should bear responsibility, and should play a role commensurate with

its position in the international community in the prevention of global warming. Based on this recognition, Japan has formulated the 'Action Programme to arrest Global Warming', which was adopted by the Council of Ministers for Global Environment Conservation on 23 October 1990. The Action Programme refers to short-term principles to be respected by the government and contains an overall framework of feasible measures which represent Japan's basic attitudes towards contributions to the creation of an international framework addressing global warming.

The points in this Action Programme are as follows:

- (1) To set targets that will limit CO₂ emissions, based on the common efforts of the major industrialized countries, by stabilizing the emission of CO₂ on a per capita basis in the year 2000 and beyond at about the same level as in 1990, and also by making efforts to stabilize the total amount of CO₂ emissions in the year 2000 and beyond at about the same level as in 1990, through the development of innovative technologies at the pace and in the scale greater than currently predicted;
- (2) To progressively implement extended and comprehensive measures towards the attainment of the set targets;
- (3) To review this programme, as necessary, so that a flexible response is possible to international trends and accumulated scientific findings; and
- (4) To report each year on the progress made in implementing measures and to re-examine the promotion of the Programme as necessary. I am convinced that this Action Programme is certain to receive international appreciation.

The SWCC Ministerial Declaration also underlined the importance of strengthening co-operation with developing countries to enable them to address climate change issues without hindering their national development goals and objectives. The Government of Japan is indeed very active in this field. Could you please describe in general terms the criteria of selecting the countries you assist, conditions under which this assistance is provided, as well as the types of assistance?

Environmental problems in developing countries are given high priority in Japanese aid programmes. At the Arch Summit in 1989, Japan announced that it would expand and strengthen its bilateral and multilateral aid in the environmental field to up to approximately 300 billion yen (US \$2.25 billion) for three years from financial year 1989 to financial year 1991. Japan almost achieved this goal by the end of the second year, having allocated about 130 billion yen in financial year 1989 and 165 billion yen in financial year 1990 for this purpose.

On the occasion of the London Summit in July 1990, Japan expressed its basic idea that aid for promoting the self-efforts of the developing countries needed to be strengthened through functional and efficient combinations of aid options in accordance with the development stages and socio-economic situations of the recipient countries, and through the utilization of Japan's technologies and know-how. This idea is based on the recognition that global environmental issues are best handled through the co-operation and collaboration of both developed and developing countries, taking past experiences into account.

As part of the aid programmes addressing climate change or global warming in the fields of alternative energies and conservation of energy, Japan has been

conducting development surveys, providing group training courses for trainees from developing countries, holding regional seminars to strengthen co-operation in the Asia-Pacific region, supporting the establishment of various centres, and implementing technological co-operation. Through these joint activities, Japan is promoting the capacity-building of the developing countries to help to address the problem of global warming.

Close communication with the developing countries is essential to promote co-operation in this field. Japan intends to make every effort to find and develop appropriate projects sharing the view, with officials in developing countries, that co-operation in this field is important.

Could you please provide some information concerning the UNEP International Environmental Technology Centre which is to be established in Japan?

The UNEP International Environmental Technology Centre is to be established in Japan with a view to promoting the transfer of environmentally sound technologies to developing countries and countries with economies in transition. At the Houston Summit in 1990, the former Prime Minister of Japan, Mr Toshiki Kaifu expressed Japan's intention to invite such a centre to Japan, and subsequently the UNEP Governing Council formally adopted a decision in this respect. This is one of Japan's contributions through international organizations for the conservation of the environment.

The facilities of the Centre will be set up in two sites, one in Osaka and the other in Shiga. The Osaka office will deal with technologies for environmentally sustainable

management of big cities, for example air pollution, water pollution, urban waste treatment, and the conservation of energy and resources, whereas the Shiga office will deal with technologies for environmentally sustainable management of freshwater lake basins, including monitoring and the assessment of water quality. Both offices will offer training, advice, survey and research capabilities, and an information service through the establishment of a data base.

At present, UNEP is preparing, in co-operation with Japan, for the establishment of this centre in 1992. To support this plan financially, Japan has contributed US \$800 000 to a trust fund for the preparatory work.

Considering policy issues for action, the SWCC Declaration reaffirmed that there was a need to strengthen national, regional, and international research activities in climate, climate change, and the sea-level rise. Research efforts pertaining to climate-related activities have been going on in Japan for quite a number of years and your country has vast experience. Would you like to indicate the main areas in which current research activities are focused, the results achieved and, if possible, the beneficial effects for developing countries?

In order to minimize climate change and to mitigate its adverse effects, we should take measures to solve as many uncertainties as possible by promoting scientific research, observation and monitoring, and put whatever scientific knowledge thus acquired to good use.

Japan has been promoting integrated research, and observation and monitoring of global warming based on national programmes of scientific research and development ('Basic Plans for Research and Development

on Earth Science and Technology' and 'Comprehensive Promotion Programme for Global Environment Research, Monitoring, and Technology Development'). In the process of implementing these programmes, Japan has been actively participating in projects within integrated international programmes such as the World Climate Programme (WCP). Further, Japan also intends to participate in the Global Climate Observing System (GCOS), which the Eleventh World Meteorological Congress decided to initiate immediately following a recommendation made at the Second World Climate Conference. Additionally, Japan promotes research, observation and monitoring of global warming in the Asia-Pacific region, in co-operation with experts of the region, and disseminates the results by incorporating them into international databases and networks.

Such activities by Japan are carried out to develop human resources of the developing countries in this field. I believe that these activities, along with the accumulation of scientific knowledge, will contribute to enhancing the capacity-building of the developing countries in accordance with respective situations.

Ministers at the SWCC were particularly aware and concerned about the potentially serious consequences of climate change, including the risk for survival in low-lying and small island States and in some low-lying coastal areas of the world. To eliminate this risk, a phasing out of the production of CFCs and proper use of energy is essential. Japan has a vast experience in this domain. Could you please explain some of the related activities, their current and future beneficial effects?

To minimize the effects of climate change, the emission of greenhouse gases must be limited, in particular the

emission of carbon dioxide which is thought to contribute to over half of the global warming effect. Also, the production of chlorofluorocarbons (CFCs) is being cut internationally so as to protect the ozone layer.

There are difficulties in limiting emissions of carbon dioxide from the combustion of fossil fuels because the consumption of fossil fuels closely relates to economic growth. Through its own effort, Japan has overcome earlier difficulties, and now the country's energy efficiency is ranked among the highest in the world. Japan's per capita Gross Domestic Product (GDP) (US \$1) CO₂ emission from energy consumption in 1988 was 110 g, much lower than those in the United States (290 g), Britain (230 g) and West Germany (180 g).

As has been mentioned previously, to further contribute to stopping global warming, Japan has formulated the 'Action Programme to arrest Global Warming'. Based on the provisions of this programme, Japan has been implementing various concrete measures aiming at limiting CO₂ emissions through change in urban and regional structures, transport systems, production structures, and energy supply structures and life style, which will lower CO₂ emissions. Japan is also taking measures to pursue preservation and enhancement of CO₂ sinks through the proper management of domestic forest reserves and urban green areas and the careful use of the nation's timber resources.

I hope that Japan's technologies accumulated on the basis of its past experience will contribute, through international technical co-operation, to preventing climate change.

As regards the protection of the ozone layer, the special circumstances of the developing countries must be taken into

consideration and their participation must be ensured by all means. Therefore, technical and economic co-operation with developing countries is essential. Japan has made a number of efforts in this direction. Would you like to explain some of these activities?

Japan has actively endeavoured to facilitate the participation of developing countries in protecting the ozone layer, based on the understanding that it is essential that all countries cooperate in undertaking global environmental preservation, including the protection of the ozone layer.

In May 1989, Japan hosted the 'Asia-Pacific Seminar on the Protection of the Ozone Layer' in order to stress the importance of the issue to the developing countries in this region, and to encourage them to take part in the Montreal Protocol. The Seminar was attended by a large number of neighbouring countries such as China, Korea, and Indonesia.

Further, Japan provides technical training courses and seminars to present Japan's technologies on the protection of the ozone layer to developing countries, and to transfer these technologies to them.

Japan considers that financial assistance to developing countries is important so that effective measures can be undertaken to protect the ozone layer, since most developing countries do not have sufficient financial resources to implement such policies. Japan supports these activities in the developing countries through the Multilateral Fund for the Protection of the Ozone Layer, established in 1991. Japan contributes financially to the Fund and also serves on the Executive Committee of the Fund.

Deforestation is a major problem of environmental degradation in developing countries. The Government of

Japan has taken a number of steps in assisting the developing nations in curbing deforestation and assisting in reforestation through bilateral arrangements and agreements. Would you please mention some of these projects and the results achieved?

Japan has implemented many bilateral co-operation programmes, mainly in South-east Asia. To cite some examples, a forestry project for Pantabangan region in the Philippines was carried out for afforesting desolate areas in dam basins. In this project, a training centre on forestry was built to train local researchers and engineers, and 8 000 hectares of land was afforested. Similar projects have been implemented in South-east Asia, Oceania, Africa and Latin America. Seven such projects have been completed and 14 projects, including the one in Pantabangan, are in progress.

An Indonesian afforestation project in South Sumatra is among our successful examples. The project capably developed afforestation technologies, enhanced expertise, and completed the afforestation of a 3 000 hectares pilot plot. It is also necessary to intensify similar co-operative ventures and see that they evolve into larger-scale afforestation projects. To realize these aims, Japan has assisted Indonesia by a yen loan in 1989 and again in 1990 with a sector programme loan for afforestation.

Apart from South-east Asia, Japan has implemented similar projects in South-west Asia, Oceania, Latin America, and Africa. Japan would like to further co-operation with other nations, taking account of the specific situations at each site.

To cite a case, one of the main causes of deforestation in Africa is the chopping down of trees for charcoal. Therefore in Kenya, Japan is promoting a project that provides inhabitants with seedlings by

selecting trees that are suitable for charcoal-making and trains local personnel to become expert planters.

Japan also actively takes part in multilateral co-operation. Japan particularly supports the International Tropical Timber Organization (ITTO), which advocates as its objective to 'restrict timber trade by the year 2000 to timber produced in forests managed in a sustainable way' (ITTO Year 2000 Target). Amongst the member countries of this organization, Japan is the largest contributor. To achieve this ITTO objective, Japan calls for 'the environmentally friendly three principles on tropical timber trade' namely:

- (1) A monitoring of tropical timber trade;
- (2) The effective and rational use of valuable tropical timber resources; and
- (3) Increase in the value of tropical timber products.

Japan also supports the activities of the Tropical Forest Action Programme (TFAP) of FAO and the Consultative Group on International Agriculture Research (CGIAR).

The Government of Japan is advocating for 'The New Earth 21'—Action Programme for the 'Twenty-first Century. Could you give further details about this programme?

For dealing with global warming, it is important for all countries to co-operate in tackling this issue comprehensively, keeping a long-term perspective in mind. Japan has been advocating internationally the necessity to develop a world-wide, century-long vision ('New Earth 21'). This vision comprises a consolidation of the scientific findings, the promotion of energy and resource conservation, introduction of clean energy,

development of innovative environmental technologies, the expansion of sinks of greenhouse gases through afforestation and preservation of tropical forests, and the development of a future generation of energy-related technologies.

Japan is doing its best to realize this vision by transferring environmental technologies and scientific knowledge through, *inter alia*, training programmes, and also by promoting various scientific research and technology developments at research institutes.

Finally Mr Prime Minister, what is your greatest personal desire as regards the outcome of UNCED?

Japan, wishing to contribute to world peace and prosperity, has started to actively tackle various issues in the field of the environment and development internationally, taking full advantage of the knowledge and technologies of environmental conservation that it has developed in clearing up its own industrial pollution.

At the United Nations Conference on Environment and Development (UNCED), framework conventions on climate change and on biological diversity and an agreement on forestry, as well as an 'Earth Charter' and 'Agenda 21' are expected to be adopted. In particular, I strongly hope that an effective framework convention on climate change, containing appropriate commitments and addressing all sources and sinks for greenhouse gases will be formulated by the time of UNCED.

**His Excellency
Maumoon Abdul Gayoom
President of the Republic of
Maldives**

It is understood that questions related to economic management, planning and environment—towards sustainable development—were placed at the top of your agenda when you took office in 1978; this was indeed demonstrated clearly when you addressed the UN General Assembly in 1987. What sort of planning processes and infrastructure did you set up to deal with these issues?



The economic management and development planning in the Maldives has been pragmatic, though systematic planning processes were begun only in the late seventies and the economy has functioned reasonably well since then. With the introduction of tourism, increased international trade following the expansion of shipping, and the diversification of the fisheries industry, the need for socio-economic planning became imperative. In the beginning, while Male' developed rapidly, the outer atolls lagged behind causing an unprecedented migration to the capital. Therefore, when I took office in November 1978, I placed this development issue at the top of the national development agenda. Hence the creation of a National Planning Agency (NPA), directly under the President's

Office. The NPA functioned initially as a statistical office calculating national accounts, conducting surveys and censuses. In 1982, the NPA was replaced by the Ministry of Planning and Development; and in 1988, as global environmental changes became a major international concern, I decided that real environmental management could only come about at the planning level, thus reconstituting the Ministry of Planning and Development as the Ministry of Planning and Environment. The environment programme of the Ministry, assisted by the National Commission for the Protection of the Environment, includes the formulation of policy guidelines, research, environmental legislations and planning and design of environment related projects.

Global warming and sea-level rise are two among many problems of vital concern to Maldives. You, as President, have initiated an international campaign against global warming and sea-level rise. Would you please comment on this?

There is very little that a small developing country like the Maldives can do to tackle global issues like the current environmental changes. But we are doing everything we can do to draw international attention to the serious environmental problems that concern us. In 1987, I raised the issues of global warming and sea-level rise at the UN and at the Commonwealth Heads of Government Meeting in Vancouver, and also at the third SAARC Summit in Kathmandu. In 1989, the Maldives hosted the first Small States Conference on Sea-level Rise in which representatives from 14 small island States participated. The Male' Declaration on Global Warming and Sea-level Rise which emerged from that conference set out the steps to be pursued by small island States to combat the effects

of sea-level rise. It also called for the establishment of an Action Group to pursue and follow up on the recommendations of the Conference. The first meeting of the Action Group was held in Male' in January this year. Representatives from the Indian Ocean, South Pacific, the Caribbean and the Mediterranean regions took part in the meeting. The group's recommendations include campaigns to promote greater international awareness on the issues of climate change and sea-level rise, increased participation by small States in the global activities such as the IPCC process and the negotiations for a framework convention on climate change.

Considering the importance and urgency for acquiring comprehensive information on the properties and evolution of the Earth's climate, the Eleventh World Meteorological Congress (Geneva, 1991) decided to establish a Global Climate Observing System. This new system will be built on the existing WMO World Weather Watch, the Global Ocean Observing System as well as the Global Atmosphere Watch. These evolutions will, of course, necessitate a considerable expansion of national Hydrometeorological Services. You may wish to explain the measures that are envisaged in your future plans for the Meteorological Service of Maldives.

I understand that the Global Climate Observing System (GCOS), established by the Eleventh Meteorological Congress in May 1991, will provide observations to monitor the climate system and detect climate. This means a very sophisticated and highly scientific and technical network of observing stations, not only of purely meteorological elements but of atmospheric chemistry to measure the atmospheric concentrations of greenhouse gases, changes in the ozone layer and in the long-range

transport of pollutants. The biggest challenges faced by our Meteorological Service are lack of trained manpower and facilities. Therefore, I feel our Service has to go a long way before being able to actively participate in any research endeavour. As far as the development of the Meteorological Service is concerned, the highest priority is accorded to the training of its personnel. Even if not all, most training activities have to be carried out abroad. However, strengthening and further development of the humble training unit of the Meteorological Department is envisaged for the future. The establishment of a fine mechanic's workshop and further development of the electronic maintenance at the National Meteorological Centre (NMC) to carry out repair and maintenance of our electronic equipment are planned.

In the Maldives, we have a sea area of 90 000 square kilometres. This vast open ocean poses great difficulty, I believe, for our Meteorological Service since data from this is virtually non-existent. However, we hope that this complex situation will be overcome with the acquisition of a weather radar. I understand that the Meteorological Service is hopeful of obtaining such a radar under the assistance of the Japanese International Co-operation Agency. The Japanese Authority, I am told, is currently studying the request.

Furthermore, the Indian Government and my own entered into a memorandum of understanding in 1990 for the installation of a Meteorological Data Receiving System at the National Meteorological Centre for the regular reception of meteorological data, including INSAT cloud imagery data, analysed weather charts and conventional meteorological data transmitted via INSAT. It is hoped that this system will materialize in a not too distant future thereby enhancing the forecasting capability of the Weather Service.

I must say that I am confident that our Meteorological Service will greatly benefit from the reception of suitable training opportunities from WMO.

In November 1989, under your personal guidance, a Ministerial Conference on Sea-level Rise was held in Male'. The Conference issued the Male' Declaration on Global Warming and Sea-level Rise. In retrospect, are you satisfied with the outcome of the Conference?

The predicted global warming and sea-level rise are a threat to the very survival of the Maldives. Our islands, which are merely two metres above sea-level, stand on coral reefs that continue to grow in response to the changes in sea-level. With a view to drawing immediate international attention to environmental issues, the Maldives hosted the Small States Conference on Sea-level Rise in November 1987. It was decided at this meeting to develop a programme of action within the small States, for co-operation and exchange of information on strategies and policies in relation to climate change, global warming and sea-level rise which are common concerns of mankind. It was also decided to call upon and urge all States in the world to take immediate and effective measures according to their capabilities to control, limit or reduce the emission of greenhouse gases and to formulate plans and strategies for a change over as far as possible, to alternative, less environmentally harmful sources of energy. All States were urged to strengthen environmental management capabilities, to protect and manage their coastal zones and to protect vulnerable natural ecosystems such as coral reefs and mangroves which may already be at risk. The Male' Declaration appealed to all States to embark on intensive

afforestation and/or revegetation programmes and urged the industrialized nations to develop modalities and mechanisms to facilitate funding, technology transfer and training in areas related to the causes and problems associated with sea-level rise. The Declaration also called for negotiations for a framework convention on climate change. Following the Small States Conference, and at the initiative of the Government of Trinidad and Tobago, an association called the Alliance of Small Island States was formed with the aim of drawing international attention and assistance to mitigate the specific problems of small island States.

Since the Small States Conference on Sea-level Rise in Male', a more co-ordinated effort among the small island States has been noticed in their international activities. This is evident from the co-operation and co-ordination that is taking place in the negotiations of the climate convention and the work being carried out in the PREPCOMS leading to the United Nations Conference on Environment and Development to be held in Brazil in June 1992.

The Male' Conference decided to establish an Action Group to oversee the implementation of the decisions and recommendations of the Conference. You may wish to outline the follow-up action and to state whether you are satisfied with the progress so far achieved.

It was decided at the Male' Conference in November 1989 to establish an Action Group, initially comprising representatives from the Caribbean, South Pacific, Mediterranean and the Indian Ocean regions, to oversee the implementation of the decisions and recommendations of the Small States Conference on Sea-level Rise, to

co-ordinate a joint approach on the issues of climate change, global warming and sea-level rise, and to pursue global and regional response strategies.

The first meeting of the Action Group was held in Male' in January 1991 and its recommendations include:

- Mounting public information and education campaigns to promote greater understanding of climate change and sea-level rise issues;
- Encouraging the international media to promote the views of small States on issues of climate change and sea-level rise;
- Increasing participation by small States in the global climate and sea-level monitoring programmes;
- Intensifying efforts to mobilize funds to facilitate wider participation of small States in all relevant international meetings and activities;
- Seeking international assistance to upgrade the technical capabilities of national climate and sea-level monitoring institutions to adequate standards.

I am happy that the people of the Maldives are fairly well sensitized to the potential threat of sea-level rise. The government receives the full participation of the people in its endeavours to minimize the adverse effects of climate change and to promote a better environment.

The Conference decided to mount a campaign to increase awareness of the international community of the particular vulnerability of the small States to sea-level rise. Since this issue is of vital importance to Maldives, you may wish to express your view on this.

The global environment issue is a matter that concerns every nation, and it is the industrialized countries that are

largely responsible for these problems of today. Global warming, ozone depletion, acid rain and deforestation have all been caused largely because of their race for economic supremacy. There is very little that a small island developing country like ours can do to tackle global issues like climate change, but we are doing everything we can. To draw the world attention to the issue of climate change, I have raised the subject at the UN, the Commonwealth and at the Summits of the SAARC Heads of State/Government. I believe that the international community should be urged to guarantee assistance in cases of aggression against small States. Following my request at the Vancouver Summit, the Commonwealth Secretariat convened an Expert Group to examine and report on climate change, sea-level rise and flooding. The Group's report was submitted to the Commonwealth Heads of Government Meeting in Kuala Lumpur in 1989. In any action that has to be taken for the protection of the global environment from the adverse effects of climate change and other such environmental phenomena, the developed and the developing world have to be equal partners and make undivided efforts together. Such co-operation is called for particularly in view of the fact that the underlying reason for the destruction of the global environment is the rapid industrialization of the developed countries. Besides, it is these countries that have the technology as well as the resources to tackle the problems foreseen. Therefore, absolute global partnership is essential to deal with environmental problems.

During the Second World Climate Conference and its Ministerial Session (Geneva, October/November 1990), a number of the participants from the Pacific Island States and the Caribbean were determined to make their views known as

regards the seriousness of the global warming and sea-level rise. What do these problems mean for economic and development survival of Maldives?

Very little environmental data is available in the Maldives. But recently we have been giving great importance to establishing an environmental database in the country. In this regard, an environment research unit has been established and the collection of data has been initiated. This would eventually lead to the establishment of exact data on the damage that would be caused by a given rise in sea-level. But to carry out this programme, we would need to train a number of people in various environment-related fields. For this, we would naturally require assistance from the developed countries. However, even at present, I would say that a rise of 50 cm would have serious consequences for the Maldives and other low-lying coral islands. The average height of our islands is about two metres above mean sea-level. Therefore, with a sea-level rise of 50 cm, the coasts of the island would be very seriously affected in case of high waves or severe storms. Some islands would be flooded while some others may become submerged.

As the economy is based mainly on tourism and fisheries, climate change could have very dangerous consequences for our economy. A 50-cm rise would seriously affect many of our beaches. Because of stronger wave action, infrastructure on some of the resorts could also be affected. A one-degree rise in global temperature could affect the migration patterns of some species of fish. This could be catastrophic for our fishing industry.


Counting the adverse effects this may have on our economy, we have taken a sustainable development approach, which at times costs more in monetary terms, but hopefully would prove to be a saving in the long run.

To be specific, this means for instance, importing almost all our building materials in order to protect our reefs. In economic terms we are bound to feel the punch of costs now; but these would eventually turn out to be a saving in the future.

The Male' Conference also called on all small coastal and island States to take adequate measures to maintain their aquifers, protect their coral reefs, mangroves and freshwater resources which may already be at risk. The industrialized nations of the world were called upon to increase their ongoing financial assistance and technology transfer. This is of course the most important issue. Do you agree that the small island countries should present their problems collectively to the UNCED with a view to attracting increased assistance?

In any action that has to be taken for the protection of the global environment from the adverse effects of climate change and other such environmental phenomena, the developed and the developing world have to be equal partners and make undivided efforts together. If we, the small island countries present our problems collectively, we are bound to get a better response than doing so separately. The Alliance of Small Island States was formed to try and achieve this goal. In my opinion, it is extremely desirable to voice the concerns of small States in a collective manner in order to achieve absolute global partnership which is essential to deal with environmental problems that are of particular importance to small and environmentally vulnerable States.

Finally Mr President, what is your greatest desire as regards the outcome of UNCED?



The main aim as the outcome of UNCED, in my opinion, should be the preservation of our environment which is undergoing severe destruction as a result of man's actions. A climate convention must be adopted so that the global community can form a common policy to deal with their environmental problems.

The world is dying a slow death; we have to save it before it becomes too critical.

His Excellency Carlos Salinas de Gortari

President of Mexico

In March 1991, Ministers and senior government officials from 34 Latin American and Caribbean countries met in Mexico City and adopted the Tlatelolco Platform on Environment and Development which spelled out the priorities of Latin American countries with regard to the Environment and Development. In your opinion, what was the most important issue discussed during the meeting?



The environment has certainly become a major focus of attention in the region. The main aim of the Tlatelolco Platform is that the development of our countries should proceed in accordance with strictly-observed standards of environmental protection.

This aim represents a highly constructive attitude on the part of Latin America and the Caribbean. We are making both a personal and global commitment to ensuring that environmental protection and economic development are not regarded as separate—or mutually antagonistic—objectives.

It is altogether clear that if the commitment is genuine and if there is a real desire to tackle the root of the problems then all nations will have to work together on such

fundamental issues as sustainable economic growth, the elimination of poverty and the preservation of the environment and natural resources.

The Platform also recognizes the need to make progress both on the promulgation of instruments regulating environmental monitoring and control in our countries and on acquiring the economic and financial resources necessary to combat environmental degradation.

This political will was endorsed in July 1991 during the First Conference of Latin American Heads of State and Government, which took place in the city of Guadalajara in Mexico, one of the basic issues referred to in the Guadalajara Declaration being that of the environment. The participants agreed that environmental problems, which are global by nature, must at all times be tackled in a spirit of respect for national sovereignty and ecological policy.

We also affirmed the need to develop a global legal framework envisaging the inseparable aspects of development and environment protection.

We likewise issued an appeal for concerted action on the part of the international community to prevent both the use and transfer of polluting technologies and the discharge of toxic wastes. This calls for new forms of co-operation and technology transfer with all our nations sharing in the associated benefits.

The Tlatelolco Platform expressed concern that 20 years after the adoption of the Stockholm Declaration, the serious deterioration of the state of the global environment has continued. In your opinion who is responsible for this deterioration?

A moment ago I mentioned that our countries have a new will to tackle this problem, which affects the international community as a whole, and not just a single people. The

Tlatelolco Declaration was in no way an attempt to revive or recreate scenes of confrontation or ill-feeling between countries. In acknowledging that our peoples are themselves involved in the problem, and in firmly advocating effective international co-operation to deal with it, the Declaration views the problem in a manner that respects the sovereignty and jurisdiction of all States.

In a world of ever-increasing interdependence, in which ecological links have become truly global, the challenge of achieving a form of development compatible with our natural surroundings is, of necessity, one to which all of us must rise. The responsibility is therefore also global. Confrontation, the pursuit of unilateral solutions and attitudes of indifference will only result in a stalemate. Hence the importance accorded by the Tlatelolco Platform to international co-operation.

The Ministerial Declaration of the Second World Climate Conference (SWCC) — Geneva, November 1990, expressed the view that precautionary measures should be taken to mitigate the adverse consequences of environmental degradation that might result from climate change. In this context the Tlatelolco Platform calls on the developed countries to recognize their responsibilities for greenhouse gas emissions and transboundary air pollution. Assuming that is done, what follow-up action do you expect?

In this connection, I would point to the efforts now being made by the Intergovernmental Negotiating Committee to reach an international consensus and to draft an agreement on climate change for presentation at the Brazil Conference in 1992.

Also fundamental is the work being done by the Intergovernmental Panel on Climate Change, which

involves research, expert advice and technical support in the interests of identifying solutions to this problem.

With regard to follow-up, I should also mention the Montreal Protocol, and express the hope that we shall see a rise in the level and rate of implementation of the commitments adopted therein.

Lastly, I would point out that Mexico is particularly interested in contributing to the establishment of an Inter-American Institute on Global Climate Change.

The Intergovernmental Negotiating Committee (INC) for a Framework Convention on Climate Change has held several meetings and will continue to meet in order to prepare acceptable proposals for consideration by UNCED. In your opinion what are the most important issues which must be spelled out in the INC document?

It must spell out the need, on the one hand, to identify the options available for stabilizing and reducing the emission of harmful gases and, on the other hand, to identify options for the introduction of a viable commitment toward preserving the planet's biological diversity.

There is a need for clear definitions regarding energy saving, and, of course, for the practical strengthening of technological and financial co-operation. My country trusts that this Committee will arrive at the Brazil Conference with specific proposals that are achievable in the short to medium term.

Could you please explain how serious the problem of greenhouse gas emissions is in Mexico and what remedial actions are envisaged?

In Mexico, we have already taken decisive action on this matter, despite the fact that international negotiations on greenhouse gas emissions are still in progress.

We have set up vigorous programmes to protect the atmosphere in those areas where emission levels are critical, such as Mexico City.

We are engaged in an ever-expanding energy-saving programme, which, by slowing the growth in the country's fuel consumption, will play an important part in reducing greenhouse gas emissions.

We are also introducing reforestation programmes which, together with the measures being taken to safeguard our woods and forests, will serve to increase the country's green areas, thus helping to reverse the greenhouse effect.

We are making these efforts in the knowledge that our country's economic growth necessitates increasing levels of energy consumption, and that our path to development therefore lies, and must continue to lie, in energy-saving and productive efficiency.

Clearly, it is not a matter of halting our economic growth, but rather of acting to ensure that future energy consumption takes place in a way that does not lead to an uncontrolled increase in harmful emissions. With a view to stabilizing and ultimately reducing the emission of these gases, we are introducing efficient technologies, involving savings-oriented programmes throughout the energy supply chain and improved fuels.

This is our contribution to the great joint effort that has to be made.

On the issue of the 'ozone depletion', and as part of a global effort to protect stratospheric ozone, has your Government prepared or envisaged any future plans for transition to CFC-free technologies?

Mexico was the first country in the world to ratify the Montreal Protocol, and we can probably state that we are fulfilling to the letter our commitments regarding the delicate problem of ozone depletion. In some cases, we have even introduced measures in advance of the agreed timetable.

The great and exemplary concerted effort that has been made in Mexico by both producers and users of ozone-damaging substances has been such that we are in this respect, on a par with the developed countries. This is a great achievement for my country, where a tremendous effort has been made to replace productive processes and equipment in the industries concerned.

Virtually all the environmental issues are directly or indirectly linked to freshwater availability. Could you please mention some of the major economic and development issues in Mexico which are water related and which require immediate attention?

This is a fundamental issue for Mexicans, given the implications it has for our daily life. I shall mention the factors which make this matter a national priority.

The fact that our most extensive freshwater reserves are located in the south-east of the country poses a major problem in view of the increasing cost of piping this vital resource over vast distances and through several mountain ranges to the rest of the country.

As in other parts of the world, our rivers and lakes are suffering the effects of decades of pollution caused by harmful agricultural residues and inadequately-controlled wastes from urban and industrial areas. This situation is then aggravated by the insufficiency of the drinking water networks, drainage systems and waste-treatment facilities in various parts of the country.

For Mexicans, the top priority is drinking water for human consumption. However, it is not simply a matter of extending drinking water networks and drainage systems—an effort which, under the National Solidarity Plan, has already benefited over five million people in only three years—but also of encouraging the use of processed water in the various manufacturing sectors and of jointly assuming the costs of that processing. Mexico's principal rivers are now the object of clean-up programmes which include strict monitoring and financing arrangements involving industries, farmers and local authorities.

The Tlatelolco Platform called for sustainable management of forests, recommending measures 'which do not necessarily have to be of a mandatory nature'. It reserved each country the right to set its own criteria for sustainable management of its timber and other forest commodities. What were the reasons for this reservation?

It is also stated that forests must be exploited in a rational manner. The intention is very clear: countries must commit themselves to preserving the relationship between forests, climate, natural resources and biodiversity, bearing in mind the specific characteristics of each country and region. The natural resources in our countries must be preserved for our peoples. The manner in which they are used and the efforts made to ensure their continued existence are matters on which each country must decide in a rational manner which takes account of the need to maintain a balance with nature.

In all discussions on environment, two issues have been emphasized continuously: (i) Transfer of technology to developing countries; and (ii) The need for adequate financial assistance to

developing nations. In your opinion, at what stage and when will these two important issues be analysed in detail, including figures?

It is in no country's interests to abandon its own efforts and to rely solely on external assistance. Only firm and direct national policies can smooth the way toward an acceptable climate of co-operation and mutual responsibility. We are therefore approaching the environmental challenge within the context of industrial modernization and growth in our economies.

At the same time, however, we must not forget that these efforts and the success of each country's reforms depend on an open world economy, in which there is no room for protectionism and unilateral conditions. This will determine to a large extent the success of the environmental policies pursued by our countries.

The United Nations Commission on Environment and Development has a framework of basic technologies, which, if disseminated world-wide, could lead to significant progress on global environmental protection, and which will form the core of the discussions at Rio.

It is clear that no environmental issues could be studied and analysed without having access to reliable data which is adequate in quantity and quality. This is particularly true in relation to the atmosphere, climate change studies, oceans, freshwater resources, agricultural activities and marine and coastal protection and development. The present international concern about the environment reaffirms the importance of the work carried out by the national Meteorological and Hydrological Services in developing countries. In your opinion, is the national Meteorological Service in Mexico equipped to face this challenge?

Mexico's Meteorological Service has a long history and uses advanced technology. However, it is not the only means at our disposal for observing systematically the range of phenomena that you mention. We are constantly monitoring the state of our rivers, lakes and coasts, as well as the quality and potential of all of our natural resources.

Having said that, we are nevertheless planning to implement major developments in our research infrastructure and associated technology in order to improve the quality of the data received in connection with our environment and natural resources.

Finally Mr President, what is your greatest personal desire as regards the outcome of UNCED?

We have for some time maintained that environmental and ecological problems constitute the most serious argument against existing development models. So as far as UNCED is concerned, my desire is that all societies and governments should achieve real co-operation and act together with greater decisiveness to protect the environment.

In this I am optimistic. In exchanges of views with Heads of States and non-governmental groupings, and particularly in indirect contacts with the Mexican public, I have observed the general increase in environmental awareness.

We are now at a crossroads; at a favourable moment at which to begin a new stage in international co-operation. We must today—not tomorrow—incorporate an ethical dimension into our development aims. It is now that we must shoulder the immense responsibility of bequeathing to future generations a healthy environment that will give dignity and enhance the quality of their lives.

His Majesty King Hassan II

Kingdom of Morocco

During the scientific session of the Second World Climate Conference and its Ministerial Session (Geneva, October/November 1990), it was recognized that problems such as climate change, atmosphere and water pollution, desertification and so on should be studied and discussed, not in isolation but in conjunction with their underlying causes. It is widely recognized that the study of these problems is very close to your heart. Would you please express your personal views on these issues and in particular in the context of sustainable development?



We followed the Second World Climate Conference with much interest, as it was to bring out the impact of man's development on the climate and the environment in general.

The industrialized civilization to which our world has committed itself, particularly over the last century, entails disturbance to the Earth's ecological balance. Although this disturbance is still to be quantified, experts are unanimous about the certainty of its existence. The soaring world-wide population is placing severe pressure

on the planet's natural resources (soil, fresh water, oceans, forests and minerals), by damaging them to the point of possible degradation and exhaustion.

This poses the problem as to what extent man's economic and social development will have repercussions on our present responsibilities towards future generations.

In this context, it is salutary to note the sudden awakening of the international community to the need to take concerted remedial action to ensure sustainable development which does not hamper the legitimate aspirations of future generations to live in perfect harmony with the environment we leave them.

Environmental problems obviously have a global dimension, as they cross national boundaries, and they fully justify the mobilization of the world community.

Nowadays, global climate change, air, sea and freshwater pollution, desertification and so on are among the most important problems facing mankind. Which of these issues are of particular concern to Morocco?

Morocco is very concerned with all issues related to the environment-development problem. It occupies a special geographic position at the north-western tip of Africa with coasts washed by two seas, and a climate which varies under the combined influences of the ocean, Mediterranean and Sahara.

Morocco's development is closely linked to realizing the potential of its natural resources.

Since most of the country is semi-arid to arid, Morocco is sensitive to climate-related disasters, particularly droughts. These have affected many regions in the world, particularly Africa in the 1970s, but have also hit Morocco, which experienced the longest drought

on record over five consecutive years (1981–1985) or even more in certain regions.

Given the climate's aridity and irregularity, desertification is a serious threat in many regions in southern Morocco.

As regards water, we have two main concerns:

- First, because of its long coastline, the country is obliged to give special attention to rational development of its fishing resources and tourism, in complete harmony with the environment, and in general to protect the environment and coastline;
- Second, as regards inland water, over many years we have strived to develop many regions through water-resource development.

However, our water resources are being increasingly threatened by pollution, hence the priority given to their conservation and protection. We are also giving more importance to problems of forests as well as soil erosion, which hampers agricultural production and hydraulic infrastructures. Morocco gives particular attention to these issues and is generally concerned with all environment-related problems.

What sort of infrastructure has been set up in Morocco to deal with environmental problems in general and what are its links with the national Meteorological and Hydrological Services?

In addition to the work of the ministerial departments concerned with environmental problems in the various economic sectors related to water, agriculture, town planning and the sea, we have started concerted public action on the main issues.

For example, we have created national bodies, such as the *Conseil National de l'Environnement*, *Conseil Supérieur de l'Eau*, and *Conseil National de la Forêt*, to permit broad public participation in the debate and in the definition of guidelines for national environmental policy.

We have also taken much action in this field. For example, in the 1980s, we started in-depth studies on climate in order to understand and prevent drought. We also started up the Al Ghâit applied research programme on artificial rain which produced sufficiently encouraging results for us to continue it. Moreover, we created a national reference laboratory for the analysis of pollution and its harmful effects. Considering the extent of the arid zone in Morocco, we decided to create a specialized institute specifically devoted to arid-zone research and development. All of these actions involve the participation of our national Meteorological and Hydrological Services which carry out the indispensable groundwork of collecting basic data for environmental studies.

Climate monitoring, disaster preparedness and water-resource assessment cannot be undertaken without the specific contribution of meteorologists and hydrologists.

Another, no less important activity entrusted to the national Meteorological Service for the whole of Africa, is the measurement of the ozone layer. The station in Casablanca has been in operation since 1974 and therefore has a considerable time series of data which, combined with that of other stations has, as you know, enabled us to detect the ozone layer trend at a time when it is of major concern.

The national Meteorological Service of Morocco is also taking part in an international pilot project to study concentrations, transportation and deposition of air pollutants in the Mediterranean basin.

On the global scale, the present measurements of the state of the atmosphere, oceans and water assessment are highly inadequate. The Eleventh Session of the WMO Congress (1991) established a Global Climate Observing System to serve as an umbrella for integrating the present WMO World Weather Watch, the Global Ocean Observing System and the Global Atmosphere Watch. This requires a considerable expansion of national Meteorological and Hydrological Services. What measures have been foreseen in Morocco?

The international community must indeed make greater efforts to ensure closer monitoring of the state of the atmosphere, oceans and water resources. International co-operation in this field must be exemplary, because, in order to be significant on the global scale, this monitoring must cover all countries and regions of the planet.

Morocco is allocating considerable budgetary resources to these monitoring activities and envisages reinforcing them in the future. The equipment budget of the meteorological services has already been augmented five times in 1991. In this connection, we were anxious to give special directives to reinforce and develop our national Meteorological Service by integrating it last year within the highly technical *Ministère des Travaux Publics, de la Formation Professionnelle et de la Formation des Cadres*, which is also responsible for the national plan for hydraulic and water-resource matters; this will facilitate co-ordination of all of these activities which have the same objectives.

It is indeed important to include development-oriented meteorology in all economic activities rather than giving priority only to air transport as has been the case until recently.

An increase in the means placed at the disposal of the services will doubtless permit Morocco to take a more active part in WMO programmes, in particular the World Weather Watch.

The powerful systems for data collection, management and analysis which are currently being acquired by this Service will also improve research, monitoring and climate-change assessment activities and will be able to supply rapid information or warnings needed by users to tackle environment-related problems.

Science and technology are vital to economic and social progress and there is a need for continuous flow and transfer from industrialized nations to developing countries. In your opinion, under what conditions should such a transfer be effected?

This is a crucial programme which determines the development of many countries in the Third World. The developing countries can only feel concerned by the commitments of the world community to overcome climate change risks in so far as their development is not jeopardized and they can be given easy access to advanced technologies.

From our point of view, all international agreements on the protection of the world's environment should include provisions to facilitate access to such technologies by countries needing them. It is only in this way that the whole world community will progressively adhere to the objectives for protecting our planet's environment, and participate effectively in related programmes.

We can also contribute towards a real transfer of scientific and technical knowledge in an atmosphere of constructive collaboration, characterized by the free circulation of information and of the results of studies and research in order to encourage the active participation of all countries.

Problems of climate change, protection of water resources, land degradation, atmospheric warming due to greenhouse gas emissions, sea-level rise and so on are interrelated and call for inter-regional and international action. Unless developing nations have a pool of specialists at their disposal, they cannot participate effectively in implementation of such programmes. In your opinion, what action could be taken to speed up the process of training?

There is a considerable need for training in the environmental sphere in developing countries, since few higher education institutions offer specialized courses. We think that institutions in developed countries should open their doors to a larger number of students and specialists from developing countries and encourage the latter to organize similar training in environmental sciences in their own institutions. Training should also be promoted through research and high-level centres should be created for applied research on specific problems relating to developing countries. We therefore decided to create an *Institut de Recherche sur le Développement des Zones Arides* which we hope will serve as a channel for regional and international co-operation in this field.

We also consider that the organization of international meetings is a good means of informing the public on scientific and technical concepts as well as environmental problems. Our country therefore frequently hosts international meetings such as the one on drought in 1985 or on environment and development in 1990.

The international organizations within the United Nations system have a very important role to play in organizing such meetings and in seeking greater participation by representatives of developing countries in their work.

The successful implementation of any environment and development plan rests with the public and for this an effective educational campaign is highly desirable. Are there any such plans envisaged in Morocco?

It is important for the environmental protection and conservation programmes to have the support of the population; hence the absolute need to increase public education and awareness with regard to environmental problems. This task falls both to the public authorities and to the population itself. Not a single week goes by without one of the Moroccan media covering an aspect of the environment. Television, radio and the newspapers have thus actively participated in national campaigns to save water and energy.

At local level, this public awareness of the need to protect the environment also exists thanks to the activities of provincial councils for the environment and to initiatives taken by regional associations. At national level, the work of certain bodies, such as the *Conseil Supérieur de l'Eau*, which had to deal with water pollution during two annual sessions, also contributes towards public awareness.

I was anxious to chair this body myself because any major decision in this regard will be a determining factor for the future of our country.

I was also anxious to follow the evolution of the main aspects of the environment and preservation of our natural heritage, and gave instructions for setting up permanent green zones around cities as well as for protecting our forests and water resources, combating marine, air and water pollution and preventing the effects of drought which threaten certain provinces.

Morocco is blessed with an agreeable climate and access to the Mediterranean Sea and the Atlantic Ocean. These, combined

with the traditional Moroccan hospitality, are important resources for attracting tourists. Are you concerned about problems such as greenhouse gas emissions and consequent warming of the atmosphere, sea-level rise and inland water pollution?

We feel particularly concerned by the possible impacts of climate change, especially since they are supposed to be more acute in countries with an arid climate. Prospects of more severe droughts than those already recorded, the aggravation of flooding phenomena, and increased pollution of our water resources are particularly worrying for a country such as ours which has developed its economy through its water resources.

Global warming and the ensuing risks of a sea-level rise are equally worrying since this country has over 3 000 km of coast where there are many towns and infrastructures, which are vital for the country's economy, particularly for tourism. We are therefore very concerned by all of the activities undertaken by the world community to monitor and analyse these phenomena, and by the determination of the most suitable remedial measures. Morocco is fully prepared to contribute to such efforts within the organizations of the United Nations system, particularly the World Meteorological Organization.

During recent years, WMO has acted as the executing agency for two projects co-sponsored jointly by Morocco, UNDP and WMO: (i) Maintenance and strengthening of hydrological activities; and (ii) Strengthening and development of meteorological observations network for application of meteorology to various economic sectors. In your opinion how important has been the role played by the UN specialized agencies in strengthening national efforts?

The UN specialized agencies have a strategic role to play in involving developing countries in the debates and decision-

making process regarding the world environment and its evolution. They are, in fact, high-level centres of activity in their respective fields and constitute, for the developing countries, the best means of access to information and, more generally, to the transfer of knowledge and technology.

We thus collaborate in many environment-related fields with UN agencies, such as WMO in meteorology and hydrology.

Moreover, we would like this co-operation to be strengthened to enable our national Services to improve their scientific and technical capacities continually in order to meet future challenges and make meteorology really instrumental in ensuring economic and social development and the best possible management of our water resources.

For our part, we are sure that these objectives cannot be reached without close co-operation with institutions such as the UNDP, WMO, UNEP and other UN specialized agencies.

Finally Your Majesty, what is your greatest desire as regards the outcome of the United Nations Conference on Environment and Development (UNCED) to be held in Brazil in 1992?

The forthcoming United Nations Conference on Environment and Development is an excellent opportunity for the international community to make a self-critical assessment of the negative aspects of development and lay down the foundations for sustainable development in total harmony with the requirements for environmental protection.

We hope first of all that this conference will adopt concrete measures to overcome climate change and its impacts in the future. We also hope that it will adopt measures to mobilize the means for meeting the challenges to come as regards environmental protection.

For example, we had an opportunity of recommending that the States allocate 1% of their GDP to ecological action and create an international fund for programmes to combat pollution of water resources world-wide and to increase aid to developing countries for developing their water resources.

In this field, we also hope that the conference will adopt concrete measures to facilitate access by all countries to advanced technologies in order to favour a world-wide mobilization to solve the environmental problems in the future.

Morocco is willing to host a high-level North-South meeting to define a common strategy to meet the risks of water shortages in developing countries.

We have already stressed that problems related to the environment and pollution cross boundaries and that international solidarity is needed to draw up a large-scale international programme, taking into account the legitimate interests of all sides. Such a programme could be financed by an international fund supplied by the economic sectors whose activities have the most negative impact on the environment.

Another big problem which is often discussed within the international economic and financial bodies is that of the third-world countries' debts. Combating major sources of pollution could be an opportunity to mobilize this international solidarity which is so often mentioned; we could thus imagine that third-world countries' debts could be either completely or partially transformed into aid for financing national programmes in environment-related areas.

These are a few ideas which we sincerely hope to see take on concrete form at this important conference, which we hope will be a complete success. We also hope that it will form a historical turning-point in consolidating mechanisms of international co-operation in forming a world in which man can live in perfect harmony with his environment on planet Earth.

**His Excellency
Ibrahim Babangida**
**President of the Federal
Republic of Nigeria**

During your tenure of Office, Nigeria has recorded remarkable achievements in her environmental programmes. Your administration has placed environment on a top priority in its agenda. On 27th November 1989, at the New Federal Capital, Abuja, history was made when you formally launched the Nigeria Comprehensive National Policy on the Environment, and laid the foundation stone of the Headquarters of the



Federal Environmental Protection Agency (FEPA). What are the main goals of this policy? What is the intention of your government in establishing other environmental bodies in addition to FEPA such as the National Resources Conservation Council (NRCC) and the Ecological Problems Fund (EPF)?

Recognizing the important role of a benign environment in sustainable development, my administration, right from inception decided to establish appropriate laws to govern the Nigerian environment in particular and, in collaboration with other national governments, that of the world in general. We also decided to put in place the appropriate institutions to enforce these laws and provide materials and infrastructure for monitoring and controlling the environ-


ment. This led to the establishment of the NRCC and EPF with the following main policy goals:

- To secure for all Nigerians a quality of environment adequate for their health and well-being;
- To conserve and use the environment and natural resources for the benefit of present and future generations;
- To restore, maintain and enhance the ecosystems and ecological processes essential for the functioning of the biosphere, to preserve biological diversity, and the principle of optimum sustainable yield in the use of living natural resources and ecosystems;
- To raise public awareness and promote understanding of essential linkages between environment and development and to encourage individual and community participation in environmental improvement efforts.

As mentioned above, Nigeria is committed to a policy of development in a sustainable manner, based on proper management of its environment in order to meet the needs and aspirations of the present generation, but without undermining the capacity to meet the needs and aspirations of the future generations.

In the light of increasing global concern on issues such as global warming, climate change, desertification, deforestation, food shortages, etc., do you believe that the Meteorological Services Department of Nigeria is well placed to render the services required and to meet the challenge where its impact is critical?

The Meteorological Services Department of Nigeria was set up originally in response to the demand from the aviation



industry. However, in the last three decades, it has been realized that meteorology can serve other disciplines such as agriculture, water-resources development, other means of transport, the energy sector, construction engineering, health, etc. It is no wonder therefore that, during the last two decades, the department has moved from the Ministry of Works to the Ministries of Agriculture, Transport and Communications, before ending up in the Ministry of Aviation. The Meteorological Department is not at the moment fully equipped to meet all the requirements of the nation as well as the current global challenges of global warming, climate change, desertification, deforestation, food shortages, etc. as demanded by the United Nations. We would need to set up more climate monitoring stations, climate/weather early warning systems in the country and intensify training of relevant scientists in order to meet the demands of climate change issues. We have to provide modern equipment to the meteorological services and solicit for substantial technical assistance from appropriate United Nations agencies and friendly donor countries.

For the immediate future, we intend to set up a National Climate Committee as directed by the 1990 Ministerial Session of the Second World Climate Conference with a view to assessing climatological practices of the various institutions of the country and to plan further assessment and prediction strategies of climate and climate change phenomena. Climate change impact studies on the social and economic aspects of the country will also be undertaken. It is hoped that the proposed Committee will be in a position to advise the Government on issues related to climate and climate change. In addition, consideration is being given to the Department of Meteorological Services, presently under the Ministry of Aviation, so that it may have some measure of autonomy to enable it to discharge its functions more effectively to other arms of Government and the

society other than aviation. In addition, I believe that given some degree of autonomy, the Department can be developed sufficiently enough for it to market its services and recover some of its running costs. This policy has proved successful in most of the countries where it has been introduced and it is my intention to direct the course of the development of the Department towards achieving this goal.

For better development and conservation of water resources, Nigeria created the Federal Ministry of Water Resources, and River Basin Development Authorities. How would you assess the achievements of these institutions to date in relation to the objectives for which they were established?

Nigeria attaches very high priority to the development of water resources in the country. You will agree with me that the present and future well-being of our people depends largely upon the availability of a safe, dependable supply of water. Historically, the demand for water has been primarily for human and livestock consumption. However, if the standard of living of our people is to improve, water will be required to meet the projected demands of agriculture, industry, recreation and other uses.

The ultimate potential of the country and the continent to meet the future needs of our people is therefore closely tied to the ability of water-resource managers to efficiently utilize the supply of water which is naturally available and to make wise and informed decisions concerning the use of this precious resource. These considerations formed our broad objectives for establishing the River Basin Authorities and the Ministry of Water Resources, while the specific objectives included the assessment of present and immediate future water demands, flood control and management, consequential side effects of planned water-

resource programmes. These side effects which are well known, include impact of water impoundment arising from severe seasonal variation of flow of surface water, impact of irrigation activities, accelerated borehole construction, and impact of channelization and flood-control programmes. As regards the performance of the River Basin Authorities, I would like to say that they have performed moderately well over the years; this average performance was due to the initial structural and managerial problems. However, for the past four years after their restructuring and re-organization, I must say that the River Basin Authorities have carried out their tasks remarkably well. They have contributed immensely to the success of wheat production in Nigeria and water supply particularly to the Northern States of Nigeria which lie within the semi-arid/Sahelian areas of the sub-region. They have also contributed in no small way to fighting drought and desertification problems in these areas.

As you know, the Second World Climate Conference (Geneva, October/November 1990) and its Ministerial Session met with great success. Your personal interest in the Conference was indeed highlighted by the participation of the Nigerian Minister of Civil Aviation, Alabo T.O. Graham Douglas and other Nigerian scientists and experts in all preparatory work and the Conference itself. Dr J.A. Adejokun, the Director of the Meteorological Services Department of Nigeria, is indeed the Rapporteur of the WMO-UNEP Intergovernmental Panel on Climate Change (IPCC) who, together with the chairman and vice-chairman, form the Bureau. Are you satisfied with the way the Conference concluded its work and the manner in which IPCC tackles the scientific issues?

First, I am very satisfied with the scientific work of the members of the Intergovernmental Panel on Climate

Change (IPCC). I congratulate them for producing the first Assessment Report on climate change. I hope they continue to work with the same dedication for the benefit of humanity. As you rightly said, Nigeria actively participated at the Second World Climate Conference (Geneva, October/November 1990). My Government is satisfied with both the report of the Conference and the Ministerial Declaration. The Conference and its Ministerial Session, definitely achieved its aims. The current global atmospheric problems, which include climatic variability and its impact on the economic and social life of human beings on earth, were successfully brought to the attention and awareness of the global political leaders. Policy options for minimizing the adverse effects of climate change and/or adapting to them were well highlighted. With the message ably brought out during the Conference the leaders of the world community can now proceed to map out strategies that will ensure a better and safer environment for the future generation. The most striking achievement of the Ministerial Session was the consensus reached, on the basis of give and take and mutual understanding, between the developed and the developing countries on an issue so sensitive as that of the climate change impact and the reduction in the emission of greenhouse gases as a result of anthropogenic causes. This is a classic example of international co-operation.

In recent years, Africa has been in the forefront in dealing with development and environment issues. The Lagos Plan of Action, The Monrovia Declaration, The Cairo Programme of the African Ministerial Conference on Environment, The Kampala Declaration, the OAU Summit and the recent African Regional Preparatory Conference for the United Nations Conference on Environment and Development (UNCED) (Cairo, June 1991) have demonstrated clearly the African resolve to handle issues

of environment and development. In your opinion, are African nations ready now to attend UNCED, Brazil, 1992, with well-established plans?

Individual African nations and sub-regional groups recognize fully the socio-economic implications of the effects of global warming and climate change. In this connection, these governments and sub-regional groups (SADACC, ECOWAS, MAGHREB, CILSS, ASECNA, etc.) have developed national and sub-regional programmes to combat the impacts of climate change. A series of continental UNCED PREPCOM Meetings are being held to harmonize these national and sub-regional positions into a continental stand on the issue. It is hoped that by UNCED, Brazil, 1992, Africa will be ready to attend with a unified and well-established plan.

Drought and desertification have caused famine, malnutrition, disease and death in many countries in Africa. The major WMO programmes under implementation in Africa, aiming at improvement of national and regional Meteorological and Hydrological Services, are: The African Centre of Meteorological Applications for Development (ACMAD), the AGRHYMET Programme of CILSS countries, the Drought Monitoring Centres (DMCs) for eastern and southern Africa, the Hydrological Forecasting System for the River Niger Basin, Regional Meteorological Training Centres (RMTCs) and the Tropical Cyclone Programme for the South West Indian Ocean Countries. Do you agree that African countries should present their problems collectively to UNCED in the hope of attracting further support for these institutions?

So far, in Nigeria, the issue of combating drought and desertification has only been taken up at national level,

funded by the National Ecological Committee and also with the co-operation of certain international organizations such as the European Economic Community (EEC) and the World Bank. The National Technical Committee on Drought and Desertification is a body set up by my government for co-ordinating activities and matters related to drought and desertification. In addition, some States receive financial support as well as drought relief from the Federal Government while others are supported by the EEC. The Centre for Arid Zone Studies, attached to the University of Maiduguri, has also recently received sizeable financial support from an organization (a University) in Britain for drought and desertification studies.

The present situation vests the office of the Vice President with the responsibility for matters concerning ecological disasters which include disasters due to drought and desertification. I look to the World Meteorological Organization and other internationally co-ordinated Organizations to set up programmes on droughts and desertification in order to make a more positive impact in Nigeria. Perhaps a centre for West Africa on similar lines as the Data Monitoring Centres for eastern and southern Africa may improve the contribution of WMO to the problems of drought monitoring and desertification especially in Nigeria. It is imperative that African countries present collective problems to UNCED with the hope of attracting further financial aid and support.

The implementation of the 1977 UN Plan of Action to combat desertification led somewhat to controlling desertification but now after 14 years it remains still a plan. A lot of precious time, land and livelihoods have since been lost due to desert advancement, particularly in the Sahel. Don't you believe that the time

has come for African Governments to accord to anti-desertification measures the priority they deserve in their national plans and budgets?

As I said earlier, anti-desertification and drought measures form the major part of individual African nations and sub-regional group programmes. Most heads of State/Government in Africa have come to realize that drought and desertification are creeping phenomena, therefore, their effects cannot be rapidly and completely eradicated. More important, we believe that drought and desertification phenomena should not be treated independently from the issues of climate change and global warming. Therefore, while I agree that African Governments should accord more priority to anti-desertification and drought issues in their national plans and budgets, these issues should be presented at the 'Earth Summit' in 1992 by Africa for the world body to also accord to the issues the high priority they deserve.

The depletion of the ozone layer is another universal problem requiring national, regional and global action. Under the Montreal Protocol to protect the ozone layer, a multilateral fund of up to US \$240 million over a period of three years has been established to assist the developing countries to acquire new technologies in refrigeration, air conditioning, electronics and other development activities. Since this is inadequate to meet the requirements, what other sources of funding could be envisaged to help African nations to give up ozone depleting products?

We all realize that it is an immense problem for third world countries particularly those in Africa to give up ozone depleting products. This is because we are talking about an issue that has to do with the socio-economic development of these

nations striving to achieve self-sufficiency for their citizens. These developing countries as you know are exploiting their natural resources to service their debts and at the same time strive to industrialize. In the first instance, the cost of integrating a new technology that is environmentally benign is very high. Additional financial and technological assistance will therefore be needed by these countries to acquire new technologies in refrigeration, air conditioning, electronics and other development activities. A fund of US \$240 million over a period of three years is inadequate. Further assistance will be needed from bilateral arrangements and from other United Nations agencies such as the World Bank, WMO, etc. It should also be realized that continued exploitation of our natural resources will further degrade our environment. Additional financial, environmentally benign technological assistance and the provision of expertise will therefore be needed to protect and conserve the environment for our future generations.

The availability of financial resources is prerequisite to ensure access by African countries to clean environmental activities. There are, of course, many financial sources, bilateral and international. What do you think of the proposal of 'debt-for-nature swap'? It is said that this has been practised in Latin America. Would it work in Africa?

As you are aware, information from IPCC and other scientific bodies shows that 75% or more of the greenhouse gas emissions come from the developed countries of the world. Besides, the industrial development of the third world has a chance of being stunted by the current debt burdens and global recessions. Their ability to contribute seriously to the emission of greenhouse gases which cause global warming is very doubtful. Today most developing countries are

aiming for technological and industrial development and if they have to follow the path of the developed world from inception of the industrial revolution there is no guarantee that their contribution to greenhouse gas emissions will not become significant with coming decades. It is therefore necessary that the developed and developing countries should come together to work out an agreement whereby the developing countries would be able to develop rapidly (technologically and industrially) while emitting low greenhouse gases. This will require a variety of assistance, technological and scientific as well as financial, from the developed countries. One of the surest and more specific ways of assistance from the developed countries to the third world countries, particularly to African nations, could be the 'debt-for-nature swap'. Once poor countries are relieved of their debt problem, special attention could be paid to the economic and social dimensions of climate and climate change issues. I have no doubt that the 'debt-for-nature swap' scheme will work. It will enable African countries to put in place cost-effective measures to prevent environmental degradation arising from climate change.

Finally Mr President, what is your greatest desire as regards the outcome of UNCED?

Nigeria like most other countries is now preparing its position for the 1992 UNCED. Nigeria has participated actively in all fora dealing with climate change and the environment. We in Nigeria are satisfied with the conclusions from the 1972 Stockholm Conference and the 1990 Second World Climate Conference in Geneva.

I therefore expect from the 1992 Summit that there will emerge a balanced global convention on climate, climate change and the environment with opportunity for

the developing countries to continue on their march to technological advancement so as to improve the standard of living of their citizens. I also expect the Conference to form a basis for strengthening international co-operation between all nations.

Her Excellency
Mrs Gro Harlem Brundtland

Prime Minister of Norway

The protection of the atmosphere is on the agenda of UNCED. Nevertheless it would be very valuable to have your views on the importance of the atmosphere in general since atmospheric issues are linked to each other and to other issues and sectors of the environment.



The World Commission stressed very strongly that the environmental and developmental problems were interlocked. The threats to the world's atmosphere are caused mainly by the increasing scope of human activities on Earth. Man-induced emissions lead to acid rain, depletion of the stratospheric ozone layer and climate change.

In OECD countries, we have made some progress in reversing some of the first generation atmospheric problems, such as CO₂ emissions. Such emissions have led to widespread acidification of freshwater lakes and rivers in Norway and other countries. Acidification is now also becoming a problem for the Third World. This problem now needs to be addressed.

The Montreal Protocol, which came after our report, was an important breakthrough in the efforts to curb emissions that damage the ozone layer. The latest

scientific evidence suggests that we must accelerate the phasing-out of ozone-depleting chemicals. On the whole, the Montreal Protocol is a positive experience of what can be achieved through determined international action.

The climate issue is one of the most serious, and certainly one of the most complex global problems facing us today. The first generation of agreements mainly addressed 'end-of-pipe' problems at relatively low costs. Now we are moving into the core of industrialism—its energy systems, production structure and consumption patterns—and of the North/South gap. To face this vitally important issue, better terms for technology transfer and new, additional financial resources to developing countries will be necessary.

What we need now is a new partnership in a new generation of environmental agreements. To ensure that we get most environmental value for our money, we must base future agreements on the principle of cost-effectiveness.

In view of the fact that many disasters affecting the largest numbers of people are water-related, some readers of the report consider that the question of scarcity of fresh water, in particular in developing countries, deserves more attention. Of course, the International Conference on Water and the Environment to be held in Dublin in January 1992 will provide a focus on freshwater issues. In the light of your personal interest and knowledge of the developing nations, your comments on this issue will be appreciated.

Healthy fresh water is certainly one of the natural resources which is now under severe stress in many regions. Such stress is created both by a shifting balance between supply and demand caused by rapid population growth, and by increased pollution to air and water caused by human activities.

The Dublin Conference will hopefully deal with some of the problems related to freshwater supply. It should discuss ways to provide clean water for the poor as well as on methods to use water more efficiently. It should ensure that aquatic ecosystems can go on providing food. It should launch strict rules so as to avoid having water resources contaminated by persistent and toxic substances. Agreements on these issues in Dublin will be an important contribution to the documents prepared for the Rio Conference.

Returning now to the atmosphere, you agree that at present one can hardly imagine any issue with more global impacts on human societies and national environment than the greenhouse effect. The Intergovernmental Negotiating Committee for a Framework Convention on Climate Change is pursuing efforts to reach agreement on certain principles for reducing greenhouse gas emissions and hopefully a text will be ready for ratification by the time of UNCED. The question arises as to what action should be taken if no unanimous agreement is reached as regards stabilization level or exact timings. Could you please express your views on this?

The climate negotiations must not be allowed to fail. We negotiate in good faith, and I am sure that others do as well. There are different problems in each country, hence interests and opinions differ. But our target must still be to conclude a framework convention on climate change in time for a signing ceremony at the Rio Conference in June 1992.

In the current negotiations on a world climate convention, Norway has proposed an approach based on a cost-effective implementation of the targets set to limit global emissions of greenhouse gases. Some kind of global and/or regional targets should be set to curb emissions of greenhouse gases.

The parties to the climate convention should be encouraged to implement its provisions individually or in cooperation with others. This would encourage investments in countries where significant reductions could be achieved at lower costs than in high-cost countries. It would tap new sources of capital, encouraging the private sector to take part.

During the initial phase, the most cost-effective projects are likely to be found in eastern Europe and in developing countries. Such an approach could therefore lead to more assistance to these countries, and relieve public budgets for expenses that will have to be undertaken anyway.

To assist in carrying out this task, the climate convention should contain provisions for an international clearing house. Such a mechanism will be needed to assess and recommend projects and to match them with funding provided by parties who wish to implement commitments outside their own territories.

One of the important existing problems is the long-range transport of air pollution contributing to the acidification of distant environment. According to the report of the Commission some of the greatest damage has been observed in central Europe and in several hundreds of lakes in North America. The same acids enter soil and groundwater. Since acidification is a problem of industrialized countries, one would imagine that a solution to this problem would have been found already. What are the main obstacles to tackling this problem?

The technology needed to curb emissions is available. Among industrialized countries, international treaties—such as the ECE Convention on Long-range Transboundary Air Pollution—are in place. The main problems are now found in eastern and central Europe, but emissions are now being

reduced even here. Present bottlenecks are caused mainly by the difficult economic transition these countries are going through, rather than by lack of political will as under the previous regimes.

The next step will be to renegotiate the protocols on sulphur and nitrogen emissions in order to bring emissions of these substances below the threshold of environmental tolerance. Tougher regulations on industrial emissions will probably be necessary, for example through emissions standards, particularly for stationary sources.

But we should also seek new strategies to reach effects-oriented and cost-effective agreements. We know that the marginal costs for cleaning SO₂ emissions are substantially higher in Norway, where significant reductions have already been achieved, than in central Europe. We should therefore aim for agreements promoting differential obligations where more of the reductions needed can be achieved in central and eastern Europe. This would lead to substantial benefits both economically and environmentally, compared to agreements based on equal percentage cuts for all countries and which disregard the fact that individual nations have very different starting points.

Throughout the report 'Our Common Future', emphasis has been made on the importance of assisting the developing nations in planning their combined economic and environmental development. Bilateral, multilateral financial assistance and transfer of technology have been given as examples. In the World Meteorological Organization, the importance of assisting the developing nations has been highlighted by the WMO Executive Council which has selected 'Meteorology and Transfer of Technology' as the theme for celebration of the World Meteorological Day 1993.

What is important here is the source of funding. Under the Montreal Protocol to protect the ozone layer, a multilateral fund of US \$240 million over three years has been established. The World Bank, co-operating with UNDP and UNEP, has established the Global Environmental Facility (GEF) of US \$1.5 billion over the same three-year period. Can you please give an idea of the order of magnitude of the sum required to assist developing nations?

It does not serve any rational purpose to speculate on ideal sums, but I can give you an example of what my country is doing. The average level of official development aid from OECD countries today is 0.36% of GDP. The accepted aim is 0.7%. In 1991, Norway's contribution will be 1.09%, the highest among industrialized countries. Our contributions to the fund under the Montreal Protocol is additional to this sum. On top of this, we have also established a climate fund, separate from and additional to our ODA. Norway's contribution to the GEF comes from this fund, which is also used for other climate-related purposes in other countries.

It is not realistic, however, to expect that foreign governments can or should shoulder the entire burden of investments in development and environment. Change will also have to come from within individual nations through a reordering of priorities, that is away from arms and military purposes and towards sustainable development. We should also establish arrangements that will encourage the private sector to take part.

Economies of the developing countries depend on the delicate balance of human population and their ecological support systems. In developing regions of Asia, Africa and Latin America, population growth accounts for 85 per cent of

global population since 1950. In your view what sort of population policy could be set up to pursue broad national demographic goals in relation to other socio-economic objectives?

The policies that will stabilize population growth will also strengthen the foundations for sustainable development within each country. When women are given the opportunity to get education and training, when women and men are given the information and means to plan their families, and when basic health services ensure that children do not die before they learn to walk, then we will also achieve a stabilization of population rates. And we will have no chance of coping effectively with the population explosion unless we deal squarely with the poverty issue in the developing world.

It appears that, in consultation with the UNCED Secretary-General, you have decided to hold a special meeting of the World Commission to discuss action for the UN Conference on Environment and Development (UNCED). Could you please describe some of the points on your agenda?

The aim of the meeting is to review progress made by the world community in implementing the recommendations of the World Commission, assess the major trends that have occurred in the world since the release of the report in 1987 and suggest ways of effective implementation of sustainable development issues, that is through the UNCED process.

What are your feelings concerning the 1991 Grawemeyer Award bestowed on the Commission for the report 'Our Common Future'?

It is, of course, a great honour extended to all the members of the World Commission and to those who were involved in the preparation of our report.


Such awards also serve as an opportunity to promote public awareness about the issues raised by our report. I hope that the Grawemeyer Award will be instrumental in spreading interest and knowledge about 'Our Common Future' in the United States.

Finally, Madam Prime Minister, what is your greatest desire as regards the outcome of UNCED?

UNCED must become an expression of the global vision that we now need to achieve sustainable development, and an instrument for translating this vision into concrete action on the issues before us. We must use the time left before the opening of the Conference to try to develop a geopolitical movement for our common future.

We must strengthen the development dimension of UNCED, otherwise we will not succeed in responding effectively to the global environmental challenges. Key objectives of the Conference should be a new world climate convention, a convention on biological diversity and a forceful Agenda for the twenty-first century. We should strengthen the institutional capability of the United Nations to enable us to deal more coherently, forcefully and effectively with the vital problems of environment and development as we prepare to meet the next millennium.

The expectations from the independent sectors and from our peoples are high. A success in Brazil will be important to give our peoples hope and confidence that corrective action can be taken in time to turn around even deep-rooted negative trends if we put our hearts and minds to it.



Concrete results in Brazil would be essential to set the agenda for international co-operation on environment and development for the rest of the 1990s. We should develop further the grand coalition between governments and the independent sectors which has now so painstakingly been put together to save our common future. It constitutes a tremendous resource of innovation, dedication, and willingness to change.

His Excellency Alberto Fujimori

President of Peru

Your Government has been very much concerned about the continued deterioration of the state of the environment in Peru. Indeed, this question has been given the highest priority in your Government's policy. Could you please enumerate the major environmental problems which your country is facing these days?



In Peru, environmental degradation is directly related to the cultivation of the coca leaf, which is the main ingredient for cocaine. Much of the slash-and-burn activity in Peru's forests is to make way for this crop. Moreover, the drug industry carries out chemical processes near the growing areas in order to convert the coca leaf into basic cocaine paste, to which end it uses, among other things, millions of litres of paraffin, sulphuric acid, acetone, toluene and quicklime, whose highly toxic residues contaminate the soils and rivers in the Amazon basin, causing severe damage to both flora and fauna.

In addition, a process of salinization and desertification of the soils along Peru's coastline is also occurring, and we are unable even to keep an adequate control of mining effluents which reach the sea via the rivers, or of the fumes released into the atmosphere by the mineral processing centres.

Moreover, the combined effects of an inadequate agricultural policy and deforestation have resulted in the loss of extensive areas of arable cover in the Andean part of the country. Elsewhere in Peru, such as the brow of the Selva or the coastal mountain range, the mountains appear to be completely bare.

In your message marking the occasion of the 'World Environment Day—5 June 1991', you said that the citizens of Peru and the world must be made aware of the rate of deforestation in Peru and its negative consequences. Would you please expand on this?

Precisely on that day, I mentioned a fact obtained from FAO that is truly alarming, namely that in Peru 350 000 hectares of tropical forest are lost every year through the completely irrational slash-and-burn practices related to migratory farming which arose after the country's agricultural crisis. At the same time I noted that to reconvert deforested land into virgin soil sometimes takes up to 200 years. Imagine the dimensions of this damage and its negative impact on the life of future generations.

You referred particularly to the linkage between deforestation, soil erosion, land degradation, desertification, etc. Could you please describe the extent of damage already made by deforestation in Peru and how much effort and time would be required to complete remedial action?

Deforestation, together with the gradual process of desertification which it entails, presupposes the loss of soil and the outcropping of the subsoil and of the bedrock. To reverse this situation could, as I have already indicated,

take two centuries. It is therefore necessary to curb this process by tackling the root of the problem, namely the lack of economic development which obliges farmers to over-use the land and take short-term views in the absence of ecological awareness.

You expressed the view that in Peru one of the factors contributing to the destruction of forests was the so-called migratory farming. Could you please describe how this phenomenon contributed to the depletion of the country's natural resources?

Well, migratory farming uses the slash-and-burn technique, which effectively razes and destroys the forests. This occurs in Peru partly because of the cultivation of coca and partly because of the poverty of the Andean rural population. Peru is the world's main producer of the coca leaf, owing to the high demand from the consumer market beyond our borders. Misguided strategies resulted in repression of coca farmers and the destruction of the coca fields using chemicals and fungi. But what would be the result? The migrant farmers would simply go elsewhere and continue destroying the forests in order to cultivate the coca leaf, having no alternative for subsisting in this region.

To what extent is your Government concerned with problems related to climate change, atmospheric warming caused by greenhouse gas emissions and the depletion of the ozone layer, and what policy has been envisaged by your Government to tackle these problems on a global scale?

Peru has 77.6 million hectares of forest and is thus the seventh country in the world in terms of tropical forest

area. We know this, and are at the same time aware of the balance, which is today quite precarious, between nature and the manner in which it is exploited by man. We also know that if this balance is deeply disturbed, the very negative consequences for the global climate would extend to apparently remote areas of key importance to the climate such as the Andean-Amazon region which, like the sea, is a source of oxygen and life. With its long coastline and low-lying coastal areas, Peru will be affected by the global climate change. Its effects will be noted in the coastal region as the sea-level rises, and throughout the country, as unpredictable changes in rainfall patterns give rise to insoluble agricultural problems. My Government therefore takes a very keen interest in the world-wide campaign to protect the environment and, I must emphasize, is struggling boldly against one of the worst enemies of the environment, namely the traffic in drugs.

Nowadays, there are few regions of the world that are not affected by problems of degradation of water quality, pollution of surface and groundwater sources. Aquatic ecosystems are disturbed and freshwater resources are threatened. How serious are these problems in Peru?

Problems are starting to occur in Peru with regard to water quality deterioration, mainly caused by mining operations and domestic waste. One of the most serious problems involves the pollution of water by mining wastes in the form of slurries and slags which are dumped into surface watercourses. It is also thought that this is starting to pollute the groundwater. The main pollutants are heavy metals and other chemical compounds.

Peru has an extensive coastal zone of highly diverse and biologically productive ecosystems and habitat. Are the coastal zones in Peru threatened by pollution and other degrading factors?

The coastal zones are threatened by water pollution from various sources: agricultural, mining, industrial and domestic.

In the past, the failure to implement adequate monitoring and control mechanisms prevented action from being taken to evaluate the true situation. We are now working to overcome this. The dumping of waste, mainly of domestic and mining origin, via the country's watercourses causes damage to ecosystems in the coastal valleys. Furthermore, the increased use of fertilizers and the increase in soil drainage and salinity have caused an even greater deterioration in water resources, thus limiting their ability to stimulate the area's development.

The sea is also being threatened by the inflow of surface water or groundwater polluted by the effluents mentioned earlier and by the waste matter produced by the machinery and other equipment used for fishing. The shipping of oil and its derivatives also brings the risk of pollution in coastal waters.

Other human activities affecting the coastal environment include cutting of the dry forest in the north of the country to provide firewood, charcoal and timber; destruction of the mangrove swamps to make way for more prawn farms; contamination of farmland through excessive use of salts, especially in the middle and lower valleys; pollution caused by the excessive use of agrochemicals; and the degradation of inland waters, rivers and lakes by mining effluents and agricultural and domestic waste.

We could also mention soil erosion, overgrazing on the coastal hills, social aspects such as urbanization of farmland, the spread of urban slums, the high population


density, the absence and inefficiency of basic services, the lack of employment possibilities and the extreme poverty.

Peru is also threatened by natural phenomena such as the *El Niño* and seismic phenomena, frequent landslides and other forms of land collapse giving rise to mass migrations, and tidal waves or tsunamis.

Ever since 1945, Peru has ratified many international conventions and treaties on matters related to environment protection. In April 1991 your Government enforced a new 'Penal Code' in the country on ecological offences. Are greenhouse gas emissions, protection of the atmosphere and climate change covered by this law?

The Criminal Code, which covers ecological crime, penalizes damage to the environment due to emissions of solid, gaseous or liquid substances which damage the flora and fauna and hydrobiological resources. It also covers industrial waste and aggravating circumstances when the scope of the damage is catastrophic. It defines as an ecological offence indiscriminate wood-cutting, which, as we have seen, leads to soil erosion and has implications for climate change. Other articles condemn any activity which damages the environment.

It is well recognized that any study and research on environmental questions, in particular, the atmosphere, oceans, inland waters, etc. require access to adequate data and, for this reason, the national Meteorological and Hydrological Services must play an important role in acquisition of such data. In your opinion is the Peruvian National Meteorological and Hydrological Service (SENAMHI) adequately equipped to face this challenge?



The national Meteorological and Hydrological Service is not properly equipped to obtain the necessary information, especially in the field of remote-sensing, and does not have the necessary number of fixed stations to ensure full coverage.

It is well recognized that the question of environment protection cannot be discussed in isolation. It must be dealt with in conjunction with economic development issues. What are your views on the questions such as: additional financial resources, transfer of technology, research and training facilities to be made available to developing nations to enable them to tackle their environmental problems?

We cannot speak of damage to the environment without considering the socio-economic framework within which are conducted the human activities which cause it. My Government has therefore pointed out in various fora the indissoluble link between environment and development and has referred specifically to acute poverty as an important factor in environmental degradation in our region. The allocation by the developed countries of new and additional financial resources and the transfer by them of clean technologies on favourable terms in the interests of sustainable development in our countries are fundamental to the framework that should emerge from UNCED. These are the basic elements of the new form of co-operation which is needed if the developing countries are to be able to make commitments in support of the global environment—commitments which, in some cases, would otherwise render certain perfectly reasonable economic growth objectives more costly or even unattainable.

Such measures would in turn serve to honour the ecological debt acquired by the industrialized countries

through their greater current and historical contribution to the planet's environmental degradation. The concept of a new form of co-operation is recognized in United Nations General Assembly Resolution 44/228, on the convening of a Conference on Environment and Development to be held in June 1992 in Brazil.

Finally Mr President, what is your greatest personal desire as regards the outcome of UNCED?

Peru considers negotiation to be the best way of protecting its environmental and development interests within the framework of a new North-South dialogue. To that end, and in pursuance of the above-mentioned United Nations Resolution, it is therefore Peru's express desire to promote co-operation in these areas with a view to finding joint solutions to environmental problems. These should be based on national, regional and global efforts that permit the application of sustainable development models.

Her Excellency Mrs Corazon Aquino

President of the Philippines

During the Second World Climate Conference (SWCC) held in Geneva in October/November 1990, Ministers representing the world community expressed concern in their Declaration about the predicted rate of climate change over the next century. The main reason being the continuing accumulation of greenhouse gas emissions from human activities. Could you please explain if atmospheric pollution is a serious problem in the Philippines?



Although atmospheric pollution is observed, especially in the urban areas, it is not yet a serious problem in the rural areas. The geographical location of the country coupled with the north-south orientation of the archipelago, and the prevailing wind systems contribute to the mechanism by which the pollutants are removed in the atmosphere. The local sea-breeze/land-breeze circulation is active in the day-to-day dispersion of pollutant emissions. Moreover, on the seasonal scale, the southwest monsoon circulation and the accompanying rainfall effectively remove pollutant species through washout and rainout processes, thereby lowering the concentration of pollutants to below the critical levels.

What are the main sources of atmospheric pollution and what actions have been envisaged to prevent the damage?

The main sources of atmospheric pollution are motor vehicles, power plants, industrial plants and volcanoes. A nationwide campaign to stop black smoke emission from motor vehicles is now being undertaken. Power plants and industrial plants are also required to install air pollution control devices aimed at minimizing their emissions hazardous to health and to the environment in general.

Have the emissions of pollutants in the atmosphere created an acid rain problem in your country?

In the early 1990s, results of measurement of acidity through dust-fall jars showed high pH values which indicate alkaline rainfall.

The Philippine Atmospheric and Astronomical Services Administration (PAGASA) is the lead agency concerned with research and monitoring of weather and climate conditions in the country. In 1988 PAGASA instituted a monitoring project for rainfall chemistry as part of the WMO/UNEP Global Background Air Pollution Monitoring Network (BAPMoN). Could you please mention the main findings of this project?

In support of the WMO/UNEP Global Background Air Pollution Monitoring Network, the BAPMoN station has been operational since September 1988 up to the present day. Based on the chemical analysis of the rainwater samples taken at the BAPMoN station at Mount Sto.

Tomas, the average acidity of the rainwater in the area is equivalent to pH 6.4 for the period covering 1989–1991. This pH level is indicative of the still relatively good rainwater quality in the Mountain Province.

The Philippines is a signatory to the Montreal Protocol for the Protection of the Ozone Layer which was officially adopted in Montreal in 1987. Are there any national plans for reducing greenhouse gas emissions which include the amount of reduction and the target time?

The Philippines became a signatory to the Montreal Protocol on 14 September 1988 and ratified it in March 1991.

Although currently there is no production or any export of controlled Ozone Depleting Substances (ODS) in the Philippines, consumption of ODS amounted to about 4 200 tons in 1989 corresponding to a calculated consumption of 0.05 kg per capita. This is well below the 0.3 kg per capita level which allows us, a developing country, to delay compliance with the Protocol control measures by 10 years. It may, however, be found convenient to adopt an accelerated phase-out programme to limit the use of controlled substances in order to avoid difficulties in obtaining them after the year 2000 or in exporting goods containing or manufactured using ODS.

In the Philippines, efforts have been made to form a National Committee on Climate Change and Ozone Depletion to include all government agencies concerned with effects of climate change. What is the present status of this Committee?

Administrative Order No. 220, dated 8 May 1991, created an Inter-Agency Committee on Climate Change co-

chaired by the Department of Environment and Natural Resources (DENR) and the Department of Science and Technology (DOST). A steering group has been formed to assist the Committee in its activities, and plans for continuing action are now being prepared. On the matter of ozone, PAGASA operates a Total Ozone Observation Station and regularly sends observed data to the World Ozone Data Center in Colorado, USA.

In response to the drought which occurred twice during the last decade, a drought advisory called the Drought Early Warning and Monitoring System (DEWMS) was released by PAGASA. This led to the creation of a Cabinet Crisis Committee to monitor drought and its effects on water supply and agriculture. What follow-up actions have been taken by this Committee and what are their achievements?

The Water Crisis Management Committee, of which PAGASA is a member, meets regularly to tackle water-related concerns. It considers reports on existing drought conditions and recommends the courses of action to be taken by water-related government agencies. It has been instrumental in the implementation of a scheme in the allocation of water supply both for domestic and agricultural needs, in order to alleviate the water shortage in the country.

The forestry sector plays an important role in the Philippines economy and environment. There are many factors causing forest destruction such as forest fires, logging, mining operations, pests and diseases. What actions have been envisaged to halt deforestation and encourage the restoration and protection of national forests?

The Master Plan for Forestry Development provides the framework for the development of the forestry sector in the Philippines. The function of the Plan is to point to the direction that the country's forestry sector should take and to draw the support needed to move the sector into the prescribed direction.

The general objectives of the plan are as follows:

- (a) To meet the needs for wood and other forest products by placing all of the country's forest production under sustainable management;
- (b) To contribute to the production of food, water, energy, and other needed commodities by properly managing the upland watersheds;
- (c) To protect the land and its resources against degradation and ecological devastation through proper land management practices;
- (d) To conserve forest ecosystems and their diverse genetic resources;
- (e) To contribute to employment and growth of national and local economies through fully developed forest-based industries; and
- (f) To promote social justice and equity in recognition of the rights of indigenous cultural communities (ICC) in the management, conservation, and utilization of forest resources.

The major focus of the Plan lies in the provision of opportunities for participation by the people in forestry development, management, and utilization, making them agents of forest conservation rather than of forest destruction.

The Master Plan was made possible through technical assistance from the Asian Development Bank and the Finnish International Development Agency. The aggregate cost of the 15 Master Plan programmes is P192.6 billion over the 25-year period (1991–2015).

It is envisaged that the private sector will participate actively in the implementation and funding. Foreign financial aid is also seen to be vital for the funding of the Master Plan.

Agricultural production in the Philippines has relied considerably on chemical fertilizers. To what extent have the waters of the lakes, streams and coastal regions been chemically contaminated as a result?

Based on the latest pesticides study (1986), there has been no indication that rivers and lakes are heavily contaminated. Due to lack of funds, pesticide monitoring has not been undertaken since then.

Fresh water is increasingly becoming a scarcity for many areas in the Philippines. Although there is a great potential of the country's inland water resources, given the current rate at which such resources are degraded, the question arises as to whether these resources could be saved before it is too late. Could you please explain in general terms what is being done in the country to ensure comprehensive assessments of water resources, arresting pollution and enforcing standards and regulations?

The DENR undertakes continuous surveillance and monitoring of water quality aimed at determining trends and concentration levels of pollutants in selected parts of the country. The data collection is vital in making important judgements affecting environmental protection and natural resources. The information further serves as an indicator of the present condition as well as the development of our water resources. DENR is strictly implementing the Pollution Control Law through the Water Quality Criteria, and Rules and Regulations.

Geographically, the Philippines is in a region with the highest frequency of tropical cyclone occurrence in the world, the consequences of which are floods and storm surges. Could you please indicate the order of magnitude of economic damage caused by this natural disaster?

The Philippines has one of the highest frequency of tropical cyclone occurrence in the world. An average of 20 tropical cyclones enter the Philippine Area of Responsibility each year and about 10 of them cross the country. The Philippines experiences tremendous losses due to strong winds, floods and storm surges. In 1990 alone, property damage for both public and private entities amounted to P12.108 billion, with Typhoon Ruping (TY MIKE 9025) causing the greatest damage at P10.276 billion.

The full understanding of the behaviour of the atmosphere, oceans, land and ecosystems requires continuous observations by means of a well-established network. With this in mind the Eleventh World Meteorological Congress (Geneva, May 1991) approved the establishment of a Global Climate Observing System (GCOS) to serve as an umbrella to the existing WMO observational network. To achieve this, new organizational arrangements and expansion of the existing services at national and international levels are needed. What do you believe the role of PAGASA should be to ensure the effectiveness of GCOS in the Philippines?

In relation to the approved establishment of a Global Climate Observing System (GCOS) to serve as an umbrella to the existing WMO observational network, PAGASA could be of assistance by actively pursuing climate-related data gathering in all its synoptic stations; transmitting the

data to the GCOS. If the need arises, PAGASA could enhance its observation capability by acquiring necessary equipment for the purpose.

The United Nations Conference on Environment and Development (UNCED) will be convened in Brazil in 1992 to address a wide range of issues relating to the protection of the environment. Madam President, what is your greatest personal desire as regards the outcome of UNCED?

It is hoped that the United Nations Conference on Environment and Development in 1992 could crystallize the resolve of the member countries to persevere in the protection of the environment as part of the strategy for sustainable development, instituting reforms where necessary, and to evolve a global agenda towards the protection of Planet Earth. Hopefully, man will finally awaken to the reality and imminence of global change and exert concerted efforts to prevent it and save mankind from further environmental damage.

His Excellency Abdou Diouf

President of Senegal

The Second World Climate Conference (Geneva, October/November 1990), went on record to say that the developing countries should be assisted in order to build up their capabilities for monitoring, assessing, and applying climate information. In this context, as you are aware, WMO has already initiated a number of regional programmes and projects in which Senegal has been taking part actively. Examples are the AGRHYMET Programme for CILSS countries and the African Centre of Meteorological Applications for Development (ACMAD). Furthermore, at the country level WMO, in collaboration with UNDP and the Government of Senegal, has implemented other national projects with the aim of strengthening observational networks and improving agricultural activities. To what extent do you believe that these efforts have been beneficial to Senegal?



The Sahelian region has been suffering from an almost endemic drought since the 1960s. Following a resolution adopted by Ministers from the Member States of the Permanent Inter-state Committee on Drought Control in the Sahel (CILSS), the regional AGRHYMET Programme was

launched in 1975 with support from the international community. Like other countries in the region, Senegal has been carrying out national projects since that time, with financial assistance from the UNDP and donor countries and technical assistance from WMO. I would like to take this opportunity of thanking them. These projects continue to help my country to strengthen the Meteorological and Hydrological Services by providing them with consolidated, well-structured observing networks, qualified personnel and fast data transmission and processing means. Senegal's climate monitoring and climate change assessment capacities have thus been increased. The projects also make an appreciable contribution to the country's food security by establishing agrometeorological monitoring of the agricultural situation and its probable evolution during the rainy season, and by broadcasting information, advice and warnings to decision-makers at all levels.

Successive AGRHYMET national projects have produced promising results in the application of climatological information to improve farming practices for both rain-fed and irrigated crops on small farms and thus to increase yields. However, there is a constant concern to preserve the country's renewable natural resources.

So, to answer your question, I think that the efforts made to date have been beneficial to my country and I hope that our partners will continue to strengthen their support so that action taken or still to be taken will contribute more to climate monitoring and climate change assessment as well as to the reduction of the food shortage and to greater food security, whilst preserving our environment on which any sustainable development depends. I hope so all the more strongly since the projects in question have helped the Senegalese Government to control agricultural production, which is a key factor for the country's economy and consequently for the population's well-being.

However, Senegal builds much hope on other demonstrations of solidarity on the part of the international community, such as the creation of the African Centre of Meteorological Applications for Development (ACMAD) under the auspices of the ECA and with WMO's assistance. We will continue to give our support to this centre, since, for Africa, it represents an essential means of effective monitoring and prevention of both drought and other weather-related disasters. Another factor is that its success would constitute a good example of African integration, the attainment of which is one of our priorities.

Nowadays there is a consensus of opinion that emissions of greenhouse gases resulting from human activities will cause climate change and global warming. A global warming will, undoubtedly, compound the existing problems, the consequences of which will be felt most in regions already under stress. What are the prevailing environmental problems in Senegal, in particular those pertaining to freshwater resources, agriculture, forests, coastal regions, etc.?

There are real dangers for Senegal in the areas you have just mentioned. As regards freshwater resources, they depend on our control of groundwater pollution which is caused by a proliferation of unauthorized dumping of wastes of all kinds (domestic, industrial, etc.).

There is also the problem of the lowering of water-table levels and the drying up of certain water outlets, which is due to worsening drought conditions, as well as the pollution of certain watercourses, either by industrial waste or by excessive use of chemical fertilizers. As regards agriculture, the most obvious problems are the falling fertility of soil owing to overuse of natural resources, or the latter's erosion, essentially through the disappearance of the plant cover and

the salination of certain areas around estuaries. As to our forests, they must be protected against excessive tree-cutting, straying animals, bush fires and the impacts of escalating urbanization. Erosion, compounded with the use of sand from the sea and pollution of all kinds, is a real scourge on our coasts.

The dangers I have just mentioned are something of a ransom for development. But, at the same time, they are impediments to the attainment of our development objectives, particularly food self-sufficiency. This is why we have made it one of our priorities to overcome and eradicate them. Among the steps taken for this purpose, I might mention the annual reforestation campaigns which we carry out under our long-term reforestation plan, as well as the adoption of an Environment Code.

North Africa and the Sahelian zone are subject to frequent droughts, progressive aridity and encroaching desertification. The major reason for Sahelian droughts is a decrease in annual precipitation. Two major problems requiring immediate attention are water resources and water quality management. None of these issues can be fully dealt with without access to: (i) A systematic network for meteorological data monitoring; and (ii) Improved and expanded surface hydrological data-collection networks. Apart from the WMO assisted projects referred to before, in your opinion are there any other sources of assistance which could be utilized for this purpose, such as bilateral help?

Besides WMO, organizations such as FAO have assisted us in our efforts towards proper environmental management. Some countries have also shown their solidarity, such as France, Sweden, USA and the United Kingdom. Other sources of funding can still be mobilized, whether bilateral or multi-lateral. This increased solidarity would improve the

efficiency of the actions that we take at national level as well as at sub-regional level with our partners in the sub-region. In this connection, I should point out that environmental protection policies are being integrated within the framework of ECOWAS.

Wide-scale deforestation contributes to the greenhouse effect and can alter local and regional climates. Africa's forests are disappearing at the rate of four million hectares per year. Could you please describe the seriousness of this problem in Senegal and what action is being taken to halt deforestation?

Deforestation and its consequences are among the most worrying environmental degradation problems today in Senegal. More than 60% of the country, particularly the whole northern part, is arid and semi-arid. This, combined with devastating human activities such as excessive tree-felling, has placed tree planting and reforestation at the top of our priorities. However, we are by no means neglecting other environmental problems such as pollution, which is often alarming in certain cities, coastal erosion, hazardous wastes, etc.

As regards the specific phenomenon of deforestation, the high energy demand in urban areas is causing it to spread. We have therefore adopted a series of remedial measures. For example, thanks to assistance from friendly countries and certain international institutions, as well as the population's commitment, considerable reforestation work is being done throughout the country, either during campaigns initiated and conducted by public administrations, or by simple planting activities carried out by the population itself.

In parallel, new strategies have been adopted to solve the energy problem. These include the preparation of a plan for energy redeployment in Senegal (RENES) whose main

objective is to meet the high energy demands as far as possible by reducing to a minimum dependence on oil and pressure on ligneous resources. Research into, and the promotion of "improved fireplaces", i.e. stoves designed to use wood for heating more economically and rationally, as well as research into renewable (wind and solar etc.) energy and into other sources of energy (turf, lignite, etc.) are also aimed at meeting this objective.

Irreversible damage is being done to soils in many parts of the world. Today, two-fifths of Africa's non-desert land risks being turned into desert. The need for daily survival forces the poor to overgraze grasslands, to over exploit soil and to cut what remains from forest stocks. Do you agree that environmental stress in developing countries cannot be eliminated without attacking poverty?

Poverty is both the cause and consequence of environmental degradation. It is essential to remember this. During preparations for the forthcoming United Nations Conference on Environment and Development (UNCED), poverty should therefore be given a central place among the problems to be solved. Our populations are sometimes obliged to use, or even overuse natural resources to survive. This makes our efforts to protect the environment in the rural context successfully even more difficult. It is important that the developed countries understand this special situation of the countries in the South, and that we take account of it in our common efforts to face environmental challenges.

There are no doubts that developing countries recognize the urgency to address global environmental threats. However,

transition to environmentally clean activities requires considerable expenditure. In your opinion from which sources can these expenses be met?

For the most part, funding can only be from multilateral sources. Within the United Nations, consideration should be given to the idea that UNCED should launch an operation to set up a multilateral fund. It is within such a framework that the developing countries are calling for "additional assistance" to the conventional type they receive from their bilateral partners. One cannot ask these countries to withdraw sums from the conventional assistance, which does not meet all of their needs, in order to finance environmentally clean activities. These new expenses would considerably hamper their financial possibilities, which are in any case already limited.

Today there is a widespread agreement that industrialized countries must provide additional resources for environmental investments. Indeed, the international work is going on to find the right approach. What do you think of new ideas such as debt-for-environment swaps?

Debt-for-environment swaps have already been tried in some countries in Latin America as well as in Africa. So far, they have not resulted in a significant reduction of the debts of the countries concerned.

The principle is good for the environment, which can thus benefit from the possibilities of funding certain projects. We should therefore continue to give it thought in a spirit of greater solidarity.

What do you think of the recent agreement to establish an Interim Multilateral Fund to help developing countries make

the transition required by the Montreal Protocol on the protection of the ozone layer? Do you believe the sum of US \$240 million over three years would be adequate to assist the developing countries?

The London agreement to set up an interim international fund to assist developing countries in their policy to protect the ozone layer is an important step in the right direction. It must be welcomed. It goes without saying that the sum allocated would not solve the problem in a country such as China or India and *a fortiori* in all of the developing countries. It is possibly for this reason that ozone has become one of the four areas of eligibility for the Global Environment Facility (GEF) located at the World Bank. It is still true that the GEF itself has limitations which mean that substantial assistance cannot be given to the developing countries to meet the expenses related to their concern for the environment. Although the problems encountered in the four GEF fields of activity (biodiversity, international waters, global warming or greenhouse effect, and ozone) are global concerns, it must be recognized that they are of special concern to the countries in the North. They affect us and we welcome the initiatives taken to solve them. Maybe it is necessary to extend the GEF fields of activity.

The United Nations Conference on Environment and Development (UNCED, Brazil 1992) provides a unique opportunity to forge an international solution to environmental problems. Do you agree that the African countries should adopt a concerted approach to address the Conference, since no effective global action can be taken on environmental matters without participation by developing nations?

Like countries in other continents, the African countries will go to Rio de Janeiro with a concerted approach. The African

Ministers for the Environment, under the aegis of the Organization of African Unity (OAU) and of the United Nations Economic Commission for Africa (ECA) adopted a common position last November for all of the preparatory processes for the 1992 conference. This does not prevent our solidarity with other developing countries and our constant awareness that environmental problems are not limited by national boundaries.

Finally Mr President, what is your greatest desire as regards the outcome of UNCED?

I am expecting from UNCED more solidarity and concrete action to express this solidarity. Our planet is one and undivided and, I repeat, the environment is not limited by boundaries. We must therefore suppress national self-interest for the benefit of the whole planet.

His Excellency
Luis Alberto Lacalle

President of Uruguay

In Uruguay, pastoral farming is an important economic activity and practically all available land is in use for grazing or agriculture. Could you please describe your views on the question of sustainable development in the context of your country?



Uruguay has a large area of land which is very suitable for agriculture, mainly in the west, covering most of the departments of Río Negro, Soriano, Colonia and Rocha, large parts of the departments of Paysandú, San José, and, to a lesser extent, those of Artigas, Canelones, Flores and Durazno. Other parts of the Republic also contain suitable areas, but for specific crops (mainly rice).

In view of the increasing degradation of agricultural land through decades of cereal growing, and the decreasing yield per hectare, farmers are now introducing leguminous forage crops in association with the conventional cereals (wheat, barley, flax, etc.), and combining crop and livestock production in a new way. The result is an increase in the field response capacity, mainly through nitrogen fixing in the soil, this element

being of prime importance for production indices. Under this type of farming, the land is protected from premature degradation whilst the yield per hectare is noticeably increased.

Helped by constant advice from the competent bodies, viz. the Plan *Agropecuario* (which reports to the *Ministerio de Ganadería, Agricultura y Pesca (MGAP)*) and the *Dirección Nacional de Medio Ambiente* (which reports to the *Ministerio de Vivienda, Ordenamiento Territorial y Medio Ambiente*), farmers throughout the country are ensuring sustainable development in this sector which is crucial for the national economy.

Land is the most important resource. Agriculture employs the majority of people in most developing countries. Preservation of land productivity is therefore very important. To what extent is your country concerned with problems of land degradation and what are the main causes?

As regards land degradation and the measures taken to reduce it, Uruguay has an experienced group of agronomic engineers who work either for the MGAP or the Bank of the Republic of Uruguay, which is the main banking institution providing funds to national production structures, or else for the co-operative system. Their main tasks are:

- To advise farmers to use the system of contour lines in preparing land for ploughing, thus reducing 50–80% of the degradation caused by erosion (mainly by water);
- To monitor crops to determine the type of treatment to be used in cases of pest outbreaks, etc. (i.e. insecticide and/or fungicide which farmers should

apply in their fields, the type being laid down by the technician from an MGAP-authorized list).

In performing this work, they are supported by Experimental Stations which are located in areas representative of the region's type of production (whether mixed livestock and cereal crops, fruit growing or stock breeding). The purpose of these stations is to study, analyse and, most importantly, disseminate management and production techniques in their various areas of competence. The *Instituto de Investigaciones Agropecuarias (INIA)*, a non-governmental public body, is responsible in these stations for advising producers on reducing land degradation. It reports directly to the executive on its research, including results and suggestions for action.

Inappropriate land management in agricultural areas, including fruit-growing and cattle round-up areas, has been minimized by the transfer of techniques developed by these Experimental Stations, in co-ordination with the 'extension' work by the MGAP Plan *Agropecuario*.

Water is a vital resource and its pollution by human activities such as agriculture and industry constitute serious local problems for many countries. Does this problem exist in your country?

Uruguay has an extensive hydrographical network, being drained by large rivers as well as smaller ones which nevertheless maintain an annual flow of water covering the basic requirements for both humans and animals. Only in summer (December-February) do low flows occur naturally and the cattle suffer to a certain extent from lack of water, but this does not reach the catastrophic levels found in other

countries. The water for human use is regulated by the *Obras Sanitarias del Estado (OSE)* which is responsible for the supply of drinking water to all settlements throughout the country. Its management can be considered acceptable given constant investment within the limits of the scarce budgetary resources available.

Pollution of watercourses by human activities has reached worrying levels, mainly in Montevideo, which is the largest city in the country with approximately 50% of the total population. Its origin is mainly effluents from waste-management companies, leather, wool and paint factories, etc., containing heavy metals and organic synthetic products which are detrimental to human health. The Government is considering setting up a waste water (sewage and effluent) treatment plant for Montevideo, mainly to treat biodegradable elements.

The *Ministerio de Vivienda, Ordenamiento Territorial y Medio Ambiente* and the *Dirección de Medio Ambiente, Obras Sanitarias del Estado (OSE)*, and other government departments are now held responsible for the strict control of waste water. Dissuasion of offenders may include the payment of 'ecological fines' calculated on the basis of the value of indexed mortgage units in cases where orders from the inspector who had observed considerable water pollution were disobeyed.

As regards agriculture, the use of toxic agrochemicals has not reached levels which are damaging to watercourses.

Atmosphere, though a renewable resource, is now threatened by human activities and life style. On the national scale do you consider this a major problem?

Human activities and the way of life in Uruguay are not at present a major problem. Nor does the country have an

excessive number of motor vehicles (although those which exist are very old). Emissions from refrigerators and aerosols (CFCs) can also not be considered as producing quantities of gases which affect the upper layers of the atmosphere.

However, this does not hamper the national measurements and programmes being carried out to monitor and evaluate air quality and determine any trend towards deterioration and its impact on human health.

There is general agreement that the oceans are being misused by man and that this may become a very serious threat on national and global scales. To what extent is your country concerned with this problem?

Uruguay has a long coastline and the executive supports a policy of conservation and control of the territorial waters, as can be seen in the efforts made by all of the competent bodies, particularly the Navy.

Within the limits of the modest material means available, an attempt is being made to halt the overfishing of species which come to spawn in these latitudes by powerful fishing fleets entering these waters clandestinely. Some success has been achieved in stopping large tankers from cleaning their engines and dumping residual hydrocarbons.

Uruguay's beaches have excellent natural conditions, making them a very important source of hard currency through tourism. Because of this, and the 'ecological awareness' which the local population is acquiring through the growing public information campaign conducted by the national and departmental authorities, we think that the country is on the right track toward preserving this precious heritage for future generations.

Forests are critical elements of the global climate and its carrying capacity. They provide useful products and prevent soil erosion through water and wind. They constitute a habitat for wildlife and preserve biodiversity. Deforestation speeds up the process of greenhouse gas emissions and warming of the atmosphere. Latin America has one of the largest reservoirs of the world's forests. What are your views on deforestation and the future of Latin America?


An opinion on deforestation in Latin America must inevitably take account of the problem of impoverishment of Third World countries, and the condition of 'hostage-partners' which we have as regards warming of the atmosphere.

There is no doubt that massive destruction of forests will bring about an imbalance in natural habitats, with a reduction in flora and fauna species (biodiversity), as well as a (relative) acceleration of the global warming impact. However, how can it be explained to societies whose sustenance is based on the production of raw materials that they should not cut trees because this is harmful to the 'whole'?

With what moral authority can developed societies invoke the depletion of the ozone layer, the greenhouse effect and other impacts which are almost entirely caused by themselves?

We are aware of the need to conserve the environment, but we are also conscious of the fact that we were not guilty of starting the whole phenomenon of environmental degradation and that any solution should therefore be weighted in such a way that environmental preservation is linked with the development of our peoples who are those from whom 'a great effort' is being requested.

In order for Latin America to be able to be the 'future natural lungs of the world', effective economic assistance



must be envisaged without reciprocity, as well as the transfer of technology on favourable terms. This region will thus have a reason, or an incentive to continue to exist.

As was mentioned at the fifth plenary session of the IPCC in Geneva in March 1991 by the developing countries, the evaluation of areas and the reafforestation of natural zones should be seriously envisaged by the developed countries, based on effective assistance and without counterpart contributions. Such projects could be supervised by the FAO with UNEP support (some are already being implemented).

On the issue of the greenhouse gas emissions, the Ministerial Declaration of the Second World Climate Conference (SWCC)—Geneva, October/November 1990, at which your country was represented by your 'Ministro de Vivienda, Ordenamiento Territorial y Medio Ambiente' reaffirmed the need for strengthening national, regional and international research activities in climate, climate change and sea-level rise. Could you please describe what action has been taken by your country to implement these proposals?

An International Seminar on Environmental Conservation and Coastal Development in Latin America and the Caribbean was held in Montevideo from 25 to 29 November 1991, with the support of the Organization of American States (OAS) and co-organized by the *Ministerio de Vivienda, Ordenamiento Territorial y Medio Ambiente (MVOTMA)* of Uruguay. It was attended by eminent specialists on coasts from universities and official institutions in Argentina, Brazil, Colombia, Guyana, Honduras, Jamaica, Mexico, Trinidad and Tobago, Uruguay and the USA.

During this seminar, dramatic projections were made regarding the possible sea-level rise, particularly by the island countries in the Caribbean area.

The National Directorate of the Environment of the MVOTMA, which has a technical unit specialized in coastal matters, the Coastal and Marine Ecosystems Division, has started preparations for making observations and a general diagnosis of the Uruguayan coastal belt, including a study of the possible impacts of a sea-level rise.

The Ministers at the SWCC recognized that, for the developing countries, the alleviation of poverty and achieving social and economic development had to be given the highest priority. For this, adequate and additional financial resources should be mobilized to obtain the best environmentally sound technologies expeditiously and on a fair and most favourable basis. Has your Government prepared an assessment of the immediate requirements in this context?

Uruguay has not yet made a precise evaluation of the country's immediate needs for the transfer of technology to alleviate poverty and ensure economic and social development.

In parallel, it is considered important to encourage national and regional research into new technologies which are adapted to the real conditions in the country. However, it is of fundamental importance to maintain direct relations with centres where similar research is being carried out, with a view to seeking mutual support and possibly an unrestricted transfer of technology between developing countries such as ours.

The Ministerial Declaration of the SWCC recommended that financial resources channelled to developing countries should,

inter-alia, be directed to enhancing atmospheric, oceanic and terrestrial observational networks, to facilitate research and monitoring and assessment of climate change and the impact on those countries. Are the national Meteorological and Hydrological Services in your country taking the necessary measures to face this challenge?

Uruguay, which was represented at the Second World Climate Conference, naturally subscribes to this recommendation whilst considering that the national strategy to attain this objective should be to complete the existing sparse networks.

The meteorological and hydrological observing networks are being used within the framework of the recently created National Water Commission. The recommendations of the International Water Conference (Mar del Plata, Argentina, 1977) were taken into account together with an interpretation of the suggestions by the International Conference on Water and the Environment to be held in Dublin, Ireland, in January 1992.

Finally, Mr President, what is your greatest desire as regards the outcome of the United Nations Conference on Environment and Development (UNCED)—Brazil 1992?

Uruguay hopes that the United Nations Conference on Environment and Development (UNCED) will mark a permanent raising of the collective consciousness with regard to the environment. It should result in conventions being signed to determine legally the rights and responsibilities of both states and individuals and emphasize the types of ecological offences and international responsibility. We should strive in these agreements to avoid UNCED's becoming another

'Stockholm'. We should actively seek practical solutions and concrete, efficient measures to deal with the problem at source.

Countries with scarce financial resources, such as Uruguay, will try to ensure that the points of view, concerns and requirements of the developing countries, particularly those in this region are heard.

We will continually promote the idea that the environment, its conservation and sustainable development are elements which are intrinsically linked. The sensitive ethical and cultural implications of measures to 'adjust' the situation by implementing conservation policies cannot impair the personal development of each individual in our society.

Uruguay and the other countries in the region as well as other developing countries are the great 'hostages' of this problem.

'Differential responsibility' in the political treatment of this topic is an essential premise for UNCED.

The transfer of technology on favourable terms (if not free of charge) should set the tone at the negotiating table if the developing countries are to be expected to collaborate effectively in combating this scourge of mankind.

