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1998
UNEP
SASAKAWA

ENVIRONMENT
PRIZE



United Nations Environment Programme



UNEP



**1998
UNEP
SASAKAWA**

**ENVIRONMENT
PRIZE**



United Nations Environment Programme



UNEP



*We invite you to nominate,
to the prestigious UNEP Sasakawa Environment Prize,
individuals who have made an outstanding global contribution
to the management and protection of the environment*

Previous winners

- 1997** *Barbara Pyle*
- 1996** *Triloki Nath Khoshoo*
- 1995** *Canaganayagan Suriyakumaran*
Norman Myers and Peter Raven
- 1994** *M. S. Swaminathan*
Paul and Anne Ehrlich
- 1993** *Mostafa Kamal Tolba*
- 1992** *Qu Geping*
Yuri Izrael
- 1991** *Wolfgang Burhenne*
Françoise Burhenne-Guilmin
- 1990** *Francisco "Chico" Mendes*
- 1989** *Lester R. Brown*
- 1988** *World Commission on Environment and
Development*
*Royal Commission for Jubail and Yanbu,
Saudi Arabia*
- 1987** *Elizabeth Mann Borgese*
Nicholas Polunin
- 1986** *Mtweka College of African Wildlife Management*
- 1985** *Hassan Asmaz*
Gilbert R. White
- 1984** *Aurelio Peccei*
-
- *1976** *Maurice F. Strong*
- *1977** *Commandant Jacques-Yves Cousteau*
- *1978** *Professor Mohammed El-Kassas*
Thor Heyerdahl

* Pahlavi Prize

The United Nations Environment Programme (UNEP) Sasakawa Environment Prize

The UNEP Sasakawa Environment Prize is one of the most prestigious environmental awards in the world.

The establishment of an international environment prize was recommended at the United Nations Conference on the Human Environment held in Stockholm in 1972. This Prize, then known as the Pahlavi Prize, was first awarded in 1976.

In 1982, the UNEP Governing Council accepted an endowment of US\$ 1 million from the Japan Shipbuilding Industry Foundation to finance the Sasakawa International Environment Prize which would be administered by UNEP.

Now known as the UNEP Sasakawa Environment Prize, it is awarded annually to leading environmentalists and recognizes the work of these individuals at the global level.

Since its inception, interest in the award has increased significantly as attested by the growing number of nominations. After serious deliberations and in the light of the kinds of nominations received over the years, the Selection Committee decided to reevaluate the process and has recommended that all nominations be considered on an annual basis and that the Prize be awarded to *“individuals who have made an outstanding global contribution to the management and protection of the environment.”* The Prize also aims to encourage environmental achievement in any field of the environment.

The annual award of \$50,000 was increased to \$200,000 in 1990 making it one of the world's most valuable environmental prizes.

Eligibility

The Prize is awarded to individuals who have made outstanding contributions to the management and protection of the environment consistent with the policies, aims and objectives of UNEP.

Candidates can be associated with any field of the environment. Those eligible to make nominations include, but are not limited to, specialists in environmental sciences, academies of science, engineering and research, members of the United Nations system, governments, inter-governmental organizations, trade unions and non-governmental organizations.

NO CANDIDATE MAY NOMINATE HIMSELF OR HERSELF.

PAST RECIPIENTS CANNOT BE RENOMINATED.

Length of candidacy

Nominees will be considered on an annual basis. A new letter of nomination and updated description of achievements is required every year.

Nomination procedures

Identify nominee by completing the attached nomination form.

Include name, professional and home mailing address, present occupational title and institutional affiliation and date and place of birth. Enclose a curriculum vitae or résumé.

Summary of accomplishments

Provide a brief statement of no more than two pages of the individual's achievements in the fields for which the award is proposed. Be precise and factual.

Description of contributions

Provide a detailed explanation of the contributions and explain why each is valuable and effective. Describe how each was accomplished. Mention any significant involvement of others.

References

Provide three letters of recommendation from individuals who can assess the nominee's contributions. Identify three additional referees who might be contacted by the Selection Committee.

Evidence of achievements

The Selection Committee reserves the right to request examples of publications or other evidence which demonstrate the candidate's contributions to the environment. Such materials will be retained by UNEP unless otherwise requested.

Nomination forms

Additional nomination forms for the UNEP Sasakawa Environment Prize may be obtained from:

The Secretary

*UNEP Sasakawa Environment Prize
United Nations Environment Programme
Information and Public Affairs Branch
P.O. Box 30552
Nairobi, Kenya
Telephone: (254 2) 62 3401 /62 3128
Fax: (254 2) 62 3692/62 3927
E-mail: elisabeth.guilbaud-cox@unep.org
rajinder.sian@unep.org*

Deadline for nominations

Nominations for the Prize, related credentials, information in support of the nomination and letters of reference must be received no later than **30 April 1998**.

UNEP Sasakawa Environment Prize

Nomination Form

N.B. NO PERSON MAY NOMINATE HIMSELF OR HERSELF

NOMINEE (name in full) _____

DATE OF BIRTH _____

PLACE OF BIRTH _____

NATIONALITY _____

ADDRESS _____

Telephone: _____ Telefax: _____ E-mail: _____

PRESENT OCCUPATION _____

EDUCATION _____

HONOURS _____

PUBLICATIONS (considered most relevant for the purpose of the Prize)

CURRICULUM VITAE (please attach an up-to-date Curriculum Vitae)

SUMMARY (Outline below the reasons why the nominee should receive the Prize)

References: Provide three persons, not related to the nominee, who are familiar with the nominee's qualifications and work.

REFEREE

NAME (IN FULL) _____

ADDRESS _____

Telephone: _____ Telefax: _____ E-mail: _____

PROFESSION _____

REFEREE

NAME (IN FULL) _____

ADDRESS _____

Telephone: _____ Telefax: _____ E-mail: _____

PROFESSION _____

REFEREE

NAME (IN FULL) _____

ADDRESS _____

Telephone: _____ Telefax: _____ E-mail: _____

PROFESSION _____

NOMINATOR

NAME (IN FULL) _____

ADDRESS _____

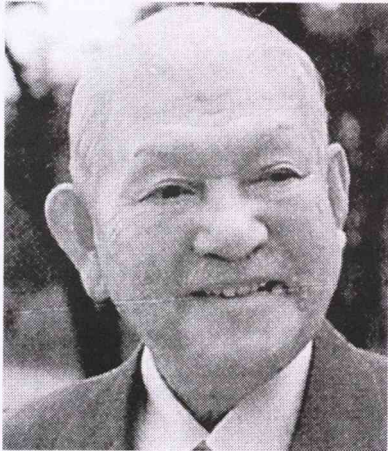
Telephone: _____ Telefax: _____ E-mail: _____

PROFESSION _____

DATE: _____ SIGNATURE _____

Please send the nomination form and Curriculum Vitae typed or in block letters, to:

The Secretary
UNEP Sasakawa Environment Prize
United Nations Environment Programme
Information and Public Affairs Branch
P.O. Box 30552
Nairobi, Kenya
Tel.: (254 2) 62 3401/62 3128
Fax: (254 2) 62 3692/62 3927
E-mail: rajinder.sian@unep.org
elisabeth.guilbaud-cox@unep.org



Mr. Ryoichi Sasakawa, who passed away in July 1995, was the founder and Chairman of the Sasakawa Foundation for more than three decades. He donated more than US\$400 million to social and public works projects both within and outside Japan. He has also made numerous personal donations. His initiative in Africa with the former United States President Jimmy Carter is now, through the Sasakawa Global 2000, bringing benefits to thousands of peasant farmers throughout the continent.

In 1979, Ryoichi Sasakawa took part in the United Nations Educational, Scientific and Cultural Organization (UNESCO) Peace Forum in Paris as a member of the delegation from Japan. In the same year, he received the United Nations Scroll of Appreciation, which cited his "personal support and extraordinary philanthropy in the cause of improved international standing and co-operation." That was also the year in which, as a major contributor to the campaign to eradicate smallpox, he established a Memorial Health Foundation to combat leprosy in the world. In 1982, the then United Nations Secretary-General, Javier Perez de Cuellar, presented him with the United Nations Peace Medal.

Selection Committee



*H.E. Misael Pastrana Borrero
Chairman, Selection Committee*

It is with deep sorrow that we announce the passing away, on 21 August 1997, of the Chairman of the UNEP Sasakawa Environment Prize Selection Committee, His Excellency **Dr. Misael Pastrana Borrero**.

For more than a decade Dr. Pastrana Borrero led the committee with great commitment and dedication. His unassuming and serene manner always resulted in productive deliberations. His leadership will be sorely missed.

His Excellency Dr. Pastrana Borrero, was President of Colombia from 1970 to 1974. He was his country's First Minister from 1966 to 1968 and held other senior ministerial posts between 1960 and 1963. He was a member of the Constituent National Assembly and the Foreign Affairs Commission of Colombia, and head of the Social Conservative Party.

Internationally, he served as a member of the International Democratic Union (IDU), on the Council of the Club of Rome, and was a member of the UNESCO Peace Prize Jury. He was also Chairman of the Board of the newspaper *La Prensa*.

Selection Committee

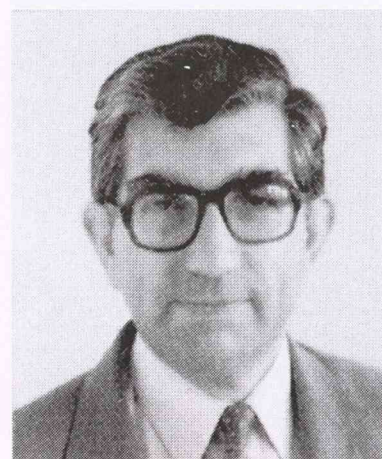
Professor Dr. Her Royal Highness Princess Chulabhorn is founder and President of the Chulabhorn Research Institute. She is currently Professor of Organic Chemistry at Mahidol University in Bangkok, Thailand and Chairman of the Foundation for the Promotion of Nature Conservation and Environmental Protection. She is also an Executive Member of the International Organization for Chemical Sciences in Development and Patron of the International Foundation for Science (Sweden).



H.R.H. Princess Chulabhorn

From 1988 to 1991 she was Honorary President of the Heritage Trust of England and Goodwill Ambassador for the World Health Organization. In 1992, she was head of the Thai delegation at the second Ministerial Conference of Developing Countries on Environment and Development and at the United Nations Conference on Environment and Development (UNCED). In 1986 she was awarded the Einstein gold medal of UNESCO and made Honorary Fellow of the Royal Society of Chemistry, London. Her Royal Highness is also the recipient of eight Honorary degrees from universities on four continents.

Lord Stanley Clinton-Davis, the United Kingdom's Minister of State, Department of Trade and Industry, was made a life peer (House of Lords) in May 1990. He leads the Labour peers on transport and is also a spokesman on trade and industry. In 1988, he was awarded the Eurogroup for Animal Welfare's First Medal for Outstanding Services to Animal Welfare in Europe. He served as the Labour Member of Parliament for Hackney Central from 1970 to 1983, as Parliamentary Under-Secretary of State in the Department of Trade from 1974 to 1979, as Opposition spokesman on trade, prices, and consumer protection from 1979 to 1981, and then on foreign affairs from 1981 to 1983.



Lord Stanley Clinton-Davis

From 1985 to 1989 he was a member of the Commission of the European Communities with responsibility for transport, environment and nuclear safety. He chairs the Advisory Committee on Protection of the Sea and also the Refugee Council. He is a member of the Council of Justice. In 1989 he was awarded the Grand Cross, Order of Leopold II, for services to the European Community.

Selection Committee



Abdulbar A. Al-Gain

Dr. Abdulbar A. Al-Gain is President of the Meteorology and Environmental Protection Administration in Jeddah, Kingdom of Saudi Arabia. He represents the Kingdom in all activities related to the Kuwait Action Plan and in other conventions and protocols governing regional cooperation on pollution, oil spills, and emergencies threatening the Gulf. He is General Secretary of his country's Environmental Protection and Coordinating Committee and also heads the Saudi delegation to the UNEP Governing Council.

He served as Vice-President of the Meteorology and Environmental Protection Administration from 1981 to 1988, was Deputy Director General of Saudi Arabia's General Directorate of Meteorology from 1977 to 1981, and Dean of the Institute of Meteorology at King Abdulaziz University from 1976 to 1978. In 1978, he headed the Saudi delegation to the

Kuwait Regional Conference of Plenipotentiaries on the Protection and Development of the Marine Environment and Coastal Area, which resulted in the Kuwait Action Plan.



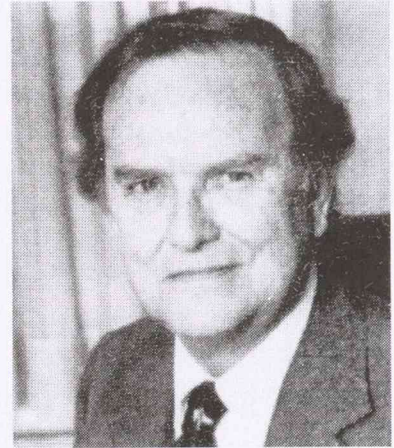
Wangari Maathai

Professor Wangari Maathai was Kenya's first woman Ph.D., and at 38, the first to become a Professor at the University of Nairobi. She is the founder and Director of the Green Belt Movement in Kenya which now operates in 12 African countries and through which more than 10 million trees have been planted to combat deforestation and desertification. She has become known as the "Tree Woman of Kenya" and is recognized as one of Africa's leading environmentalists. In 1991, she won The Hunger Project's Africa Prize for Leadership and the Goldman Award for Environmental Activity.

Selection Committee

Dr. Russell W. Peterson is President Emeritus of the National Audubon Society. He served as Vice-President and Regional Councillor of the World Conservation Fund up to 1990 and is now President Emeritus of the International Council for Bird Preservation. He has also served as Vice-Chairman and President of the Better World Society. He was Governor of the State of Delaware from 1969 to 1973 and Chairman, from 1973 to 1976, of the President's Council on Environmental Quality, which led to the creation of the Environmental Industry Council. He was Director of the United States Congress of Technology Assessment, from 1977 to 1979.

He is a former Vice-Chairman of United States delegations to the United Nations Conference on Human Settlements and to the United Nations World Population Conference, and among his many awards is the National Wildlife Federation's "Conservationist of the Year" award which he received in 1971.



Russell W. Peterson

Winner 1997

Barbara Y. E. Pyle

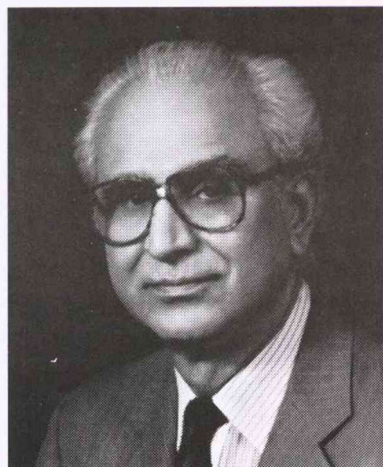
For more than two decades, **Ms. Barbara Pyle**, has encouraged the media to assume a major responsibility for informing and educating the public, including decision-makers. Ms. Pyle has brought environmental issues closer to the hearts and minds of people the world over. As a writer, director and producer of numerous television programmes, she has inspired countless individuals to care about the environment and to take responsibility for its protection.

She has produced more than 35 films which have won more than 75 awards. She is the founder of *Earth Matters*, CNN's daily environmental news feature and founder and Chairman of the Board of the Captain Planet Foundation, an organization which awards grants to children's grassroots environmental projects.

Ms. Pyle's philosophy is "Our planet will not be saved by any one big decision, but many individual choices. The media has an important responsibility to provide the information necessary to enable us to make those choices". Using the unique global reach of CNN, CNN International and World Report, Pyle's work has been seen by approximately two billion people worldwide.



Vice-President, Environmental Policy
Turner Broadcasting System
One CNN Center
P. O. Box 105366
Atlanta, Georgia 30348-5366
U.S.A.
Tel: (404) 827 1918
Fax: (404) 827 4292



*No. 103, Pocket -H
Sarita Vihar
New Delhi
India*

Tel: (91 11) 460 1550/462 2246

Fax: (91 11) 462 1770/463 2609

E-mail: khoshoo@teri.ernet.in

For more than 30 years, **Dr. Triloki Nath Khoshoo** has been an advocate of strong regional environmental planning for long-term ecological and economic security, particularly in the developing country context.

His conservation work in cytogenetics, biological diversity, biomass production and environmental research and development have been significant. He has generated considerable new knowledge regarding the genetic-evolutionary race history of a number of plants. Based on this knowledge, he has delineated, for the first time, centres of their diversity and origin, circumscribed gene pools and standardized procedures for studying the taxonomy of cultivated plants. Dr. Khoshoo has also initiated work on the standardization of herbal drugs and their compound formulation, particularly for rural use and development.

His pre-emptive strategies, while Secretary to the Government of India's Department of Environment, were based on sound scientific analyses and resulted in policies which helped insulate the country from further environmental damage.

His efforts have earned him a place as a leader in the environment field.

Co-Winner 1995

*Professor Canaganayagan
Suriyakumaran*

Professor Canaganayagan Suriyakumaran is Chairman of the Centre for Regional Development Studies (CRDS) in his native Sri Lanka and a visiting Professor at the London School of Economics. He is considered a pioneer in the environmental field for shaping the nature of our responses to environmental challenges. He is responsible in great part for the new perception of multi-sectoralism with his observation long ago that "environment is not a sector, but a dimension in all sectors".

For more than 30 years, Professor Suriyakumaran has given his best to the environmental cause. He fostered and encouraged the involvement of non-governmental organizations within the wider context of their societies, and has also played a key role in promoting global environmental programmes within the United Nations system. For his outstanding services to Asia, he was honoured by His Royal Highness the King of Thailand as a Knight Commander of the Most Noble Order of the Crown.



*19 A/2 Alfred Place
Colombo 3
Sri Lanka
Tel: (941) 574 912
Fax: (941) 574 879*

*Dr. Norman Myers
Dr. Peter Raven*

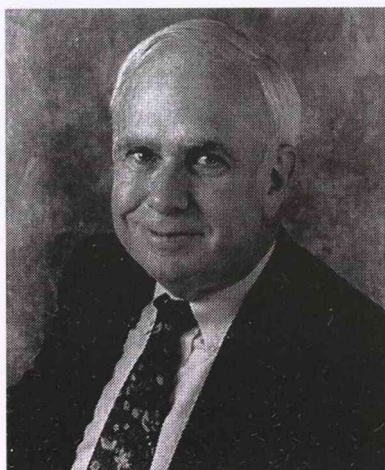
Co-Winners 1995



*Upper Meadow
Old Road, Headington
Oxford, OX3 8SZ
U.K.
Tel: (44 1865) 750 387
Fax: (44 1865) 741 538
E-mail: normanmyers@gn.apc.org*

Dr. Norman Myers and Dr. Peter Raven have been leaders in the environmental field for more than a quarter of a century. Each, in his own way, has worked tirelessly to address two major environmental problems: tropical forests and biological diversity. Over the years, they have broadened the scope of their activities to include population, poverty, desertification, global warming, consumption patterns, environmental economics and the North/South dialogue. They have each won a number of awards, and in 1992, their work was once again recognized when they shared the Volvo Environment Prize.

In the early 1970s, Dr. Myers and Dr. Raven undertook detailed research which demonstrated that humankind was indeed witnessing the mass extinction of species, among other forms of biodepletion. They immediately took their findings, together with a set of recommendations, to scientific and environmental leaders of major governments, in both developing and developed countries, and to a host of international agencies. As a result, the two problems which they decided to tackle became firmly established on the global agenda.



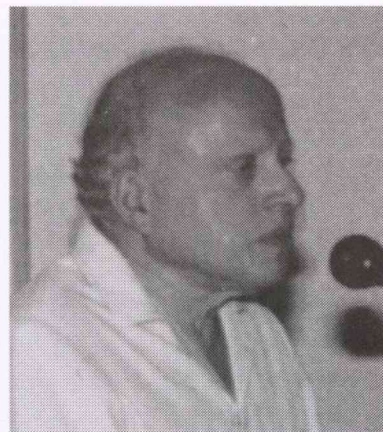
*Director
Missouri Botanical Garden
P. O. Box 299
St. Louis, Missouri 63166
U.S.A.
Tel: (314) 577 5110/1
Fax: (314) 577 9595*

Co-Winner 1994

Dr. M. S. Swaminathan

Dr. M. S. Swaminathan, the Director of the Centre for Research on Sustainable Agricultural and Rural Development, in Madras, India, has for the past 40 years played a pivotal role in the conservation of biological diversity. As one of the world's leading agricultural scientists, he has played a catalytic role in his country's green revolution and in agricultural research and development.

Dr. Swaminathan is widely known as the father of the economic ecology movement and his research on the conservation of wild relatives of the potato, wheat and rice led to India developing a strong national food security system.



*Chairman
M. S. Swaminathan Research Foundation
3rd Cross Street
Taramani Institutional Area
Madras 600113
India
Tel: (91 44) 235 1229/235 1698
Fax: (91 44) 235 1319*



Anne and Paul Ehrlich are leading authorities on the issue of population and the environment. They have been an intellectual force whose works have had an unparalleled impact on the field of environmental science and policy. For more than a quarter of a century, they have systematically traced environmental deterioration to its root causes, projected the probable consequences of continued deterioration and proposed and analyzed the relative merits of alternative solutions. The Ehrlichs have always stressed the devastating impact of overconsumption in industrialized nations.

The Ehrlichs were awarded the Prize for greatly improving the quality of life on this planet, with their insightful analysis and articulate communication of environmental, social, scientific, economic and development issues.



Both the Ehrlichs and Dr. Swaminathan believe that gender equity is fundamental to the whole population issue. They have long emphasized the critical need to empower women, giving access to health care, education and economic opportunities.

*Department of Biological Sciences
Stanford University
Stanford, California 94305-5020
U.S.A.
Tel: (415) 723 5920/857 1408
Fax: (415) 493 2092*

Winner 1993

Dr. Mostafa Kamal Tolba

Dr. Mostafa Kamal Tolba, world renowned scientist and for 17 years Executive Director of the United Nations Environment Programme (UNEP), has been an eloquent and tireless defender of the environment for most of his life.

Born in Egypt, a country whose economy depends on the waters of a river that flows through other states, made him aware of the link between environment and politics. He has always believed that common environmental interests should override political differences, even conflicts between nations.

In 1972, he led his country's delegation to the Stockholm Conference on the Human Environment which gave rise to UNEP. It is to his leadership that much of the credit for directing the environment to the forefront of global thinking and action is due. He applied his belief that environmental decisions are inseparable from socio-political decisions in all his consultations with political leaders.

His negotiating skills and scientific knowledge contributed to UNEP's most widely acclaimed success - the historic 1988 agreement to protect the ozone layer - the Montreal Protocol. The Protocol is recognized as setting a precedent for international preventive rather than corrective environmental action.

At the Earth Summit in Brazil, he was at the helm of the negotiations when the Conventions on Climate Change and Biological Diversity were signed.

He also successfully worked for treaties to protect the Mediterranean Sea, the Red Sea and the Gulf of Aden. During the Iran-Iraq conflict he often had the warring parties at the same negotiating table discussing common environmental interests. '

In making its selection, the Committee noted that although Dr. Mostafa Tolba, as Executive Director of UNEP, was in a privileged position he went far beyond the call of duty in his commitment, dedication and contributions to the environment.



46 Mosaddak Street
Dokki, Giza
Egypt
Tel: (202) 269 5800/706 044
Fax: (202) 269 1267



*Administrator
National Environmental Protection
Agency (NEPA)
No. 115 Xizhimennei Nanxiaojie
Beijing 100035
The People's Republic of China
Tel: (861) 832 9911
Fax: (861) 832 8013*

Professor Qu Geping, Administrator of the National Environmental Protection Agency of the People's Republic of China, has made an outstanding contribution in promoting and supporting environmental protection in China.

In a country where industry is still largely underdeveloped, he has, over the past 10 years, been instrumental in putting forward measures designed to integrate environmental protection policies within economic and industrial development strategies. His work has embraced environmental management, legislation, education and industrial pollution prevention and reduction.

Through his activities as a lecturer, broadcaster and publisher of many papers he has increased the level of environmental awareness throughout the vast territory of China.

A believer in scientific and technological solutions to environmental problems, Professor Qu Geping's response to the serious environmental problems facing the industrialization of China has been practical and realistic and has served as an example to other developing countries.

The Prize Selection Committee described the 1992 shared award as drawing attention "to the problems caused by rampant and careless industrialization faced by the countries of the newly created Commonwealth of Independent States, and to the challenges of emerging industrialization now being experienced by China, the world's most populous country".

Professor Yuri Izrael, a Russian scientist, is former Chairman of the Committee for Hydrometeorology - the central organization for the provision of natural disaster warnings throughout the former Soviet Union. He is also Director of the Institute of Global Climate and Ecology which is part of the Russian Academy of Sciences.

As the first and two-term Vice-President of the World Meteorological Organization (WMO), he helped to develop World Weather Watch, an international programme designed to improve the weather services of the various nations of the world, particularly developing countries. He is an expert in the fields of ecology, geophysics, chemistry of the atmosphere, oceanology and geography and has also devoted many years to the cause of natural environment protection in his own country.

He showed remarkable courage in visiting the Chernobyl site on the second day of the disaster. He continued to work in the Chernobyl area, measuring the radiation situation and studying the impact of radioactive contamination on the natural environment - and subsequently spent nearly four months in hospital. Later, President Gorbachev awarded him his country's highest honour.

His scientific and organizational skills have contributed to Working Group II (Impact Assessment) of the Intergovernmental Panel on Climate Change (IPCC), sponsored jointly by WMO and UNEP.



*Pavlik Morozov 12
Moscow
Russian Federation
Fax: (095) 160 5847*

*Drs. Wolfgang Burhenne
and Françoise Burhenne-Guilmin*

Winners 1991



Postfach 120369
Adenauerallee 214
D-5300 Bonn 1
Germany
Tel: (49 228) 269 2216
Fax: (49 228) 269 2250/51/52/53

No two people have done more to strengthen the position of international and national environmental law as a fundamental element of environmental management, than **Wolfgang and Françoise Burhenne**. They have been directly involved in nearly all the major international conventions concerned with conservation over the past 25 years, and to the development of the World Conservation Union (IUCN) Environmental Law Centre in Bonn. Under the direction of Dr. Françoise Burhenne-Guilmin, who is Belgian, the Centre has accumulated the world's most extensive collection of environmental legislative texts.

The couple's first venture together was helping the Organization of African Unity (OAU) establish the Algiers Conservation Convention, in 1968. Dr. Wolfgang Burhenne was one of 12 signatories to the Morges Manifesto which established the World Wide Fund for Nature (WWF) in 1961. The insights and skills of the Burhennes were essential to the creation of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) in 1973, the World Charter for Nature, adopted by the United Nations General Assembly in 1982, and the Association of South-East Asian Nations (ASEAN) Agreement on the Conservation of Nature and Natural Resources in 1985.

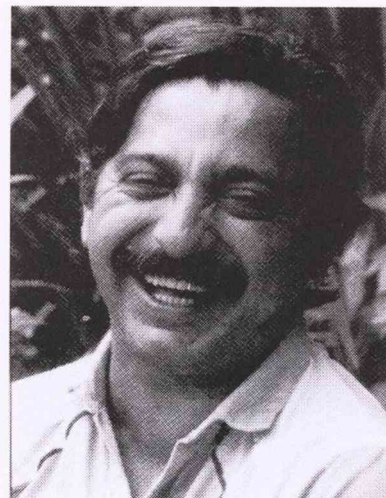
Winner 1990

Francisco "Chico" Mendes Filho

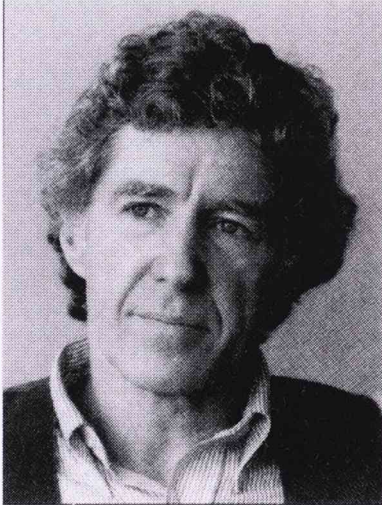
The murder of **Francisco "Chico" Mendes** in December 1988 reinforced the significance of his efforts to protect the Brazilian rainforest. As President of the Rural Workers' Union of Brazil, Chico Mendes led the fight against the cattle ranchers' destruction of the rainforest, on which the livelihoods, and even survival, of the indigenous forest people and rubber tappers depend. He also called for new approaches to land reform and the establishment of special "extractive reserves" within the forests.

He became a world-renowned environmentalist in the mid-1980s as a result of his flair for campaigning and his ability to draw attention to the rubber tappers' plight. His ability to link ecology and society's needs guided future efforts to achieve sustainable development.

The value of his work was recognized in 1987 with the presentation of the UNEP Global 500 Roll of Honour Award.



*c/o Instituto de Estudos Amazonicos
e Ambiente - IEA
Rua Monte Castelo
380 Taruma, 82530-200
Curitiba
Parana
Brazil
Tel: (041) 262 9494
Fax: (041) 264 7152*



President
World Institute
1776 Massachusetts Avenue, NW
Washington, DC 20036
U.S.A.
Tel: (202) 452 1999
Fax: (202) 296 7365

Dr. Lester R. Brown, recipient of a MacArthur Foundation "genius award", has been described as "one of the world's most influential thinkers" by the *Washington Post* and the "guru of the global environmental movement" by *The Telegraph* of Calcutta.

The Library of Congress has requested his personal papers and manuscripts, recognizing the role of his work and that of the Worldwatch Institute under his direction in shaping the global environmental movement. The annual *State of the World* report published by Lester Brown has a circulation of more than 100,000 in English alone. It is published in 10 languages by the Worldwatch Institute, which he founded in 1974.

Lester Brown began his working life as a New Jersey tomato farmer, later becoming an analyst and commentator on international agricultural issues. He has written several books on agriculture and the environment. The UNEP Sasakawa Environment Prize Committee paid tribute to his writings which "over the years have been outstanding in teaching about threats to the biosphere". In 1991, he inaugurated the Environmental Alert series of books, with *Saving the Planet: How to Shape an Environmentally Sustainable Global Economy*.

Winner 1988

World Commission on Environment
and Development

Our Common Future, the **World Commission on Environment and Development** 1987 report, was hailed as the most important document of the decade. The 21-member Commission had been charged by the United Nations General Assembly, on recommendations of the Governing Council of UNEP, with formulating a "global agenda for change".

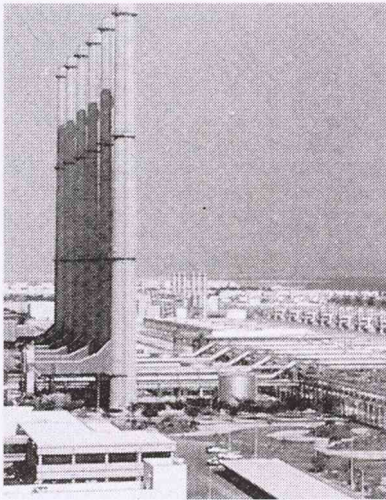
After hearing evidence from public meetings held on all five continents over three years, its recommendations included environmental strategies for achieving sustainable development by the year 2000 and beyond. The Commission, chaired by former Norwegian Prime Minister Mrs Gro Harlem Brundtland, was praised by the UNEP Sasakawa Environment Prize Selection Committee for its "valuable analysis of environmental problems and positive guidance for their solution".



c/o Gro Harlem Brundtland
P. O. Box 8001 DEP
0030 Oslo
Norway
Tel: (47) 22 29 42 70
Fax: (47) 22 74 44 63

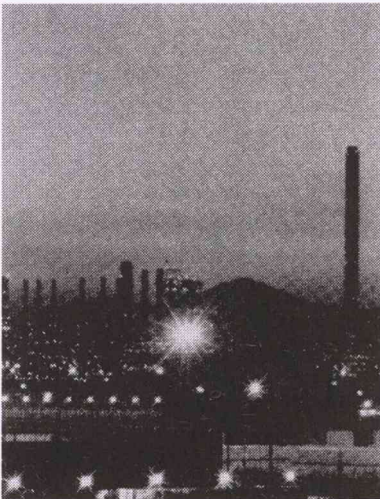
*Royal Commission for Jubail and Yanbu,
Saudi Arabia*

Winner 1988



The Saudi Arabian towns of Jubail and Yanbu are believed to be among the most environmentally clean of any comparable urban concentrations in the world - testimony to the work from 1975 of the towns' Royal Commission, which became a blueprint for successful environmentally-conscious urban growth in the developing world.

As a result of the Commission's work, monitoring and analysis of air, land and sea takes place constantly in the two towns, located on opposite sides of the Arabian Peninsula. The UNEP Sasakawa Environment Prize Selection Committee honoured the "excellent planning and implementation of environmentally-sound management of the two industrial complexes".



*c/o Meteorology & Environmental
Protection Administration (MEPA)
P. O. Box 1358
Jeddah
Kingdom of Saudi Arabia
Tel: (966 2) 651 2312
Fax: (966 2) 651 1424*



*President
International Ocean Institute
c/o Department of Political Science
Dalhousie University
Halifax, Nova Scotia
Canada*

After escaping from Nazi Germany in 1933, **Elisabeth Mann Borgese**, youngest daughter of the great German writer Thomas Mann, became a world-renowned scholar in the fields of international relations, law of the sea and marine environment. In 1970, she organized the first of many *Pacem in Maribus* meetings in which she was involved in bringing together more than 200 key figures in law of the sea development. Two years later she was a key participant in the formation of an International Ocean Institute at the Royal University of Malta. She has attended all United Nations meetings on the Law of the Sea since 1968.

Mrs Mann Borgese is President of the International Ocean Institute and Professor of Political Science at Dalhousie University in Canada. It was in 1967, while serving as a Fellow of the Centre for Democratic Institutions, that she shifted her focus of attention to the law of the sea, which she recognized as an area of growing environmental crisis and a possible test-bed for ideas she had developed concerning a common global constitution.



*Secretary-General and Editor
International Conferences on
Environmental Future
7 Chemin Taverney
1218 Grand-Saconnex, Geneva
Switzerland
Tel: (41 22) 798 2383/798 2384
Fax: (41 22) 798 2344*

Professor Nicholas Polunin has been a towering figure in the environment movement for more than 35 years and has written more than 400 research and scientific papers and books. He has taught at Oxford University in England, lectured at Yale and Brandeis Universities, was Professor of Botany at McGill University and at the Universities of Baghdad and Ife. He is widely recognized as a leading authority on Arctic botany and ecology and has arranged many conferences to seek solutions to problems related to his field.

He created the Foundation for Environment Conservation, whose journal he originally financed and published. He also played a part in establishing the International Society for Environmental Education. His vision has latterly embraced the outer reaches of the biosphere and a culmination of this sustained effort was the creation of an international annual Biosphere Day on 21 September which started in 1991. In the same year he was elected to the UNEP Global 500 Roll of Honour.

Winner 1986

*Mweka College
of African Wildlife Management*

Virtually every east and central African national park has on its staff graduates from the **Mweka College** in the United Republic of Tanzania. Sensitive and skilled management is needed for Africa's wildlife population to be sustained as an economic and ecological resource and it was to this end that the College was established in 1963. Today, it runs full-time courses in natural sciences, wildlife management and estate management, and produces a ready and replenishable local source of expertise in wildlife and national park management. There have been more than 1000 graduates from at least 15 African nations.

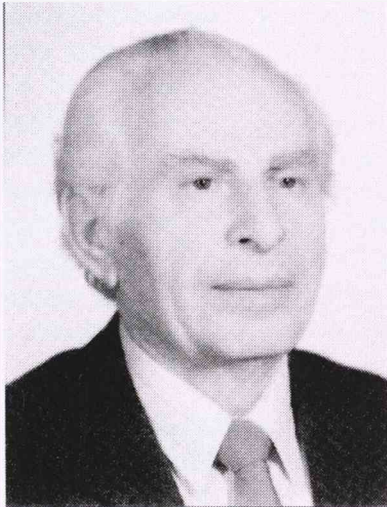
Mweka College operates under the auspices of the Tanzania Ministry of National Resources and Tourism, with funding mainly from fees paid by governments and other bodies to support students at the college and with further assistance provided by UNEP and other international organizations.



*P. O. Box 3031
Moshi
Tanzania
Tel: c/o Kibosho 18*

*Hassan Asmaz
Professor Gilbert White*

Co-Winners 1985



*President
Turkish Association for the
Conservation of
Nature and Natural Resources
2 CAD No/ 65/5 Bahcelievler
Ankara, Turkey
Tel: (312) 425 1944
Fax: (312) 417 9552*

Hassan Asmaz's lifelong campaign to improve the environment of his native Turkey has taken him from the remotest villages to the heart of his national Government. It is largely thanks to him that Turkey's children study nature and conservation as part of their primary and secondary school curriculum. He has led national campaigns to combat soil erosion, has helped prohibit the hunting of several rare and endangered bird and animal species, and has been the driving force behind many other public campaigns to promote environmental awareness in Turkey.

In 1955, he helped establish the Turkish Association for the Conservation of Nature and Natural Resources. It was accepted into the World Conservation Union (IUCN) in 1963 and two years later Mr. Asmaz became its President.

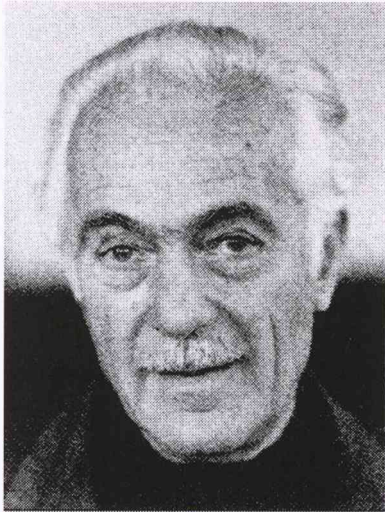
He received the Turkish Prime Minister's Environment, Friendship and Service Award in 1988, and the Turkish Conservation of Nature Reward of Service in 1989.



*Director
Institute of Behavioural Science
University of Colorado
Boulder, Colorado 80309
U.S.A.
Tel: (303) 492 6311*

As a member of many advisory groups concerned with greenhouse gases, nuclear waste disposal, water, and man's relationship with the biosphere, **Professor Gilbert White** continues to strive to promote understanding of the implications for human welfare of basic environmental processes. Perhaps his most significant contribution in the field of the environment has been his work on the behavioural aspects of natural hazards research.

He has been Director of the Natural Hazards Research Applications and Information Center at Colorado University, President of Haverford College, Professor of Geography at Chicago and Colorado Universities and a visiting Professor at Oxford University in England. He has been active in floodplain management and domestic water usage in developing countries and has collaborated extensively with UNEP, the United Nations Integrated River Development scheme, and in World Bank programmes for water and urban poor.



The inaugural UNEP Sasakawa Environment Prize was awarded posthumously to **Dr. Aurelio Peccei**, who had died just two months before the Prize Selection Committee announced its decision to recognize the outstanding contribution the former industrialist had made to defend the environment. He saw the urgency of the problems of man's relationship with nature and the dangers of the growing gulf between rich and poor. He had been a member of the boards of several of Italy's leading companies and in his new role turned the Club of Rome, which he had helped found, into one of the world's leading bodies promoting sustainable and fair development.

He gave tirelessly to the causes which he espoused, as a member of the UNESCO Panel of Counsellors on Major World Problems; a member of the Governing Council of the Society for International Development; a member of the Board of Trustees of the Foundation for the International Training for Third World Countries; and as a member of the Friends of the Earth Advisory Council.

DRAFT PROPOSAL TO THE
UNITED NATIONS FOUNDATION
FOR A JOINT INITIATIVE OF THE
WORLD COMMISSION ON DAMS AND THE
UNITED NATIONS ENVIRONMENT PROGRAMME

1. Background

1.1 WCD process and objectives

Many of the controversies relating to water and energy resources management transcend the local and national contexts of a particular dam and have become subjects of international debate. This international debate reflects both a growing awareness of the global environment as well as the emerging global orientation of an increasing number of private sector actors and civil society networks.

The WCD represents a pioneering initiative in global public policy development. Recognising the need for genuine multi-stakeholder processes in addressing the world's major sustainable development debates, the WCD has been established through an unprecedented partnership at the global level - involving governments, corporations, NGO's, utilities and affected people organisations. This process can be summarised as follows:

The IUCN - The World Conservation Union - and the World Bank Group invited 35 key representatives from all sides of the debate to a workshop in Gland in April 1997. After two days of intensive debate and dialogue, agreement was reached among the participants to work together towards the establishment of an independent commission.

The establishment of the commission was facilitated – at the request of all the participants - through an interim working group jointly hosted by the World Bank and IUCN.

During an eight-month period proponents and opponents of dams, representatives of multi-laterals, the private sector, NGO's, academia, Governments and affected peoples' organisations jointly developed the mandate of the Commission.

The participants to this process selected the chair and members of the WCD (see Annexure A for a biography of Commission members) and assisted in the fundraising from the public, private and civil society sectors.

The WCD process and approach thus reflects the recognition that fundamental policy conflicts, such as those related to dams and the broader implications for sustainable energy and water resources management, require new institutional and procedural frameworks. These must enable the private sector and civil society to be active participants in the development of a consensus and corresponding new policy frameworks. An overview of the WCD strategy and objectives is attached as Annexure B. The two key objectives of the Commission as defined by the Gland workshop are:

to review the development effectiveness of dams and assess alternatives for water resources and energy development, and

to develop internationally acceptable criteria and guidelines to advise future decision making in the planning, design, construction, monitoring, operation and decommissioning of dams.

After preliminary discussions between the Chair of the World Commission on Dams (WCD) - Professor Kader Asmal - and the Executive Director of the United Nations Environment Programme (UNEP) - Professor Klaus Toepfer - agreement was reached that the two organisations will develop a joint initiative relating to the WCD's mandate and work programme. This agreement would have a particular focus on work related to growing water and energy demands in developing countries with rapidly growing economies. The development of a formal partnership between the WCD and UNEP represents a logical extension of the WCD's approach.

1.2 UNEP objectives and linkages

UNEP's global environmental mandate as well as its mission and approach to working with a diverse range of stakeholders in addressing global environmental challenges offers significant opportunities for assisting the WCD process.

The key water-resource issues and challenges faced in meeting human and environmental needs within and among countries are reflected in chapter 18 of Agenda 21. The crucial issue faced by the modern world in regard to freshwater resources is how to meet those needs in an efficient, timely and sustainable manner. The need to solve this problem is becoming ever more urgent because, while humanity has continued to increase in number and with it, its need for water, the amount of freshwater on Earth remains constant. The WCD process presents an important opportunity to address some of these concerns.

Both the Commission for Sustainable Development (at its fourth and fifth sessions) and the General Assembly (at its special session for the purpose of an overall review and appraisal of the implementation of Agenda 21), emphasised the essential role of freshwater in satisfying basic human health, food and survival needs, for preserving essential ecosystems and for economic and social development. Furthermore, it highlighted specific issues to be addressed in ensuring that water resources are managed and used in an environmentally sustainable manner in the attainment of development goals. The WCD process will serve the goals of the Programme for the Further Implementation of Agenda 21, adopted by the General Assembly in its resolution S/19-2 of 28 June 1997.

As the principal United Nations agency in the field of the environment, UNEP continues to play a critical and innovative role in encouraging an environmentally sustainable approach to the conservation of freshwater resources. UNEP assessment activities provide a basis for advancing the goals of the WCD process, which is consistent with the findings of the UNEP Global Environment Outlook 1997 report. The Outlook 1997 report set the environmental context for discussions at the special session of the General Assembly for the purpose of an overall review and appraisal of the implementation of Agenda 21.

In addition, UNEP has specialised experience with freshwater issues in developing regions and through its chairmanship of the Water Working Group of the Secretary-General's United Nations System-wide Special Initiative on Africa. A major goal of the Special Initiative is to assess whether large-scale water projects necessarily work to the benefit of all basin inhabitants, particularly for developing countries. The Special Initiative also places particular emphasis on small-scale demonstration projects, focusing on how indigenous and environmentally-sound technologies, may provide a rational means of ensuring an equitable distribution of the benefits, including environmental benefits, of freshwater resources in developing countries. These insights will be of interest to WCD process.

Following its review of the comprehensive assessment of the world's freshwater resources at its fifth session, the Commission on Sustainable Development recommended that the General Assembly, at its special session for the purpose of an overall review and appraisal of the implementation of Agenda 21, should call for:

The highest priority to be given to the serious freshwater problems facing many regions, especially in the developing world; and

A dialogue to build a consensus on the necessary actions, in particular, the means of implementation, and on the tangible results necessary for the initiation of a strategic approach for the implementation of all aspects of the sustainable use of freshwater for social and economic purposes.

The WCD process will contribute towards the achievement of these goals.

Between 1995 and 1996 UNEP convened a series of workshops of government-designated experts for the purpose of determining the status of implementation of chapter 18 of Agenda 21 on a regional basis. Regional expert group meetings assessed the implications of chapter 18 for the integrated management and use of freshwater resources, and the progress made - as well as that still needed - in implementing the objectives of chapter 18.

The experiences gained in these workshops will enable government representatives and experts to provide policy inputs and advice on the full range of environmental, social, and economic issues related to some aspects of the WCD process. These efforts could be strongly promoted through the UNEP regional offices, as well as through its existing frameworks for regional cooperation and programmes. The latter include such UNEP-supported regional forums as the ministerial conferences on the environment.

2. Rationale for a partnership

In approaching the UN Foundation for financial support, the WCD and UNEP aim to achieve a number of joint and complimentary objectives that take into account the respective mandates and objectives of the two organisations. The rationale for such an initiative reflects both immediate goals in terms of the specific issues related to water and energy resources management, as well as the more strategic implications of the WCD process for future initiatives of a similar nature.

UNEP wishes to develop this partnership to strengthen important strategic linkages between the specific mandate of the WCD - focused on dams and their implications for water and energy resources management - and the broader role of UNEP. The latter needs to be viewed in the context of the Conventions on Climate Change and Biodiversity, as well as the UN's overall efforts in the field of sustainable development and Agenda 21. Two strategic themes emerge from this context:

Of particular importance to UNEP's strategic focus for the future are issues related to renewable energy sources and the Clean Development Mechanism discussed at Kyoto and at subsequent meetings of the parties. The WCD's work programme will address many of the issues that define the difficult choices and trade-offs that arise in planning future energy and water resources strategies. Assessing the role of hydropower and its alternatives in the post-Kyoto context will provide a major input to the debate and UNEP's own work in this field, given that the economic viability of future hydropower projects may be significantly affected by the costs agreed for CO² trading.

UNEP's work related to freshwater resources in general and the global challenge of coping with the emerging water crises of the future provides a second point of strategic linkage between the WCD and UNEP's strategic agenda for the future. The depletion of freshwater resources and related ecosystems has been recognised as one of the major global threats to both people and the environment. The CBD identifies the need for sustainable management of freshwater ecosystems as a priority.

The work programme of the WCD will provide concrete guidance for decision-making related to the provisions and objectives of FCCC and CBD in terms of the option of dams and their alternatives in water and energy resource management.

From the WCD perspective, a partnership with UNEP offers a number of important opportunities. First among these is UNEP's strategic role in the global environmental policy arena. Working closely with UNEP will ensure that the WCD gains access to key fora through which it can engage in a dialogue with key stakeholders. It also provides the WCD with opportunities for securing additional expertise and financial resources.

A second benefit relates to UNEP's ongoing work in a number of related fields - in particular freshwater resources, biodiversity and climate change - which the WCD must access efficiently to build on existing data and analyses in these areas.

Given the WCD's somewhat unusual institutional structure as an independent Commission with a limited mandate of two years, it is essential that the long-term impact of the WCD process is secured through strategic partnerships with key institutions, such as UNEP. Such institutions could utilise the Commission's final report and guidelines and criteria in its long-term programme of work.

Finally, many observers regard the WCD process as an opportunity for exploring new institutional models and processes in the domain of international public policy development. UNEP, within the UN family of organisations, is currently restructuring its programme and long-term objectives. Fostering a partnership between the WCD and UNEP, with the support of the UN Foundation, will ensure that the

WCD process will not only be reviewed in terms of its impacts on the large dams debate, but also its broader implications for global policy dialogue and mediation. This embodies the role that UNEP and other UN organisations may want to play in the future.

3. Description of the cooperative partnership

3.1. Objectives

The financial resources being sought for this initiative will support five specific objectives:

To assist the WCD in implementing elements of its work programme related to the global review of large dams and alternatives as well as the development of guidelines and criteria for future decision making.

To facilitate a cooperative partnership between the WCD and UNEP enabling both institutions to review, synthesise and share existing information, data and policies of relevance to large dams, water and energy resources management and utilise these within their respective work programmes.

To enable the WCD to undertake consultative and outreach activities to involve a diverse range of stakeholders and interest groups in the WCD process (e.g. consultations, panels, task forces, WCD Forum) and establish linkages to UNEP fora such as the UNEP Financial Services Initiative and African Ministers Conference on the Environment.

To support a global dissemination strategy for the findings and recommendations as well as guidelines and criteria for future decision making to be presented by the WCD in June 2000.

To review and document the WCD as a process in terms of lessons learnt and implications for future initiatives addressing global environmental policy debates and conflicts – with particular emphasis on the potential role of UNEP and the UN system to facilitate such initiatives.

3.2. Major Activities

The joint WCD/UNEP initiative will focus on major activities that will add value to the partners by maximising opportunities for utilising the comparative advantages of each organisation. Based on the five objectives outlined above, UNEP and the WCD have agreed on the following framework for implementation of major activities proposed for support through the UN Foundation.

The major activities to be funded and undertaken are as follows:

Focal dam/river basin case studies, thematic reviews and the 150-dams cross check survey to be implemented through independently commissioned WCD teams as identified in the work programme of the WCD.

Review of UNEP data bases and information sources relevant to WCD review of large dams and water/energy resources management; coordination meeting of WCD – UNEP staff to identify scope for joint products; commissioned analyses, reports and summaries on selected issues and data sets for use in WCD and UNEP work;

WCD consultations/hearings for the Africa/Middle East and South East Asia regions to be held in 1999; panels/task forces associated with the thematic reviews and the final drafting of the criteria and guidelines for future decision making; and one meeting of the WCD Forum in April 2000;

Preparation of a global dissemination strategy for WCD findings and final report aimed at key stakeholders and interest groups; professional editorial support for final report; joint event with UNEP to publicise WCD report in UN system, with UN Conventions and other fora such as the UNEP Financial Services Initiative; publication of report, summary versions and dissemination materials; To commission associated research, documentation and study/analysis of the WCD as a process; co-host an international workshop on the WCD process and its implications for future initiatives in global public policy development and conflict resolution.

3.3. Deliverables/Outputs

The cooperative partnership will contribute to and enhance the following key deliverables, as outlined in the WCD work programme:

Independent case studies of 8 to 10 Large Dams and major river basins undertaken world-wide.
17 thematic reviews/expert panel reports on specific issues such as options/alternatives assessment, decision-making processes, institutional frameworks, social and equity considerations and environmental impacts and global change etc.

Large Dams Cross Check Survey for 150 large dams reflecting characteristics of global dams population.

Public dissemination of notes developed by the Commission on specific issues and processes.

4 stakeholder consultations in different regions of the world (South Asia, Latin America, Africa/Middle East and South East Asia), as well as related to specific elements of the work programme.

Interim Progress Report in July 1999.

A set of recommended international policies, standards, and criteria for decision-making on dams and related water and energy resources management aspects.

Final published report summarising WCD findings and recommendations for global dissemination.

In addition, the UNEP/WCD review of the WCD process will be summarised in a research report highlighting the potential role of UNEP and the UN system to facilitate conflict resolution and policy evolution on pertinent sustainable development debates.

3.4 Milestones, Monitoring and Evaluation

The Commission will function for approximately two years from May 1998. The activities undertaken in partnership with UNEP are implemented within the time frame approved by the Commission and its stakeholders, as outlined below.

Pre-Commission Phase:

Appointment of Chair	September	1997
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Appointment of Commissioners	February	1998
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Selection of Head of Secretariat	March	1998
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Start-up Phase:

Establishment of Secretariat	June – September	1998
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Development of strategy		
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and work programme

August – October	1998
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Implementation Phase:

Work programme initiated	October	1998
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Commission Interim Report	July	1999
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Review Activities completed	January	2000
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Synthesis Phase:

Draft Reports prepared	March	2000
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Final Report and Recommendations	June	2000
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Process Review:

Workshop and research report	July - September	2000
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The WCD is committed to the above milestones and its work programme. Progress in terms of the work programme of the WCD is monitored through regular Commission meetings (nine in total during the two-year period). The Secretariat of the Commission publishes regular progress reports, and information is also disseminated on the Internet as it becomes available. An interim progress report will be published during June 1999. In addition, individual progress reports could be provided to financial contributors as per agreement.

The success factors for the WCD are the follows:

Completion of the agreed work programme by June 2000;

Agreement on the proposed criteria and guidelines for decision-making on dams and related water and energy resources management;

Recognition and/or acceptance of the findings of the WCD by international financing agencies, governments, private sector firms and non-governmental organisations.

On completion of the Commission's work, it will submit its report and recommendations to the President of the World Bank and the Director-General of the IUCN as well as the international community at large. Full documentation will also be made available to financial contributors.

3.5 Institutional Support and Consultative Partnerships

The Commission consists of a Chair, Professor Kader Asmal, the Minister of Water Affairs and Forestry in South Africa, and eleven Commissioners of which one, Mr Lakshmi Jain of India, has been selected as Vice-Chair. The Secretary-General is Mr Achim Steiner who was previously with the German Agency for Technical Cooperation (GTZ). A list of Commissioners is attached.

As the involvement of diverse stakeholders representing governments, the private sector, civil society organisations, and multilateral investor/finance institutions is regarded as an essential part of the implementation approach, the Commission has reconstituted the Reference Group, originally constituted by the Gland-meeting representatives in April 1997, as the WCD Forum. There will also be a wider informal network of stakeholders and interested parties, with whom the Commission will communicate through the Internet and by other means such as meetings and hearings.

The Commission will be supported by a full time secretariat located in Cape Town, South Africa with approximately ten international professionals. For key topics - such as the thematic reviews - on which the Commission wishes to break new ground and make major recommendations, task forces and expert panels will be formed to serve the Commission as needed. Strong collaborative ties will also be established with the governments of countries that will partake in the 10 focal dams/river basin case studies. The Commission has to date secured financial support from twenty-eight organisations, including national governments, international NGO's and private sector firms.

3.6 Budget and Financial Allocations:

The proposal is based on the specific budget prepared by the WCD and approved by the Commission members (see Table 1) as well as estimates for UNEP implemented activities. Although it is expected that the work of the Commission will be supported by a broad coalition, including governments, the private sector, multilateral international organisations, and non-governmental organisations, the UN Foundation's financial support will constitute one of the core contributions to the Commission.

However, the dynamic nature of an international conflict resolution process, and as yet growing coalition of financial contributors, as well as the fact that the Commission also receives contributions in-kind, reinforces the necessity for the condition that the Commission's funds cannot be tied to specific budget categories.

This funding condition is stipulated to ensure the Commission's independence and ability to deal with issues that address both broader considerations such as water and energy policy, and more specific technical and policy oriented questions (such as resettlement, compensation entitlements of affected communities, and watershed impacts). In addition to the analytical and synthesising work of the Commission, task forces, special studies and secretariat, there is an emphasis on resources for outreach and consultation.

The budget outlined herewith provides a framework within which activities described can be implemented. Actual costs for individual activities may vary depending on emerging issues and the corresponding need for panels or additional research. Funds may be allocated on a flexible basis within the same budget line provided they are in support of activities described in the work programme of the Commission.

Proposed allocations for the major activities are as follows:

Activity 1:	Case studies/thematic reviews/survey of dams:	US\$ 500,000
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Activity 2:	Synthesising data & information; joint products:	US\$ 300,000	
Activity 3:	Consultative/outreach activities; panels		US\$ 350,000
Activity 4:	Global dissemination of the final report & info materials/events	US\$ 450,000	
Activity 5:	Research on strategic implications of WCD process for UN, etc.	US\$ 100,000	
	Total		US\$ 1,700,000

It is estimated that of the total amount of US\$ 1,700,000, the WCD would be allocated up to US\$1,400,000 for activities to be implemented as part of the joint initiative, while adhering to the independent mandate of the WCD.

Subject to approval by the UN Foundation an initial grant of US\$800,000 will be made, of which US\$500,000 will be transferred as a grant to the WCD. This would be in support of the case studies, thematic reviews and cross check survey of 150 dams as outlined in paragraph 3.2. UNEP would draw up to US\$ 300,000 for joint activities to be undertaken directly through UNEP (i.e. regional consultations, staff time for data/information, roundtable/expert group meeting, joint events etc).

In addition, it is proposed that the UN Foundation consider providing a challenge grant facility for the WCD which would provide a matching grant of US\$ 1.00 for every US\$ 1.00 raised by the WCD from other sources - up to a maximum total of US\$ 900,000. These funds would be made available as a direct grant to the WCD via the trust fund managed by UNEP. It is envisaged that such funds generally be allocated against the budget lines of the WCD with an emphasis on support for the WCD's communication and outreach strategy, the global dissemination of the Commission's final reports and related information, as well as research activities related to reviewing the WCD process.

In order to maximise opportunities for cooperation and provide for timely availability of funds that would become available under this partnership it is essential that agreements are finalised in May 1999.

TABLE 1:
World Commission on Dams
For Info

Purposes

Projected Expense Schedule
Exps to Date

Actual Feb99

Oct-98

Jan-99

Apr-99

Jul-99

Oct-99

Jan 2000

Apr 2000

Jul 2000

Total

Commissioners

193,000

70,000

140,000

150,000

180,000

200,000

200,000

200,000

160,000

1,300,000

Personnel

725,000

295,000

300,000

300,000

350,000

350,000

350,000

350,000

300,000

2,595,000

Secretariat Office Operating Costs

103,000

70,000

31,000

25,000
25,000
25,000
25,000
30,000
40,000

271,000

Equipment

117,000

95,000

5,000

5,000

5,000

5,000

115,000

Travel - Secretariat Staff

140,000

77,000

70,000

130,000

130,000

130,000

80,000

90,000

40,000

747,000

External Services

34,000

25,000

10,000

20,000

20,000

7,000

82,000

Basin Case Studies

18,000

50,000

700,000

500,000

350,000

100,000

1,700,000

Thematic Review

-

100,000

400,000

250,000

200,000

20,000

970,000

150 Dam Cross Check Survey

-

80,000

80,000

40,000

20,000

220,000

Stakeholder Consult. & Communic.

72,000

36,000

40,000

130,000

100,000

150,000

100,000

200,000

244,000

1,000,000

Synthesis Papers/Final Report

-

50,000

100,000

30,000

180,000

Special Funds
108,000

30,000
76,000
80,000
100,000
100,000
100,000
150,000
150,000

786,000

-

Total for the Quarter

698,000
822,000
1,995,000
1,740,000
1,600,000
1,115,000
1,055,000
941,000
9,966,000

Cumulative Expense

698,000
1,520,000
3,515,000
5,255,000
6,855,000
7,970,000
9,025,000
9,966,000

1,510,000

3.7. Implementation Arrangements

In order to facilitate effective and efficient disbursements and respond to the potential for a challenge grant mechanism, it is proposed that UNEP establish a trust fund for WCD related activities. The trust fund will disburse funds for three purposes:

direct financial contributions to WCD core budget for activities that need to be implemented independently to comply with the mandate of the Commission which stipulates that funds must not be tied – these will be paid to the WCD as advances on request;
funding for jointly implemented/initiated activities (panels; consultation, commissioned papers, research, publications/dissemination etc); and
direct funding for UNEP managed activities, which enable it to work with the WCD, and address key issues related to dams, water and energy resources management.

Disbursements from the trust fund will be based on a joint agreement signed by both organisations specifying activities and budgets in the form of block grants. WCD will prepare the required financial and progress reports based on a format to be agreed by the two organisations.

19 March 1999

ANNEXURE A

ANNEXURE B

1. Background and Introduction

1.1 The World Commission on Dams (WCD) has been established to address a central issue of controversy in the global debate on sustainable development. It provides a unique opportunity to bring into focus the many assumptions and paradigms which are at the centre of the search to reconcile economic growth, social equity, environmental conservation and political participation in the changing global context. In an otherwise frequently abstract debate over what sustainable development implies, dams provide a rare focus for addressing these crucial issues leading into the 21st Century.

1.2 Dams have become symbols in the debate over what development can achieve, but also undermine or destroy. By 1997, an estimated 800,000 dams had been built in the world. By one count, more than 45,000 of these dams have been categorised as large (dam height more than 15 metres above the natural river bed). An additional 1700 large dams are reported to be under construction world wide today. The future context for water resource planning and the consideration of dams and alternatives is set against the background of a number of larger global trends. These include: rapid but uneven global population growth, the emergence of mega-cities, climate change, regional water shortages and crises, growing environmental awareness, growing human rights awareness, increasing public participation in decision making, and shifts in global financing affecting large infrastructure projects. A central concern is that an estimated one billion people world-wide do not have adequate access to water for daily needs and to meet development aspirations.

1.3 Historically dams have played a central role in supporting irrigation, power generation, contributing to urban and industrial water supply, providing flood management and control, as well as providing navigation and recreation benefits. For example, today about 19% of the world's electricity is generated through hydropower. Hydropower accounts for at least 50% of national electricity production in 66 countries. In 1998, more than 400 hydropower projects with more than 130,000 MW of new electrical capacity are being built. Current estimates for developing country investments in hydropower amount to US\$15 billion per annum.

1.4 While the various benefits of dams initially dominated decision-making, the costs and impacts of large dams and consideration of alternatives to dams in planning and decision-making processes have become key issues in local, regional, national and international debates. The recognition that many of the indirect and actual costs were often not taken into account in the original planning efforts and may continue to be underestimated, in many cases, has contributed to current scepticism and

fuelled the opposition to dams. Furthermore, decision-making processes leading to the construction of dams have been criticised for failing to address issues such as who benefits and who bears the costs of these projects, or the rights of local communities in terms of their traditional use of resources, preservation of their cultural heritage, and their ability to participate in national planning processes.

1.5 A reference group composed of representatives of governments, civil society, dam affected communities, the private sector, multilateral and bilateral organisations who participated in a workshop sponsored by the IUCN-the World Conservation Union and the World Bank in Gland, Switzerland in 1997 developed the scope of the WCD. The terms of reference were subsequently summarised in a mandate statement for the Commission. The mandate defines in broad terms the goals, objectives and time schedule for the WCD. These can be viewed on the WCD web page at www.dams.org.

1.6 Established through a process involving representatives from all perspectives of the debate, the WCD sets a new precedent for addressing development and resource management conflicts at an international level. It further reflects the recognition that such conflict resolution can no longer be addressed by governments alone, but must include civil society and the private sector as partners in the process. The WCD will facilitate a better understanding of the world's past and more recent experience with dams (both successes and failures) as well as the alternative options for development, and effective and participatory decision-making processes.

1.7 Against this background the overall goals for the WCD, as prescribed by its mandate, are to:

Review the development effectiveness of dams and assess alternatives for water resources and energy development; and

Develop internationally acceptable criteria, guidelines, and standards where appropriate, for the planning, design, appraisal, construction, operation, monitoring and decommissioning of dams.

1.8 The mandate further stipulates that:

The WCD's work and recommendations will be of an advisory nature, and not investigatory in the sense of a judicial Commission.

The WCD should ensure an open and transparent process of communication including dissemination of summary and full documents.

The reference group would continue to serve as one of the forums for stakeholders and interest groups to participate in the WCD's activities.

The WCD should submit its report by June 2000 with an interim progress report being made available in June 1999.

Work Programme Activities and Outputs

2.1 The design of the work programme of the WCD reflects a strong emphasis on concrete outputs that help to fulfil the mandate. As shown in Figure 1, three outputs have been planned for completion by June 2000:

a global review of the development effectiveness of dams;
a framework for options assessment and decision making processes for the development and management of water and energy services;
a set of criteria, guidelines and standards where appropriate for the planning, appraisal, design, construction, operation, monitoring and decommissioning of dams.

2.2 Given the time constraints and mandate of the WCD, its approach to studying the issues will focus on understanding the knowledge available on dams and the varying perspectives of different groups. The Commission's approach will thus draw on four principal sources:

expertise of Commission members and Secretariat staff

(e.g., existing data and information to be collected, reviewed and synthesised); consultation with interest groups (e.g. hearings, workshops, meetings); case studies, cross-check analysis and thematic reviews conducted and commissioned by the WCD; expert advice and guidance solicited through panels and task forces.

2.3 The work programme will serve the purpose of independently collecting and verifying facts and views to develop a shared knowledge base from which Commission members can proceed in formulating their own understanding on the questions raised in the WCD mandate. The work programme also facilitates inputs from interested groups and individuals through a range of processes for interaction.

2.4 The focal dam/basin case studies will be prepared by inter-disciplinary teams consisting of Secretariat staff and regional professionals/institutions for up to 10 basins. The large dam data base prepared by the Secretariat staff will provide a comparative matrix of 150 + large dams drawing on information on the focal and non-focal large dams in the river basin case studies, and also drawing from a wider selection of large dams around the world to achieve a diverse sample.

The thematic reviews will address cross cutting issues of importance in assessing both the historical experience with dams, and highlighting the emerging trends and the future context for water resources management involving consideration of dam and non-dam options. The thematic reviews will be:

global in focus;
identify and articulate varying concerns, issues and perspectives;
highlight commonalities and differences in concerns, issues and perspectives across nations and regions;
describe the current knowledge base and practices on the issues.

The five themes selected to provide the framework for the key questions and analysis are: social issues, environmental issues, economic issues, options assessment and institutional processes. Further sub-topics will be examined in detail within these thematic areas. The thematic reviews will address cross-cutting issues of importance in assessing both the historical experience with dams and highlighting emerging trends and the future context for water resources management.

The main objective of the Global Review of the Development Effectiveness of Dams will be to review and assess, with hindsight, the global experience with dams to date and identify the key lessons learnt. With more than 45,000 large dams constructed, this objective poses not only a quantitative challenge but also a methodological one. The WCD aims to address these challenges by the following four lines of inquiry:

River basin/focal dam case studies.

A data base of a broader sample of 150 + large dams.

Thematic reviews to address key issues of economic cost/benefit analysis, environmental and social impacts, option assessment, decision-making and institutional processes.

Inputs submitted by interested individuals, groups and institutions to the WCD.

The products to be derived from these four lines of inquiry will include:

Methodological framework for the Global Review.

Reports of focal dams/river basins case studies conducted by the WCD.

A report of the major findings identified through the database on 150+ large dams.

2.7 The principal objective of the Framework for Options Assessment and Decision Making Processes for Water Resources and Energy Services, Management and Development will be to provide decision makers and other stakeholders an assessment of dams and their alternatives. As well as an integrated and more effective decision support system composed of tools, methodologies and procedures to assess various socio-economic, managerial and technical alternatives within the broader context of sustainable management of water and energy resources. The WCD will achieve these objectives by the following lines of inquiry:

review and assessment of the major options for power, irrigation, water supply and flood management; identification of good practices for internalising externalities in economic analysis; analysis of institutional approaches, policy frameworks and sector planning strategies - i.e. lessons learnt and 'best' practices with particular emphasis on policy and legal frameworks, including governance and human rights; examination of social issues with particular emphasis on displacement, resettlement, rehabilitation and development as well as impacts on downstream communities; investigation of environmental issues including environmentally sustainable river basin management as well as environmental impact assessment and mitigation.

The products to be derived from these lines of inquiry include:

A series of discussion papers/reports summarising the results of the thematic reviews.
A summary report assessing existing institutional, policy and sector planning strategies.
A set of state of the art tools/methodologies/approaches for options assessment, sustainable river basin management, participatory planning processes, etc.
A section of the final report of the WCD.

The principal objective of the Criteria and Guidelines for planning, design, appraisal, construction, operation, monitoring and decommissioning of dams will be to provide the international community with a policy framework that can be used by all stakeholders and interest groups to guide, assess, review and benchmark the full cycle of dams-related decision making. To achieve this objective, output 3 will address the following tasks:

review existing policy frameworks, criteria and guidelines developed by experts, private institutions, government, non-government organisations and international agencies;
assess critical legal, institutional and procedural factors/pre-conditions that need to be in place for criteria and guidelines to be effective;
formulate criteria, guidelines, and standards where appropriate;
identify key actors and institutions to take the lead role in adopting, promoting and disseminating the WCD's recommended criteria and guidelines.

The products to be derived from these lines of inquiry include:

a compendium of existing criteria, guidelines and standards;
a review of the effectiveness of existing policies, standards and guidelines and the key factors determining their impact;
a set of proposed criteria, guidelines, and standard where appropriate for future dams-related decision making .

Commission Process

3.1 The Commission meetings as a whole (three in 1998, three in 1999, and three in 2000) will provide the principal mechanism for co-ordinating the Work Programme as well as monitoring progress made. Commission members will also participate in one of three Programme committees associated with the three outputs. These Programme committees will provide the principal mechanism for addressing the more detailed aspects of the Work Programme.

3.2 The work of the WCD Secretariat, located in Cape Town, will be co-ordinated by the Secretary General on the basis of the Work Programme and guidance provided by Commission members. The Secretariat will be staffed by up to 12 full-time technical staff, as well as finance and support staff. The principal functions of the Secretariat will be to assist the Commission in:

developing conceptual and methodological frameworks for the Work Programme

managing, co-ordinating and participating in the Work Programme
reviewing, analysing and synthesising submissions and results of the Work Programme for
consideration by Commission members
facilitating inputs from interested groups, individuals and institutions
representing the WCD at appropriate events and fora.

3.3 A substantial part of the WCD's capacity will be directed towards encouraging and facilitating the input of all interested stakeholders. The WCD will also seek to develop a high public profile through information dissemination as well as national and international media work to prepare the ground for the presentation of the final report to the international community. Activities and products planned for consultations, outreach and communications include:

co-ordination of two meetings of the WCD Forum
organisation of a series of consultations to be held in different regions of the world
facilitation of stakeholder consultations in case studies and thematic reviews
dissemination of WCD progress through quarterly newsletters
development of a state of the art, interactive WCD web-site (<http://www.dams.org>)
production and publication of WCD case studies, thematic reviews, consultation summaries, interim and final reports.

3.4 The Work Programme has been divided into several phases. These should be regarded as core periods. In practice, there will be overlap and a continuous process of information gathering, analysis, synthesis and reconfirmation as the Work Programme is implemented:

June '98 - August '98:

Commission start-up, establishment of Secretariat, recruitment of staff, logistics, fund raising

September '98 - December '98

initial review of existing knowledge base, drafting of Work Programme, holding of South Asia Consultation, development of methodology and implementation of pilot case study in South Africa

January '99 - November '99:

implementation of studies, field work and consultations, drafting of interim progress report for June 1999, preliminary review of findings, task forces

November '99 - February '00:

synthesis phase, identification of gaps and corresponding activities to address these

February '00 - April '00:

drafting of conclusions and recommendations, review and feedback from stakeholders and interested parties

April '00 - June '00:

drafting of final report and presentation to international community

3.5 The final report of the WCD will provide both a summary of findings as well as recommendations for the future. While the final WCD report represents the principal vehicle for sharing WCD conclusions, it will also provide governments, non-governmental organisations, financing institutions, the private sector and the public with a range of planning tools and guidelines (published and software based).

The principal language of the WCD will be English. Introductory parts of the web-site as well as a limited range of leaflets will be published in other major languages. For public consultations held in a specific region the most appropriate language will be used with simultaneous interpretation in English being provided. Where there is a demand for translation of documents into other languages, the WCD Secretariat will seek to identify additional support to assist with translations. The final report will be published in English, Spanish and French as well as additional languages subject to resources being secured. The option of producing a CD-ROM will be considered.

PAGE

PAGE 6
WCD-UNEP PROPOSAL.DOC

PAGE 1

PAGE 20

PAGE 1

PAGE 21

World Commission on Dams – Brief Biographies

Chair: Prof. Kader ASMAL (South Africa) is South Africa's Minister of Water Affairs and Forestry. Professor Asmal brings with him a distinguished track record in water policy as well as human rights. He has led the fundamental review and reform of South Africa's water resource management policy.

Vice Chair: Mr Lakshmi Chand JAIN (India) is currently the Indian High Commissioner to South Africa. He has served on the Central Planning Commission and Planning Boards of several Indian states, and as the Chairperson of the Industrial Development Services consultancy organisation in India for 30 years.

Commissioners:

Mr Donald BLACKMORE (Australia) is the Chief Executive of the Murray-Darling Basin Commission, in Canberra, Australia. He has brought principles of environmentally sustainable water management to a major river basin initially focused on irrigation and hydroelectric power generation. Ms Joji CARIÑO (Philippines) is Executive Secretary of the International Alliance of Indigenous-Tribal Peoples of the Tropical Forest. Her work began as an activist and analyst of indigenous peoples in her native Philippines, and has effectively carried her agenda into global fora.

Prof. José GOLDEMBERG (Brazil) is a professor at the University of Sao Paulo, Brazil, and has been recognized for his work on the future of energy globally. He has served as Rector of his University and Secretary of Science and Technology for the Federal Government of Brazil and Minister of Education. Dr Judy HENDERSON (Australia) is Chair of Oxfam International, as well as a Board member of the Environmental Protection Agency of NSW, Australia, and of Greenpeace International. She has a distinguished record of involvement on social and environmental issues internationally.

Mr Göran LINDAHL (Sweden) is the President and CEO of ABB -- Asea Brown Boveri, Ltd., a global engineering company with headquarters in Zurich. An electrical engineer by profession, he has spent his whole career in the electrical power sector and has been involved in many major projects, including large hydroelectric schemes.

Ms Deborah MOORE (USA) is the Senior Scientist at the Environmental Defense Fund. She has worked to reform water and economic policies in the United States and internationally including substantive analysis on the economic, environmental, and social aspects of several large-scale river development projects in Asia and Latin America.

Ms Medha PATKAR (India) is a social scientist and the founder of the Narmada Bachao Andolan (Struggle to Save the Narmada River) in India; an organisation campaigning against the construction of large dams on the Narmada River that includes affected people, Indian supporters, and people around the world.

Prof. Thayer SCUDDER (USA) is a Professor of Anthropology at the California Institute of Technology. His work over 40 years on social issues associated with river basin development has been definitive in the field.

Ms SHEN Guoyi (Peoples Republic of China) is Director-General of the Department of International Cooperation in the Ministry of Water Resources, People's Republic of China. She is in charge of international cooperation for the water sector in China, and has extensive experience with large-scale water resource management projects in China.

Mr Jan VELTROP (USA/Netherlands) is an Honorary President of the International Commission on Large Dams (ICOLD). He worked for Harza Engineering Company for nearly 40 years where he gained broad experience in all aspects of engineering, administration, finance, management, quality of work and safety, as well as with educational and training activities.

Secretary-General: (Ex-officio member of the Commission): Mr Achim STEINER (Germany) has been appointed Secretary General of the World Commission on Dams. His professional background is in the field of international development and environment policy. He has worked with public and non-governmental organisations in Asia, Africa, Europe and the United States.

Contents

1. Background and Introduction.....	1
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Work Programme Activities and Outputs	3
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3. Commission Process.....	5
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FIGURE 1

WORLD COMMISSION ON DAMS Outputs and Products

This input includes

All documents, reports and case studies submitted to the commission by interested individuals and groups

HEARINGS AND CONSULTATIONS

REPORTS, PAPERS

CASE STUDIES,

Regional Hearings

South Asia

Central/South America

Africa/Middle East

Other

2 WCD Forum Meetings

Social Impacts of large dams: equity and distributional issues

Dams, Indigenous people and Vulnerable Ethnic Minorities
Displacement, resettlement, rehabilitation, reparation and development
Dams, ecosystem functions and environmental restoration
Dams and global change
Economic, financial and distributional analysis
International trends in project financing
Assessment of electricity supply and demand management options
Assessment of irrigation options
Assessment of water supply options
Assessment of flood control and management options
Operation, refurbishment, relicensing and decommissioning of dams
Planning approaches
Environmental and Social assessment for large dams
River basins-Institutional frameworks and management options
Regulation, compliance and implementation options
Consultation and participatory decision making

150+ CROSS-CHECK ANALYSIS

WCD FINAL REPORT

INTERNATIONALLY ACCEPTED
CRITERIA AND GUIDELINES

AND ENERGY RESOURCES

PROCESS FOR WATER

AND DECISION MAKING

OPTIONS ASSESSMENT FRAMEWORK

EMPIRICAL RESULTS, EXPERIENCES AND
FINDINGS DERIVED FROM WCD RESEARCH,
SUBMISSIONS AND HEARINGS

INPUTS RECEIVED FROM INTERESTED GROUPS AND INDIVIDUALS

THEMATIC REVIEWS

FOCAL DAM/BASIN
CASE STUDIES

EFFECTIVENESS

DEVELOPMENT

GLOBAL REVIEW OF

150+ large dams
patterns and trends
dams from case studies
dams from other databases and sources

Focal Dam	Country
Tarbela	Pakistan
Kariba	Zambia/ Zimbabwe
Pak Mun	Thailand
Grand Coulee	USA
Danjiangkou	China
Itaipu/Tucuruí	Brazil
	Norway*
	Russia*
	Turkey *
	India*

Pilot study:
Gariiep/Vanderkloof Dams
South Africa

* focal dam to be determined

wcdprop2.doc 23/03/9922



United Nations
Environment
Programme



UNEP

Distr. Limited
UNEP(GPA)/NGO.2.2
28 May 1999
Original: English

Second informal consultation with non-governmental organizations to review the status and further steps in implementation of the Global Programme of Action for the Protection of the Marine Environment from Land-based Activities

The Hague, The Netherlands, 26 - 28 May 1999

DRAFT REPORT OF THE MEETING

Extracts only

for info + advice

gkg

36. WWF cannot make any major commitments this week. We are supportive of the GPA implementation work and are already making a major contribution. WWF has much to offer, via a range of activities, especially with respect to :

- Raising awareness via reports, briefings, media work, advocacy, workshops.
- Information exchange
- Policy development
- Field programmes – working with local communities
- Educational material/programmes

37. But WWF needs to gain internal commitment within our regional and national programmes before we can make specific commitments. At our annual marine meeting in September, WWF will discuss the results of the GPA Consultation Meeting (and will be communicating internally between now and September). WWF's International Marine Strategy (joint with IUCN) makes a commitment to the implementation of the GPA - so WWF will (and in fact already do) have a "concrete" input.

The International Oceanic Institute (IOI)

38. Mr. G. Kullenberg introduced the mission of the International Ocean Institute as to promote education, training and research to enhance the peaceful uses of ocean space and its resources, their management and regulation as well as the protection and conservation of the marine environment, guided by the principle of the Common Heritage of Mankind.

The IOI is a network of 12 operational centres, established in host institutions through a formal agreement. The IOI is incorporated in the Netherlands and has a small headquarter in Maastricht.

39. The goals of IOI are to:

1. Enhance the ability of developing countries to develop and manage their own resources sustainably for their own benefit, to establish self-reliant developments, and help with education and eradication of poverty from community to national level;
2. Enhance abilities for self-reliant development at community level, taking into account the diversity in developing as well as developed countries, including control and protection of natural resources for future generations; the eradication of poverty in coastal areas; and mitigation of and adaptation to natural hazards.
3. Enhance participation of people, in particular women, in development projects which take into account environmental issues;

4. Establish sustainable mechanisms able to tackle inter-related social, environmental and economical issues in an integrated fashion.
40. The IOI's activities include training projects, information dissemination, conferences, research and publication.
1. Training of hundreds of decision-makers and professionals, mainly from developing countries, through short and long duration interdisciplinary courses in ocean and coastal management;
 2. Development work among coastal communities with the objective of improving their livelihood while restoring and preserving coastal ecology;
 3. Information dissemination to NGOs and coastal communities through the global IOI networks and the IOI Websites;
 4. Organization of the annual PACEM IN MARIBUS (Peace in the Oceans) conference and other seminars and workshops;
 5. Research on a variety of ocean related areas such as international and regional agreements and policies on oceans and the coastal zone; on regional and sub-regional cooperation and on scientific and technological approaches to sustainable management of living and nonliving marine resources;
 6. Education and awareness creation about ocean resources, marine and coastal environment, and the need to care for them;
 7. Technology evaluation, transfer, and evaluation of the effects thereof; and
 8. Publication of the *Ocean Yearbook* in collaboration with the Dalhousie University, Canada, *Across the Oceans*, the IOI's Newsletter, as well as directories of experts, funding opportunities, and potential clients for IOI services. Regional operational centers also publish their own newsletters, research papers and reports.
 9. Services include advice, consultancy, and information regarding ocean and coastal environments.
41. The IOI system could be used to help and facilitate the implementation of the GPA-LBA. The IOI could specifically contribute through;
- a) Dissemination of information about the GPA-LBA and what it means, the interpretation, at ground level, to the communities;
 - b) Collect information on functioning of traditional local/national actions and alternatives on environmentally sound technologies; used for environment protection or resource protection and development;

- c) Initiate linkages with international and national NGOs which can help through their network in information dissemination, collection and exchange;
- d) Contribute to education and public awareness, including generation of an understanding at community level of what the GPA-LBA aims at and why it ~~may be~~ important; getting people involved in the process; by including this in the evolving, and existing IOI courses, and alumni refresher meetings;
- e) Possible establishment of co-management structures, involving communities, authorities at local and national level, and various organizations, so as to help generate a comprehensive management approach;
- f) Help establish a dialogue and an open, transparent monitoring system gathering information on effects and implications of actions related to GPA-LBA;
- g) Prepare and organize printing of publications and information in different languages as regards the GPA-LBA and related matters, with the help of the IOI Operational Centers;
- h) Having suitable PIM conferences address the issue.

European Seas Port Organization (ESPO)

42.

Greenpeace

43. The representative of Greenpeace International made a presentation on their overall work programme and the key campaign areas and other activities which are of relevance to the implementation of the GPA. Greenpeace International counts with offices in Western Europe and Mediterranean, South Pacific and South-east Asia. National offices are present in Russia, Czech Republic, Argentina, Brazil, USA, Canada, Mexico, Japan, China, New Zealand. The three main campaigns related to the GPA are Toxics, Oceans (including fisheries, aquaculture and whales) and Nuclear (reprocessing). Other Campaigns being pursued by Greenpeace focus on Forests, Climate Change and Genetic Engineering.

44. He highlighted that in 1999 and 2000, Greenpeace planned ship tours will generally address Persistent Organic Pollutants (POPs), especially focusing on organohalogenes and organochlorines, including chlorinated solvents, PCBs and chlorinated bleaching, as well as heavy metals.

Annex V

Potentials for joint action between GPA Coordination Office and Non-Governmental OrganizationsJoint action on general support to GPA implementation

- publishing an electronic/hard copy booklet with an overview of NGO activities related to GPA, to be presented at the SIDS -General Assembly meeting of September 1999
- Providing secondments/internships at the GPA Coordination Office

Joint action for LBA assessment activities - GESAMP

- Contribute to the work of the MEA Working Group for the LBA assessment, by sending scientific information to the UNEP/GPA Coordination Office for further consideration by the Working Group
- Contribute to "peer"-review of the assessments being prepared by the Working Group

Joint action for the implementation of National and Regional Action Plans

- Support the implementation of regional programmes of action developed to date in 6 regions (West and Central Africa, East Africa, East Asia, South East Pacific, Upper South West Atlantic, ROPME Sea area) under the framework of UNEP's Regional Seas Programmes.
- Key-sources of pollution identified where specific involvement of the NGO-community was expected includes sewage, solid wastes, industrial wastes and agriculture,
- Assist with expertise on public awareness-raising, and participation in decision-making processes
- Support capacity-building efforts and technical assistance for regional programme and national programme development.

Joint action on NGO Involvement in the GPA Clearing-House

- Contribute content and expertise:
 - participate in clearing-house implementation teams
 - deliver on-hands assistance on delivering HTML pages
 - contribute news & information articles
 - create and maintain GPA clearing-house 'kiosks'
 - contribute to experts databases, documents, reports, etc.
- Contribute financial or other resources (specialised personnel)
- Provide direct access to the GPA through your Web-site
- Become a GPA clearing-house compatible node
- Undertake a cooperative lead in other pollutant land-based activity areas (tourism, agriculture, etc.)
- Assist UNEP with our implementations on physical alterations & destruction of habitat, heavy metals, and/or POP's
- Assist with GPA information delivery to non-Internet users

Joint action on mobilizing financial resources

- Financial/in-kind contribution
- Fill the GPA Small Projects Fund, for support to public participation at the local, national and regional levels.
- Join in Partnership Shaping
- Join in preparing project proposals, and support bringing such proposals forward to potential donors.
- Contribute to the project on economic instruments (phase 1: Overview) as a preparation to capacity-building activities in regions
- Contribute to the project on Public/Private Partnerships (phase 1: Overview) as a preparation to capacity-building activities in regions

- Contribute to further development of the concept of "Regional and National Partnerships meetings".

Joint action on Awareness raising *more public participation*

- Make available experiences on awareness raising and reaching the stakeholders
- Integrate GPA aspects in the NGO's information channels *more participation*
- Jointly develop education and information activities
- Contribute to the GPA News Forum, by way of
 - sending news articles to the IOI-editorial team
 - distributing the News Forum through the NGO channels (electronic and hard-copy)
 - participating in the Editorial Board
- Develop and sign a Brochure leaflet on NGO participation, consisting of:
 - a statement of commitment to the GPA,
 - a list of NGO's having signed up to this statement, and
 - an illustration of activities that are being developed by NGO's for GPA implementation
- Development of a Brochure leaflet on Public Participation processes
- Develop a Video or CD-Rom in joint UNEP/NGO production, presenting GPA objectives and activities, for in-flight use, for TV-broadcasting, and for more general distribution.

Joint action on review and reporting about progress in the implementation

- Contribute to the development of formats and indicators for reporting progress in the implementation by Governments.
- Contribute to the development of recommendations and guidance on the implementation of the GPA.
- Participate in regular informal consultations

Joint action for the Strategic Action Plan on Sewage

- Contribute to assessment of new developments and opportunities
- Participate in and develop independent awareness-raising activities in the process leading to the Global Conference
- Suggest case-studies for illustrating economic benefits of taking action
- Contribute to an overview of successful strategies, measures, and partnerships.
- Contribute to illustrating the role of NGO's in developing national action plans.
- Actively participate in the development of national action plans and implementation projects
- Contribute to awareness-raising, education and capacity-building activities in implementation phase of the national action plans on sewage

Joint action for the Global Conference on Sewage

- Deliver information on ecosystem functioning
- Give experience on awareness raising and education measures in light of sewage action plans
- Organize/facilitate working group on public participation during Conference
- Participate at the Partnership Market Place through
 - facilitation of partnerships
 - contribute to the trade fair
 - organize workshops relevant to NGO interests

Annex I

LIST OF PARTICIPANTS

Ms. Pamela Curry
 Political Unit
 Greenpeace International
 Keizersgracht 176
 1016 DW
 Amsterdam
 Tel: (31 20) 523 6242
 Fax: (31 20) 523 6200
 Email: pam.curry@ams.greenpeace.org
 Website: www.greenpeace.org

Dr. Erik de Ruyter van Steveninck
 IHE
 Postbus 3015
 2601 DA, Delft
 The Netherlands
 Tel: (31 15) 215 1777
 Fax: (31 15) 212 2921
 Email: edr@ihe.nl
 Website: <http://www.ihe.nl>

Dr. Ljubomir Jetic
 Director of Programmes
 Advisory Committee on Protection of the Sea
 (ACOPS)
 11 Dartmouth Street
 London SW1H 9BN
 United Kingdom
 Tel (44 171) 799 3033
 Fax: (44 171) 799 2933
 Email: acopsorg@netcomuk.co.uk
 Website: www.acops.org

Dr. Arseen Seys
 EuroChlor (CEFIC) and WCC
 Av. E. Van Nieuwenhyse 4
 Box 2
 1160 Brussels
 Belgium
 Tel: (32 2) 676 7251
 Fax: (32 2) 676 7241
 Email: ase@cefic.org
 Website: www.cefic.org

Dr. Gunnar Kullenberg
 Executive Director
 International Ocean Institute (IOI)
 P.O. Box 3
 Gzira GZR01
 Malta
 Tel: (356) 346 528
 Fax: (356) 346 502
 Email: ioimla@kemmynet.net.mt
 Website: www.ioinst.org

Mr. Kevin Stairs
 Greenpeace International
 Keizersgracht 176
 1016 DW
 Amsterdam
 Tel: (31 20) 523 6242
 Fax: (31 20) 523 6200
 Email: Kevin.Stairs@diala.greenpeace.org
 Website: www.greenpeace.org

Dr. Sian Pullen
 Head, Marine Conservation
 World Wildlife Fund (WWF-UK)
 Panda House, Weyside Park
 Catteshall Lane, Godalming
 Surrey GU7 1XR
 England
 Tel: (44 1483) 426 444
 Fax: (44 1483) 426 409
 Email: spullen@wwfnet.org
 Website: www.wwf-uk.org

Mr. Bernard Vanheule
 Assistant Secretary General
 European Sea Ports Organization (ESPO)
 Avenue Michel - Ange 68
 B-1000 Brussels
 Belgium
 Tel: (32 2) 736 3463
 Fax: (32 2) 736 6325
 Email: bernard.vanheule@hebel.net
 Website: www.espo.be

Dr. Simon Vowles
Marine Pollution Officer
World Wildlife Fund (WWF-UK)
Panda House, Weyside Park
Catteshall Lane, Godalming
Surrey GU7 1XR
England
Tel: (44 1483) 426 444
Fax: (44 1483) 426 409
Email: svowles@wwfnnet.org
Website: www.wwf-uk.org

Ms. Monica Borobia
Programme Officer
P.O. Box 16227
2500 BE, The Hague
The Netherlands
Tel: (31 70) 311 44 68
Fax: (31 70) 345 66 48
Email: m.borobia@unep.nl

UNEP / GPA The Hague

Mr. Omar Vidal
Acting Coordinator
P.O. Box 16227
2500 BE, The Hague
The Netherlands
Tel: (31 70) 311 44 64
Fax: (31 70) 345 66 48
Email: o.vidal@unep.nl

Mr. Kenneth Korporal
Programme Officer
P.O. Box 16227
2500 BE, The Hague
The Netherlands
Tel: (31 70) 311 44 67
Fax: (31 70) 345 66 48
Email: k.korporal@unep.nl

Mr. Leo de Vrees
Senior Expert
P.O. Box 16227
2500 BE, The Hague
The Netherlands
Tel: (31 70) 311 44 65
Fax: (31 70) 345 66 48
Email: l.dvrees@unep.nl

Mr. Robbert Droop
Senior Expert
P.O. Box 16227
2500 BE, The Hague
The Netherlands
Tel: (31 70) 311 44 66
Fax: (31 70) 345 66 48
Email: r.droop@unep.nl



United Nations Environment Programme

برنامج الأمم المتحدة للبيئة · 联合国环境规划署

PROGRAMME DES NATIONS UNIES POUR L'ENVIRONNEMENT · PROGRAMA DE LAS NACIONES UNIDAS PARA EL MEDIO AMBIENTE
ПРОГРАММА ОРГАНИЗАЦИИ ОБЪЕДИНЕННЫХ НАЦИЙ ПО ОКРУЖАЮЩЕЙ СРЕДЕ

GPA - The Hague, Coordination Office of the Global Programme of Action for the Protection of the Marine Environment from Land-based Activities

Implementation of the Global Programme of Action for the Protection of the Marine Environment from Land-based Activities

Consolidated Progress Report¹

(Second report, January-June 2000
Third report, July-October 2000)

Summary

During the period January-October 2000, focus was given to consolidating the new programme direction through:

- Streamlining administrative procedures, soliciting and obtaining financial support
- Making the necessary links/outreach with donor Governments, non-governmental organizations, Convention Secretariats, private sector and United Nations agencies
- Initiating the 2001 Intergovernmental Review process on the implementation of the GPA by preparing, convening and following-up on the GPA Expert Group Meeting (The Hague, 26-28 April 2000)
- Cooperation with the Global Environment Facility (GEF)
- Further implementing the strategic action plan on sewage and the GPA clearing-house mechanism

I. ASSESSMENT/ANALYSIS FOR ACTION

I.1 GLOBAL

1. The final drafts of the two GESAMP (UN-sponsored Joint Group of Experts on the Scientific Aspects of Marine Environmental Protection) assessment reports prepared under the leadership of UNEP were endorsed by the 30th session of GESAMP (Monaco, 22-26 May 2000):

- A Sea of troubles
- Land-based sources and activities affecting the quality and uses of the marine, coastal and associated freshwater environment

2. Negotiations with commercial publishers and on modalities for launching the reports are underway. A brochure highlighting some of the main aspects of the reports was prepared and distributed at the First Biennial Global Environment Facility International Waters Conference (Budapest, 14-18 October 2000)

I.2 REGIONAL

3. Two new regional assessment on land-based activities have been published:

- Overview of land-based sources and activities affecting the marine environment in the East Asian Seas – Regional Seas Report and Studies Series no. 173 (English only)

¹ This summary outlines the activities of the GPA Coordination Office, January-October 2000, according to the main clusters of programme delivery.

- Overview of land-based pollutant sources and activities affecting the marine, coastal and freshwater environment in the Pacific Islands region – Regional Seas Report and Studies Series no. 174 (English only)

4. The series of regional overviews on land-based activities is available electronically through the GPA clearing-house (www.gpa.unep.org)

II. MOBILIZING ACTION AT NATIONAL, REGIONAL AND GLOBAL LEVEL

II.1 ADVANCING BINDING AND NON-BINDING POLICY AND PROGRAMME AGREEMENTS

II.1.1 National

5. The GPA Coordination Office continued to support Governments in developing National Programmes of Action on land-based activities. In particular, Brazil has developed a proposal for preparation of its National Programme, which has been reviewed and finalized in cooperation with the GPA Coordination Office. A Memorandum of Understanding between Brazil's Ministry for the Environment and the Coordination Office is being finalized for this purpose. This initiative is being linked with the preparation of a GEF project being negotiated by Brazil and the World Bank addressing land-based activities such as tourism, ports and harbors, bays and estuaries. It is also part of the GEF/GPA Medium-Sized project proposal for developing National Programmes of Action in developing countries (see below).

6. The GPA Coordination Office is a member of the steering group of the GEF-PDF B project on "Support to the national plan of action for the protection of the Arctic environment from anthropogenic pollution in the Russian Federation". The First Six-Monthly Report for October 1999-March 2000 was completed.

7. A GEF/GPA project proposal (mentioned above) for the development and implementation of National Programmes of Action on land-based activities in 20 countries (Brazil, Colombia, Costa Rica, DPR Korea, Egypt, Georgia, India, Indonesia, Jamaica, Jordan, Panamá, Saudi Arabia, Seychelles, Sri Lanka, Sudan, Philippines, Republic of Korea, Tanzania, Vanuatu and Yemen), under the overall framework of the Regional Seas Programme, is being finalized for submission to the GEF. The project proposes a coherent strategy and methodology to develop National Programmes of Action in those countries that wish to do so. Concrete costed, target activities and interventions will be identified as means of setting the path for implementation.

8. The business community in the Philippines, at the invitation of the Philippine Government, will develop a business plan and investment portfolio culminating in a partnership-market meeting (PMM) addressing land-based activities. The concept of PMM was initiated by the USA Government in cooperation with the GPA Coordination Office and IUCN-The World Conservation Union, and may be developed into a GEF project.

II.1.2 Regional

9. A draft concept for a GEF medium-size project proposal focusing on lessons learned on implementing the GPA and the way forward has been also prepared between the GPA Coordination Office and the IUCN-The World Conservation Union, and discussed with other potential partners at the First Biennial GEF International Waters Conference (Budapest, 14-18 October 2000). This project aims at advancing implementation of the GPA, moving from action planning to results in those regions where plans have been developed, and developing action plans in places where necessary, through a coherent and tested framework. It will achieve this by building a stronger knowledge base of successful and unsuccessful approaches to GPA implementation based upon analysis of experiences learned to date. It will identify the factors contributing to successes and failures in ongoing or finalised GPA related projects, and derive recommendations on the way forward.

10. Close collaboration has been established with the non-UNEP Regional Seas of the Helsinki Commission for Baltic Marine Environment Protection (HELCOM), OSPAR Commission (for the North Atlantic) and the Protection of the Arctic Marine Environment (PAME), concerning exchange of

information and experiences, their contributions to the 2001 GPA Intergovernmental Review, linking of respective web-sites and "twinning".

11. The GPA Coordination office contributed (both substantially and financially) to preparation of the drafts of the regional programmes of action on land-based activities for the Red Sea and Gulf of Aden (produced by the Regional Organization for the Conservation of the Red Sea and Gulf of Aden-PERSGA) and for the South Asian Seas (produced by the South Asia Cooperative Environment Programme-SACEP). Both regional programmes require further refining and subsequent implementation at the national level (via the GEF/GPA project proposal for National Programmes of Action, see above).

12. The Regional Programmes of Action on land-based activities for the South Pacific (adopted by Governments in December 1999 via consultations with the South Pacific Regional Environment Programme-SPREP) and the East Asian Seas (adopted at the Fourteenth Meeting of the Coordinating Body on the Seas of East Asia-COBSEA, Bangkok, November 1999) will be published in 2000 in cooperation with the GPA Coordination Office. These will be the first two in a companion series to that produced on the regional overviews on land-based activities.

13. The GPA Coordination Office contributed to the development of a GEF medium-sized project proposal for Sub-Saharan Africa. This project aims at assisting Sub-Saharan African countries by, among others, the development of a programme of interventions addressing problems of regional priority that may be presented to the 2002 Partnership Conference, established by the Conference on Cooperation for the Development and Protection of the Coastal and Marine Environment in Sub-Saharan Africa (Cape Town, 30 November-4 December, 1998).

14. Opportunities for GEF-funded projects have been discussed with the GEF Secretariat and close cooperation has been established. This will result in, among others, project proposals for the development of National Programmes of Action and lessons learned (see above), demonstration projects and GPA involvement in a number of proposed or on-going projects in various regions.

15. The GPA Coordination Office participated in the first round of negotiations of a draft Convention for the Protection and Sustainable Development of the Marine and Coastal Area of the Northeast Pacific (Panama, 5-8 September 2000), in which addressing land-based activities has a prominent role (see section on the 2001 GPA Intergovernmental Review, below)

II.2 VOLUNTARY AGREEMENTS BY GROUPS OF STAKEHOLDERS

16. As previously reported, close partnerships have been developed with the tourism sector. A feasibility phase for transfer of the Blue Flag Campaign on beach management has been completed for the Caribbean and Asia Pacific regions with the production of country feasibility reports (seven participating countries in the Caribbean and three in Asia). Draft regional criteria for the implementation of the campaign in both regions have been prepared and are being reviewed. Commitments have been secured in several Caribbean countries to establish national coordinating mechanisms and a regional coordinating mechanism is being discussed.

17. In the framework of preparations for the 2001 GPA Intergovernmental Review, several sectors of industry have been requested to submit reports about their involvement in the implementation of the GPA and related development of codes of conduct or other forms of voluntary action, including:

- **Tourism:** Report prepared by the Caribbean Alliance for Sustainable Tourism
- **Insurance:** Report prepared by Gerling Sustainable Development Project
- **Ports and Harbours:** Report prepared by the European Sea Ports Organization
- **Water:** Presentation made by Suez-Lyonnaise des Eaux focusing on their experiences in establishing sewerage and treatment facilities in developing countries. Modalities for cooperation on sharing experience on sewage management are under investigation

18. The above initiatives form the steps towards developing guidance for stakeholders' involvement in the implementation of the GPA, for the development of voluntary action and other forms of partnerships between the public and the private sector, and input to the 2001 GPA Intergovernmental Review.

19. The GPA Coordination Office contributed to the new Montevideo III Programme on development of international environmental law, drawing attention to aspects related to private sector involvement.

II.3 MAKING CONNECTION WITH NATIONAL AUTHORITIES, CONVENTIONS AND INTERNATIONAL PROGRAMMES

II.3.1 The Convention on Biological Diversity (CBD)

20. The GPA Coordination Office and the CBD Secretariat signed a Memorandum of Understanding as means of developing joint programming opportunities. Areas of mutual interest include the GPA clearing-house mechanism, physical alterations and habitat destruction, impacts of land-based activities on marine biodiversity (e.g. tourism, introduction of alien species) and other elements of the Jakarta Mandate. Concrete follow-up activities, also involving the Regional Seas, will be discussed at the Third Global Meeting of Regional Seas Conventions and Action Plans (Monaco, 11 November 2000).

II.3.2 Inter-Agency Committee on Sustainable Development (IACSD)

21. The role and responsibilities of the Administrative Committee on Coordination (ACC) Sub-committee on Oceans and Coastal Areas and the ACC Sub-committee on Water Resources in facilitating inter-agency cooperation on implementation of the GPA were agreed upon in January 2000. These were presented and accepted by the IACSD.

II.3.3 UN Open-ended Informal Consultative Process on Oceans Affairs and the Law of the Sea (UNICPOLOS)

22. The GPA Coordination Office gave an invited presentation during the Discussion Panel B on "Economic and Social Impacts of Marine Pollution and Degradation, Especially in Coastal Areas", during the first meeting of UNICPOLOS (New York, 30 May-2 June 2000) and joined other UN agencies in delivering a side event on the ACC Sub-committee on Oceans and Coastal Areas.

II.3.4 Second World Water Forum and Ministerial Conference

23. The GPA Coordination Office has carried out the following activities in connection with the convening of the Second World Water Forum (The Hague, 17-22 March 2000):

- Convening the session on Water and Tourism attended by some 60 participants with panelists from WTO, private sector, Government water authorities and regional non-governmental organizations
- Facilitating several meetings (i.e. African municipal managers, World Water Council and the ACC Subcommittee on Water Resources)
- Co-convening, with Habitat, the session on Water and Megacities
- Member of the Intergovernmental Planning Committee for the Ministerial Conference
- Input to several sessions as panelist (e. g., Chief Executives Officers Panel, Special Session on Deltas and their Ecological importance)
- Coordination and organization of the UN Pavilion (including UNEP, UNESCO, Habitat, FAO, UNICEF, IAEA, WHO, WMO, UN/DESA, UNU, WB, GEF and UN/ECA)
- Participation in the initiative of the Netherlands Government to develop recommendations and guidelines on sustainable river basin management. These have been published as "Towards sustainable river basin management: recommendations and guidelines on best management practices"

II.3.5 National authorities and non-governmental organizations

24. Briefs on the GPA have been given to Environment Ministries and other interested national institutions, as well as to non-governmental organizations. Cooperation and support to the implementation of the GPA have been obtained from Governments (Australia, France, Belgium, USA and the Netherlands) as well as from IUCN-The World Conservation Union, the World Wildlife Fund and the International Network of Basin Organizations (INBO).

II.4 PROMOTING AWARENESS AND CAPACITY-BUILDING EFFORTS

II.4.1 Training programmes

25. Further development of the Train-Sea-Coast Programme module on the GPA, focusing on sewage management has continued. The Rockefeller Foundation has been approached for support and identification of other interested donors is ongoing.

26. The GPA Coordination office lectured at the 20th International Ocean Institute (IOI) Annual Training Programme on the *Law of the Sea: Its Implementation and Agenda 21* (Halifax, 12 June 2000). A module on the GPA will be developed as a joint effort and incorporated as a standard feature in future annual programmes of IOI-Canada.

II.4.2 Twinning within the context of the Regional Seas

27. The Helsinki Commission for Baltic Marine Environment Protection and UNEP's Regional Seas Programme for the Eastern African region signed a Twinning Arrangement on 30 May 2000 at the Global Ministerial Environment Forum (Malmö, Sweden). The concluding of the agreement was facilitated by the GPA Coordination Office.

28. Under the Twinning Arrangement, the Helsinki Commission will support the Nairobi Convention by acting as a good-will ambassador for its work and providing technical assistance to its member States. The Arrangement identifies three priority areas: (a) sewage management; (b) Protocol on land-based sources of pollution by October 2000; and (c) integrated coastal management.

II.4.3 Awareness raising

29. Production and publication of a Brochure on "Pollution from the land: the threat to our seas" in English, French and Spanish, outlining recent facts and figures on the threats and impacts on the marine environment from land-based activities (April 2000).

GPA NewsForum

- The *GPA NewsForum* has been launched and it is accessible through the GPA clearing-house mechanism or the Internet (www.gpanews.unep.org)
- A second hardcopy edition of the *GPA NewsForum* was released at the occasion of the Second World Water Forum (March 2000)
- A discussion forum was launched on 19 June 2000 as an integral part of the *GPA NewsForum* and the first topic is focussing on public and private partnerships
- A dynamic event calendar is under development

II.5 GPA STRATEGIC ACTION PLAN ON MUNICIPAL WASTEWATER

30. To respond to UNEP's Governing Council decision 20/19B.1d, the GPA Coordination Office developed a strategic action plan on sewage in cooperation with the World Health Organization (WHO), Habitat and the Water Supply and Sanitation Collaborative Council (WSSCC).

31. Some of the activities undertaken to implement this action plan include (a) preparation of a set of case studies illustrating the environmental, social and economic benefits of addressing wastewater in coastal areas of East Asia, South Asia, Eastern Africa and the South-East Pacific; (b) preparation of a general "Source Book" with best practices on municipal wastewater management and possible physical, policy and public awareness/education measures, and external financing possibilities (to be available as hard copy, CD-ROM and through the GPA clearing-house mechanism); (c) development of the draft "Recommendations for Decision-Making on Municipal Wastewater" (edited versions in English, French and Spanish will be available by the end of 2000); (d) securing funding to conduct regional partnership meetings in the wider Caribbean, Eastern Africa, West Asia and wider East Asia regions in the framework of the Regional Seas Programme and bringing together representatives of Governments, local authorities, private sector, international financing institutions, potential donors and other major groups (donors have been approached for funding of meetings in the Latin American and Black Sea regions); and (e) establishment of cooperation with WHO, the World Bank/Water and Sanitation Programme and WSSCC to develop the clearing-house node on environmental sanitation.

32. With regard to the feasibility of convening a global conference on sewage, and after consultation with partners, it was considered more appropriate to have a global consultative process consisting of three parts: (i) a high level segment, seeking the endorsement of the recommended practices and procedures; to be associated with the first intergovernmental review meeting on implementation of the GPA; (ii) various sessions for professionals through participation in relevant global and regional professional conferences; and (iii) a set of regional meetings, involving a wide range of stakeholders.

33. The Expert Group Meeting (see below) endorsed the above approach, which also expressed general support for the approach contained in the Strategic Action Plan. The experts concluded that there was no need for a global conference on sewage, but rather recommended that sewage, as one of the most important components of the GPA should be assigned a prominent place in the 2001 GPA Intergovernmental Review meeting.

34. The "Recommendations for Decision-Making on Municipal Wastewater" distilled from the "Source Book" have been prepared and were reviewed by a number of experts, including from United Nations agencies. They have also been discussed at the 2000 Coastal Zone Canada Conference and will be presented at the 5th Global Forum of the WSSCC (Iguaçu, Brazil, November 2000) and at the International Symposium on Frontiers in Urban Water Management (Marseille, June 2001). The edited version of these Recommendations is expected to be ready in November 2000 and then will also be subject to discussion, amendment and endorsement by the regional consultative meetings.

35. The European Union will contribute to the development of the above Recommendations. Links with development banks, such as the Asian Development Bank are being established

III. EVALUATING PROGRESS AND FURTHER DEVELOPMENT OF THE GPA

III.1 Intergovernmental review on the status of implementation of the GPA

36. The Governing Council of UNEP (decision 20/19 B of 5 February 1999) decided to undertake the first intergovernmental review of the status of implementation of the GPA in the year 2001, and invited the Executive Director to organize an expert group meeting, with participation by governments and international governmental and non-governmental organizations, in order to facilitate the preparations for such a review.

37. In response to the above, UNEP, in its role as Secretariat of the GPA, convened an Expert Group Meeting (The Hague, 26 -28 April 2000). The experts noted that positive developments had taken place related to the protection of the marine and coastal environment in some regions, which had contributed to the implementation of the GPA since its adoption in November 1995.

38. The low level of participation by other United Nations agencies in activities related to implementation of the GPA (with the exception of work they are performing as lead agencies in the development of the clearing-house mechanism) was noted with concern. The expert meeting was attended by only two (UNESCO/IOC and the UN Centre for Human Settlements-Habitat) of the six United Nations agencies invited.

39. The experts agreed on a number of preparatory activities that need to be conducted prior to the 2001 GPA Intergovernmental Review meeting. The products and action fall into five categories: (a) binding and non-binding agreements at the national and regional level; (b) voluntary agreements and involvement of the private sector; (c) capacity-building; (d) innovative financing and use of economic instruments; and (e) sharing experiences through reporting and the further development of the clearing-house mechanism. Different partners, including governments, regional and international governmental and non-governmental organizations (including UNEP's Regional Seas Programme), international financial institutions and the private sector, will be invited to take part in the delivery of these products.

40. The meeting also established a *GPA Correspondence Group* and recommended that the Executive Director of UNEP considers the establishment, as soon as possible, of a Steering Committee to advise UNEP on the Intergovernmental Review process and the 2001 Review Meeting.

41. As requested by the Expert Group Meeting, the GPA Coordination Office drafted two documents: one outlining the proposed preparatory process and expected specific products of the Intergovernmental Review meeting and the other a draft GPA High-Level Statement. Both documents were circulated for comments to the *GPA Correspondence Group* and others.

42. The GPA Coordination Office has contributed and participated in several fora where the preparations for the GPA Intergovernmental Review meeting were considered, including:

- Coastal Zone Canada Conference (Saint John, 17-22 September 2000): two GPA-related sessions were organized (one on lessons learned and moving forward GPA implementation within the context of the Intergovernmental Review meeting; and another focusing on municipal wastewater)
- International Ocean Institute Leadership Seminar on Mediterranean Basin-wide Co-development and Security (Malta, 21-22 September 2000): as a follow-up, the Secretariat of the Mediterranean Action Plan (MAP) and the GPA Coordination Office have agreed on, *inter alia*, (i) the input of the Mediterranean region into the GPA Intergovernmental Review; (ii) participation of MAP in the Steering Committees of the two GEF/GPA medium-size projects mentioned above; (iii) forward "twining" arrangements with other Regional Seas to facilitate GPA implementation; and (iv) implementation of the Jakarta Mandate with the CBD Secretariat.
- High-Level Government-Designated Expert Meeting of the Proposed Northeast Pacific Regional Seas Programme (Panama, 5-8 September 2000): the regional preparatory process and the contributions by the Northeast Pacific region to the GPA Intergovernmental Review meeting were discussed and agreed upon at this meeting. To coordinate the preparatory process and facilitate input from the region (including reporting), the meeting established GPA National Focal Points and a GPA Steering Committee. The meeting also agreed on, *inter alia*, (i) preparation of an action-oriented regional assessment on land-based activities as a means of identifying the priority pollutant source categories and the action needed at the national and regional level to protect the region's marine and coastal environment; (ii) preparation of a regional workprogramme 2001-2006 with focus on addressing land-based activities; and (iii) participate in the GPA/GEF medium-sized project on development of National Programmes of Action on land-based activities

43. On early October 2000, the Government of Canada officially accepted the invitation of UNEP's Executive Director to host the GPA Intergovernmental review meeting in October/November 2001, and a host agreement is being prepared.

IV. THE GPA CLEARING-HOUSE MECHANISM (www.gpa.unep.org)

44. The central node of the GPA clearing-house mechanism continues to be expanded with the addition of new content, reorganisation of some elements to improve ease of use, and the enhancement and development of new functionality. Progress is also being achieved with other clearing-house initiatives, including the development of the pollutant source category nodes by the relevant United Nations agencies, development of regional prototype nodes and the acquisition of support and resources for additional activities.

45. There are also a number of related activities initiated with relevant UNEP Divisions and offices, including the Division of Environmental Information, Assessment and Early-Warning (DEIA&EW), Division of Environmental Conventions (and the Regional Seas Programme) and GRID Centres. It is intended that the GPA clearing-house mechanism will be fully compliant and compatible with new UNEP wide information management initiatives (*UNEP.NET*) being lead by DEIA&EW. The GPA clearing-house architecture was designed to most of the standards now being incorporated into *UNEP.NET*.

IV.1 Pollutant source category nodes

Sewage – the World Health Organization (WHO) and core partners (currently the WSSCC, the World Bank Water and Sanitation Programme, the International Water Association and the GPA Coordination Office) are developing the *Sanitation Connection* clearing-house. It is planned to launch a prototype in late November at the Fifth Global Forum of the WSSCC in Brazil.

Nutrients and sediment mobilization – the Food and Agriculture Organization of the United Nations (FAO) continue to develop the prototype clearing-house node on nutrients and sediment mobilization. Although FAO plans to launch the node in late 2000, there are concerns about further development and maintenance unless sufficient resources are made available.

Oils (hydrocarbons) and litter – the International Maritime Organization (IMO) has worked with the Government of Canada to develop a prototype node that is now available from the IMO homepage. The GPA Coordination Office will be meeting in November with IMO and Canada to agree on plans to improve the structure and organization of the prototype and to expand the content. There will also be a meeting with consultants, who are working for OSPAR and the Swedish EPA, to combine efforts to further develop the global litter clearing-house node.

Radioactive substances – the International Atomic Energy Agency (IAEA) is continuing to develop the radioactive substances node with a planned launch of a prototype in late 2000. The IAEA is hoping to use this node as a catalyst for the development of an agency-wide environmental information management system.

Persistent organic pollutants (POPs) – the POPs node is being developed by UNEP Chemicals (Geneva), with seed funding from a grant received from the Nordic Council of Ministers, and it intends to develop and launch a prototype node before the end of 2000.

Physical alterations and destruction of habitats – Enhancements and further expansion of this node are being discussed with the CBD Secretariat and the Regional Seas at the Third Global Meeting of Regional Seas Conventions and Action Plans (Monaco, 11 November 2000) and with UNEP DEIA&EW.

Heavy metals – UNEP Chemicals (Geneva) is providing seed funding and in-kind resources to develop a heavy metals node. A consultant will commence activities in October with the launch of the prototype planned for late 2000. Links will also be established with databases on cleaner production and relevant industries in cooperation with the UNEP DTIE (Paris).

4.2 Regional nodes

46. The GPA Coordination Office is initiating regional clearing-house activities in partnership with the Regional Seas Programme. Two pilot projects have been ongoing since late 1999: one in collaboration with the South Pacific Regional Environment Programme and the other with the Caribbean Environment Programme. The South Pacific needs evaluation and workplan are almost finalized and the next stage will be to develop a prototype node and to obtain necessary funding and support to implement the workplan. The Caribbean completed the needs evaluation and workplan and developed a prototype node.

47. Support and funding are being sought to initiate GPA clearing-house developments in other Regional Seas and it is hoped that activities will begin in early 2001, assuming that potential donor and partner support is forthcoming.

4.3 Other related activities

48. A number of clearing-house related project proposals have been developed and submitted to potential donors. Discussions with several Governments concerning possible areas of support are ongoing.

49. The GPA Coordination Office is UNEP's focal point for the UN Atlas of the Oceans project. The UNEP outputs will provide an important source of content for a number of the GPA clearing-house initiatives, as well as input and tie-ins to the GEO-3 process and other UNEP activities.

Date: Fri, 10 Dec 1999 12:14:42 +0100
 From: carol <c.wooley@unep.nl>
 To: ioihfx@dal.ca
 Subject: GESAMP draft report on the state of the marine environment

TO: ELISABETH MANN BORGESSE, International Ocean Institute

Dear Colleagues,
 Individual letters were mailed to you yesterday (signed by Dr. Stjepan Keckes, Chairman, GESAMP's Working Group on Marine Environmental Assessments) with the self-explanatory text reproduced below, together with hard copies of the two draft reports.

Herewith, I am attaching the electronic version (in Word) of the draft report "Seas of Troubles - The State of the World's Oceans". Please note that I am sending this message to groups of five individuals/ addressees in order to avoid "crashing" the system.

The file is: gesamp-state-marine-environm.doc [Seas of Troubles - The State of the World's Oceans] The second document, "Land-Based Sources and Activities Affecting the Quality and Uses of the Marine, Coastal and Associated Freshwater Environment" will be sent to you by email under separate cover.

2000
 UNEP

Best regards.

Omar Vidal
 UNEP Technical Secretary of GESAMP
 Coordination Office
 Global Programme of Action for the Protection of the
 Marine Environment from Land-based Activities
 United Nations Environment Programme
 P.O.Box 16227
 2500 BE The Hague The Netherlands
 tel: (31 70) 3114 464
 fax: (31 70) 3456 648
 e-mail: o.vidal@unep.nl
 Web: <http://www.gpa.unep.org>

Dear Colleague,

GESAMP, the Group of Experts on the Scientific Aspects of Marine Environmental Protection, working under the auspices of eight United Nations bodies (UN, UNEP, FAO, UNESCO/IOC, WHO, WMO, IMO and IAEA) and with cosponsorship of the Advisory Committee on Protection of the Sea (ACOPS) have prepared two reports: a general report on the state of the marine environment and another focusing on the impact of land-based activities on the marine and coastal environment. The drafts of both reports are attached to this letter.

The drafts of the reports are in advanced stage and are planned to be reviewed, at the end of January 2000, by GESAMP's Working Group on Marine Environmental Assessments.

In order to ensure that the reports reflect a wide range of opinions relevant to the issues treated in the reports, GESAMP decided to submit them to peer review by persons representing a good cross-section of potential readers and users of the reports.

You have been identified as one of the persons who may be interested to be among the reviewers.

Should you be willing to accept this role, we would appreciate receiving your written comments and suggestions by 15 January 2000, so that they could be taken into account by the meeting of the Working Group.

We appreciate that an individual reviewer's field of expertise may be such as to make him/her comfortable with reviewing only parts of the report dealing with the impact of land-based activities. We therefore request that you review only the sections of that report that align with your expertise and interests.

The contributions of the reviewers would be acknowledged in the reports and they would receive, as a token of our thanks, a complimentary copy of the report they have reviewed.

Trusting that you will accept to review the drafts of reports which are attached to this letter and provide us with your comments and suggestions by the deadline indicated above, on behalf of the Working Group I would like to express our appreciation and thanks for your cooperation.

Yours sincerely,

Stjepan Keckes
Chairman
Working Group on Marine Environmental Assessments

P.S. Your answers, including your comments and suggestions, should be sent to me and copied to Mr Omar Vidal, the Technical Secretary of the Working Group, at the following addresses: - by e-mail: skeckes@compuserve.com and o.vidal@unep.nl or - by fax: (385 52) 811 543 and (31 70) 345 66 48 or - by mail: Stjepan Keckes, 21 L. Brunetti, Borik, 52210 Rovinj, Croatia and Omar Vidal, GPA/LBA Coordination Office, UNEP, P.O.Box 16227, 2500 BE The Hague, The Netherlands

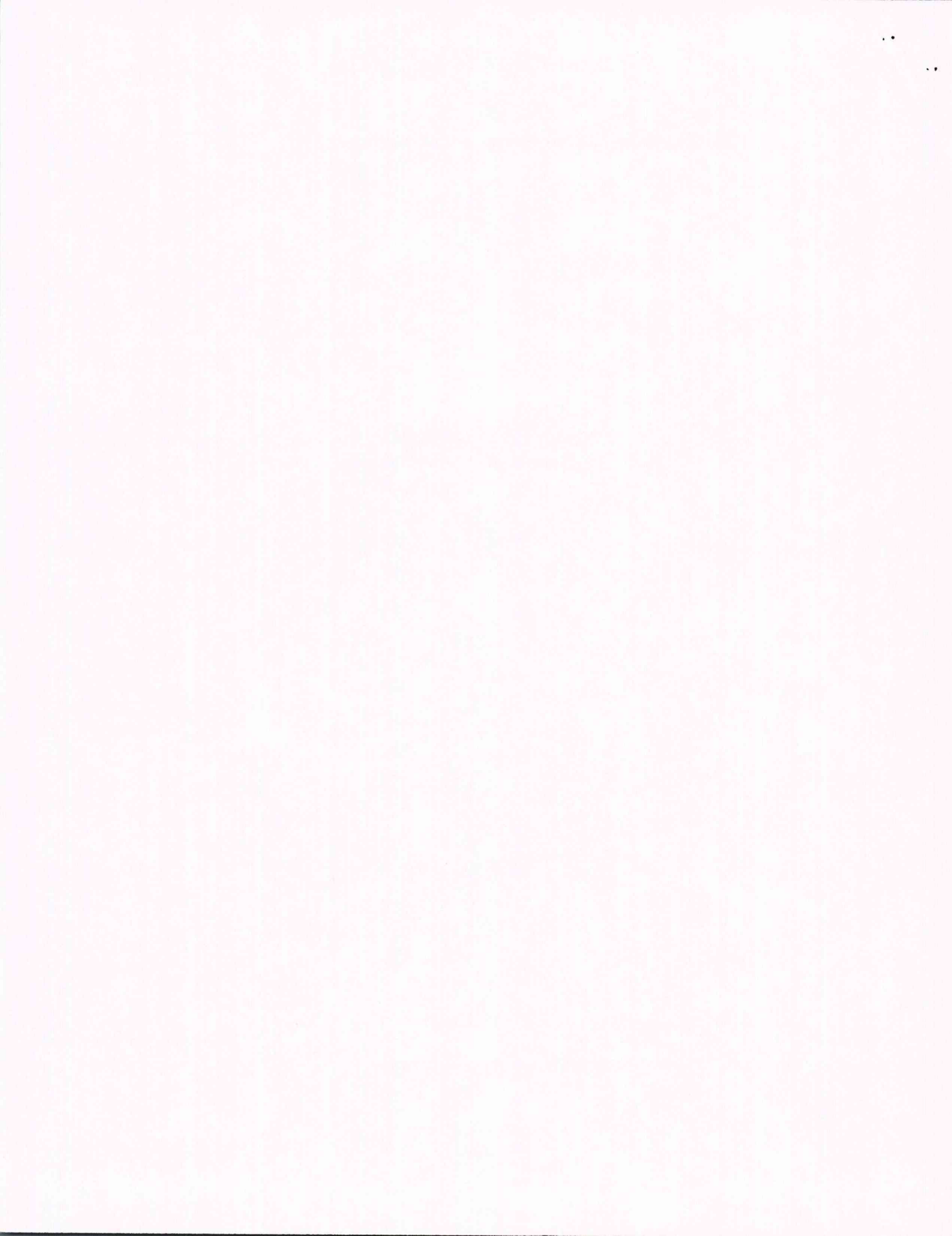
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GESAMP Working Group on Marine Environmental Assessments

SEAS OF TROUBLES
The State of the World's Oceans

UNEP, December 1999



DRAFT NOT TO BE CITED**Contents**

Chapter 1. The Changing Relationship	1
Pressures and Effects	1
Changing Perspectives	3
Chapter 2. Causes and Effects	5
The State of the Waters	5
Pollution	5
Eutrophication	8
Altered sediment flows	9
The Life of the Seas	9
Fisheries	9
Biodiversity	12
Alien Species	12
Habitats	14
Coral reefs	14
The Oceans and the Atmosphere	15
Global Warming	15
Ultraviolet Light	18
Nitrogen	18
Chapter 3. Land and Sea	19
Urbanisation	19
Industry	20
Agriculture, Forestry and Aquaculture	22
Hydrological changes	23
Commerce and Transport	23
Tourism	24
Military activities	25
Chapter 4 Action	25
The causes of failure	27
Science and policy	28
Risks and benefits	29
An integrated approach	30
Chapter 5 Conclusions and Recommendations	32
Appendix	36

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Chapter 1. The Changing Relationship

If it were not for the sea, the Earth would just be one more small, dead planet, another desert island adrift in the limitless black ocean of space. Life began in its waters, and no animal could clamber out of them onto dry land before algae in the primaevial oceans had released oxygen to provide a welcoming atmosphere. And without the water from the sea that falls as rain, the continents would become barren again.

The world's cultures also owe much to the seas. They nurtured its early civilisations, clustered around their shores, and spread trade and ideas in the ships that came to ply them. Wealth and knowledge continued to travel mainly by water until the very dawn of the modern era, and the oceans still retain an enormous, if largely unrecognised, economic importance. They cover 70 per cent of our planet's surface, regulate its climate, and provide its ultimate waste disposal system, yet still our myopic, terrestrial species insists in naming it after the land.

Humanity's future, just like its past, will continue to depend on the oceans, on the intricate interchanges between land and water. Yet the relationship has changed. Over most of human history it has been dominated by the sea's influence on people. But now, and in the future, humanity's effect on the state of the sea is probably at least as important. And that relationship is getting worse.

The state of the world's seas and oceans is deteriorating. Most of the problems identified decades ago still elude resolution, and many are worsening. New threats, moreover, keep emerging. The traditional uses of the seas and coasts - and the benefits that humanity gets from them - have been widely undermined.

All this is happening because human activities are increasing over ever wider areas. The closer the seas come to people, the greater is the damage. The greatest harm is caused by what we do on land - and particularly on the coasts - rather than at sea. Indeed the main driving force behind the environmental problems of the oceans, old and new, is ill-planned coastal development.

The picture is not universally black. There has been some progress, in some places, in reducing the harm to the marine environment. But this is continually being outstripped by the pace and scale of the deterioration. More hopefully, perhaps, there is a dawning realisation that neither individual problems, nor the crisis of the seas as a whole can be dealt with in isolation. They are intricately interlinked both with themselves and with social and economic development on the coasts. Policy decisions, research, and management programmes are all shifting their focus accordingly.

Pressures and effects

The nearer you get to land, by and large, the greater is the hurt to the sea, its life and resources. The crisis is deepest where the waters are shallowest. It is here that pollution is at its worst, habitats are most readily destroyed, and much of the depletion of fisheries take place.

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The open oceans suffer some contamination and ecological damage, but compared to coastal areas they are still in a relatively healthy state. Pressures have been increasing on the seas above continental shelves, as drilling for oil and gas has ventured into deeper waters, and fisheries have expanded. But it is the waters nearest to the shores - and particularly those in estuaries and in semi-enclosed seas and bays - that have suffered the steepest decline over the last decade.

More and more of the narrow strip of land along the world's coasts - and its habitats - has been ruined by a host of poorly planned and regulated activities, from the explosive growth of coastal cities and towns to the increase in tourism, from industrialisation to the expansion of fish farming, from the development of ports to measures taken to try to control flooding. The pressures are particularly exacerbated along the coasts of many developing countries, where rapid growth in the numbers of people combines with persistent poverty, and where there is little capacity to manage the situation.

The intensity of the pressures vary from place to place, and so does the vulnerability of different ecosystems. By and large, the ecosystems of the tropics and the poles are thought to be less resilient than those in temperate climates.

Box (possibly represented graphically)

Vulnerable areas and systems - and the sources of their problems.

Coral reefs - eutrophication, sediments, overfishing, destructive fishing, reef mining, the aquarium and curio trade, diseases.

Wetlands - reclamation and development, including landfills.

Seagrass beds - siltation, coastal development, eutrophication, physical disturbance.

Coastal lagoons - reclamation, pollution.

Mangroves - excessive exploitation, clearing for reclamation, development and aquaculture.

Shorelines - development, modification of habitats; erosion.

Watersheds - soil erosion, pollution.

Estuaries - reduced water flows, siltation, pollution.

Small islands - changes in sea level, waste management, pollution.

Coastal shelves - pollution, fishing, dredging, navigation.

End box.

Nevertheless, the seas and coasts worldwide are being used more and more to provide the basics of life, and for commerce and recreation. Growing demand is putting increasing pressure on the resources of the oceans. The burden of waste sent out to the sea is growing worldwide, even though it has been lightened in some places by better technology and practices. The use of pesticides, fertilisers and other agrochemicals is rising worldwide, as is the amount of them that is washed and blown off the land into the oceans. Fisheries are grossly mismanaged and overexploited almost everywhere, turning a precious sustainable resource into a shambolic free-for-all. And the introduction of species, either intentionally or accidentally, to habitats far from their own is now taking place on a large scale, often disrupting both ecosystems and economies.

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On the positive side, there is convincing evidence that better measures in some areas have cleaned up beaches and bathing waters and produced seafood that is safer to eat. Concerted national and international action has cut the amount of oil discharged from ships. Indeed shipping is probably the only activity which has not significantly increased its pressure on the health of the oceans over the past decade - though such coastal developments as expanding and maintaining harbours have important effects on the environment, and a welcome increase in ports taking wastes from ships often raises problems over what to do with them afterwards.

The nature and extent of pressures on the seas differ from place to place. But, apart from the threats arising from predicted global warming, the most serious ones worldwide are:

* **The destruction and alteration of habitats**, which is common and widespread in seas and coasts everywhere. Rivers, lakes, estuaries and coastal waters are the hardest hit - and wetlands, mangroves, seagrass beds and coral reefs are particularly vulnerable. Pollution is not the only culprit, or even the greatest one. Reclaiming land, felling forests, mining, building on coasts and other activities that directly damage and destroy the land are just as important, as are destructive ways of fishing, like using poison, explosives, or catch-all nets.

* **The decline of fisheries and other renewable resources**. Overfishing has brought an end to 40 years of increases in the harvest from the seas, and now threatens to cut catches sharply over the next decade. Destructive fishing methods add to the crisis, as do poor management and questionable social and economic measures in support of unsustainable practices. Overfishing denudes both seas and freshwaters, while the overharvesting of tropical coastal resources - such as coral reefs - is important in many developing countries.

* **The effects of sewage and chemicals on human health**. New work, reported in these pages, suggests that sewage pollution has a massive effect on health worldwide, ranking with some of the most feared diseases afflicting humanity. Meanwhile some chemicals are increasingly suspected of causing cancer, disrupting reproduction and altering behaviour - though some pollutants now pose less of a threat than before.

* **Widespread and increasing eutrophication**., the excessive growth of marine plant life, is seriously disrupting ecosystems and threatening health throughout the world. Coral reefs, seagrass beds and other vital habitats are suffering. And it can cause explosive blooms of toxic algae which can blight tourism, damage tourism, and poison people.

* **Changes to hydrology and the flow of sediments** - caused by such developments as building dams, creating reservoirs, establishing large-scale irrigation schemes and changing the way land is used - often seriously degrade habitats and significantly change ecosystems. Changing the flow of rivers in these ways also cuts the amount of sediment being carried down them, which can alter coastlines. Felling forests, by contrast, can increase their sediment burden, damaging wetlands, deltas and coral reefs.

Changing perspectives

Over the last decade, the emergence of new issues has placed the protection of the seas in a new perspective, and heightened their value both to the world and to national economies. There has also been a new realisation that the problems of the oceans can only be tackled in an integrated way.

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Global warming, firmly predicted by the scientific community over the last decade, will both be heavily influenced by the oceans, and have profound effects upon them. The seas massive ability to store heat will do much to govern the rate at which the Earth warms up, and will make the process, once started, extremely hard to stop. Meanwhile the climate change is expected to alter the pattern of currents, with far-reaching effects both on sea and land, to disrupt fisheries, change ecosystems and cause the seas to rise, inundating low-lying islands and coastal areas.

Some pollutants - such as lead and oil - are now seen as much less threatening than in the past. Others - like sewage - have now been found to damage health much more than had been realised. It has become ever clearer that activities on land (or based on it) are the major source of pollution - and that the main problems may come less from fixed points, like factories, on the coasts than from diffuse practices like agriculture. Perhaps even more importantly, pollution - the introduction of substances that damage the environment or human health - is now recognised to be neither the only, nor necessarily the most severe, threat to the oceans. Damage to ecosystems and habitats, and overexploitation of the resources of the sea, are probably even more important.

There is also a new appreciation of the richness of the biodiversity of the sea, and a new realisation that it has so far suffered much less from destructive human activities than the land. Until now this has been a relatively neglected field; there are powerful arguments for paying much more attention to it.

As new understandings of the environmental problems of the seas have grown, so has the recognition that they cannot be tackled in isolation. Many authorities have been arguing for decades that the seas and coasts - and the river basins that run down to them - must be protected and managed together in an integrated way. Some countries practice this successfully, but it has taken longer for the vital principle to be enshrined in international agreements.

The signing of the UN Convention on the Law of the Sea, in 1982, marked the first major - if timid - political step towards this. There has also been some progress in some regional and subregional programmes, which have recognised that one of the best ways of solving the environmental problems of the seas and oceans is to manage development on the coasts, and their hinterlands, properly. But the crucial turning points came only with the adoption of Agenda 21 at the 1992 Earth Summit (the United Nations Conference on Environment and Development - UNCED) and, three years later, of the Global Programme of Action for the Protection of the Marine Environment from Land-Based Activities. Both recognise that freshwater (including groundwater), the coasts and the seas are inseparably linked. And they specifically asked that conflicting interests over the seas, coasts and river basins should be resolved by an integrated management of resources, within the framework of environmentally sound economic development.

Even more importantly, perhaps, managers and policy makers are gradually recognising the value of the services that the oceans provide for the Earth and its people. In the past, the worth of the seas has usually been counted in the resources it provides, whether sand and gravel, oil and gas, or fish. But these are dwarfed by the value of the unrecognised services that the oceans provide, from regulating the earth's climate to recreation, from supplying rainfall to receiving and treating waste. Many lie outside the conventional market economy, but life on Earth could not continue without them.

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There is general agreement that the value of these services must be brought into mainstream economic and social calculations. Ways of valuing them are improving, but still have limitations - though not as great as those of the ability of existing institutions to take them into account. The best estimate of one recent calculation, which drew on over 100 studies over the past two decades, suggest that they may be worth over US \$20 trillion a year, more than the world's entire GNP. It suggests too, that the seas and oceans, provide two thirds of the value of all the natural services provided by the entire planet. Whatever the true figure, it is clear that the health of the oceans is vital for the world's economic - as well as its ecological - well being.

Chapter 2. Causes and Effects

Vast and awe-inspiring, apparently limitless and indestructible, the oceans have been the ultimate depository for humanity's wastes since the dawn of civilisation. For even longer, their waters and coasts have seemed to provide an inexhaustible bounty of fish and other resources. And for thousands of years they did indeed seem able to absorb everything that was done to them, though some relatively small areas did become overwhelmed. But as the world's population and wealth have increased, as industries have grown, fishing has intensified, and people have crowded to the coasts, the oceans have been plunged into crisis.

A host of problems have now been on the political and environmental agenda for decades - and still persist there, unresolved. They, and their main causes, are fairly well understood, as are the technical, economic, social and political options for solving them. The solutions are generally available, if at a cost. But, though great improvements have been achieved in a growing number of places, the complexity of the problems - and of the conflicts of interest surrounding them - has ensured that managers and decision makers, for all their labour, have been unable to resolve them.

Meanwhile other issues have emerged during the last decade - either in response to new developments (or ones that can be predicted for the future) or as a result of better insights into old problems. They, too, now demand closer attention.

The State of the Waters

Pollution

Historically, pollution has caused the most concern about the state of the oceans. Over the last decades, increasing understanding of the seriousness of other threats - such as overfishing and the destruction of habitats - and the damage they do, has tended to overshadow it. But very recently new evidence, compiled by GESAMP, suggests that it has far greater effects than has been realised. Contamination of bathing waters and shellfish by micro-organisms and sewage may well have as big an impact on health as some of the most feared diseases afflicting humanity.

Sewage pollution of the sea is, of course, as old as civilisation. It is not necessarily a bad thing, as it provides nutrients which, in moderation, can benefit sea life. The problem arises when there is too much of it in too small an area. Even in ancient times some stretches of sea - such as the Bosphorous and the waters off the Nile delta - became badly polluted. Now with the

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rapid growth of the world's population, and its increasing concentration round the coasts, many inshore waters have become overwhelmed.

This is more than just an aesthetic nuisance. Sewage pollution ruins large areas for recreation and tourism, causing major economic loss. Eutrophication and blooms of algae, stimulated by too much nutrition from sewage and agricultural chemicals and wastes, does widespread and serious damage to the life of coastal waters (see below). And there are frequent outbreaks of cholera, typhoid and other diseases, caused by contaminated seafood and bathing areas - particularly in areas where there are many carriers of the pathogens, and sewage treatment and disposal is inadequate. A major outbreak of cholera in Naples in 1973, for example, came from eating shellfish: an even greater epidemic of the disease which affected many millions of people in Latin America from 1991 to 1995 - and took 10,000 lives - started in the coastal cities of Peru.

But, in fact, such dramatic outbreaks are responsible for only a small part of the toll of disease caused by sewage pollution. A new study sponsored by GESAMP and the World Health Organisation (WHO), now shows that - far from just causing isolated, local problems - contamination of the sea has precipitated a health crisis with serious and massive global implications.

Many studies show that respiratory and intestinal diseases and infections among bathers rise steadily in step with the amount of sewage pollution in the water. They demonstrate, too, that bathers are at risk even in lightly contaminated waters that meet the pollution standards laid down by the European Union and the US Environment Protection Agency. A recent WHO report has estimated that one in every 20 bathers in "acceptable", slightly polluted waters, will become ill after venturing just once into the sea.

The GESAMP/WHO study - based on global figures of the number of tourists who bathe, and WHO estimates of the relative risks at various levels of contamination - estimates that bathing in polluted seas causes some 250 million cases of gastroenteritis and upper respiratory disease every year: some of these people will be disabled over the longer term, and some will die. The global impact can be measured by adding up the total years of healthy life that are lost through disease, disability and death using a new measurement- the Disability Adjusted Life Year (DALY) - developed by WHO and the World Bank. When this is done the world-wide burden of disease incurred by bathing in the sea, adds up to some 400,000 DALYs, which is comparable to the global impacts of diphtheria and leprosy. It costs society, worldwide, about US \$1.2 billion a year.

The toll from consuming contaminated shellfish is even greater. One study suggests that seafood is involved in 11 per cent of all the outbreaks of disease carried in food in the United States, 20 per cent of them in Australia, and over 70 per cent in Japan, which has a particularly strong tradition of eating it raw.

Pathogenic bacteria can survive in the sea for days and weeks; viruses can survive in the water, or in fish and shellfish, for months. The particularly virulent infectious hepatitis virus - which has caused many outbreaks of the disease associated with eating shellfish - can remain viable in the sea for over a year. Shellfish, like oysters, mussels, clams and cockles, feed by filtering huge amounts of seawater - and can concentrate viruses and bacteria a hundredfold from the water in which they live..

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A series of studies has found viruses in about a fifth of the shellfish taken from waters that meet US bacteriological standards for growing and harvesting them. There is strong evidence that fresh shellfish - on sale for food - frequently contain enough viruses to make a many of those who eat them ill. They are often eaten raw, or after only light steaming which is not enough to deactivate most of the viruses or bacteria.

One US study suggested that one in every hundred people eating relatively lightly contaminated raw shellfish will be infected with a moderately serious intestinal virus disease; the risk rises to up to 50 in a 100 if the virus is highly infectious. Other studies in both the United States and the United Kingdom suggest that a quarter of those who are taken to hospital suffering from infectious hepatitis - a disease that can confine sufferers to bed for two to three months - have caught it from eating raw or lightly steamed shellfish.

Some eight billion meals of shellfish are thought to be eaten worldwide each year. The GESAMP/WHO study estimates that these cause between five and ten million cases of infectious hepatitis, 50,000 - 100,000 cases of long-term liver damage, and another 50,000 - 100,000 deaths. Its calculations suggest that this produces a global burden of between 3,500,000 and 7,000,000 DALYs a year, comparable to the impact of diabetes and trachea, brachia and lung cancer - and costs world society some US\$ 10 - 20 billion annually.

This is just one example of a general reappraisal of the relative importance of different pollutants of the sea that has been taking place. Some of those once thought to be the most damaging worldwide are now seen to be much less important, either because more is known about them or because they have been brought under control.

To take one example, the supposed effects of man-made radionuclides discharged into the sea still loom large in the minds of the general public and politicians. Although threats from accidental releases cannot be ruled out, radionuclides now probably worry scientists less than any other category of marine pollutants. Much the same is true of oil pollution, which is now seen as affecting particular areas, rather than the world's oceans as a whole: even dramatic accidental spills have only local effects. Similarly, metals - including the once greatly-feared heavy metals - are now thought to pose a far smaller global threat than, say the nutrients that cause eutrophication or persistent organic chemicals.

Until recently, most attention concentrated on pollutants which directly or indirectly poisoned sea life and those consuming it - or were suspected of doing so. Less attention was given to the potential effects of substances, like the persistent organic chemicals, which may have much more subtle, but possibly even more damaging effects. These include changes in the composition of ecosystems and the way they function - through damaging reproduction and altering behaviour - and effects at the molecular level - such as causing cancer or mutations or disrupting endocrine systems. The evidence that the concentrations of these substances now in the marine environment is causing such effects is mostly inconclusive. But there are indications that they may indeed be taking place, and that they could harm the health of people who eat seafood.

It is now well-established that endocrine disrupting chemicals can harm a wide range of wildlife species, at both land and sea, and they may give rise to strange 'gender-bending effects'. Tributyl tin, for example, - which has been widely used as in anti-fouling coatings on ships and in fish farming - appears to have caused female dog whelks to grow false penises: its use has now been restricted in most developed countries, but it is still being traded on the black

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market. It is very possible that other environmental chemicals could 'sneak up on us', causing other unexpected effects.

Eutrophication

The excessive growth of marine plant life - eutrophication - is potentially one of the most damaging of the many harmful effects that humans have on the oceans, both in its scale and its consequences. It can turn parts of the sea into wastelands.

Plants in the oceans, as on land, need adequate nourishment from minerals and organic substances if they are to grow well. Life is far more profuse in coastal waters, which are rich in these nutrients, than in the open oceans. Conversely, areas with poor supplies of nutrients support little life; their transparent and apparently 'clean' blue waters may be aesthetically attractive, but biologically they are the equivalent of deserts on land.

But water can also have too much nutrients. When this happens, usually because of pollution from the land, plant life - phytoplankton or algae - proliferates. Long term increases in phytoplankton, and their decay in deep waters, can deplete oxygen over large areas, either periodically or permanently - and dramatically alter ecosystems. Coastal areas with relatively little circulation of water are particularly vulnerable. A "dead zone", for example, appears off Louisiana in the Gulf of Mexico each summer: excessive nitrogen from agricultural fertiliser used upstream, and flushed down the Mississippi River, has been blamed.

Increases in the abundance of phytoplankton also make water less transparent, and thus reduce the penetration of sunlight into the sea. Coral reefs, seagrass beds, and other ecosystems that depend on light, can suffer. And the reefs can be threatened in another way too. Eutrophication can cause seaweeds on the ocean floor to grow so fast that they outstrip the corals and smother them; the reefs stop growing and start to erode, and much of the diversity of the ecosystem is lost.

Eutrophication can cause explosive 'blooms' of algae - such as 'red tides' - which cover the surface of the sea. And changes in the relative amounts of different nutrients can increase the growth of toxic algae, or ones that are harmful in other ways. The toxins can accumulate in shellfish and poison people when they are eaten. The poisons can also be blown to land, at times causing eye irritation, respiratory problems, and other complaints. Algae can also harm other marine life, including whales, dolphins and other marine mammals - and commercial fish. They devastate tourism in areas like the Adriatic, and damage aquaculture, with massive economic and social costs. There are indications that blooms, both toxic and otherwise, are increasing.

Humanity mainly adds nutrients to the sea in sewage, through agriculture (for example from fertilisers and animal wastes) and in the fallout of nitrogen oxides from burning fossil fuels. Naturally, municipal sewage tends to be the main source near cities and agriculture in rural areas. Worldwide the most nutrients reach the seas down rivers (the main route for inshore areas) and by being blown in the winds (the main one for the open ocean).

Cutting the amounts of nutrients that naturally reach the oceans can also do damage. Building dams and reservoirs, and withdrawing and diverting water for industry and agriculture, all reduce the natural contribution of nutrients from rivers to the sea. This can reduce the productivity of marine life, change the diversity of ecosystems, and hit fisheries. Building the

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Aswan High Dam, for example, reduced the flow of the Nile by more than 97 per cent, cutting the nutrients travelling down the river. As a result catches of sardines slumped by 90 per cent, those of shrimp by 75 per cent.

Box.

Falls in nutrients from natural causes have hit fisheries. The best known example is the effects of the El Nino phenomenon along the west coast of South America. Normally, deep water rises to the surface, bringing plentiful supplies of nutrients to these waters and making them among the most productive in the world. But during El Nino events this process stops and the amount of nutrients in coastal waters is greatly reduced. Plankton populations drop dramatically, disrupting the whole food chain, including anchoveta and birds. During the 1957/8 El Nino event about half of the 30 million guano-producing birds in the area starved to death, while the 1972/3 event reduced the fish catch from 14 million to two million tonnes, nearly causing an economic catastrophe in Peru.

End Box

Altered sediment flows

Changing the flow of rivers in these ways also cuts the amount of sediment flowing down them to the sea. This can wreak major changes on coastlines and has led to serious coastal erosion in many parts of the world. The shores of the Nile Delta were swept away much faster when the completion of the Aswan High Dam reduced the flow of sediments down the river to less than 3 per cent of what it had been. The same thing happened to the Delta of the Indus after the construction of barrages cut the sediment carried by the river by 80 per cent.

Other activities, by contrast, *increase* the flow of sediment down rivers. Felling forests, for example, causes more soil to run off the land, especially during storms; it goes into rivers and streams and eventually finds its way into the sea. Some agricultural practices also cause soil erosion. The amount of sediment in rivers can rise during the building of dams and roads, and other large earth-moving projects, and the diversion of watercourses. Increased sediment makes the water cloudier, cutting down the light reaching life that depends on it. Coral reefs and other communities on the sea-bottom suffer both from losing light in this way and because they become covered in silt. And increased sedimentation along the shore can affect wetland and delta habitats.

The Life of the Seas

Fisheries

The world's fisheries - on which about a billion people, mainly in developing countries, depend for their primary source of protein - are in crisis. Many are now in decline, many more may follow them. The effects on the environment, economies and societies are probably causing more concern than any other marine issue, apart from the wide and varied impacts on the seas from activities based on land.

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The last decade has seen the end of a 40 year fishing boom. The worldwide catch increased more than four times over between 1950 and 1989; but has since stayed at around the same level. In 1997, 86 million tonnes of fish were caught at sea (catches from inland waters, and rapidly increasing aquaculture, increased total fish production to 122 million tonnes): 40 - 50 million tonnes of this marine catch is eaten directly by people, while much of the rest goes to feed poultry, farmed fish and other animals raised for human consumption.

Fishing harder will not do much to increase the catch. Indeed the boom ended because it went too far; the levelling off is mainly the result of overfishing. Catching fish faster than they can reproduce reduces stocks, and thus the harvest of the seas falters and then falls. The decline has reached serious proportions in many coastal waters - particularly inshore areas with dense populations, a high demand for fish, and little employment - and has also affected many fisheries on the high seas.

In the early 1950s, 55 per cent of the world's fisheries stocks were under-exploited: by the end of the 1960s, none were. By the mid 1990s catches of about 35 per cent of the world's stocks were decreasing, and those of another 25 per cent had stagnated at a high level of exploitation; only the remaining 40 per cent were continuing to yield more fish.

Putting more effort into fishing most of the stocks currently exploited will only lead to further falls in catches. Indeed, if widespread overfishing continues - and there is no sign of it abating - worldwide food supplies from the sea may well decline sharply over the next decade. It has been estimated that the amount of fish caught for direct human consumption may fall by a fifth by 2010, from the present 50 million to 40 million tonnes.

Overfishing does not just deplete fisheries and reduce catches. It makes fishing very expensive, reducing its economic benefits, as boats have to go further, stay at sea longer, and burn more fuel to gather their harvest.

Much of what is caught - whether fish, shellfish or other marine life - is thrown away. Every year, it is estimated, the "by-catch" of unwanted fish - including "discards" (those thrown back into the sea) - amounts to 20 million tonnes worldwide. Usually these are undersized or unmarketable fish, accidentally caught in the nets. But sometimes perfectly useable fish are thrown away, through the practice of "highgrading". This can happen, for example, when quotas are set on the number of fish to be caught, ironically a conservation measure: fishermen may then discard part of their catch in order to make space for bigger or more valuable fish.

Traditionally, the most intensive fisheries have been near coasts, but now fleets are venturing out into deeper waters in search of new stocks as the more accessible fisheries are increasingly overexploited. Fishing on continental slopes in depths below 500 metres for predators at the top of the food chain is becoming more common. These fish are long-lived and grow slowly, and so are particularly vulnerable to overfishing, as the story of the orange roughy demonstrates (see box).

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Box.

Rough times for the orange roughy.

Fishing for the orange roughy began on New Zealand's continental slope in 1984. The fish became very popular, partly because of its excellent taste and partly because it has a high concentration of healthy fatty acids; so it was soon fetching a high price in export markets. As a result, both fishing for the orange roughy, and catches, increased rapidly; 63,000 tonnes of it were landed in 1988.

This haul, however proved to be the high point - just four years after fishing began. For the fishery grew much faster than did knowledge about it. The orange roughy - unlike most commercially harvested fish - is very long lived; some scientists believe they can survive for 150 years. It grows slowly, takes 20 to 30 years to reach sexual maturity and reproduces at a leisurely pace. So it can only sustain a low level of catches, much lower than took place while the fishery was growing. Catches fell after 1988, as the stock declined, even though new areas were constantly being opened up for fishing.. Stringent measures have now been imposed to try to rebuild the stock, but this will take decades.

End box

Deep sea ecosystems are very vulnerable, recovering only very slowly once they have been disturbed; so there is particular concern that trawling them may do grave damage. Fishing can severely deplete them by removing large amounts of their life, both in the intended catch and in the by-catch - which can comprise more than half of the contents of the nets.

Other practices endanger ecosystems nearer to the shore. Excessive trawling and dredging and illegal fishing with explosives, poisons or drift-nets have a major ecological impact. Pollution can pose a severe threat to harvesting shellfish. Eutrophication can choke near-shore waters important to young fish, though it does not seriously affect fish stocks. And some fish seem to be particularly vulnerable to climatic changes - like those attributed to the El Nino phenomenon in the Pacific - and other external factors.

The fisheries crisis is driven by three main failings:

* Many of the world's fisheries - and particularly those on the high seas - are still a free-for-all. For all our civilisation, we are still hunter-gatherers at sea. Free and open access encourages overfishing as each boat, and each nation, tends to catch what it can - like our forebears on the African plains - without taking care, as a farmer would, to maintain and increase the stock. Existing fisheries bodies and agreements have only a weak commitment to international co-operation.

* Many nations heavily subsidise their fishing fleets; one recent study estimated that subsidies total up to \$20 billion worldwide every year. By encouraging unprofitable and unsustainable fishing, they make overfishing even worse. Removing and reducing them, however, would have short to medium term economic and social consequences that Governments and the fishing industry are reluctant to accept. Meanwhile many developing countries are struggling with an increasing demand for food from their growing coastal

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populations, can offer little alternative employment to people now working in the fisheries sector, and do not have the capability or resources to enforce sustainable fishing..

* Some attempts to conserve fisheries - like introducing closed seasons or setting limits on the total catch allowed, but not on the amount that can be caught by each boat - may unintentionally allow fishing fleets to grow too much. If a fishery is profitable enough, owners will continue to build and operate boats even if they have to be tied up during part of the year. And they will therefore work all the harder during the period when they are allowed to go to sea.

In all, the present system adds up to a massive waste of capital, labour and fishery resources. And it looks like continuing to be so. Unless governments - and other users of fisheries - take effective action, overfishing, and long-term declines in catches, will inevitably continue.

Genetic modification is a new threat. New strains of fish, invertebrates and microalgae that grow fast and resist disease have been developed for fish farming. There is increasing concern that if these are released, intentionally or not, into the seas they could threaten the health - and even the survival - of populations of their wild relatives.

Biodiversity

Not long ago the oceans were thought to be less biologically diverse than the land. Now they are known to be much more so. Forty three different animal and plant kingdoms (*phyla*) are represented at sea, compared to only 28 on land. Recent studies suggest that even the deep seas, which were thought to be comparatively devoid of life, may contain more species than all the Earth's landmasses put together.

Research into the biodiversity of life at sea has been relatively neglected, but there is a great deal to be gained from protecting it. Fish catches depend on it; the species caught by fishermen are sustained by the biodiversity of their food chains and habitats. Marine species are probably the greatest untapped source of chemicals that could become new pharmaceutical drugs. The genetic material of some species may prove to be useful in biotechnology. And species found near the hot vents on the deep ocean floor have shed light on some of the basic processes of evolution.

Some species, like corals and fish from coral reefs, are threatened by trade. They are much in demand in rich countries as curios and for aquariums and for luxury foods, as is shark fin, for soup. They therefore fetch high prices, providing a strong incentive to trade in them. The trade is poorly regulated and largely uncontrolled. So they are often severely overexploited, and sometimes their habitats are destroyed in the process. Some coral reefs have been degraded both by having too much coral taken from them and by being damaged by people catching the fish. But, by and large, outright destruction of habitats - like the mining of reefs for construction materials - has a much more serious effect in biodiversity.

The good news is that the wildlife holocaust that has been taking place on land has not reached the seas; species are not becoming extinct at anything like the same rate. But though less attention has naturally been paid to the reduction of the biodiversity of the oceans, it is gradually being recognised that this is a potentially important issue. Marine species, like sea turtles and giant clams have been driven to local extinction by overexploitation or because their habitat has

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been destroyed. There is particular concern about the effects of killing off 'keystone' species, which hold ecosystems together; when they disappear the structure and functions of the whole ecosystem may change.

Alien species

As the world shrinks, through growing travel and transport, marine species are frequently ending up, breeding and thriving, far from their natural habitats. They can have devastating effects on their new environments and ecosystems, and could end up costing economies many billions of dollars.

Of course, people have taken other species with them since they first began to travel, introducing them to their new homes to provide food or sport, or even merely for aesthetic reasons. There have also been major invasions of species from one sea to another when humanity has artificially connected them, as with the Suez Canal. Often introductions have been mainly beneficial: most modern crops and livestock have been spread through the world in this way. But there are cases where they have done grave ecological and economic damage, while introductions of toxic algae have even harmed human health.

What is happening now, however, is on a much bigger scale. Every day, it has been estimated, 3,000 species of animals and plants are being transported around the world in the ballast water of ships. They join the ship when the ballast is taken on board at the start of the journey, and leave it when it is discharged at the destination, possibly on the other side of the world. Other species get into the sea after being released from aquariums and fish farms.

Most of these alien species are introduced near coasts, and these waters are particularly vulnerable to them. Many do no damage to their new habitats, but some have threatened the survival of native species or even driven them to extinction, damaged fisheries and aquaculture and changed whole ecosystems. European zebra mussels have done damage worth many millions of dollars in the Great Lakes of North America, a Mediterranean crab has had a similarly costly impact in Latin America and the United States, and so has North Pacific Seastar from Japan in Australia. One of the most damaging of all such invasions has been the spread of a jellyfish, *Mnemopsis leidyi*, in the Black Sea. (see box)

Box: The Nemesis of the Black Sea,

The effects of a jellyfish invasion on the Black Sea is one of the best documented examples of the far reaching - almost catastrophic - economic and ecological consequences that can follow introducing an alien species into an environment favouring its almost unlimited expansion.

Mnemopsis Leidyi originates on the Eastern seaboard of both North and South America. It abounds in their ports and harbours, and is pumped in ballast water into cargo ships. Enough food to sustain the jellyfish on the 20 day voyage to the Black Sea, may well be pumped in withn them. But they will survive, even it is not, because they can live for three to four weeks without nourishment, by reducing the size of their bodies. They were first found in the Black Sea, off the South East Crimea, in 1982.

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Damaging human activities - including overfishing, pollution, water extraction and barrages on rivers running into the sea - set the stage for its entrance. Overfishing and eutrophication seem to have combined to remove top predators like turbot, bluefish, and monk seals and to cut the numbers of plankton-eating fish severely, opening up a niche for the jellyfish. Meanwhile plankton proliferated.

Hermaphroditic and self-fertilising, the numbers of jellyfish exploded from 1988. The populations of plankton crashed as the invaders ate them. Then fish stocks collapsed, as the jellyfish deprived them of their food and ate their eggs and larvae. The catch of the former USSR states plummeted from 250,000 tons to 30,000 tons a year, and it was much the same story in Turkey. At least \$300 million was lost in falling fishery revenues between the mid 1980s and the early 1990s, with grave economic and social consequences: fishing vessels were put up for sale, and fishermen abandoned the sea.

End box

The problem is bound to get worse. Increasing trade and coastal development - and greater commerce in sea life - will make introductions of alien species even more common. They are hard to control. It usually takes a long time - often decades - before an introduced species has multiplied enough for its presence, and effects, to become obvious; in some cases billions of dollars of damage have been done before the first attempts at control have been worked out. And, with present technology, controls are insufficient and haphazard, even when implemented

Habitats

The greatest of all threats to biodiversity, and the most widespread human impact on coastal zones, comes from the destruction and alteration of habitats. This can happen through a wide variety of means; physical, such as draining or 'reclaiming' land, extracting gravel, or the deposition of sediments from soil erosion or deforestation; chemical, such as pollution; and biological, such as invasions of alien species. It can also occur as a result of entirely natural processes.

Destroying habitats often has dramatic knock-on effects. Take the widespread destruction of mangrove forests; in many tropical areas more than half of them have now been cut down to provide wood and wood chips or to make way for such developments as aquaculture, road building and the spread of towns and cities. But this hits fisheries, as mangroves are vital breeding areas and nurseries for many fish, crustacea and molluscs. It increases the flow of sediments, normally filtered out by mangrove roots. And it increases the vulnerability of coasts and their peoples to storms - turning natural events into human disasters - as intact forests provide effective buffers against them. Wetlands have also been enormously reduced by coastal development, with similar knock-on effects. In all, only about five per cent of Europe's coastline remains undisturbed.

Box.

Tens of thousands of people died in October 1999 when a cyclone hit the eastern coast of India, with winds of up to 300 kilometres per hour. It brought a tidal surge and torrential rain, causing rivers to break their banks. The flat land near the coast was flooded and slums as far as 50 kilometres from the coast were destroyed. The tragedy would have been much smaller if the

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coastline had still been covered in mangrove forests, as they would have dissipated the energy of the waves and greatly reduced the damage and loss of life. But these had been destroyed to make way for shrimp farms.

End box

Coral Reefs

Coral reefs, arguably the richest of any of the ecosystems in the sea, have been damaged in 93 of the 110 countries in whose waters they are to be found. Some 27 per cent of the world's reefs are at high risk of degradation: this figure rises to 80 per cent in populous areas. The damage comes from a wide range of causes, ranging from sedimentation and eutrophication, to ships anchors and trampling by tourists. They are also blasted to make way for ports or navigation, and mined for building materials and lime. Overfishing can profoundly imbalance their ecosystems, while fishing with dynamite and poisons does further damage.

There is increasing concern about outbreaks of disease which, over the last decade, have in places seriously reduced the number of corals and other key organisms, and badly affected the ecology and productivity of reefs. Presumably, some of these diseases are natural: they have been known since the 1970s, and occur on reefs far from the impact of human activities. Yet there is reason to believe that they are becoming both more frequent and more serious. There is particular concern about corals in the Caribbean and off the Florida Keys.

Many uncertainties remain, but nevertheless there is a strong suspicion that these diseases are linked to increasing pollution of coastal waters. If this is so, the very future of the reefs and their ecosystems is in doubt: if there are fewer corals to build the reefs, they may erode away and eventually be destroyed altogether.

Coral reefs are also increasingly affected by bleaching (see box). The combined effects of diseases and bleaching may have far reaching economic and social consequences. Fisheries and tourism are both likely to be particularly badly hit, resulting in serious losses of income and jobs.

Box; Coral Bleaching.

Mass bleaching of corals was discovered on reefs all over the world between 1996 and 1998. In 1998, they were found on two thirds of all the world's reefs; in some places, such as around the Maldiv Islands, the proportion rose to 90 per cent. It is caused by the water at the sea surface getting warmer; these outbreaks took place at the same time as a strong El Nino event. It is not yet clear whether bleaching is increasing worldwide as a result of global warming. But there is increasing concern that reefs will not be able to recover if it becomes more frequent, particularly when they are already stressed by pollution and other human activities.

End box

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The Oceans and the Atmosphere

Global Warming

Global warming - predicted to take place faster than at any time in the last 10,000 years - is probably the most widely recognised issue affecting the world's seas and coasts. It is likely greatly to exacerbate many of the problems they face.

Although the effects of human activities on the climate are still debated, the best scientific assessment is that the steady and accelerating increase in concentrations of carbon dioxide and other greenhouse gases in the atmosphere over the last century - mainly from emissions in industrialised countries - is rapidly altering the Earth's heat balance. Evidence is mounting that, as a result, the world's climate is already changing.

The most recent estimates suggest that, unless preventative measures are taken, the Earth's temperature will rise by between 1 and 3.5 degrees over the next century. At the same time, according to the Intergovernmental Panel on Climate Change, average sea level is expected to rise between 13 and 94 centimetres (50 centimetres is seen as the most probable figure).

The oceans will both profoundly affect the rate of climate change and be profoundly affected by it. They can absorb a thousand times more heat as the atmosphere. By storing these they create a massive inertia in climate change, which delays its onset, but then, once it begins to take hold, makes it irreversible in anything less than several centuries.

Most concern over global warming has focused on its effects on land - and on the species, including *homo sapiens*, that live on it. Relatively little attention has been paid to its impact on the seas and oceans. But it threatens to cause a whole series of changes to the marine environment.

The flow of major currents, one of the driving forces of the oceans, may change. This would alter the make-up of marine ecosystems, and the way they are distributed through the seas, with far reaching consequences both for the ecology of the oceans and for the economies of the nations that surround them. It may also have dramatic repercussions on climate; for example, if global warming alters the flow of the Gulf Stream, as some scientists predict, North West Europe could get very much colder, even as the rest of the world heats up.

Commercial fisheries are a product of finely-balanced ecosystems, and are bound to be affected as they are disrupted. There are already instances when the abundance of fish has been affected by changes in the oceans linked to the climate; the El Nino phenomenon of the South Pacific, for example, has helped cause crashes in Peruvian fisheries.

Hurricanes, flood, droughts and other extreme climate events are expected to get fiercer and more frequent with global warming: the US National Oceanographic and Atmospheric Administration is already reporting that the number of heavy rainstorms and blizzards has increased by a fifth since 1990. This is bound to have a serious impact at sea as well as on land. For example, major storms can do devastating damage to ecosystems in the intertidal zone, destroy structures, and create breeding sites for carriers of infectious diseases

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Box; The Impact of El Niño.

El Niño is a natural phenomenon, which long precedes global warming. But its effects around the world - killing people, destroying homes and other buildings, disrupting transport and devastating agriculture - may give a foretaste of what can be expected from the greater and more frequent extreme events expected as the world warms up. The World Meteorological Organisation reports that the extreme climates caused by the last El Niño in 1997-8 seriously affected some 117 million people worldwide, killed more than 21,000, and made around 540,000 ill. It drove 4.9 million people from their homes, did US \$14 billion worth of damage to buildings and other structures worldwide and, in all, cost the world's economies US \$33 billion. Developing countries were the worst hit. South and Central America suffered the greatest economic loss, while mortality was highest in Africa.

End box.

The seas will rise, mainly because the oceans will expand as they warm up, inundating coastal areas. Some cities - like Bangkok, New Orleans and Amsterdam - have all, or much, of their land below sea level.

The rising seas will not just affect cities, towns, villages, industry and infrastructure. They, and the changing currents and wave patterns they will bring, will also profoundly change key natural habitats like wetlands, estuaries, deltas, mudflats, mangroves, and coral reefs. These are particularly vital to the life of the sea, as fish and other species breed in them, providing food for birds, reptiles, amphibians and mammals, including humans.

Pollution will increase as seawater floods sewerage systems, industrial plants, waste tips, and power stations on the coast. And the flooding may also increase malaria, because it is likely to increase the amount of brackish water, in which the *Anopheles* mosquitoes that carry the disease prefer to breed.

Rising temperatures and sea levels may also increase the incidence of other diseases, such as cholera and shellfish poisoning, since viruses and bacteria survive longer in warmer water. Some scientists have suggested that global warming will increase the frequency of blooms of algae, which will in turn lead to more cholera outbreaks as they may harbour the pathogen that causes the disease: but this has not yet been firmly established. Diseases may also take hold more readily in the future because of increasing malnutrition due to falling fish catches, and due to damage to immune systems caused by extra ultraviolet light penetrating a thinner ozone layer.

Some measures proposed to tackle global warming might also pose threats to the oceans. There have been suggestions, for example, that fertilising relatively barren areas of the seas could increase phytoplankton, which would take up more carbon dioxide from the atmosphere, and might even lead to richer fisheries. Experiments suggest, for example, that adding iron to large areas of the southern and tropical Pacific, where a shortage of the metal is limiting plankton growth, could have dramatic effects of this kind. But such a big, deliberate, artificial intervention in the life of the oceans may also have ill-effects, such as favouring the growth of certain species at the expense of others. We just do not know enough to be able to predict the consequences.

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Another idea is to inject carbon dioxide, emitted by burning fossil fuels, directly into the deep oceans, rather than letting it escape to the atmosphere. This would effectively create a short cut. The gas would eventually be absorbed by the oceans anyway; keeping it out of the atmosphere ameliorates climate change. But studies that have examined the proposal conclude that (apart from obvious technical, legal and economic difficulties in putting it into practice) we do not know enough about the natural biological, geochemical and physical processes in the deep seas - or about the effects that injecting the carbon dioxide may have on nearby life - to be able to work out whether it would be either feasible or desirable.

Ultraviolet light

As the ozone layer high in the atmosphere gets thinner, the amount of harmful ultraviolet light getting through to the Earth greatly increases, and so does its effect on the life of the planet. Specifically, there is a rise in short wavelengths of UV-B radiation, especially at the poles. Generally speaking, damage to life increases exponentially as UV-B wavelengths get shorter. So small decreases in the amount of ozone in the stratosphere lead to big increases in biologically dangerous radiation: its effects on marine life are as yet poorly understood.

UV-B radiation affects the upper layers of the ocean. There is evidence that relatively small increases in it can affect photosynthesis, growth or reproduction in some marine species. The eggs and larvae of many fish (including those caught commercially) and bottom-living species float near the surface of the sea, and so may be threatened.

This may become even worse because the ozone depletion may also interact with the lessening of polar ice cover, brought about by global warming, to cause major changes in the spectrum and intensity of the light falling on the waters. This could affect the productivity of the marine plants and phytoplankton on which the food chains of the seas depend. It may have its gravest effects on ecosystems in high, polar latitudes - and the eyes of polar bears may be particularly sensitive to it.

Nitrogen

Enormous amounts of nitrogen reach the seas as fallout from the air. Two fifths of all the nutrient's contamination of Chesapeake Bay, in the United States, for example, reaches it in this way - either through the rain falling directly on its waters, or through rainfall running off the land in rivers to the sea. This means that the fallout fertilises the bay almost as much as farmers do the fields around it; the amount of nitrogen reaching each square metre of water from the air is almost identical to the amount applied to each square metre of cropland. Nor is this an isolated example: similar results have been found in other estuaries and coastal waters in, for example, the North, Baltic and Mediterranean seas.

There is also growing concern about nitrogen fall-out to the open oceans, particularly where - as in vast areas of the central North and South Pacific - lack of the nutrient limits or controls biological productivity. Current estimates suggest that the nitrogen that reaches these areas by air is only a small percentage of the total amount in their waters, but that is recognised not to be the whole story. For great pulses of it arrive at once, when storms sweep it out from the continents to the oceans, and then it may play a much more important role.

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The fallout will almost certainly increase as more and more fossil fuels are burned and more and more fertilisers are put onto the land. And its distribution around the world is likely to change. Over the next 20 years or so, most developed countries are expected only to increase their emissions of nitrogen to the air modestly, if at all: in many rapidly developing regions, by contrast, they will rise significantly. Emissions of nitrogen oxides from energy use are predicted to increase fourfold in Asia, and six times over in Africa, between 1990 and 2020, accounting for 40 per cent and 15 per cent respectively of their worldwide growth. And nitrogen from fertiliser use is expected to more than double in Asia over the same time, contributing about 88 per cent of its increase worldwide. These predictions suggest that there should be big increases in nitrogen fall-out to the seas and oceans downwind of Asia, South and Central America, Africa and the former Soviet Union - and computer models agree. These could possibly lead, in turn, to major changes in the life of the waters in these areas, at least from time to time.

Chapter 3. Land and Sea

Almost all of the problems of the oceans start on land. It is here that virtually all of the pollution originates, whether from factories and sewage works discharging directly at the coasts, from fertiliser or pesticides washed into rivers and down to the sea, or from metals and chemicals emitted from car exhausts and carried by the winds far out to the oceans. Human activities on land - from covering wetlands with rubbish to selling curios from coral reefs, from felling mangrove forests to changing coastlines - put most of the pressure on the ecosystems and habitats of seas and coasts. Similar land-based activities are responsible for almost all the emissions of greenhouse and ozone-depleting gases that have such an effect on the oceans. And even the decisions that guide the fishing fleets and other ships that roam the seas are mostly taken on land.

None of this, of course, is new. Scientists have long been voicing concern about the effects of land-based activities on seas and coasts, and policy makers have widely appreciated them. But more and more data over the last decade have shown that they have been growing - both in scale and type - and are increasingly damaging the environment, both near and far. They are now the major focus of international attention.

The effects on the seas cannot generally be blamed on individual sources or activities. They mostly result from the cumulative effect of a whole variety of them, which vary in importance from place to place, and cannot always be traced with great certainty. Indeed, it can be difficult to work out the amounts even of single pollutants reaching the oceans, particularly when they come from such diffuse sources as agriculture or traffic. But it is possible to describe the nature and consequences of particular categories of land based activities in qualitative - and sometimes in quantitative - terms, as the following sections of this chapter set out to do.

Urbanisation

Humanity is increasingly gravitating towards the coasts. About one in every three people on the planet now live within 100 kilometres of the sea, and 44 per cent - more people than there were on the entire globe in 1950 - are within 150 kilometres of it. Two thirds of all cities with over 2.5 million inhabitants are on the coast, and they are growing fast. Casablanca's population soared from 600 in 1839, and 29,000 in 1900, to almost 5 million today. Dar Es Salaam is growing by 7.8 per cent a year, well over twice as fast as population growth in Tanzania as a

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whole. The rate of population growth in coastal areas is accelerating and increasing tourism adds to the pressure.

The more people that crowd into coastal areas, the more pressure there is on them, both on land and sea. Natural landscapes and habitats are altered, overwhelmed and destroyed to accommodate them. Lagoons and coastal waters are 'reclaimed', wetlands are drained and covered with rubbish, the floodplains around estuaries are built over and reduced, and mangroves and other forests are cut down. Ecosystems are damaged, frequently lost for ever. Fisheries, fresh water, soils and beach sands are often overexploited, at great economic and ecological cost.

Increasing volumes of waste, particularly sewage, are sluiced out into coastal waters: this can cause eutrophication and endanger public health. Solid waste is often dumped on important habitats, like wetlands and mangroves; they are destroyed, and contaminants leach from the rubbish into coastal waters. The waste itself is increasingly getting into the sea, either by accident or design, in what is a growing worldwide problem. Litter is common in coastal waters and is strewn across many beaches, even in remote areas.

Many industrial and household chemicals are also discharged to sea, directly and indirectly, accidentally and deliberately. The commonest are soaps, detergents and other cleaning products; oils, paints, batteries, and other products containing hydrocarbons and metals; and gases used in sprays and cooling systems. A wide range of chemicals also gets into the sea by being washed off land by rain or storms. However, much progress has been made in many countries over the past decade in banning environmentally damaging chemicals, or reducing their use.

Of course, it is not just coastal cities that pollute the sea. Population increases and industrial development in river basins or groundwater catchments can do so too, and also merit concern.

Industry

Industry is also attracted to coasts, estuaries and large rivers. Many plants depend on their waters for feedstock or cooling - and to transport raw materials. They may also need the markets and labour forces provided by such well populated areas.

Much of the world's oil comes from the land or the sea near coasts. Exploratory drilling, extracting oil, and transporting and refining petroleum all produce a great deal of waste, which may seriously affect local coastal and seabed ecosystems. Pollutants can reach the sea from refineries, either directly or as fallout from emissions to the air. Large-scale oil spills have had serious - if local and temporary - effects, but most of the oil reaching the oceans comes from much less dramatic sources, such as routine discharges from ships, fallout from air pollution, and engine oil put down the drains. There is a wide public perception that it is unethical to dispose of obsolete oil platforms, such as oil rigs, at sea. But abandoning them, toppling them over, or dumping them - after removing any hazardous materials - in ways that do not increase hazards to shipping, pose little cause for environmental concern.

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Box. Deep Sea minerals.

So far, drilling for oil and gas has largely been restricted to shallow waters near coasts and to continental shelves. Recent technological developments, however, make it possible to explore for oil and gas - and to exploit them - from ever deeper waters; the current limit is about 2000 meters. The resulting contamination - for example, from the release of oil or gas - could damage large areas of the oceans and their ecosystems. And a blow-out in deep water could be difficult to control quickly, and could cause near catastrophic ecological effects.

In 30 to 50 years time - as conventional deep water oil and gas reserves are depleted - oil companies may turn to extracting gas hydrates from the ocean floor. This would have the advantage of producing a much cleaner fuel than coal, oil or oil shale. The drawback is that the main constituent of gas hydrates is methane, a quick-acting, high-impact greenhouse gas, at least ten times as powerful over the short term as carbon dioxide. Methane released from gas hydrates, as sea levels fluctuated with the coming and going of ice-sheets in geological time, may have had enormous effects on the climate. It will be important strictly to limit any release of the gas if the hydrates are ever exploited.

Extracting minerals like manganese nodules from the floor of the deep sea is not commercially viable at present - but it could become so if technologies improve and the value of the minerals increases. Exploitation on a large scale could extensively degrade ecosystems on the ocean bottom by directly disturbing them, through resuspending sediments and, possibly, through pollution from the operation itself.

End box

Exploring for minerals and exploiting them in areas under the jurisdiction of developing countries is increasingly dominated by foreign, multinational interests. These companies often do not make the same effort to meet environmental standards in those developing countries where they are less effectively enforced. And here, too, the dire need for foreign exchange can easily compromise national environmental policies.

Power plants burning fossil fuels are often built on the coast, and beside estuaries and rivers, because they then have plenty of water for cooling: coastal sites near harbours are particularly attractive as it is then easier to supply them with fuel, especially coal. The warm water they put back in return can have some beneficial effects, such as enhancing the potential for aquaculture; but it may alter the composition of ecosystems. These plants are also, of course, a major source of the carbon dioxide that is emitted to the atmosphere and - depending on the fuel they burn, and the devices they use to control pollution - can also be major contributors of nitrogen and sulphur compounds, and of metals.

Nuclear power stations are often similarly sited so that they can get cooling water. Despite a widely held belief that they are dangerous, they are a relatively minor source of radionuclides. They are generally well regulated, and their environmental record is relatively good. Plants that reprocess spent fuel - such as those at Sellafield in the United Kingdom and Cap de la Hague in France - discharge many more radionuclides both to air and water. However, so long as they are well operated and regulated, their routine emissions have relatively minor effects on human health on a regional or global scale.

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Pulp mills, also often sited on the coast, discharge a wide range of particulates and chemical compounds, sometimes including chlorinated dioxins and furans. Textile and food processing plants, and those refining metal ores are also among the commonest industrial polluters of the sea, discharging organic and particulate matter, and chemicals including nutrients, oils and other compounds. Meanwhile the chemical industry is becoming increasingly globalised. More and more installations are being built in developing countries, Eastern Europe and the former Soviet Union. Large volumes of chemicals are shipped by sea and river, road and rail; this inevitably leads to discharges from operations like tank washing, and poses a risk of accidental spills as the cargos are transferred from one means of transport to another.

Pollution generally enters the sea from coastal industries and sewage systems by being discharged directly into it. It gets there from inland industries via rivers and the air. Worldwide, most particulate pollution, such as many metals, reaches the sea down rivers. Much remains trapped in sediments in and near estuaries and deltas. This is particularly hazardous, as a change of conditions in the water can cause them to be suddenly released in what are, often, very highly populated areas.

Fall out from the air is as important as rivers in contaminating the open ocean with dissolved copper and nickel - and more important for cadmium, mercury, lead and zinc. Most synthetic organic compounds stay in the air for weeks or more, once they have been emitted, and this is the major route by which they reach the open oceans. Once in the sea they may be taken up by the air again and despatched to the polar regions by a process of global distillation, which boils the chemicals off the ocean in hotter areas, and allows them to condense out of the air again in colder ones.

Box: Fallout from the air.

Most contaminants usually reach the open ocean by fallout from the air, rather than by flowing down rivers. And this route can also be important much nearer the shore. More than 80 per cent of the aluminium and nearly 40 per cent of the lead in the waters of Chesapeake Bay gets there directly from the air (though only one per cent of the manganese arrives by this way). Similarly atmospheric fallout is the dominant route by which the pesticide, lindane, reaches the North Sea - and this is typical for many such synthetic organic compounds. It is also an important route to the Sea for lead, about as much reaching it by this route as flows in from the Atlantic Ocean, though less than from dumping.

End box

Agriculture, forestry and aquaculture

Agriculture is an even more important polluter of the sea than industry. Fertilisers and animal wastes - escaping from farms, and working their way into rivers and the sea - are major causes of eutrophication. Pesticides reach the ocean in a similar way. And soil eroded from fields adds greatly to the particulate load of rivers and coastal waters, increasing sedimentation.

Forestry, and the industries associated with it, produces wood fibre wastes, while chemicals, including dioxins and furans, are released during pulping. When not properly managed, it also mobilises sediments. The soil of forests that have been recently logged or burned is particularly likely to suffer heavy erosion, silting up watercourses and coastal waters.

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The cost of the damage done to reefs from sediment from one logging project in the Philippines - in terms of lost income from tourism and fishing - was found to cost four times the revenue gained by selling the logs.

Marine aquaculture grew at a rate of about 9.2 per cent a year between 1988 and 1997. By the end of this period it was producing 18.4 million tonnes of fish, molluscs, crustaceans and seaweed worth US \$26.6 billion a year. It amounted to just over half of all aquaculture, and about 14 per cent of all the world's harvest of fish. But badly managed aquaculture has done grave damage by destroying key habitats like mangrove forests, while genetically modified fish have escaped from it and been found at large in the seas.

Hydrological changes

Changing hydrology also causes much damage to habitats and shorelines. Diverting rivers and other watercourses, building dams, increasing irrigation and using water in industry - all widespread practices - have had major effects on coastal areas.

Dams, and other impoundments, are constructed to provide water for irrigation, control floods, and develop hydroelectric power, among other purposes. Unless special measures are taken, they interrupt the migration of fish like salmon and eels between the sea and rivers and streams and so impair their reproduction and life cycles. They also cut the amount of silt and nutrients carried by their rivers to the sea; this increases the erosion of coasts and the loss of wetlands, hits ecosystems that depended on the nutrients, and changes the shape of coasts. And they can alter the way that river flow changes with the seasons, affecting habitats and ecosystems that are attuned to it; indeed most of the damage done by the interruption of nutrients is caused less by the fact that they are reduced per se, than they no longer reach ecosystems at the time of the year when they are needed.

By contrast, carrying out other water engineering works - including straightening or deepening rivers and streams, diverting them, building levees to try to stop them flooding, and destroying wetlands for development - can increase the amount of sediment reaching the coast. They too can change the seasonality of river flows. The results are seen in cloudier water and greater sedimentation, increases in the nutrients discharged to the sea, and changes in the circulation, mixing and salinity of water in estuaries.

Commerce and Transport

Building causeways and roads along the coast often destroys valuable habitats, while emissions from vehicles, carried on the winds, are a major cause of the contamination of the open oceans with nitrogen and hydrocarbons. (On the positive side, removing lead from gasoline has greatly reduced levels of the metal in ocean surface water worldwide).

The development of ports imposes particular stress on coastal habitats. These can be completely destroyed by dredging, reclaiming land, and construction on the coast. And they may be just as badly affected by the jetties, navigation channels, basins for turning and anchoring ships, and all the other infrastructure that ports require. These dramatically alter flows of water, sediments and nutrients - as well as other processes in ecosystems. They can have just as severe an impact as the direct physical destruction of habitats, and affect a much larger area.

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All this will get worse, for an ever-increasing growth in maritime commerce and traffic is demanding the development of more ports and the expansion of existing ones. And it is not just the volume of traffic that is growing; bigger ships, with much deeper drafts, are on their way. So even the ports that can handle more ships will need deeper and larger channels, basins and docks to accommodate these new classes of vessels.

Unfortunately, the places most favoured for ports are often home to particularly valuable habitats. These wetlands, lagoons, mangroves, seagrass beds and coral reefs are as biologically diverse and productive as any ecosystems on earth, and are critically important breeding, nursery, feeding and migration sites for fish and other wildlife. They are also often prime sites for fishing, recreation and tourism. So developing ports can have effects that are out of proportion to the area involved. There is even more need than usual for good planning and management - including a thorough and integrated environmental cost-benefit analysis.

The ideal place for a port is a natural deep-water harbour. In practice, however, most develop in estuaries, deltas and enclosed bays. These are shallow and suffer a great deal of sedimentation, and so they need continual dredging if ships are to be able to go on passing through them. This - and the disposal of the dredged spoil at sea - repeatedly resuspends sediments in the water, and can, if not properly regulated, have effects as severe as building the port in the first place.

On the positive side, more and more facilities are being provided at ports to receive waste from ships, as part of a global drive against pollution from vessels. But, desirable as this is, it does create the risk of pollution when the measures taken to manage the wastes, once received, are inadequate. Many small islands, for example, simply do not have enough safe places to put large volumes of them.

Tourism

Tourism is the world's biggest industry - indeed the biggest the planet has ever seen - and it is growing rapidly. The number of tourists worldwide grew from 170 million in 1971 to 635 million in 1998, while the amount they spent soared from US\$ 21 billion to US \$439 billion. By 2020, The World Tourism Organisation predicts, 1.5 billion international tourists will be spending \$2 trillion - or over \$5 billion every day. It is a big, sometimes dominant, contributor to the GDPs of many nations, particularly small island developing countries: tourism already accounts for a quarter of the total economy of the Caribbean, and provides a fifth of all its jobs.

If tourism is well planned, and is appropriate to local circumstances, it can do much for the sustainable development of coastal areas. Tourists are attracted to pristine seas, so there is a strong incentive to manage the environment properly. Tourism provides a renewable source of income for coastal communities, and can be used directly to subsidise environmental management; a fee specially levied on visitors to the Great Barrier Reef National Park produced seven per cent of the revenue of the authority managing it in 1996/7.

However, tourism is usually not managed well. There are strong economic incentives to site hotels and other tourist facilities as near to attractive spots as possible, regardless of the aesthetic and environmental damage that may result. Building hotels, marinas and their supporting infrastructure - roads, airports, car parks, harbours, jetties, breakwaters, sea walls, restaurants, golf courses etc. - often greatly changes natural coastlines and their habitats. In

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extreme cases whole ecosystems - such as wetlands, estuaries, mangroves and coral reefs - are destroyed or reduced to insignificance and, as a result, the very survival of key economic or ecological species is thrown into doubt.

The sewage and rubbish that tourists produce add to the difficulties resident populations have in managing their own detritus, especially as the visitors each usually generate more solid waste than local people. The surplus sewage often ends up in the sea, with little treatment. This adds to eutrophication, and can increase the incidence of pathogens in waters used for swimming, boating and aquaculture. Large amounts of fertilisers and pesticides used on coastal golf courses may also get into the sea.

Tourists want to eat local seafood and buy local curios, and so indigenous species are often overexploited to try to satisfy them. In many places it is common for habitats to be destroyed by people walking on reefs, diving or snorkelling - or by the anchors and propellers of boats.

Maritime tourism is increasing, posing special problems. Pleasure boat marinas are often built in attractive places, with no regard for the damage they do to wetlands, lagoons, coral reefs and other local habitats. Often they do not have adequate facilities for receiving, treating and disposing of wastes. Meanwhile many of the cruise ships' favourite destinations cannot cope with the vast amount of wastes they generate. It is, indeed, often questionable whether the countries most visited by the ships get enough of an income from them to outweigh such costs.

Box.

The number of people who go on a cruise each year more than trebled - from 1.4 to 4.5 million - between 1980 and 1983. The largest cruise ship built so far, the Carnival Destiny, carries 3,400 passengers and 1,040 crew, and is taller than the Statue of Liberty and longer than three football pitches. Cruise ships, on average generate about 4,400 kg of waste a day, compared to the 60 kg a day produced by cargo ships and 10 kg a day by fishing vessels. About a third of the waste from cruise ships visiting the Caribbean is deliberately dumped, because the ships do not have incineration units (or they are faulty) or because ports do not have adequate facilities for unloading it. Indeed, even when the waste is properly received by ports, this is often only the beginning of the problem: many countries, particularly small islands, do not have enough disposal sites to deal with it.

End Box.

Military activities and social conflict

War and social conflict also affect the sea. Intensive military activities on coasts cause large-scale destruction of their habitats and ecosystems. Damaged factories, sewage treatment plants and oil installations - rigs, pipeline and terminals - pollute the sea, as do destroyed or damaged ships and aircraft, both military and civilian. And wars increase poverty, making it much harder for countries to address their environmental concerns.

There is little sign of war abating; 20 out of the 45 sub-Saharan African countries, for example, are involved in conflict, or affected by them, a level not seen since the fight for independence decades ago. Harm is done even in peacetime. Wastes, hardware, ammunition and weapons are frequently lost or dumped - deliberately or accidentally - in the sea. They range

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from the usual wastes generated by ships to radioactive effluents, from conventional explosives to nuclear warheads and chemical and biological warfare agents, and include entire aircraft, ships and submarines - some complete with the nuclear reactors that propelled them. Nevertheless most world-wide and regional agreements on the environment exempt military activities from their provisions.

Chapter 4. Action

Action to protect the oceans - and remedy the damage done - is not keeping pace with the ubiquitous threats to them, their resources and amenities. There have been some notable successes in the past decade in improving the quality of the environment of the coasts and seas. But, in general, their degradation has continued and, in many places, intensified. While the open ocean remains still relatively unaffected, impacts on coastal areas - both land and sea - are growing.

The most serious problems, apart from the threats arising from predicted climate change, are:

- * the destruction of habitats, and their physical alteration;
- * the decline of fisheries and other renewable resources;
- * the effects of sewage and chemicals on human health;
- * widespread and increasing eutrophication;
- * changes to hydrology and the flow of sediments.

Most of these problems are old ones. The fact that they continue to be so serious reflects a failure to address them adequately on the national, regional or global scale. Effective action is needed both to deal with acute, short-term threats and with the long term trends of environmental decline. But it remains the exception rather than the rule in many parts of the world. And even where countries have made progress, damage to the marine environment continues, without even providing overall economic benefit to their societies over the long term.

This is all the more unfortunate because the threats to the world's seas and oceans - and the effects that they can have - are now widely recognised. Many governments are fully aware of the dangers, both now and in the future, of failing to tackle them properly. They also accept that there will have to be a concerted political, social, economic, technical and scientific effort to counter and reverse them.

This growing awareness has led to a remarkable number of political initiatives during the last decade. (*see box*). They have an extraordinarily broad scope and may seem, at first sight, to be impressive. But, in fact, most of them fall short of their goals and are not being implemented in a co-ordinated way. They are long on ringing rhetoric, short on effective action..

Box. Major global political initiatives.

1992. The Earth Summit - the United Nations Conference on Environment and Development (UNCED) - adopted *Agenda 21* (the Programme of Action for Sustainable Development). Chapter 17 is devoted to "protection of the oceans, all kinds of seas, including

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enclosed and semi-enclosed seas, and coastal areas, and the protection, rational use and development of their living resources."

1993. *The Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal, the Convention on Biological Diversity, and the United Nations Framework Convention on Climate Change entered into force.*

1994. *The United Nations Convention on the Law of the Sea came into force. It was recognised by UNCED as "the international basis upon which to pursue the protection and sustainable development of the marine and coastal environment and its resources."*

1995. *The Global Programme of Action for the Protection of the Marine Environment from Land Based Activities was adopted.*

1995. *The Code of Conduct for Responsible Fisheries and the Agreement for the Implementation of the Provisions of the United Nations Convention on the Law of the Sea of December 1982 Relating to the Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks were adopted.*

1996. *The Protocol to London Convention was adopted. Once in force it will replace the 1972 Convention on the Protection of Marine Pollution by Dumping of Wastes and Other Matter, and will ban the dumping of most wastes, except dredged material.*

1998. *Designated by the UN General Assembly as the Year of the Ocean.*
Box ends.

Governments as a whole are not putting their money where their mouths are. The 1992 Earth Summit (the UN Conference on Environment and Development) agreed that the world's seas would need about \$12.9 billion a year between 1993 and 2000 - \$900 million of it in aid - if the recommendations it made in Agenda 21 were to be implemented. Nothing like this sum has been forthcoming.

The causes of failure

The root causes of the problems afflicting the world's seas and coasts lie partly in the failure of political and financial commitment by governments and institutions - and in the lack of capability that many have to take effective action even if they wanted to. But they are also deeply embedded in powerful social, political and economic driving forces. These are constantly confronting governments, particularly in developing countries, with short-term needs that have to be satisfied, thus limiting their ability to adopt and implement effective long-term solutions.

Not all environment investment, however, necessarily requires public financing, and so it need not present governments with difficult decisions on where to spend scarce funds. There is plenty of evidence that even people in developing countries are willing to pay to have water and sanitation in their homes, and for their rubbish to be taken away. Encouraging private investment and management to provide such services can create new ones or improve those that already exist; governments may often have to do no more than to ensure that they are regulated properly.

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Box

A wide range of failings both reflect, and help to reinforce, Governments' lack of commitment and capability to address and solve the environmental problems of the seas in a comprehensive way. They include:

** the poor governance of the seas, both nationally and internationally, including a widespread failure to understand the need to approach environmental problems in an integrated way;*

** the fragmentation of international programmes and institutions, and the lack of co-ordination between them. Their objectives are set too broadly and their priorities are poorly defined. They approach the interlinked problems of the seas sector by sector, rather than in an integrated way, and do not involve the different stakeholders meaningfully in designing and implementing environmental programmes.*

** economic constraints, including the low priority that is given to financing measures to protect the environment, and unwise competition for such resources as are made available.*

** scientific uncertainties and deficiencies in information. In many countries the scientific infrastructure is weak, and scientists are little involved in decision-making processes.*

** insufficient public awareness about environmental issues. There is also too little public involvement in - and support for - attempts to solve them.*

** the failure to recognise the economic value of the natural services that the seas and oceans provide.*

End box

No effective long-term solutions to any problems - whether long-standing, emerging, or potential - can be found without dealing with their social and economic root causes. Most, if not all, developing countries are under increasing economic and social stress and are confronted with widespread poverty. They must meet the needs of their people as soon as possible. So many are forced to give a relatively low priority to protecting the environment and conserving natural resources - even though this may undermine their long-term, sustainable development. Addressing these properly ultimately depends on achieving development of realising this without waiving - or even forfeiting - environmental considerations. One of the most promising solutions may lie in developing countries working together to address what are often common problems within a spirit of global solidarity.

Developed countries are not bedevilled by such harsh constraints, but they too are reluctant to adopt responsible environmental policies. They sometimes use immediate economic need as an excuse for inaction. But in fact their reluctance may spring from an unwillingness to alienate powerful economic interests or to modify the institutional arrangements already set up to address the issues, from a lack of constituencies lobbying for proper conservation and management, from failure to understand how to implement responsible policies, a perception that they cannot afford them, and from a lack of understanding of the economic value of coastal ecosystems.

DRAFT NOT TO BE CITED**Science and policy**

Science, management and policy-making must work together effectively if the seas and coasts are to be protected and developed, and if their resources are to be used sustainably. When they do not interact in a balanced way - or public emotions or media outcries dominate decision-making - it is hard to develop rational solutions. For example, the bans on dumping wastes at sea have not been justified as protecting either the environment or public health; indeed sea disposal may be the best option for some materials on both of these grounds. Meanwhile, an important option has been foreclosed.

Most decisions affecting the environment are made for social and economic reasons, heavily influenced by politics. It is quite right that these should be political decisions, but they should be informed by science, and not driven by short term financial considerations. The oceans and their resources cannot be managed wisely without the reliable, useful information which only interdisciplinary scientific research and observation can provide. The need for it is increasing as environmental change accelerates - and it should be seen as very valuable, even in economic terms.

Scientific method is the only rational basis for estimating gaps and uncertainties in our knowledge and for working out the probabilities of the risks involved in different decisions about policies and management. An increasingly interdisciplinary approach among scientists is opening up new vistas and making it possible better to understand the oceans - and how they can benefit humanity. But a cautionary note must be sounded. Uncertainties are inherent and unavoidable characteristics of scientific research: it can rarely deliver the certainty politicians and the general public often expects. So decisions will often have to be taken with less than complete information. It is important that neither they, nor proper management measures, are delayed in the hope that more data may become available.

Unfortunately, only a tiny proportion of what scientific knowledge does exist is passed to managers and policy makers in a useable form. And much of what they do receive is not used, or not used properly. Scientists, for their part, do not involve them enough in designing their research and in defining what information they expect to get from it. Much of the fault lies in the inadequacies of the system: the issues to be addressed, and the research priorities, need to be established by both parties, acting in concert.

Some major scientific programmes aimed at improving protection of the marine environment - e.g the Global Ocean Observing System, initiated by the Assembly of the Intergovernmental Oceanographic Commission (IOC) in 1989 - suffer from similar problems. They have not been conceived on the basis of coordination between managers and scientists and do not adequately involve the interests of developing countries. It is not yet possible to assess whether other programmes - such as the Global International Water Assessment and the Global Programme of Action for the Protection of the Marine Environment from Land Based Activities - will avoid these pitfalls.

Risks and benefits

Caution should be a cornerstone of economic and social development, because it inevitably brings the risk of degrading the environment and natural resources. A precautionary

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approach helps to avoid unwanted results - or at least limits the likelihood of them occurring. This means that the possible consequences of actions should be evaluated when their objectives are drawn up. It means, too, that authorities should take pre-emptive action whenever there is an unacceptable risk of severe and irreversible damage to human welfare, resources or the environment - even if the effects, or the cause, is not certain. If there is doubt about the risks, they should still err on the safe side, taking action to prevent or remedy the damage, but also taking the economic and social consequences into proper account.

Common sense dictates that the activities posing the greatest risks should get the most attention. But this demands objective assessments of risk - and of the magnitude of the consequences should the worst occur. Such assessments are predominantly the domain of the natural and social sciences. But, though they have long been used as a way of determining priorities in safeguarding health, they have not been used adequately for protecting the environment. These assessments - which take into account the degree of uncertainties involved - often produce a different ranking of risks than that perceived by the general public, policy makers and managers. Unfortunately, when politicians take decisions, they often put more weight on such perception than on scientific assessment.

The object of both policy and management should be to get the greatest benefit to society by making wise and consistent choices in the trade-offs between economic development and environmental protection. There are a number of techniques for establishing such 'societal net benefits'; the most important element in all of them is to value the benefits that a healthy environment gives society which at present do not carry a market price or are priced too low. Often this involves value judgements that only society can make, usually through governments and elected leaders.

An integrated approach

The environmental problems of the seas and coasts cannot be addressed singly, or picked off one by one. They are intricately interwoven with each other. The environments of land and sea are also interdependent, linked by complex atmospheric, geological, physical chemical and biological interactions. The human activities that affect, and arise from, these environments are also dependent on economic and social factors. And the problems cross boundaries, so that there has to be international co-operation to set common objectives and implement compatible policies and programmes.

Nowhere is the interdependence of the seas and coasts with their hinterland - a linkage that is economic as well as environmental, historical and cultural as well as demographic - as obvious as where large rivers enter the sea. Many of the world's oldest, largest and most prosperous cities - centres both of culture and commerce - stand where fresh and salt waters meet. Rivers were, and still are, liquid highways carrying people, goods and ideas from the coasts deep into the land and *vice versa*. River basins and the flat land around estuaries are fertile ground for producing food and raw materials for the peoples of the coast. The accelerating environmental problems of the river basins, coasts and seas are still generally seen as separate, and treated as such, instead of being managed as units within a single holistic framework. But some countries, such as France, have developed a successful integrated system for managing river basins, which are being extended to coasts.

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Fortunately, old perceptions that the problems could be solved in isolation, by specific measures addressing single sectors, or just by "technological fixes", are beginning to wane. Today's environmental managers and policy makers are increasingly realising that lasting solutions can only be achieved through a comprehensive, systematic and sustained approach - and that management plans for the sea must be co-ordinated with those for the coastal strips and rivers and their basins.

This is often called integrated coastal management (ICM). It integrates environmental, economic, social, cultural and public health interests, within the framework of sustainable development. It can operate at different levels from the global to the local: countering global warming, for example, can only be done at a worldwide level; managing a fish stock properly has to cover its whole territory. Many countries, developed and developing, are beginning to apply the concept of ICM, in different ways (see box).

Box. ICM in practice.

There are three very broad approaches towards ICM. They are.

** **An integrated institutional mechanism**, where one organisation is responsible for most, or all, aspects of coastal management. For example, the Great Barrier Reef Marine Park Authority, in Australia, is responsible for a wide range of tasks including zoning activities on the Reef, formulating a plan for the area, running education programmes, and developing, interpreting and applying comprehensive research and monitoring programmes covering not just the Reef but the water catchments on the mainland that drain into the area. But it is limited in some ways. It does not manage fisheries on the Reef, and has no executive authority for managing the way land is used on the mainland - though it can influence it.*

** **An institutionally co-ordinated approach**, where one institution co-ordinates the plans and work of others. For example in the Chesapeake Bay Programme, in the United States, the Federal Environment Protection Agency co-ordinates other federal and state bodies. The programme aims at reducing pollution of the Bay by nutrients, and at recovering the abundance, diversity and productivity of its natural resources.*

** **Institutional co-ordination achieved through consultation** within a legislative framework. In Zanzibar, for example, the Ministry of Lands and the Environment has taken the lead in developing a holistic strategy for protecting the coasts. This is based on partnerships with local communities and provides the framework for managing natural resources and other activities. Some Mediterranean countries, developed and developing, are also applying ICM at a national, provincial or local level.*

End box.

The concept of ICM is simple enough, but implementing is often difficult and patchy in practice. As there will be both winners and losers among different interests, policies are often effectively determined by those with big enough constituencies to ensure that their views and interests prevail. Lack of funding and skills may well constrain it, and many countries may need technical and financial assistance. But much can be done to improve management within existing funds and capabilities and there are some cheap systems for providing drinking water and

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disposing of sewage, for example, which may bring great benefits until the money is available to raise standards to the levels found in many industrialised nations.

Box

Policy Requirements

Countries adopt policies to meet their own particular needs. But, when it comes to conserving coasts and seas, these should be set in a framework which contains, among others, the following elements:

** Legislation which provides a legal basis for the protection and management of seas and coasts and defines the conditions under which natural resources are to be used;*

** A policy process which takes the need to conserve them fully into account;*

** Provision for international co-operation to identify issues of common interest, and mitigate damage to shared seas;*

** Setting goals and objectives for conserving and managing the marine environment and providing an institutional framework and financial mechanisms to make it possible to attain them;*

** Considering institutional arrangements that provide for devolving management to the lowest level practicable, for approaching it in an integrated way, and for consulting with resource users and other key stakeholders on decisions that affect them - and allowing them to participate in making them;*

** Adopting principles that are central to managing the resources of the seas and coasts responsibly, including the precautionary approach, the principle of preventative action, the polluter pays principle, and the principle of equity;*

** Including actions in the policy process that will provide timely notice of environmental change due to human activities;*

** Understanding that the policy process is a learning one, and is organic and continuous.*

** A readiness to evaluate the range of available policy instruments, and apply the most appropriate ones; and*

** Providing education programmes to ensure public participation.*

End Box.

This report presents a stark picture of the deterioration of the world's seas and oceans. But all is not yet lost. There are still grounds for hope. The problems are increasingly becoming better understood: the solutions to them are increasingly being

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worked out. The gap between such knowledge and effective action is largely a matter of political will. What is needed is demonstrable political commitment, not merely in signing agreements and conventions, but in providing the resources to implement the remedies that are now so abundantly clear. Then we will be able, as Hamlet puts it, to "take arms against a sea of troubles, and, by opposing, end them."

Chapter 5. Conclusions and recommendations

1. Except for the decline of fisheries, land-based activities are the major source of problems and threats facing the oceans, and especially coastal areas.

2. Man's impact is most severely felt in coastal areas, including the coastal terrestrial strip and the adjacent waters. **Action:**

- * focus management effort on sewage, nutrients (especially nitrogen) and sediment mobilisation;

- * prevent habitat destruction and the loss of biodiversity by the development and/or enforcement of legal, administrative and economic measures appropriate to local circumstances;

- * integrate the management of coastal areas and associated watersheds, thereby recognising the interdependence of freshwater (including groundwater), coastal and marine systems; and

- * establish protected areas for habitats, sites of exceptional scenic beauty and cultural value.

3. The open ocean is much less affected than coastal areas although it shows minor contamination with pollutants that are widely dispersed by atmospheric transport, such as nitrogen, lead, mercury and persistent volatile organic substances. **Action:**

- * continue to monitor the development of the deep sea exploitation of non-living resources, oceanic responses to climate change and the delivery of nitrogen into the open ocean;

- * assess the consequences of potential interventions likely to result in large-scale effects, such as fertilisation of surface waters and sequestration of carbon dioxide in the deep ocean; and

- * design and implement global approaches, whenever appropriate.

4. Many fisheries have free and open access, encouraging overcapitalisation and overexploitation. **Action:**

- * adopt and enforce measures to equate fishing capacity and effort with optimum sustainable yields of stocks; and

- * address artisanal over-fishing through appropriate measures such as seasonal and area closures and creating opportunities for alternative employment.

5. Integrated coastal management (ICM) - encompassing associated freshwater catchments- is increasingly recognised as a more holistic and effective approach to

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managing and protecting the marine and coastal environment. It merits wider application both in resolving existing problems and in dealing effectively with new ones. **Action:**

- * promote cross-sectoral, or holistic, approaches to managing environmental resources and amenities taking full account of environmental, public health, economic, cultural and political considerations;

- * make risk management, cost-benefit analysis and environmental impact assessment (EIA) integral elements of the decision making process;

- * create or strengthen institutional arrangements needed for effective management;

- * seek the active involvement and participation of all major stakeholders (local authorities, the private sector and particularly the interested public) in the design and implementation of ICM; and

- * regularly review management systems and their implementation and adjust priorities, targets and methodologies as necessary.

6. Risks to public health from exposures to contaminated seafood and coastal waters are of greater significance than previously appreciated. Existing quality standards for bathing waters and seafood do not provide adequate protection. **Action:**

- * reevaluate coastal bathing water and seafood quality standards in the light of recent evidence of risks associated with exposures;

- * do not invest in costly treatment technologies or impose stringent quality standards unless they are needed to meet environmental and public health objectives and are appropriate to local circumstances; and

- * do invest in appropriate technologies and procedures to prevent or reduce public exposures to contaminated seafood and bathing waters.

7. There is a need to improve the balance of attention devoted to different environmental sectors (ocean, land, atmosphere) and to ensure that full account is taken of the overall consequences of interventions designed to prevent or correct problems in individual sectors. **Action:**

- * do not foreclose options for ocean disposal without due consideration of the impact on other sectors of environment and overall net benefits; and

- * refrain from an unwarranted preoccupation with issues of relatively trivial consequence for the marine environment (e.g. ocean disposal of oil production platforms, authorised discharges of radioactive wastes) and focus attention on issues of substantive concern (e.g. physical alterations, coastal development and habitat loss).

8. Public information and education on environmental problems in the ocean is inadequate; furthermore, the media and special interest groups frequently direct unwarranted public attention to peripheral and trivial issues, thus diverting attention from issues of substance. **Action:**

- * the media, special interest groups and scientific organisations should fulfil their responsibilities to provide reliable public information and education about marine (and other) environmental issues to enable the public to assess the relative significance of problems and threats.

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9. Every human activity involves a certain degree of risk. It is unavoidable: there is no "zero risk" option. **Action:**

- * strive to minimise risk and, whenever in doubt, apply the precautionary approach; and
- * involve natural and social scientists in the assessment of relative risk and weigh options on the basis of their net benefits.

10. The economic value of goods, services and amenities provided by the environment is poorly appreciated and grossly underestimated by managers and policy-makers. It is only rarely taken into account in developmental plans and activities .

Action:

- * take the economic value of environmental goods and services into account;
- * insist that the costs of environmental degradation should be borne by those who cause it; and.
- * broaden user fees to include hitherto "untaxed", cost-free uses of the environment and its resources.

11. The public sector is still the major contributor to investment in environmental protection, but investments by the private sector are playing an increasingly visible and important role. **Action:**

- * stimulate private sector involvement and investment by using appropriate economic incentives and creating legal and administrative frameworks to promote and protect such investments.

12. National capabilities to cope with the problems of the marine and coastal environment are weak and inadequate in most developing countries. **Action:**

- * governments, aided by the international community, should strengthen the capabilities of national institutions to manage the marine and coastal environment effectively and holistically; and
- * governments should provide national institutions with the authority and resources (staff and equipment) needed to carry out their tasks.

13. If existing global and regional environmental agreements had been implemented as intended, coastal areas would not be in the deplorable state they are today. National legislative frameworks to achieve national goals and implement multilateral agreements are weak in many countries and are often inadequately enforced.

Action:

- * governments should adapt national legal instruments so that they conform with the provisions of internationally endorsed agreements;
- * national and international attention should be focussed on compliance with existing agreements rather than on the development of new global international environmental agreements unless there is compelling justification;
- * governments need to develop a consistent and coordinated approach to their dealings with different international organisations and agreements; and

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* international bodies should improve the coordination among existing global agreements by promoting enhanced collaboration among their secretariats and governing bodies.

. 14. International cooperation and assistance, including the transfer of knowledge, experience, technology and financial resources is benefits both the industrialised and less developed countries and is essential in boosting capabilities of developing countries to protect the environment.. **Action:**

* the international community should improve the flow and quality of official development assistance to less developed countries and devote a larger part of this aid to protecting oceans and coastal areas through genuine partnerships between "donor" and "recipient" countries.

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Appendix

This publication has been prepared by the Working Group on Marine Environmental Assessments, established within the framework of the Joint Group of Experts on the Scientific Aspects of Marine Environmental Protection (GESAMP), with valuable input from all members of the Working Group, contributions from additional experts and assistance of a professional editor.

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The draft of the report was peer reviewed by numerous specialists with different scientific backgrounds, managers and policy-makers (see Appendix 2). Their comments and suggestions were taken into account prior to endorsement of the report by GESAMP.

Members of the Working Group

Lawrence F. Awosika (Nigeria)
J. Michael Bewers (France) – member of the Editorial Board
Richard G. V. Boelens (Ireland)
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Stjepan Keckes (Croatia) – Chairman and member of the Editorial Board
Hillel Shuval (Israel)
Helen T. Yap (Philippines)

Additional contributors

Joan Albaiges (Spain)
Tim Bowmer (The Netherlands)
Heiner Naeve (FAO)
Alexander Soudine (WMO)
Peter Wells (Canada)

Editor Geoffrey Lean (United Kingdom)

Technical Secretary Omar Vidal (UNEP)

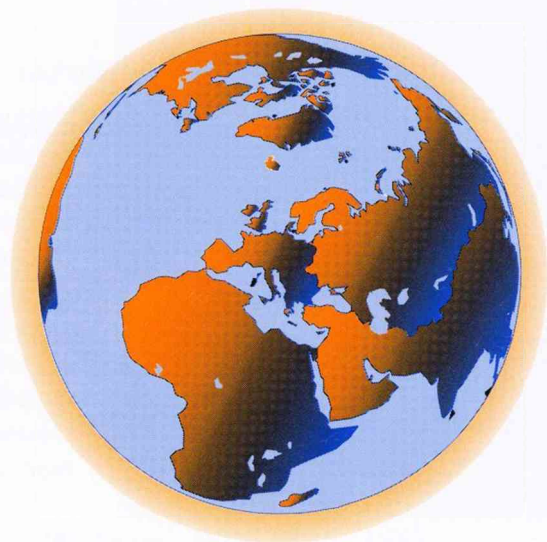
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- 1987** *Elizabeth Mann Borgese*
Nicholas Polunin
- 1986** *Mwaka College of African Wildlife Manage-
ment*
- 1985** *Hassan Asmaz*
Gilbert R. White
- 1984** *Aurelio Peccei*
- *1976** *Maurice F. Strong*
- *1977** *Commandant Jacques-Yves Cousteau*
- *1978** *Professor Mohammed El-Kassas*
Thor Heyerdahl

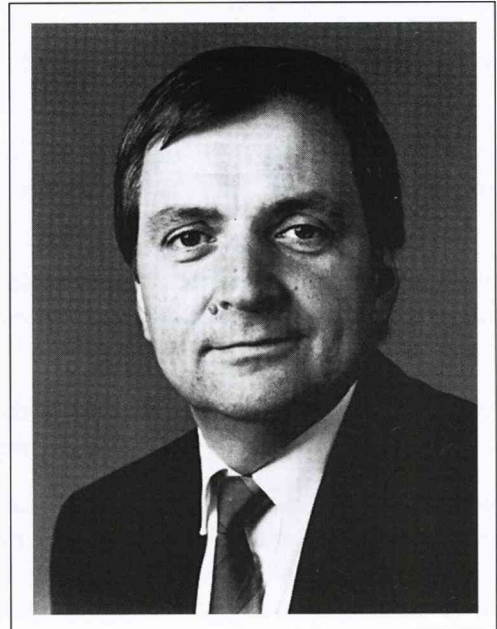
* Pahlavi Prize

EXECUTIVE DIRECTOR'S MESSAGE

It is with great pleasure that I invite you to submit nominations for the prestigious UNEP Sasakawa Environment Prize, which honours individuals who have distinguished themselves by making outstanding contributions to the management and protection of the environment.

Far more significant than the words that describe the eligibility criteria is the larger idea that lies behind it. At its core is the recognition that those honoured with this Prize represent a quest for excellence and a unique commitment to a contract with humanity. The previous laureates profiled in the next few pages display these qualities to an uncommon degree. Their remarkable examples suggests that there is a hunger in the world for people with values and the willingness to assert them.

In honouring them, the United Nations Environment Programme hopes that their examples will encourage them to continue their work and inspire others to join the global coalition dedicated to protecting the environment.



A handwritten signature in black ink, which appears to read 'Klaus Töpfer'. The signature is stylized and written in a cursive-like font.

Klaus Töpfer
Executive Director

History

The United Nations Environment Programme (UNEP) Sasakawa Environment Prize

The UNEP Sasakawa Environment Prize is one of the most prestigious environmental awards in the world.

The establishment of an international environment prize was recommended at the United Nations Conference on the Human Environment held in Stockholm in 1972. This Prize, then known as the Pahlavi Prize, was first awarded in 1976.

In 1982, the UNEP Governing Council accepted an endowment of US\$1 million from the Japan Shipbuilding Industry Foundation to finance the Sasakawa International Environment Prize which would be administered by UNEP.

Now known as the UNEP Sasakawa Environment Prize, it is awarded annually to leading environmentalists and recognizes the work of these individuals at the global level.

Since its inception, interest in the award has increased significantly as attested by the growing number of nominations. After serious deliberations and in the light of the kinds of nominations received over the years, the Selection Committee has recommended that all nominations be considered on an annual basis and that the Prize be awarded to “*individuals who have made an outstanding global contribution to the management and protection of the environment.*” The Prize also aims to encourage environmental achievement in any field of the environment.

The annual award of \$50,000 was increased to \$200,000 in 1990 making it one of the world’s most valuable environmental prizes.

Selection criteria

Eligibility

NO CANDIDATE MAY NOMINATE HIMSELF OR HERSELF.

PAST RECIPIENTS CANNOT BE RENOMINATED.

The Prize is awarded to individuals who have made outstanding global contributions to the management and protection of the environment consistent with the policies, aims and objectives of UNEP.

Candidates can be associated with any field of the environment. Those eligible to make nominations include, but are not limited to, specialists in environmental sciences, academies of science, engineering and research, members of the United Nations system, governments, inter-governmental organizations, trade unions and non-governmental organizations.

Length of candidacy

Nominees will be considered on an annual basis. A new letter of nomination and updated description of achievements is required every year.

Nomination procedures

Identify nominee by completing the attached nomination form.

Include name, professional and home mailing address, present occupational title and institutional affiliation and date and place of birth. Enclose a curriculum vitae or résumé.

Summary of accomplishments

Provide a brief statement of no more than two pages of the individual's achievements in the fields for which the award is proposed. Be precise and factual.

Description of contributions

Provide a detailed explanation of the contributions and explain why each is valuable and effective. Describe how each was accomplished. Mention any significant involvement of others.

References

Provide three letters of recommendation from individuals who can assess the nominee's contributions. Identify three additional referees who might be contacted by the Selection Committee.

Evidence of achievements

The Selection Committee reserves the right to request examples of publications or other evidence which demonstrate the candidate's contributions to the environment. Such materials will be retained by UNEP unless otherwise requested.

Nomination forms

Additional nomination forms for the UNEP Sasakawa Environment Prize may be obtained from:

The Secretary

UNEP Sasakawa Environment Prize

United Nations Environment Programme

Information and Public Affairs Branch

P.O. Box 30552

Nairobi, Kenya

Tel: (254 2) 62 3401 or 62 3128

Fax: (254 2) 62 3692 or 62 3927

E-mail: ipainfo@unep.org

Deadline for nominations

Nominations for the Prize, related credentials, information in support of the nomination and letters of reference must be received no later than **31 April 1999**.

UNEP Sasakawa Environment Prize

Nomination Form 1999

N.B. NO PERSON MAY NOMINATE HIMSELF OR HERSELF

NOMINEE (name in full) _____

DATE OF BIRTH _____

PLACE OF BIRTH _____

NATIONALITY _____

ADDRESS _____

Telephone: _____ Telefax: _____ E-mail: _____

PRESENT OCCUPATION _____

EDUCATION _____

CURRICULUM VITAE (please attach an up-to-date Curriculum Vitae)

HONOURS _____

PUBLICATIONS (attach a list of publications considered most relevant for the purpose of the Prize)

SUMMARY (Outline below the reasons why the nominee should receive the Prize)

References: Provide three persons, not related to the nominee, who are familiar with the nominee's qualifications and work.

REFEREE

NAME (IN FULL) _____

ADDRESS _____

Telephone: _____ Telefax: _____ E-mail: _____

PROFESSION _____

REFEREE

NAME (IN FULL) _____

ADDRESS _____

Telephone: _____ Telefax: _____ E-mail: _____

PROFESSION _____

REFEREE

NAME (IN FULL) _____

ADDRESS _____

Telephone: _____ Telefax: _____ E-mail: _____

PROFESSION _____

NOMINATOR

NAME (IN FULL) _____

ADDRESS _____

Telephone: _____ Telefax: _____ E-mail: _____

PROFESSION _____

DATE: _____ SIGNATURE _____

Please send the nomination form and Curriculum Vitae typed or in block letters, to:

The Secretary
UNEP Sasakawa Environment Prize
United Nations Environment Programme
Information and Public Affairs Branch
P.O. Box 30552
Nairobi, Kenya
Tel: (254 2) 62 3401 or 62 3128
Fax: (254 2) 62 3692 or 62 3927
E-mail: ipainfo@unep.org

Mr. Ryoichi Sasakawa, who passed away in July 1995, was the founder and Chairman of the Sasakawa Foundation for more than three decades. He donated more than US\$400 million to social and public works projects both within and outside Japan. He has also made numerous personal donations. His initiative in Africa with the former United States President Jimmy Carter is now, through the Sasakawa Global 2000, bringing benefits to thousands of peasant farmers throughout the continent.

In 1979, Ryoichi Sasakawa took part in the United Nations Educational, Scientific and Cultural Organization (UNESCO) Peace Forum in Paris as a member of the delegation from Japan. In the same year, he received the United Nations Scroll of Appreciation, which cited his “personal support and extraordinary philanthropy in the cause of improved international standing and co-operation.” That was also the year in which, as a major contributor to the campaign to eradicate smallpox, he established a Memorial Health Foundation to combat leprosy in the world. In 1982, the then United Nations Secretary-General, Javier Perez de Cuellar, presented him with the United Nations Peace Medal.



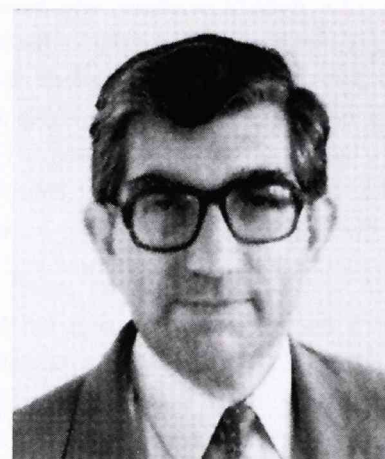
Ryoichi Sasakawa

Selection Committee

Lord Stanley Clinton-Davis, Chairman of Europe 21 and Joint President of the Society of Labour Lawyers, was made a life peer of The House of Lords in May 1990. Prior to being appointed a member of Her Majesty's Privy Council in July 1998, he was the United Kingdom's Minister of State, Department of Trade and Industry. From November 1990 to May 1997, he led for the Labour Opposition in Transport, and from 1994 to 1997, he was President of the British Airlines Pilots Association (BALPA) and he was recently reappointed to that position. From 1984 to 1985 and from 1989 to 1997, he was Chairman of the Advisory Committee on the Protection of the Seas (ACOPS) and in September 1998, he was re-elected as Joint Chairman.

From 1985 to 1989, he was a member of the Commission of the European Communities with responsibility for Transport, Environment and Nuclear Safety. From 1970 to 1983, he was the Labour Member of Parliament for Hackney Central where he was also Mayor from 1968 to 1969. He has also served as Parliamentary Under-Secretary of State in the Department of Trade from 1974 to 1979, as opposition spokesman on trade, prices and consumer protection from 1979 to

1981, and then on foreign affairs from 1981 to 1983. In 1989, he was awarded the Grand Cross of the Order of Leopold II by His Majesty the King of Belgium for services to the European Community, and in 1988, he was the first person to be awarded the European Medal for Animal Welfare.



*Lord Stanley Clinton-Davis
Acting Chairman*

Professor Dr. Her Royal Highness Princess Chulabhorn is founder and President of the Chulabhorn Research Institute. She is currently Professor of Organic Chemistry at Mahidol University in Bangkok, Thailand and Chairman of the Foundation for the Promotion of Nature Conservation and Environmental Protection. She is also an Executive Member of the International Organization for Chemical Sciences in Development and Patron of the International Foundation for Science (Sweden).

From 1988 to 1991 she was Honorary President of the Heritage Trust of England and Goodwill Ambassador for the World Health Organization. In 1992, she was head of the Thai delegation at the second Ministerial Conference of Developing Countries on Environment and Development and at the United Nations Conference on Environment and Development (UNCED). In 1986 she was awarded the Einstein gold medal of UNESCO and made Honorary Fellow of the Royal Society of Chemistry, London. Her Royal Highness is also the recipient of eight Honorary degrees from universities on four continents.

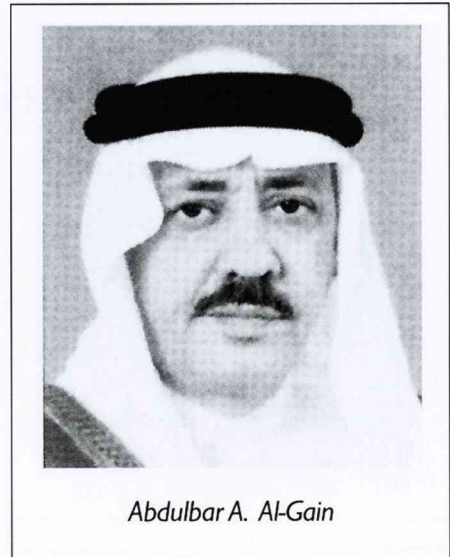


H.R.H. Princess Chulabhorn

Selection Committee

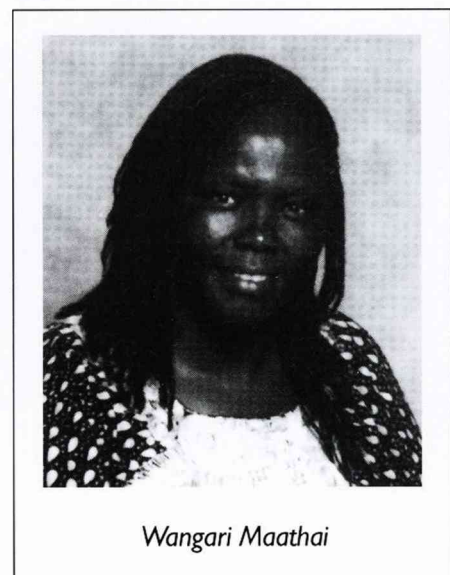
Dr. Abdulbar A. Al-Gain, a consultant on environment and development issues, was Secretary-General of the Ministerial Committee on Environment, the Kingdom of Saudi Arabia's highest policy body for environmental matters and President of the Meteorology and Environmental Protection Administration. He represents the Kingdom in all activities related to the Kuwait Action Plan and in other conventions and protocols governing regional cooperation on pollution, oil spills, and emergencies threatening the Gulf. He is General Secretary of his country's Environmental Protection and Coordinating Committee and also heads the Saudi delegation to the UNEP Governing Council.

He served as Vice-President of the Meteorology and Environmental Protection Administration from 1981 to 1988, was Deputy Director General of Saudi Arabia's General Directorate of Meteorology from 1977 to 1981, and Dean of the Institute of Meteorology at King Abdulaziz University from 1976 to 1978. In 1978, he headed the Saudi delegation to the Kuwait Regional Conference of Plenipotentiaries on the Protection and Development of the Marine Environment and Coastal Area, which resulted in the Kuwait Action Plan.



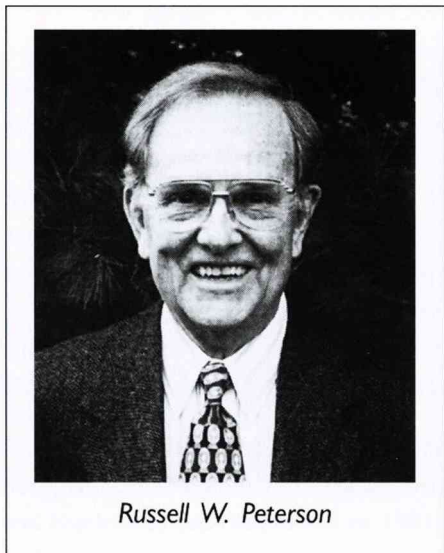
Abdulbar A. Al-Gain

Professor Wangari Maathai was Kenya's first woman Ph.D., and at 38, the first to become Associate Professor at the University of Nairobi. She is the founder and Coordinator of the Green Belt Movement in Kenya which now operates in 12 African countries and through which more than 20 million trees have been planted to combat deforestation and desertification. Professor Maathai has become known as the "Tree Woman of Kenya" and is recognized as one of Africa's leading environmentalists. She has won numerous awards, amongst them: the "Alternative Nobel Prize, The Right Livelihood Award", (1984). The Hunger Project's Africa Prize for Leadership (1992), and the Goldman Prize for Environmental Activity (1991).



Wangari Maathai

Selection Committee



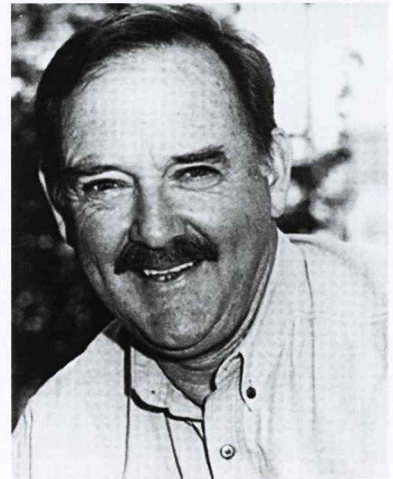
Dr. Russell W. Peterson is President Emeritus of the National Audubon Society. He served as Vice-President and Regional Councillor of the World Conservation Fund up to 1990 and is now President Emeritus of the International Council for Bird Preservation. He has also served as Vice-Chairman and President of the Better World Society. He was Governor of the State of Delaware from 1969 to 1973 and Chairman, from 1973 to 1976, of the President's Council on Environmental Quality, which led to the creation of the Environmental Industry Council. He was Director of the United States Congress of Technology Assessment, from 1977 to 1979.

He is a former Vice-Chairman of United States delegations to the United Nations Conference on Human Settlements and to the United Nations World Population Conference. Among his many accolades is the National Wildlife Federation's "Conservationist of the Year" award which he received in 1971.

Mr. Ian Kiernan has communicated in the most visible way and to the world at large, the need to protect the environment. His is a true global success story which gives credence to the belief that one person can make a difference. Who would have thought that when he embarked on a solo journey by sail around the globe in 1987, that he would have captured the imagination of so many and single-handedly done so much to arrest environmental degradation.

Ian Bruce Carrick Kiernan

*Founder and Chairman
Clean Up the World
117 Harris Street
Pyrmont, Sydney NSW 2000
Australia
Tel: (612) 9692 0700
Fax: (612) 9692 0761
E-mail:
cleanup@cleanup.com.au*



As the founder and force behind the Clean Up the World Campaign, Mr. Kiernan has brought together more than 40 million people from more than 120 countries in a progressive clean-up effort. First Sydney Harbour, then Australia and then the world. The results of the Campaign have been wide-ranging, not only in terms of public participation, increased awareness and the removal and disposal of rubbish, but also in helping to bring about long-term improvement to waste management and policies. Since the launch of the Clean Up the World in 1993, an estimated 150 million people from every corner of the world have come together in an inspirational example of community spirit and international cooperation.

Mr. Kiernan has clearly demonstrated that ordinary people - men, women and young people alike - have it in their hands to contribute substantially to a better quality of life for themselves and their communities.

Winner 1997

*F*or more than two decades, Ms. Barbara Pyle, has encouraged the media to assume a major responsibility for informing and educating the public, including decisionmakers. Ms. Pyle has brought environmental issues closer to the hearts and minds of people the world over. As a writer, director and producer of numerous television programmes, she has inspired countless individuals to care about the environment and to take responsibility for its protection.

Barbara Y. E. Pyle

*Vice-President, Environmental Policy
Turner Broadcasting System*

One CNN Center

P. O. Box 105366

Atlanta, Georgia 30348-5366

U.S.A.

Tel: (404) 827 1918

Fax: (404) 827 4292

E-mail: <barbara.pyle@turner.com>



She has produced more than 35 films which have won more than 75 awards. She is the founder of **Earth Matters**, CNN's daily environmental news feature and founder and Chairman of the Board of the Captain Planet Foundation, an organization which awards grants to children's grassroots environmental projects.

Ms. Pyle's philosophy is "Our planet will not be saved by any one big decision, but many individual choices. The media has an important responsibility to provide the information necessary to enable us to make those choices". Using the unique global reach of CNN, CNN International and World Report, Pyle's work has been seen by approximately two billion people worldwide.

*F*or more than 30 years, Dr. Triloki Nath Khoshoo has been an advocate of strong regional environmental planning for long-term ecological and economic security, particularly in the developing country context.

His conservation work in cytogenetics, biological diversity, biomass production and environmental research and development have been significant. He has generated considerable new knowledge regarding the genetic-

evolutionary race history of a number of plants. Based on this knowledge, he has delineated, for the first time, centres of their diversity and origin, circumscribed gene pools and standardized procedures for studying the taxonomy of cultivated plants. Dr. Khoshoo has also initiated work on the standardization of herbal drugs and their compound formulation, particularly for rural use and development.

His pre-emptive strategies, while Secretary to the Government of India's Department of Environment, were based on sound scientific analyses and resulted in policies which helped insulate the country from further environmental damage.

His efforts have earned him a place as a leader in the environment field.

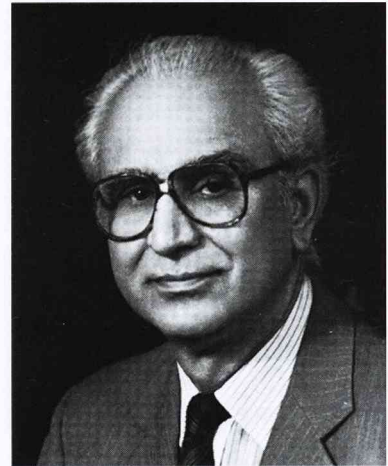
Dr. Triloki Nath Khoshoo

*No. 103, Pocket -H
Sarita Vihar
New Delhi
India*

Tel: (91 11) 460 1550/462 2246

Fax: (91 11) 462 1770/463 2609

E-mail: <khoshoo@teri.ernet.in>



Co-Winners 1995

Dr. Norman Myers and Dr. Peter Raven have been leaders in the environmental field for more than a quarter of a century. Each, in his own way, has worked tirelessly to address two major environmental problems: tropical forests and biological diversity. Over the years, they have broadened the scope of their activities to include population, poverty, desertification, global warming, consumption patterns, environmental economics and the North/South dialogue. They have each won a number of awards, and in 1992, their work was once again recognized when they shared the Volvo Environment Prize.

In the early 1970s, Dr. Myers and Dr. Raven undertook detailed research which demonstrated that humankind was indeed witnessing the mass extinction of species, among other forms of biodepletion. They immediately took their findings, together with a set of recommendations, to scientific and environmental leaders of major governments, in both developing and developed countries, and to a host of international agencies. As a result, the two problems which they decided to tackle became firmly established on the global agenda.

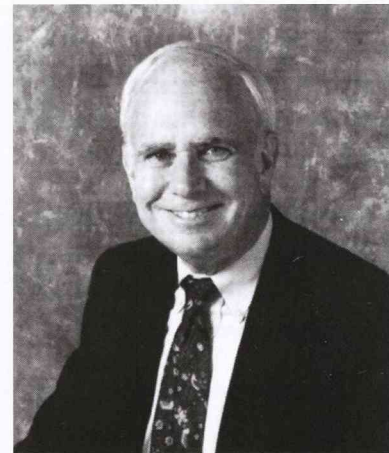
Dr. Norman Myers

Upper Meadow
Old Road, Headington
Oxford, OX3 8SZ
U.K.
Tel: (44 1865) 750 387
Fax: (44 1865) 741 538
E-mail: normanmyers@gn.apc.org



Dr. Peter Raven

Director
Missouri Botanical Garden
P. O. Box 299
St. Louis, Missouri 63166
U.S.A.
Tel: (314) 577 5110/1
Fax: (314) 577 9595



Professor Canaganayagan Suriyakumaran is Chairman of the Centre for Regional Development Studies (CRDS) in his native Sri Lanka and a visiting Professor at the London School of Economics. He is considered a pioneer in the environmental field for shaping the nature of our responses to environmental challenges. He is responsible in great part for the new perception of multi-sectoralism with his observation long ago that "environment is not a sector, but a dimension in all sectors". For more than 30 years, Professor Suriyakumaran has given his best to the environmental cause.

He fostered and encouraged the involvement of non-governmental organizations within the wider context of their societies, and has also played a key role in promoting global environmental programmes within the United Nations system. For his outstanding services to Asia, he was honoured by His Royal Highness the King of Thailand as a Knight Commander of the Most Noble Order of the Crown.

**Professor
Canaganayagan
Suriyakumaran**

19 A/2 Alfred Place
Colombo 3
Sri Lanka
Tel: (941) 574 912
Fax: (941) 574 879



Co-Winner 1994

Dr. M. S. Swaminathan, the Director of the Centre for Research on Sustainable Agricultural and Rural Development, in Madras, India, has for the past 40 years played a pivotal role in the conservation of biological diversity. As one of the world's leading agricultural scientists, he has played a catalytic role in his country's green revolution and in agricultural research and development.

Dr. M. S. Swaminathan

*Chairman
M. S. Swaminathan Research Foundation
3rd Cross Street
Taramani Institutional Area
Madras 600113
India
Tel: (91 44) 235 1229 or 235 1698
Fax: (91 44) 235 1319*

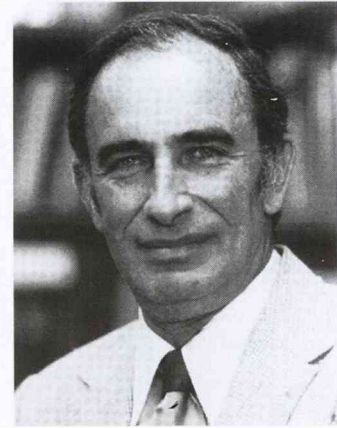


Dr. Swaminathan is widely known as the father of the economic ecology movement and his research on the conservation of wild relatives of the potato, wheat and rice led to India developing a strong national food security system.

*Anne and Paul
Ehrlich*

*Department of Biological Sciences
Stanford University
Stanford, California 94305-5020
U.S.A.*

*Tel: (415) 723 5920/857 1408
Fax: (415) 493 2092*



*A*ne and Paul Ehrlich are leading authorities on the issue of population and the environment. They have been an intellectual force whose works have had an unparalleled impact on the field of environmental science and policy. For more than a quarter of a century, they have systematically traced environmental deterioration to its root causes, projected the probable consequences of continued deterioration and proposed and analyzed the relative merits of alternative solutions. The Ehrlichs have always stressed the devastating impact of overconsumption in industrialized nations.

The Ehrlichs were awarded the Prize for greatly improving the quality of life on this planet, with their insightful analysis and articulate communication of environmental, social, scientific, economic and development issues.

Both the Ehrlichs and Dr. Swaminathan believe that gender equity is fundamental to the whole population issue. They have long emphasized the critical need to empower women, giving access to health care, education and economic opportunities.

Dr. Mostafa Kamal Tolba, world renowned scientist and for 17 years Executive Director of the United Nations Environment Programme (UNEP), has been an eloquent and tireless defender of the environment for most of his life.

Born in Egypt, a country whose economy depends on the waters of a river that flows through other states, made him aware of the link between environment and politics.

He has always believed that common environmental interests should override political differences, even conflicts between nations.

In 1972, he led his country's delegation to the Stockholm Conference on the Human Environment which gave rise to UNEP. It is to his leadership that much of the credit for directing the environment to the forefront of global thinking and action is due. He applied his belief that environmental decisions are inseparable from socio-political decisions in all his consultations with political leaders.

His negotiating skills and scientific knowledge contributed to UNEP's most widely acclaimed success - the historic 1988 agreement to protect the ozone layer - the Montreal Protocol. The Protocol is recognized as setting a precedent for international preventive rather than corrective environmental action.

At the Earth Summit in Brazil, he was at the helm of the negotiations when the Conventions on Climate Change and Biological Diversity were signed. He also successfully worked for treaties to protect the Mediterranean Sea, the Red Sea and the Gulf of Aden. During the Iran-Iraq conflict he often had the warring parties at the same negotiating table discussing common environmental interests.

In making its selection, the Committee noted that although Dr. Mostafa Tolba, as Executive Director of UNEP, was in a privileged position he went far beyond the call of duty in his commitment, dedication and contributions to the environment.

Dr. Mostafa Kamal Tolba

46 Mosaddak Street
Dokki, Giza
Egypt
Tel: (202) 269 5800 or 706 044
Fax: (202) 269 1267



Professor Qu Geping, currently Chairman of the Committee of Environmental and Natural Resource Conservation, National People's Congress, was for nine years Administrator of the National Environmental Protection Agency of The People's Republic of China. His outstanding contributions in promoting and supporting environmental protection in China have been exemplary.

Professor Qu Geping

*Chairman
Committee of Environmental and Natural
Resource Conservation
National People's Congress
No. 2 Xihuangchenggen Beijing
Beijing 100085
The People's Republic of China
Tel: (8610) 6309 8421
Fax: (8610) 6309 8439*



In a country where industry is still largely underdeveloped, he has, for more than 15 years, been instrumental in putting forward measures designed to integrate environmental protection policies within economic and industrial development strategies. His work has embraced environmental management, legislation, education and industrial pollution prevention and reduction.

Through his activities as a lecturer, broadcaster and publisher of many papers he has increased the level of environmental awareness throughout the vast territory of China.

A believer in scientific and technological solutions to environmental problems, Professor Qu Geping's response to the serious environmental problems facing the industrialization of China has been practical and realistic and has served as an example to other developing countries.

The Prize Selection Committee described the 1992 shared award as drawing attention "to the problems caused by rampant and careless industrialization faced by the countries of the newly created Commonwealth of Independent States, and to the challenges of emerging industrialization now being experienced by China, the world's most populous country".

Prof. Qu Geping was also Director-General of the Department of Environmental Protection in the Ministry of Urban and Rural Construction and Environmental Protection and Vice Chairman of the Leading Group of Environmental Protection under the State Council of China.

Co-Winner 1992

Professor Yuri Izrael, a Russian scientist, is former Chairman of the Committee for Hydrometeorology - the central organization for the provision of natural disaster warnings throughout the former Soviet Union. He is also Director of the Institute of Global Climate and Ecology which is part of the Russian Academy of Sciences.

As the first and two-term Vice-President of the World Meteorological Organization (WMO), he helped to develop World Weather Watch, an international programme designed to improve the weather services of the various nations of the world, particularly developing countries. He is an expert in the fields of ecology, geophysics, chemistry of the atmosphere, oceanology and geography and has also devoted many years to the cause of natural environment protection in his own country.

He showed remarkable courage in visiting the Chernobyl site on the second day of the disaster. He continued to work in the Chernobyl area, measuring the radiation situation and studying the impact of radioactive contamination on the natural environment - and subsequently spent nearly four months in hospital. Later, President Gorbachev awarded him his country's highest honour.

His scientific and organizational skills have contributed to Working Group II (Impact Assessment) of the Intergovernmental Panel on Climate Change (IPCC), sponsored jointly by WMO and UNEP.

Professor Yuri Izrael

*Pavlik Morozov 12
Moscow
Russian Federation
Tel: (7095) 169 2430
Fax: (7095) 160 0831*



No two people have done more to strengthen the position of international and national environmental law as a fundamental element of environmental management, than Wolfgang and Françoise Burhenne. They have been directly involved in nearly all the major international conventions concerned with conservation over the past 25 years, and to the development of the World Conservation Union (IUCN) Environmental Law Centre in Bonn. Under the direction of Dr. Françoise Burhenne-Guilmin, who is Belgian, the Centre has accumulated the world's most extensive collection of environmental legislative texts.

The couple's first venture together was helping the Organization of African Unity (OAU) establish the Algiers Conservation Convention, in 1968. Dr. Wolfgang Burhenne was one of 12 signatories to the Morges Manifesto which established the World Wide Fund for Nature (WWF) in 1961. The insights and skills of the Burhennes were essential to the creation of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) in 1973, the World Charter for Nature, adopted by the United Nations General Assembly in 1982, and the Association of South-East Asian Nations (ASEAN) Agreement on the Conservation of Nature and Natural Resources in 1985.

Drs. Wolfgang Burhenne and Françoise Burhenne-Guilmin

Postfach 120369
Adenauerallee 214
D-53113 Bonn
Germany
Tel: (49 228) 269 2216 or 269 2231
Fax: (49 228) 269 2250/51/52/53
E-mail: <100651/317@compuserve.com>
or <iucn.elc@wunsch.com>



Winner 1990

The murder of Francisco “Chico” Mendes in December 1988 reinforced the significance of his efforts to protect the Brazilian rainforest. As President of the Rural Workers’ Union of Brazil, Chico Mendes led the fight against the cattle ranchers’ destruction of the rainforest, on which the livelihoods, and even survival, of the indigenous forest people and rubber tappers depend. He also called for new approaches to land reform and the establishment of special “extractive reserves” within the forests.

He became a world-renowned environmentalist in the mid-1980s as a result of his flair for campaigning and his ability to draw attention to the rubber tappers’ plight. His ability to link ecology and society’s needs guided future efforts to achieve sustainable development.

Francisco “Chico” Mendes Filho

*c/o Instituto de Estudos Amazonicos e
Ambiente - IEA
Rua Monte Castelo
380 Taruma, 82530-200
Curitiba
Parana
Brazil
Tel: (041) 262 9494
Fax: (041) 264 7152*



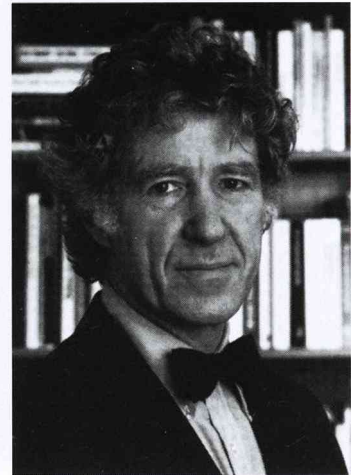
Dr. Lester R. Brown, recipient of a MacArthur Foundation “genius award”, has been described as “one of the world’s most influential thinkers” by the *Washington Post* and the “guru of the global environmental movement” by *The Telegraph* of Calcutta.

The Library of Congress has requested his personal papers and manuscripts, recognizing the role of his work and that of the Worldwatch Institute under his direction in shaping the global environmental movement. The annual *State of the World* report published by Lester Brown has a circulation of more than 100,000 in English alone. It is published in 10 languages by the Worldwatch Institute, which he founded in 1974.

Lester Brown began his working life as a New Jersey tomato farmer, later becoming an analyst and commentator on international agricultural issues. He has written several books on agriculture and the environment. The UNEP Sasakawa Environment Prize Committee paid tribute to his writings which “over the years have been outstanding in teaching about threats to the biosphere”. In 1991, he inaugurated the Environmental Alert series of books, with “*Saving the Planet: How to Shape an Environmentally Sustainable Global Economy*”.

Dr. Lester R. Brown

President
World Institute
1776 Massachusetts Avenue. NW
Washington, D.C. 20036
United States of America
Tel: (202) 452 1999
Fax: (202) 296 7365



Co-Winner 1988

Our Common Future, the World Commission on Environment and Development 1987 report, was hailed as the most important document of the decade. The 21-member Commission had been charged by the United Nations General Assembly, on recommendations of the Governing Council of UNEP, with formulating a "global agenda for change".

After hearing evidence from public meetings held on all five continents over three years, its recommendations included environmental strategies for achieving sustainable development by the year 2000 and beyond. The Commission, chaired by former Norwegian Prime Minister Mrs. Gro Harlem Brundtland, was praised by the UNEP Sasakawa Environment Prize Selection Committee for its "valuable analysis of environmental problems and positive guidance for their solution".

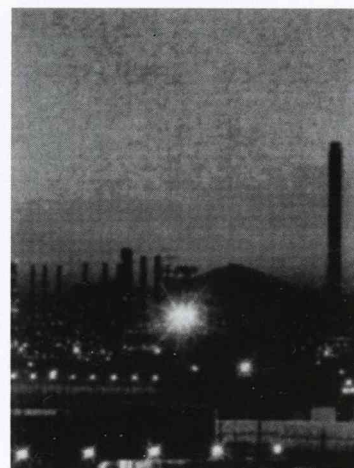
World Commission on Environment and Development

c/o Gro Harlem Brundtland
P. O. Box 8001 DEP
0030 Oslo
Norway
Tel: (47) 22 29 42 70
Fax: (47) 22 74 44 63



*Royal Commission for
Jubail and Yanbu,
Saudi Arabia*

*c/o Meteorology and Environmental
Protection Administration (MEPA)
P. O. Box 1358
Jeddah
Kingdom of Saudi Arabia
Tel: (966 2) 651 2312
Fax: (966 2) 651 1424*



The towns of Jubail and Yanbu in Saudi Arabia are believed to be among the most environmentally clean of any comparable urban concentrations in the world - testimony to the work from 1975 of the towns' Royal Commission, which became a blueprint for successful environmentally-conscious urban growth in the developing world.

As a result of the Commission's work, monitoring and analysis of air, land and sea takes place constantly in the two towns, located on opposite sides of the Arabian Peninsula. The UNEP Sasakawa Environment Prize Selection Committee honoured the "excellent planning and implementation of environmentally-sound management of the two industrial complexes".

Co -Winner 1987

*A*fter escaping from Nazi Germany in 1933, Elisabeth Mann Borgese, youngest daughter of the great German writer Thomas Mann, became a world-renowned scholar in the fields of international relations, law of the sea and marine environment. In 1970, she organized the first of many *Pacem in Maribus* meetings in which she was involved in bringing together more than 200 key figures in law of the sea development. Two years later she was a key participant in the formation of an International Ocean Institute at the Royal University of Malta. She has attended all United Nations meetings on the Law of the Sea since 1968.

Mrs. Mann Borgese is President of the International Ocean Institute and Professor of Political Science at Dalhousie University in Canada. It was in 1967, while serving as a Fellow of the Centre for Democratic Institutions, that she shifted her focus of attention to the law of the sea, which she recognized as an area of growing environmental crisis and a possible test-bed for ideas she had developed concerning a common global constitution.

Professor Elisabeth Mann Borgese

*President
International Ocean Institute
c/o Department of Political Science
Dalhousie University
Halifax, Nova Scotia, B3H 3P7
Canada
Tel: (902) 494 1737
Fax: (902) 494 2034
E-mail: ioihfx@dal.ca*

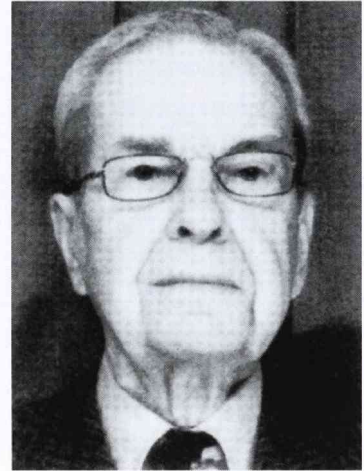


Professor Nicholas Polunin has been a towering figure in the environment movement for more than 35 years and has written more than 400 research and scientific papers and books. He has taught at Oxford University in England, lectured at Yale and Brandeis Universities, was Professor of Botany at McGill University and at the Universities of Baghdad and Ife. He is widely recognized as a leading authority on Arctic botany and ecology and has arranged many conferences to seek solutions to problems related to his field.

Professor Nicholas Polunin

*Secretary-General and Editor
International Conferences on
Environmental Future
7 Chemin Taverney
1218 Grand-Saconnex, Geneva
Switzerland*

*Tel: (41 22) 798 2383/798 2384
Fax: (41 22) 798 2344*



He created the Foundation for Environment Conservation, whose journal he originally financed and published. He also played a part in establishing the International Society for Environmental Education. His vision has latterly embraced the outer reaches of the biosphere and a culmination of this sustained effort was the creation of an international annual Biosphere Day on 21 September which started in 1991. In the same year he was elected to the UNEP Global 500 Roll of Honour.

Winner 1986

Virtually every east and central African national park has on its staff graduates from the Mweka College in the United Republic of Tanzania. Sensitive and skilled management is needed for Africa's wildlife population to be sustained as an economic and ecological resource and it was to this end that the College was established in 1963. Today, it runs full-time courses in natural sciences, wildlife management and estate management, and produces a ready and replenishable local

source of expertise in wildlife and national park management. There have been more than 1000 graduates from at least 15 African nations.

Mweka College operates under the auspices of the Tanzania Ministry of National Resources and Tourism, with funding mainly from fees paid by governments and other bodies to support students at the college and with further assistance provided by UNEP and other international organizations.

Mweka College of African Wildlife Management

*P. O. Box 3031
Moshi
United Republic of Tanzania
Tel: c/o Kibosho 18*



Hassan Asmaz's lifelong campaign to improve the environment of his native Turkey has taken him from the remotest villages to the heart of his national Government. It is largely thanks to him that Turkey's children study nature and conservation as part of their primary and secondary school curriculum. He has led national campaigns to combat soil erosion, has helped prohibit the hunting of several rare and endangered bird and animal species, and has been the driving force behind many other public campaigns to promote environmental awareness in Turkey.

Hassan Asmaz

*President
Turkish Association for the Conservation of
Nature and Natural Resources
2 CAD No/ 6515 Bachcelievler
Ankara, Turkey
Tel: (312) 425 1944
Fax: (312) 417 9552*



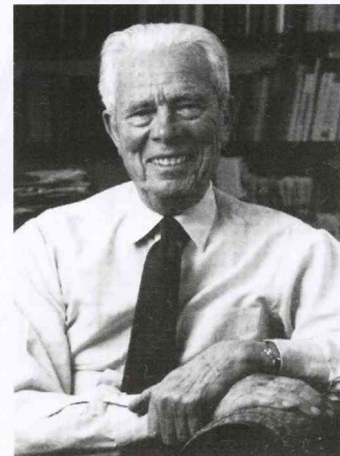
In 1955, he helped establish the Turkish Association for the Conservation of Nature and Natural Resources. It was accepted into the World Conservation Union (IUCN) in 1963 and two years later Mr. Asmaz became its President.

He received the Turkish Prime Minister's Environment, Friendship and Service Award in 1988, and the Turkish Conservation of Nature Reward of Service in 1989.

As a member of many advisory groups concerned with greenhouse gases, nuclear waste disposal, water, and man's relationship with the biosphere, Professor Gilbert White continues to strive to promote understanding of the implications for human welfare of basic environmental processes. Perhaps his most significant contribution in the field of the environment has been his work on the behavioural aspects of natural hazards research.

Professor Gilbert White

*Director
Institute of Behavioural Science
University of Colorado
Boulder, Colorado 80309
United States of America
Tel: (303) 492 6311*



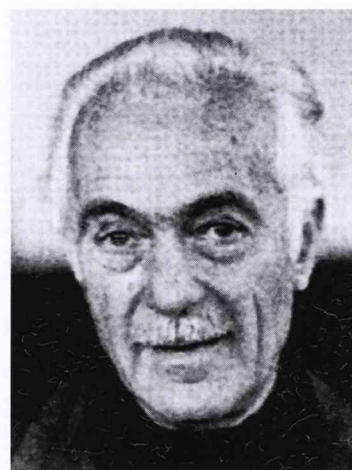
He has been Director of the Natural Hazards Research Applications and Information Center at Colorado University, President of Haverford College, Professor of Geography at Chicago and Colorado Universities and a visiting Professor at Oxford University in England. He has been active in floodplain management and domestic water usage in developing countries and has collaborated extensively with UNEP, the United Nations Integrated River Development scheme, and in World Bank programmes for water and urban poor.

Winner 1984

The inaugural UNEP Sasakawa Environment Prize was awarded posthumously to Dr. Aurelio Peccei, who had died just two months before the Prize Selection Committee announced its decision to recognize the outstanding contribution the former industrialist had made to defend the environment. He saw the urgency of the problems of man's relationship with nature and the dangers of the growing gulf between rich and poor. He had been a member of the boards of several of Italy's leading companies and in his new role turned the Club of Rome, which he had helped found, into one of the world's leading bodies promoting sustainable and fair development.

He gave tirelessly to the causes which he espoused, as a member of the UNESCO Panel of Counsellors on Major World Problems; a member of the Governing Council of the Society for International Development; a member of the Board of Trustees of the Foundation for the International Training for Third World Countries; and as a member of the Friends of the Earth Advisory Council.

Dr. Aurelio Peccei



DALHOUSIE UNIVERSITY ARCHIVES DIGITAL SEPARATION SHEET

Separation Date: June 23, 2015

Fonds Title: Elisabeth Mann Borgese

Fonds #: MS-2-744

Box-Folder Number: Box 259, Folder 1

Series: United Nations

Sub-Series: Publications, drafts, reports

File: United Nations Environment Programme prize

Description of item:

File contains a published German language collection of articles from “Da Parlament” entitled “Aus Politik und Zeitgeschichte: Beilage zur Wochenzeitung Das Parlament” (January 7, 2000).

Reason for separation:

Pages have been removed from digital copy due to copyright concerns.



United Nations Environment Programme

Mission Statement:

To provide leadership and encourage partnerships in caring for the environment by inspiring, informing and enabling nations and people to improve their quality of life without compromising that of future generations.

Water Branch: A division of UNEP dedicated to preserving freshwater and marine resources

- Develop policy-relevant assessments of the state of freshwater and marine resources
- Develop tools and guidelines for sustainable management and use of freshwater and coastal resources
- Promote international cooperation in the management of river-basins and coastal waters with focus on control of pollution from land-based sources and on the special needs of Small Island Developing States (SIDS)
- Support and give institutional servicing of regional seas conventions and action plans

UNEP is implementing these actions through the UNEP Regional Offices.

Regional Seas Programme: A global programme implemented through regional components

Action Plan

- Environmental Assessment
- Environmental Management
- Institutional Arrangements
- Financial arrangements

Global Programme of Action: For the protection of the marine environment from land-based activities

Examples of land-based pollutants affecting the marine environment:

- Sewage
- Persistent Organic Pollutants
- Radioactive Substances
- Heavy Metals
- Oils (Hydrocarbons) & Litter
- Nutrients & Sediment Mobilization
- Physical Alterations & Destruction of Habitat

The GPA helps states to:

- Identify and assess problems
- Establish priorities for action
- Set management objectives for priority problems for source categories and areas affected on the basis of established priorities.
- Identify, evaluate and select strategies and measures to achieve these objectives.

For Example, what's happening in our own back yard...

Waste Water Management Strategy for Halifax: Phase I Action Plan

Sectors contributing most toxic and hazardous wastes to Halifax Harbour

- Industrial
- Commercial
- Institutional

Implemented a Sewage Monitoring Program to determine areas of concern within each sector

Revised and strengthened By-Law W-100 Respecting Wastewater Discharge

- enables the city to enter into agreements with intense waste dischargers
- stronger enforcement tools
- higher penalties for violators

"ENVIRONMENT 2000"

GLOBAL LETTER

FROM THE UNITED NATIONS/UNEP-SASAKAWA

WORLD ENVIRONMENT PRIZE WINNERS

TO

THE PEOPLES OF THE WORLD



A "Note" On The Preparation

Of This Letter

Appears At The End

Of This Release

"How can you buy or sell the sky, the warmth of the land?...

If we do not own the freshness of the air and the sparkle of the water, how can you buy them?"

* * *

"The wind that gave our grandfather his first breath also receives his last sigh...

And the wind must also give our children the spirit of life."

**- Chief Seattle, on the 'Offer' by the
Great White Chief in Washington, in
1854, to buy his People's land.**

***(Preserved in Washington, and
displayed at American Expo '94)***

A TESTAMENT TO OUR FUTURE

Released

In the Year 2000

From Select Global Centres

Presented to The Year 2000

Millennium Sessions of the United Nations

(Sept./Dec. 2000)

T H E L E T T E R

A - Our Background	1
B - Our Contexts	4
C - "Charter - 2000"	14
I - Preamble	
II - Millennium Paths	
(1) Baseline Proposals	
Change Proposals	
D - Epilogue	27

The Prize Winners

(from inception of Awards in 1984, to 1998 - in reverse chronological order)-(X)

1. Mr. Ian Carrick Kiernan
2. Ms. Barbara Y.E. Pyle
3. Dr. Triloki Nath Khoshoo
4. Prof. C. Suriyakumaran
5. Dr. Norman Myers
6. Dr. Peter Raven
7. Dr. M.S. Swaminathan
8. Mr. Paul Ehrlich
9. Mrs. Anne Ehrlich
10. Dr. Mostafa Kamal Tolba
11. Prof. Qu Geping
12. Prof. Yuri Izrael
13. Dr. Wolfgang Burhenne -(Z)
14. Dr. Françoise Burhenne-Guilmin-(Z)
15. Francisco "Chico" Mende Filho - (Y)
16. Dr. Lester R. Brown
17. World Commission on Environment and Development
18. Royal Commission for Jubail and Yanbu, Saudi Arabia
19. Prof. Elisabeth Mann Borgese
20. Prof. Nicholas Polunin - (Y)
21. Mweka College of African Wildlife Management
22. Mr. Hassan Asmaz
23. Prof. Gilbert White
24. Dr. Aurelio Peccei - (Y)

(X) 1999 Winner Prof. Mario J. Molina, was announced subsequent to preparation of this Document.

(Y) Colleagues no more with us. This 'Letter' has however, drawn deeply from some of their work and thinking.

(Z) Requested to be excluded from participation.

A

OUR BACKGROUND

I - Conscious of the obligation owed by us, singly and as a body, as Winners of the United Nations/ UNEP-Sasakawa World Environment Prize, we have considered it our duty to address this Letter at this time, across the Globe, to all Members of our World Community.

II - We have taken the step therefore,

- (i) to take a 'Global Look' at our State, our Limits and our Lapses, as well as our Achievements up to now; and
- (ii) to lay out a 'Path' for the Future, of all Peoples of this World, at the Dawn of the new Century and Millennium.

III- In doing so, we have felt now, more than ever before, that we had to approach our problems, and our solutions - to use a much used but little practised word - in a truly 'Holistic' context.

We must now view our Environment Problem not simply as 'Environmental', but

- (i) as 'Environment-alongside-Development' and 'Development alongside Environment'; and
- (ii) as a 'Joint Perspective', of both the Rich and the Poor of the Globe.
Neglect of any of these can only be at peril,
 - as much to Development and the Rich,
 - as to Environment and the Poor.

IV- We have thus envisioned that we shall consider our presentations and conclusions as not 'confined' in any particular way, but as, a creative exchange, across Countries and borders, addressed equally to peoples in their Villages and in their Cities, and
an 'Environmental Urbi et Orbi',
for us all to share as our Common Future.

- V As our overall Theme, we have taken note of two clear dimensions of thinking and needs across the World, that have come to stay,
- (1) One is the progress that all Peoples have made since that 'first entry of Environment into the Political constituency', about the Sixties of this Century, in the Arenas of public decision makings - the Questions it then raised, and the Answers it yielded.
 - (2) The other is our still remaining Crises Areas 'that have not gone away', and we have with us,
 - (i) as Substantive conflicts, between Environment needs and Development practices in the World at large (manifest in the multitude of threats - biospheric, natural, urban, rural- to our Planetary equilibrium); and
 - (ii) perhaps now seriously, as 'Intellectual short comings', such as in our inability so far to establish at all minimum needed 'Inter Disciplinary' Perceptions, Models, and Methodologies in looking at our Environment - Development relations and needs, and their Agenda.
Indeed, if we cannot succeed in the latter, we may never succeed in the former.
- VI At this point in our Global Calendar, we must emphasise therefore that we need to go beyond 'Alerts' and 'Warnings' alone and, as we stated, to establish 'Paths' to positive - indeed feasible - policy making, enabling us to resolve our onlicts, and through our Solutions to establish, we hope, a truly 'Global Testament to Our Future'.
- VII- For ourselves, while many of us in our work have pointed to, highlighted, or warned against disaster of both Economic and Environmental natures, we are in no doubt as to the Feasibility of an "Environment-Development Future for All". This we make a pillar of our Agenda, in our perceived Millennium Paths for the Future that we seek.
- VIII- As Prize Winners, in recognition of our varied work and contributions in our several fields - from 1984 to date - we have yet remained conscious in this Letter, of the wide perceptions of Issues, Needs and Solutions, as seen by innumerable others, including committed Specialists other than ourselves, and we have not hesitated to draw on them.

IX - We also recall at this point, two of our own Colleagues Prize Winners, Dr. Aurelio Peccei, who led the way in 1984 as the First Prize Winner, and Snr. Francisco "Chico" Mendes Filho, who symbolised for us our great symbiotic relations between man and nature.

Coincidentally, both these late colleagues, each with starkly varying origins, ended up prior to their deaths in emphasising the same common denominators in their labours and their sacrifices, namely Man's relations to Nature, and the gulf between the Rich and the Poor.

X - It also fell to Aurelio Peccei, as a pioneer Member of the Club of Rome which authored the well known document entitled 'The Limits to Growth' at the end of the 60s, to be the advocate therein in behalf of "Sustainable and Fair Development", perhaps the most important Concept to emerge out of the Environment surge that followed thereafter; and perhaps, the single most important Concept for fulfilment at Millennium 2000.

When, therefore, years later in 1987, The World Commission on Environmental and Development, also one of our Corporate Prize Winners, gave 'coinage' to the words 'Sustainable Development', it had an already worthy predecessor to give it sanction.



B

OUR CONTEXTS - THE WORLD AT THIS POINT

- I. There lie, at this point in our time, two outstanding 'Realities' that, unfortunately, this closing Millennium has not been able, as yet, to reconcile. These, to use a phrase of a notable former Under Secretary General for Economic and Social Affairs of the United Nations, the late Philippe de Seynes, were the two 'Problematiques', of Environment and Development, and their needed 'Intersections', seen as of,
- * the 'emerging problematique' of Scarcity under concepts of Environment, and
 - * the 'changing problematique' of Economic Self Reliance, and 'perceived need for far more satisfying formulations of necessary development'.
- II - Both of these now demand much more urgent attention than we have given so far, and in more different ways, to the issues of,
- (i) - Continued overwhelming consumption of the World's resources by the Developed Rich (whatever their declared targets for reductions in rates of rise in such consumption); and
 - (ii)- The future massive increases in their Resources Use by the Developing 'Poor Countries', that are set to occur in the new Millennium (whatever others may say).

The consequent unprecedented aggregate challenge to the Stability of 'Future Planet Earth', is a phenomenon that the World has not been quite prepared - perhaps even not willing - to confront.

As we shall see, its resolution will, inter alia, revolve round an acceptance by the First World, of Technology as 'Centrepiece' of Third World resolution and, to borrow a phrase of the past, evolution of a global, Environmental Technologies 'Marshall Aid' Programme, in a 'Global Insurance' to both.

- III - Meanwhile, so far, in a phrase of one of our Members, while we take up our Moral Stands and issue our Warnings, 'the Global Train Runs nevertheless, in directions that are mostly just the opposite'. The answers to these naturally do not lie in mere evangelistic outpourings, observed by some and ignored by most, or general formulations of common principles or concepts, expressed by most.

There now lies pre-eminent need in our Future, for true meetings of Professional Economic Thinking and Systems, with Professional Environmental Thinking and Approaches; and full use by both, of the vast reservoirs of existing Ecological, Bio-logical, Social and Scientific knowledge of the Universe and of ourselves.

IV - It is clear that behind it all, this is also not, as we often make out, a battle between 'Environmentalists', and 'Economists' or vice versa. Perhaps by now we should understand that these are not two separate groups but the same People! Perhaps, like the great symbolics of our Epics of the Classical West and the Classical East, the battles between their forces of Good and Evil presented in them, were really forces 'within each of us', and not two and separate. 'Homo Oeconomicus' and 'Homo Enviromentus' may not be different, but the same persons and we, the practitioners of both! For ourselves, we even attend environmental conventions, travel to them and partake in them by means and appurtenances which are the creations of the same economic juggernauts that we condemn, and need halting!

V - What these mean is that, as we stated earlier, the 'conjoint application' of the range of extant, and growing, 'skills bases' of Ecology and Economy, has now come to be needed more than ever before. No more can, or must, these work separately from each other, much less in contradiction to each other.

Yet, as we also stated, to do this requires 'Methodologies', wherein sentiments alone will not carry us. There are issues, and serious issues at that, on both sides of the 'divide'.

We may set down below the more prominent of these, for our shared understanding.

VI - On the Economic side:

(i) One of our most amazing, and major, 'Conundrums' has been the phenomenon of the declared Inevitability of Ever Expanding Growth (GDP), defended as simply the only means to 'Sustain' the Economies overall of countries anywhere,

(a) in 'Equilibrium' (b) in 'Full (high) Employment', and (c) without 'Social Crises'.

(Illustrations are innumerable and easily to be found, anywhere).

- (ii) There has never been, despite some attempts of decades ago, any search for the 'Holy Grail' of 'Steady State Growth' - much less, now, any concept of its need.
- (iii) All in all, these have combined to create a situation that has left the 'Issues' of the Environment with a 'lasting problem without compare'.
- (iv) Most unnecessarily, these have also, manifested in the indifference to quite feasible Methodological absorptions of Environmental concerns into the Tools of Economic analysis and policy making, such as manifestly under Cost Benefit Analyses; as also certain other major 'Environmental Tools' - which we shall cite below.

(Ironically, these have still to be adopted within the Environmental constituencies themselves).

- (v) As a noted Economic Journal observed, "for too long, Environmental concerns have not been integrated into Development Policies. Economists have failed to consider legitimate Environmental concerns which could have been easily subsumed in a well designed and undertaken wider Cost Benefit approach".

In turn, this led also to Environmentalists having adopted "Sledge Hammer approaches to Environmental improvements".

VII - On the Environmental side:

- (i) It may be fair to say that throughout our known histories of the Environment-Development relationships, dire predictions of serious effects of Development on the Environment, have not been wanting.
- (ii) (a) A noted US Academic put down once a list of such 'environmental' predictions that had been made. We excerpt some of these 'track records' (one of them, an exception, being of such Plenty that we will not know what to do!):
 - 1870s - Saw predictions that New York will be covered with ten feet of horse manure by 1970.

The most recent meeting of the International Botanical Congress, currently headed by one of our own Prize Winners, noted that 'human activity has altered nearly half of the land surface of the Earth, which is now hurtling towards an extinction crisis'. It explained that 'if current trends continue', between one and two-thirds of all plant and animal species, most in the tropics, will be lost during the second half of this century.

As we know, the retreat of vegetation from the marginal lands of the World adjoining its Deserts has been the product of a tragic compound of gross neglect and gross poverty of many of those regions.

Over the years, the most widely known multi-faceted indexing of the State of the World's Environment, under leadership of one of our Prize Winners, and elsewhere by another, dossierled the threats to all of our Environmental resources by series of acts of thoughtlessness in management, of both Environment and Development.

With trends as we have them, and with little signs to the contrary, the World is set, in the new Century,

- to lose (almost) all its Forest cover (in the plaintive words of Snr. "Chico" Mendes) for want at least of an 'Extractive Reserves Policy' and concept;
- to alter its Weather patterns, (as more than one of our Prize Winners has emphasised), causing Natural disasters, Flooding of the World's Plains, and affecting Arctic Ecology;
- to lose vast ranges of genetic Species and possibly the irreplaceable, 'wild relations' of the great Food Crops of our humankind - described by one of our Prize Winners as the 'race histories of our plants';
- to saturate our Oceans with nitrogen - further underlining the urgings of another of our Prize Winners for a Global Constitution on our Commons;
- to tear into our Biospheric protective layers above, producing a rare union of Professionals, Practitioners and Nations;
- to bring the 'Roads of Megalopolis to Standstill', with our 'iron curtains' of the so called means of our Transport (as urged in the words of another of our Prize Winners, for 'lack of blue prints and management');
- and more!

- (iv) As we stated, it is not that all of these must, or will happen. But for that comforting prospect, we need great steps forward, in (a) express ownership by Nations of their obligations; and
(b) International commitment to genuine Co-operation and Assistance.

VIII (i) - The need for sensible assessments as much as sensible policy approaches, is therefore paramount for all of us.

A notable illustration of such an approach lay in the World Community's major concern with the phenomenon that we know as 'Global Warming', in the articulation of responses to which again one of our Prize Winners had played an unremitting, lead role.

Probably, the most widely used 'Scientific Environmental jargon' that has permeated all humankind, 'Global Warming' is significant for its warning of impending Planetary Collapse awaiting us all. The position today as to the nature of the Threat, the nature of our agreed Responses, and the nature of our Future actions, emerged broadly out of the following considerations.

- (ii) As of now, there has been broad, even though not universal, agreement among scientists that the Earth is subject to global warming, while there have been arguments over its extent and causes over recent decades. The best climate models envisage continued warming of the Planet and assume that increased concentrations of greenhouse gases are the major cause.

Yet, other scientists contend that increased solar activity is the cause of global warming in recent decades; while this hypothesis is not taken seriously by most scientists.

As Policy, following on International Agreements, action is being taken to phase out production and use of chlorofluorocarbons (CFCs), constituting a landmark in International policy making in Environment. Yet we need to note that this step has been on the simultaneous accepted premise as well that, as yet, no proper evidence that is considered as beyond doubt of these effects, has been available, or is as yet considered so.

- (iii) The consequential, major Principle that the World has therefore rightly approved, is something which has had global acceptance, namely that it would be 'too late for us to act', if the hypothesis of disaster were indeed proved right. The World is therefore in need to act as if the threatened disaster may occur - a policy stance that has now come to be known as the 'Precautionally Principle', in which if no anticipated disaster would occur, the worst could have been extra labour and some constraints - compared to total disaster, if it did occur.
- (iv) We have no doubt of course that this is how we must proceed - until we know better - in certain other Areas too of our vast Global Inheritance, for example Water (often called the most important consumer good of Man), Land, and the Plant itself.

On this last, it was a distinguished Indian Scientist who perhaps had the most poignant expression of its place for Man. 'In this whole Universe', he said, 'the Plant is the only Organism that manufactures its own food. All other Organisms either live on Plants, or on other Organisms that live on those Plants' - the sole converters of the 'Energy Force' of our Universe!

Indeed here for us, we have also the irrevocable relation of Water, Land and Vegetation, along with 'Fire' and 'Air', symbolising the most ancient heritage of the 'Unity of all Creation'. For selfish Man - throughout history, so abjectly dependent as a being, yet so arrogantly ignorant of the true nature of his dependence - even with Water and Land, but without the Plant he ceases to be. His 'Destruction' of the first two, as their 'Preservation', depend on his treatment of the third!

- IX (i) Earlier we stated that, both in Development and Environment, exhortations or even principles and concepts, were not enough, but that we needed to go beyond, to Methodologies and to evolving joint Environment-Economic Models of Resources Management - the objects of 'conservation' in the one case, and of 'conversion' in the other.

As one of our Prize Winners had long emphasised, what we have needed is a Body of Knowledge for Resources Management alongside Maximum Potential Development - 'the sustainable and fair Development' of Aurelio Percei - but which we have not had so far, pursuing, instead, separate so-called 'Environmental', and 'Economic' Management Policies. We have behaved as if our alternatives were low levels of development, or 'runaway development'.

- (ii) For instance, consider our Natural Resources endowments, in each Country, the basis for Economic Development, as also the objects of Environmental Management.

The former would construct National Sector Models of potentials and related economic follow up policies and steps, for its posited increases in production.

The latter would compare the levels of luxuriance 'before' and devastation 'after', following up with calls for draconian action - the 'sledge hammer' that we quoted earlier.

Yet, mirabile dictu, neither side has met, or even thought of meeting together professionally and seriously, within their Country, in this instance, to consider their questions together!

- (iii) Even as Sector assessments and models are constructed in Economic development and Planning analyses, over-all Macro level Environmental Resources assessments, and their 'statics' as well as 'dynamics' - seen as 'balances' between availabilities, limits, and potentials, given additional policies and technologies - could most feasibly yield us joint Enviro-Economic Resources Balances Sheets that will determine from time to time (a) agreed Assessments of actual Supplies, (b) feasible new (preferable), 'Alternative' sources of supply, (c) Management and Technology inputs that could enhance supply, and (d) agreed 'maximum levels of harmonisation' of both Economic demands and Environment needs.

These would almost assuredly be at higher level of 'Sustained' Supply than if there were no co-ordination between the two. As may be seen, the reason is that a whole range of both short and longer term alternatives and technology inputs, could become 'integral part' of both environment and economic management strategies, that would certainly not otherwise have occurred.

Important across the World, that is in the Rich countries as well, the above is markedly significant in the Poorer countries, where the World's Natural resources overwhelmingly lie, raped presently without care or concern by the Rich now, and set to be devoured in equal measure by the Developing countries soon.

- (iv) It would be noteworthy that such co-ordination would then be part of overall, Enviro-Economic Resources analyses, and not 'Economic' or 'Environmental' alone.

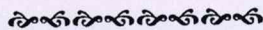
Clearly, some of the benefits of such working together would not emerge immediately, but would as outcome of a dynamic process of a Future that could hold great promise, were Economy, Environment and Technology instituted as parts of a single process.

- (v) With benefit of 'Resources Balance Sheets' if available, similar resources related, joint Environment- Development management methodologies and analyses could be carried 'down the line' - for example, at the micro project level, in the Integrated Environment Economic Cost Benefit Systems, that we referred to before.

- (vi) There are yet others, such as,

- a fully integrated 'development sensitive' Environmental Audit System, to be carried alongside traditional Financial Audit (optimising resources and technology usages 'along the line' and indeed enhancing profits); and
- the United Nations led System of Expanded Environment Economic Accounting (SEEA), to serve as a 'concurrent barometer' along with the well heeled GDP indices, for 'continuous' macro level Monitoring and 'Policy making'.

- (X) We leave this brief review of background and contexts of our Global situation now to look at our Future Contexts and Needs, and at a 'Global Charter 2000' - as we had stated, the 'Agenda of an Environment-Development Future for all'.



C

CHARTER - 2000

I. PREAMBLE

1. It is clear, in the light of all these, that a set of New Thinking and New Horizons lies ahead for us, if we may safekeep continued expectations for both our Planetary Inheritance and our Social Enhancement.

In the search for the 'points of inter-section' in the scissors created by the needs of Environment and the demands of Development, it is clear that we would in our future horizons be relying on a mix of,

- some tested Conventional Truths, and
- some needed New Views and policies,

which, together, could vastly raise the levels of well being of our Poor close to those of the Rich, and safeguard the Earth for Both.

2. The last quarter of this past Century has seen brave attempts by the World as a Global Community, to face what had by then emerged as the unresolved and threatening consequences of 'unbridled' material prosperity.

The great well known landmarks that stood out among these were the Stockholm Conference on Environment and Development of 1972, and the Earth Summit in Brazil in 1992, buttressed by some notable Global conventions, protocols and agreements (on the global commons, natural species, and pollutants).

It did not take long for the World to realise that fulfilments had fallen far short of expectations despite efforts and successes in parts - whether in containment Policies by the Rich, or development Policies for the Poor.

3. Thus, while the World had so far, even if not with full success, still evolved what may be called an 'Environment Programme for Conservation', it had still to look at its striking 'vacant area of need' and to formulate an 'Environment Programme for Development'.

4. Markedly, the latter would hinge not only in constant improvements in our Conservation strategies and compacts, but very much in search for the great potentials of 'extant, emerging and future' Technologies for environmentally suitable Resources enhancements. That was a task then in which Science and Development became partners with Environment. For, as much as Development was the 'cause of Resource Use', it has also been the 'means to Resource Expansion'.
5. Examples ring across History, and are numerous. We shall later be touching on some in our priority suggestions for the Future. Just as one example here, we had the work and contribution of another of our Prize Winners - with help of new technology and knowledge that comes with development - in the transformation of grain seed potentials in one Country, from a situation of dire gap between needs and supplies, to near self-sufficiency.
6. This contribution is now being supplemented with a bold experimental effort in what has been called 'economic ecology', marrying hopefully thereby the needs of both economy and ecology at identified farm levels in a vast Country mosaic of micro-level farms and farming.
7. Such examples are also to underline that our Recommendations as a whole are clearly to encourage the 'full scale of development' needed by the Poor for their economic and environmental well being.

Environment policy making will, therefore, be not of 'Non-development' but of 'Right development'; not only of 'Over use' of resources and 'Wrong use' of resources, but also of 'Under use' of resources - all to be equally avoided.

8. We shall need to provide policies and orientations to the Developing World, set as they are to consume vast multiples of current levels of their resource use. These will entail recommendations beyond what the North has developed for the 'Qualitative Management' of its Environment to what may be called 'Quantitative Management' of their Environment. In other words, we shall have not only the 'known issues' of pollution and waste, but the issues of how to manage vast multiples of the resources that will be required by this half of the World!

9. Thus the 'Maximum Potential Development' that we seek and refer to, would be distinguished from any impressions of 'modest development', or less than required development, as has sometimes been portrayed, in any mistaken use of the name of 'Sustainable Development' - in a so called 'low level equilibrium trap of the Sustainable Development equation' as described by one of our own Prize Winners.
10. 'Sustainable Development' was never meant to be a means only of 'poverty alleviation', or even of poverty elimination alone and, therefore never meant to be development at a lower than otherwise feasible level. That level indeed could and would be at high and increasing levels of income, comparable to the countries that have, in the last Century, escaped from Poverty.
11. As much as therefore past Technologies have transformed the peoples of the World from disease, squalor and privation, bringing vast numbers to their high levels of health and welfare - all victories for 'the Social Environment' - the great, as yet unopened, corridors of our future 'environmentally friendly' technologies may, if properly identified and pursued, lift us further, to give the still economically deprived of the World, their sought after material and environmental levels of well-being.

The Rich half of the World may by then, have even learned to spew far less waste, spread for less pollution and eat up far less resources, than they appear still set to do!

The challenge for Environment at Millennium 2000 becomes, therefore, both a 'Vision' and a 'Practical Task' in which, not Ambivalence, but full and accepted 'Ambience', between Environment and Development, would become the Way.

Beyond doubt then, such Tasks imply, not just one or other of our Specialisations, but the participation and commitment by all - Scientists, Sociologists, Economists, Ecologists, and others.

The Task of our Future is not even a shared task but, indeed, 'the same Tasks' which cannot be performed 'except together'!

II. MILLENNIUM PATHS :

(I) BASELINE PROGRAMMES: MEETING ONGOING CRISES.

- (1) It is clear that the Millennium Path, which is certainly not without hope, but indeed with promise, will need clear 'Agenda Pillars' in a Programme that Peoples will carry.

There are iron laws of the Future, some normative, some highly innovative and creative, which, if followed, should lead us to a Millennium of both Prosperity and Security.

Some of the tasks that we would need to undertake would be to redress and repair our past damages and catastrophes that we have created and loaded with explosive potential, if left unattended. To do these would constitute our Baseline programme so that, also, we may go beyond.

In such a future that we could perhaps envisage now, we shall then have the potentials of attaining new and higher levels of environmental and developmental 'equilibria', given right choices in our pursuit of Technology, Management, and Co-operation with each other.

- (2) - (A) Thus, one of our invariable priorities must be the re-affirmations and application of agreed baseline targets in respect of,
the Ozone Layer,
the Atmosphere,
the Natural Habitats, and
the Human Habitats.

We must thus, continue to underscore the value of International Conventions, Protocols, and their related conditions.

- (B) Across the board, we need in every Village, Town, Country, Region and the World, ever increasing 'Energy efficient, Waste reducing' applications of available technologies in resources management - so we may reverse our roles of recent memory, of creating rising levels of Energy use and Wastes creations, with near uncontrollable consequences on the Human and Non-human environments.

- (C) We shall need far more than 'poverty alleviation' or mere 'poverty elimination' to save the Human environment of half our World, going into genuine Development, thus not only safeguarding Health and Welfare, and avoiding starvation, but indeed of powerfully contributing to arresting a Population explosion.

In the words of one of our Prize Winners 'the Population question is also not one of over-population per se. Under gross Poverty situations, the Outer Limits become, not of Human Congestion but of Resources Privation'.

- (D) In (i) Minerals, (ii) Forestry, and (iii) Agriculture, radical new policies, based on simple honesty, must surely come in :

(i) The developed countries should as early as feasible shed their highly devastating policies of subsidising Minerals explorations, thereby creating oversupplies of these resources in the name of development, according to one of our Prize Winners, writing in 1998, leading to destruction of natural resources World wide to the tune of nearly \$1.5 Trillion per annum.

Normal pricings would surely also lead to producers and users of these minerals and related resources into assured new designs and ways of organising resources and production.

It is noteworthy that this particular distortion to the economy is one that has been spotlighted also by traditional Economists.

(ii) Forestry has been the cinderella of our surroundings, in many areas raped and denuded, in purely exponential manners. We shall have a virgin situation in which virtually all forestry could be eliminated, especially in the Third World, unless two policy instruments that have been consistently bypassed, are pursued vigorously.

(a) One is represented in the existing, but still insufficient Policies for 'Renewable Forestry' and of development of Alternative materials.

(b) The other, even more neglected, comes from the fact that Forests of the World are, also, indeed major 'oxygen lungs' of our Globe. It is a commentary of our time, that the great users of these 'lungs' have wanted them kept, but not considered paying their 'rentals' for use of them, in a situation where the owners of the great Forests are also the Poor countries of the World. It seems that we have a 'rentier' obligation here, well ignored by the Rich, to the 'owners' of the Forests.

Dictats, whether by convention or sanction, would be both meaningless and unfair, as they would be resented on the one hand and flouted on the other.

It is noteworthy that International co-operation by the Donors, as has turned out, has been limited, selective, and inadequate in relation to the consideration that one is no substitute for the other.

(c) A much related, now major, area of need is Bio-piracy of genetic resources of developing Countries, in particular such as of crop seeds and medicinal plants. While undoubtedly rewarding innovation, these cannot be 'at the cost of marginalising the poor'. At the last (1999) Sessions of the United Nations General Assembly, a particular contribution in this connection referred to Companies in the United States that 'have agreed to 10% royalty rates for the right to bio-prospect Yellow Stone National Park' in that Country.

It was suggested in the course of this statement that 'if just 2% of royalty were charged on genetic resources ... of South Asia in terms of their (established) indigenous knowledge, developed countries would owe more than \$300 billion in unpaid royalties for farmers' crop seeds and more than \$5 billion for medicinal plants'. Clearly there is an element of legitimate dues here, going far beyond the current Aid and Co-operation frameworks.

(iii) The World's management of Poverty, Population and Agrarian growth has been riddled by the policies of subsidised Developed country Farm Crops and animal husbandry, resulting in suffocation of initiatives and potentials in Countries, whose agrarian economies needed to be resurrected, if they were to meet all the three needs of Economic, Environment and Demographic equilibria.

These have been compounded by increasingly conditioned trade policies, imposed in the name of international co-operation by International Institutions, pressing on Developing countries to eliminate, or progressively reduce, all Subsidies - often in another purpose such as of reducing their Budget deficits.

(3) Clearly, all these have to change. They have simply come down to us as legacies of the last Century. These examples do not exhaust the agenda of needed attention under these Categories. We have, here, been purely selective in our examples.

(4) We go on, finally, to take up what may be called needed 'Change Programmes', for the new 'Higher Levels' of Environmental and Economic Equilibrium, of a Future that we see as feasible. In the nature of things, these also 'connect' to our past. In setting them apart, what we pin point are (a) the earlier neglect of these areas, and (b) the opportunities that we have in 'New Initiatives', if we will take them, for our Future.

II. (II) CHANGE PROGRAMMES: FOR NEW LEVELS OF ENVIRONMENT-DEVELOPMENT EQUILIBRIUM.

(1) Introduction

As in the previous segment, in which we have taken up certain needed 'Baseline Programmes', here too we shall be selective, at the same time we hope,

- (a) pointing to our top most Emerging Needs and
- (b) clarifying the nature of our future Horizons.

In order to do these, and conscious that we are engaged in a Global Letter - however slightly extended - we set down the chosen areas for our future attention in the form of brief outlinings on them.

- (2) (i) While, properly, it is not possible to prioritize the needs of the future in relation to one another, it may be fair to single out as the first, the top most need for the Poor Countries to become efficient producers from their lands.

The historical index of extensive man-land ratios in production of food grains and other agrarian outputs must without doubt give way to vigorous replication of the successful developed Countries, and attainment, certainly adapted to their own situations, of drastic reductions in the man-land ratios of their Agriculture. While a land-man ratio target as in the U.S., may not be immediately replicable - only 3% of the labour force being on the land - surely the path to this attainment, which was, inter alia, through intensive technology adoption and application must remain a guide, and a prime policy for the new Future of Poor Countries.

The examples of the Newly Industrialised Countries are perhaps more replicable and, as pointed out earlier in this Letter, the example of food self-sufficiency recently attained in one of the developing Countries despite much headway still to be made there, is itself a pointer.

(ii) Second in order of top most need of the future could be our capacity in the coming Century to embrace the concept and practice of what we termed additional 'resource creations' for which, historically, Development had served continuously to be its instrument and handmaiden.

In the philosophy of a long standing Chinese policy statement made at an International Forum of the United Nations, also reflected in the work of one of our Prize Winners, 'successful environmental management has been conceived as being within the process of Development and not outside of it'.

Explorations and researchers into new and alternative resources which enlarge their available pools within Countries is, therefore, a necessity.

(iii) We have referred before to the failure of both Economics and Environment to adopt what were perfectly feasible and available Joint Management Methodologies for optimising the purposes and

goals of both Environment and Development. We referred, at the macro level, to Resources Balance Sheets and to the U.N. gestated System of Economic and Environmental Accounting (SEEA); and at the micro level, to the Integrated Cost Benefit Analysis Framework, and to development-supportive Environment Audit Systems.

We shall not even say that these must come in as elements of the Future; rather that they will become so by need for them.

(iv) Although we repeatedly mentioned technology, the Future will need to assign a special place and pedestal for Technologies Development in all the areas of resources management, enhancement and use.

One may see this as creations of Technology programmes across all Areas, including in knowledge development and application. These may embrace Heritage Technology as much as Threshold Technology and, if we may use the term, Future Technology; and extend across all three Areas of Bio-technology, Materials technology and Resource use technology. In their pursuit, they would involve all three facets, of Fabrication technology, Process Technology, and End Use Technology.

In all these, as was once remarked at an International Forum by one of our Prize Winners, the developing Countries must progressively move from 'being receivers of the products of technology, to becoming partners in the process of technology'.

(v) We have seen in the areas that we have highlighted, for example, the needed agricultural renewal and related community organisation, or in the wide ranging needs for technology capacities, the constant gap between ambitions and realities.

One of the most powerful instrumentations in effecting change across the board in all such areas has been shown to be direct involvements of the people - the poor as much as the skilled - and

their motivation, a process in which, very strongly, information and direct participation have proved themselves to be central factors.

As two of our Prize Winners have demonstrated in their different ways, one by use of the electronic media, the other by generation of mass people's movements, direct participation and involvement have proved to be creative agents in influencing transformations.

Thus in many areas, and certainly in the two that we have mentioned, of agrarian change and endogenous technology development, example and practice have proved that the instruments of direct Association and Involvement could be made far more central agents of change than so far done.

Peoples, when made agents and owners of their resources of production, become indeed vibrant instruments of change in both resources utilization and residues management, as country experiences have shown.

Indeed, such linking also introduces an enhancement of the physical quality of life of such people, while at the same time enhancing production - contrary to purely Welfare measures introduced in isolation, that could soon be beyond the funding capacities of the Budgets of poor Countries.

(vi) Already, in the immediate years ahead, and certainly into the Millennium, the World is set to live in the Cities, with Megalopolises dominating the Urban geographies of the Third World even more than of the rest.

While it is not the intention to survey here all the issues of megalopolises and Urbanisation, an unaddressed confrontation lies ahead of us in the exponential growth of the Traffics of Cities, alongside drastic limits in transport Infrastructures.

The World has increasingly addressed and, with technological promises of the future, could be set to overcome the issues of Pollution in these areas. It has certainly not faced what one of our Prize Winners described as the great Urban Traffic standstills of the

future - our Road to Impasse, and the 'metallic iron curtains', that are set to occur, sooner rather than later - earlier of course in the population congested centres of the World, Rich or Poor. Clearly, initiation of fundamental thinking is a priority, beginning with what may be our 'basic means of transport' in Cities.

(vii) At the centre of all these perhaps stands Energy, the life blood of economic growth and, on the current sources of its availabilities, a major means to Planetary dis-equilibrium. Any future scenario based on an extension of traditional supply curves cannot but be cause for extreme discomfort in our future views of Ecological balance.

Perhaps here, in a heightened illustration of development and technology as producers of solutions, we have the prediction of a Space Scientist that, by the early years of the Millennium, 'the first commercial device producing clean, safe power by low temperature nuclear reactions could go on the market, heralding the end of the Fossil Fuel Age'. The fruition of the so called "Cold Fusion" process that had begun to be uncovered in the closing years of the last Century, resulting in the availability to the World of limitless clean energy, could become one of our outstanding 'Change Programmes' of the future, opening doors to 'new levels of Environment-Development equilibrium'.

(viii) Yet, before we leave this Vision of a New Heraldry and Plenty, let us also recall, the Universe being what it is, that no change, however absolute, is without its own trail of other creations that we may have to turn our attention to.

On Energy itself, the very consequence, by the foregoing, in new production surges will leave for sure, trails of fearsome threats from all the mountains of new Wastes.

Other consequences too could follow, from 'completion of the standstill' on the Roads of the World's Cities, to dis-emboweling the Earth in ravaging the Resources of Nature more than ever before.

We could all overcome these, however, given the rigours of our own foresight, right policies, and now more than ever before, co-operation as peoples to join together.

(ix) In discussing issues generally, and not only the issues of this 'Letter', we have tended to see the Agents of damage, or change, as stemming from the Specialists, Governments, the economic power centres of Tans-Nationals, and others.

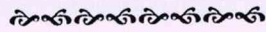
Perhaps it is proper, and to the good, to address ourselves for a moment, also to another, namely the Administrative Services of our Countries and all ranks of Administrators who make them up. In all Countries, they have been the Interpreters of Governmental Policies, the Translators of the Results of Science and Technology into Programmes, and perhaps also, controllers of fortune of the Economic Players in their Areas.

It may be right to see in our Future, an essential change in this 'Machinery' of Administrators, as 'Environment-Economic' Implementators of Policies and Programmes and, therefore, to provide for this in their development from the beginnings of their careers.

(x) Intimately related not only to the last, but to almost all areas, is the future of Education in the disciplines of Physical, Natural and Social sciences in each Country's Centres of Learning - centrally also an Area for productive and fruitful roles in positive International Co-operation.

Among others, we should foresee more direct attention to the contents and orientations in education, at the Undergraduate, Graduate and Postgraduate levels at Universities and in specialist Course Programmes on Integrated Environment and Development.

(xi) In an Overall view of our Future, we must foresee the continuing and growing importance of International Organisations for Co-operation, in increasingly liberal inter-actions of National and Global Governance and their Frameworks.



D

AN EPILOGUE

At this end of our 'Letter', perhaps we may allow ourselves some musings on us in our Universe. While our great advances in Science and Technology will, we must think, carry us into new prosperities, the World and the Universe continue to be much larger than we can possibly contain in its entirety.

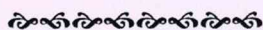
The Earth itself produces her 'mega' crises, say as a future scenario in the Antarctic with unpredicted effects on Global sea level rises beyond any that are already addressed in our global warming concerns. Icebergs, euphemistically called chips, the most recent at 40 miles long and 11 miles wide, are of course minor compared to these.

We have other fantasias, in illusions of 'stability' of the Earth's surface - containing, within her core, unanalysed seething temperatures from molten heat masses, of 5,500 C. or so.

There are many ways therefore, indeed, in which we could frighten ourselves, not excluding unknown meteors.

Yet all these, what we may be excused for calling, 'absent issues', must be more in order that, as human kind, we may conduct ourselves with 'senses of humility, and thankfulness' that, after all, the Earth - as we have it for us - is so stable, so green and so full of oceans!

This 'Letter' is a call to the peoples of the World to join in Congregation in that Thanksgiving, to do the things that, despite major blunders sometimes in the past, we have done fairly well -but to do them better now!



NOTE

ON THE PREPARATION OF THIS "LETTER"

- A -

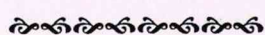
- (i) *The "Letter" is not a Document, nor Seminar or Conference Report, considered on the basis of a Secretariat Draft and finalised by a Meeting in session.*
- (ii) *It is the product of a more informal process, and has been prepared in mutual exchange of thinking of the authors themselves, as developed in their life long work and contributions, also drawing on the work of others outside as needed.*
- (iii) *While Members were invited to participate in these exchanges, where there were no further communications it was conveyed as understood that no additional views or ideas were to be awaited.*
- (iv) *Three of our Members are no more with us, one from quite recently; our latest Winner for 1999 Prof. Mario J. Molina having been announced only in December of 1999, while being kept fully informed thereafter, could not be an active participant; and the Winners of one particular year were not participants in this process.*
- (v) *These are indicated appropriately in the listing of the Prize Winners at the Contents page.*

- B -

- (1) *Members naturally have not been equally conversant with all the areas that the Letter has sought to cover. An aggregation of their various specialisations has, however, given us a surprisingly comprehensive coverage indeed of almost all the areas of our concerns in this Letter.*
- (2) *These ideas have ranged from media dissemination and mass participation, to all the areas of ecology, traditional sciences, economy, law, and the micro as much as macro levels of environmental concern.*
- (3) *We have had in mind the importance of carrying our views without undue technical terms.*
- (4) *Like all reports or documents, the Letter too carries views on which all of us agree; and some views which are of many if not all.*

The field is truly wide and it was essential, we considered in spite of the conciseness of this presentation, to be comprehensive, since it was important for the World community to receive such a view from us.

- (5) *Above all, we have been unanimous in sharing the sense of need in the solutions for the Future that we have taken up through this Message;*
and the feasibility for the whole World community to adopt the Recommendations that we have made and the Solutions that we have offered.



Country Locations of World Environment Prize Winners

**U.S.A. - Australia - India - Sri Lanka - U.K. –
Egypt - China - Russia - Germany - Brazil - Norway -
Saud Arabia - Canada - Switzerland - Tanzania -
Turkey - Italy.**

Handwritten: Elizabeth,
AS requested!
Also

Dur. 1756 m/s/UNEP?
RECEIVED OCT 30 2000

UNEP PREPARATION OF A DRAFT PROGRAMME FOR THE DEVELOPMENT AND PERIODIC REVIEW OF ENVIRONMENTAL LAW FOR THE FIRST DECADE OF THE TWENTY-FIRST CENTURY

Background: UNEP is convening a meeting of government officials expert in environmental law 23-27 October in Nairobi to prepare a programme for the development and periodic review of environmental law for the first decade of the twenty-first century. Beginning in 1982, UNEP's environmental law activities have been organized and coordinated through a series of 10-year programs (commonly known as Montevideo I and Montevideo II for the 1980s and 1990s respectively). This will be the third Montevideo action plan for UNEP, the draft of which was developed over the course of two meetings of an International Group of Experts. The Nairobi meeting will review the proposed program, which will be tabled for approval at the February meeting of the Governing Council. Canadian delegation for the Nairobi meeting will be JLO/Whiting and NROBI/Burton.

The stated objective of the Montevideo III programme is to increase the effectiveness of environmental law in helping to protect and preserve the global environment and promote sustainable development. The programme comprises three parts: Part I addresses cross-cutting issues that are designed to enhance the overall effectiveness of environment; Part II addresses conservation and management issues in various sectors of environmental law; and Part III addresses the relationship between international environmental law and other fields of law. There are 20 separate programme components, each one consisting of objective, strategy and a list of proposed activities to be undertaken by UNEP in cooperation with governments and relevant organizations.

General Comments on Draft Programme: Canada has been a strong and active supporter of the UNEP programme, believing that UNEP plays a valuable role in enhancing coherence and coordination within the framework of international environmental law, as well as facilitating and ensuring compliance with international legal requirements. We are pleased that coordination, coherence and compliance are recurring themes throughout the Montevideo III programme.

A troublesome aspect of the current draft is the pervasive use of the phrase "environmental law" without any indication as to whether the activities proposed refer to domestic or international laws and compliance. One solution would be to link the proposed activities with one or more of the three priorities established by UNEP for the Environmental Law and Institutions Programme Activity Centre (the three priorities are: to assist countries with the development, adoption and implementation of international legal instruments; to assist developing countries, upon request, through training and the provision of technical assistance; and, to collect and disseminate information on national environmental legislation and to strengthen and coordinate the use of existing information sources and databases). As UNEP and other governments will likely be loathe to restructure the draft document to accommodate this suggestion, a key objective for Canadian delegation will be to ensure that in each instance the scope of "environmental law" is defined as applying to international environmental law, domestic environmental law or both.

Canadian delegation should also seek clarification on who will be undertaking the work identified. Presumably UNEP will take the lead, seeking cooperation/assistance from member states as appropriate, and in consultation with relevant COPs, Secretariats, and other

institutions. A general point on communication and consultation with the appropriate bodies should be inserted. The adoption of new tools/instruments or the implementation of recommendations with implications for governments stemming from study/analysis must first be endorsed by the GC or the relevant COP.

There are also several instances in the document where UNEP is to "promote" within a domestic context. Canada questions whether UNEP has a role to play in domestic enforcement and implementation. UNEP's contribution in these situations should be limited to encouraging states to undertake the action identified.

The draft programme also tasks UNEP with identifying or evaluating the effectiveness of mechanisms or domestic regimes. There is, however, no indication of what the criteria will be for such assessments, nor which countries will be the case studies. Greater precision is required.

Another concern is the resource implications and demands this ambitious draft programme would have for both UNEP and governments. Canadian delegation should confirm that this program of work has been designed in the context of the current budget for subprogramme 2 (Policy Development and Law) and would be implemented over a 10 year period. There is a need to ensure a realistic programme that does not rely on an influx of new resources. Recognizing resource constraints/capacity issues, Canadian delegation should seek assurances that UNEP will ensure that in implementing its program of work demands on national governments are minimized

The draft programme would also benefit by the inclusion of the following: an indication of the relative priority among the 20 components of the work programme; an indication of timelines/milestones; an indication of what are the results and expected outputs from the actions; appropriate performance measures to assess the effectiveness of the actions undertaken; and a list of future items that would signal to countries and regulators where UNEP's focus might be.

Canadian priorities: Canadian priority areas in the draft programme are: reporting, compliance and dispute avoidance at the international level; mechanisms for the review of effectiveness of MEAs; trade and environment and attempts to forge a better fit between these two worlds; finance and environment; and enhancing the effectiveness of MEAs by improving coherence, coordination and compliance. Within the sectoral areas, Canada's priority are to continue work in support of coastal and marine ecosystems, biodiversity and supporting UNEP's work related to chemicals.

Comments specific to proposed programme elements

1. Implementation, Compliance and Enforcement

Position: Canada strongly supports efforts to enhance compliance with existing MEAs to ensure their effective implementation. Compliance regimes are an important component of MEAs, and Canada is promoting their inclusion in several existing and evolving agreements. Specifics of compliance regimes need to be addressed on a case-by-case. Canada does not support UNEP's involvement in countries' domestic implementation/enforcement.

Suggested Changes:

- Objective: add “international” before “environmental law”
- Strategy: add “international” before “environmental law” and “participation in environmental conventions” (delete “adherence to environmental law”)
- para (a)(b) and (f): add “international” before “environmental law”
- para (c): add “upon request”
- para c (i) replace “and enforcement of such obligations through domestic law” with “and enforcement of domestic law implementing such obligations” Comment: more acceptable as (c) applies primarily to LDCs
- para (e): add “international” before “compliance mechanisms”. Add “to facilitate the work of multilateral environment agreements” after “other fields of international law”. Comment: This addition suggested as it is not clear to what end this action is being undertaken
- para (f): replace “promote” by “Study the different means and mechanisms”, add “international” before “environmental” and replace “law” with “obligations”
- para (g): replace with “Study the experience and use of disincentives to encourage compliance with environmental law”. Comment: Reference to civil liability should be deleted as it is problematic. Liability regimes at the international level are generally not paid for by states, so if the intent is to improve state compliance with international law, this is not the way to proceed. There is some argument that domestic liability regimes could promote safer behaviour among the actors involved in dangerous activities, but this is not straight cause and effect either, i.e. they usually provide for a designated actor to be strictly liable, with no finding of fault necessary. So that player may be more careful, but the others in the chain of activity may not be.
- para (h): Canadian delegation clarify that “criminal administrative law” has the same meaning as Canadian “quasi-criminal” or “regulatory” offences; if so, then “promote” is acceptable. If not, this para should be replaced with “Study the effectiveness of the wider use ...” Comment: This is arguably beyond UNEP’s LDC mandate on the domestic law side unless there is some connection to how this might improve international law. Recommend Canada would support this as there are some civil law countries which do not provide for this and never prosecute anyone for an environmental offence, relying on civil monetary penalties at most (e.g. Chile).
- para (i): Australians have raised concern about role of NGOs and governments with respect to international environmental law. We do not disagree with Australian comment, but it is not clear to us whether they are suggesting changes to text or simply reiterating their position. Suggest: Replace “Explore options for the effective involvement” with “Study the experience and use of mechanisms that provide for the effective involvement...”

2. Capacity-Building

Position: Canada can support concept of UNEP’s continued work in capacity building through training/technical assistance, **on request**, to developing countries and general information sharing (model laws, etc.).

- para (a) add “At the request of States” at the beginning
- para (b) replace “others concerned on environmental law” with “others concerned with environmental law”

3. Prevention and mitigation of environmental damage

Position: Notwithstanding title of section, emphasis is on liability and not prevention or mitigation of environmental damage. This section could be improved with addition of specific actions to prevent and mitigate damage (such as mandatory reporting of accidental releases, double-hulling of ships to prevent oil spills, environmental assessments, and monitoring/back-up systems and emergency preparedness planning at industrial operations). Another suggestion would be to amalgamate this section with that on environmental emergencies and natural disasters (Section 17).

With respect to liability, Canada does not support the pursuit or promotion of a global convention on liability (idea is being pursued by UNEP Ex. Dir Töpfer as possible decision/outcome of Rio +10 meeting). Canada believes that liability issues should be dealt with, as appropriate, in the context of specific issues, as is currently being done in certain MEAs. In the lead-up to Rio meeting Canada believes focus should be on implementing existing arrangements, assessing their effectiveness and promoting compliance. Canada does not support creating a new convention. Prevention of environmental harm can be better achieved through a focus on MEAs, including better implementation (including through domestic enforcement measures) as well as the provision of capacity-building to Less Developed Countries.

Canada recognizes that pursuing the restoration of environmental damage provides an incentive for industry to invest in pollution prevention (The approach outlined is complementary to provisions under Section 205 in Part 8 of CEPA and the pollution prevention provisions under the Canada Shipping Act). Liability regimes, however, are not necessarily an extension of the polluter pay principle, which can be implemented in a wide range of ways, including through cost recovery initiatives.

- “environmental law” needs to be clarified as to whether domestic or international law is being discussed.
- “strategy”: add after “inter alia” a prevention example, rather than a mitigation one
- para (a): not clear to whether it is addressing minimum control standards or liability standards and whether these standards will be legally binding.
- para (b): replace “domestic” with “international”
- para (c): Canadian delegation may wish to broaden scope of this provision. Currently focus is restricted to compensation, but it should be extended to other techniques for mitigating damage, such as replacement, restoration.
- para (d): overly ambitious -- not within UNEP’s mandate to “further develop rules and procedures” for domestic law, as per (i) ; and in (ii), insurance and compensation funds at the international level would be problematic. For instance, Canada did not agree to a fund for the Basel Liability Protocol
- para (g): Action contemplated is domestic law issue and not within UNEP’s mandate, unless it is related to capacity-building. Add “Upon request of states”

4. Avoidance and settlement of international environmental disputes

Position: Canada supports the inclusion of dispute settlement regimes in MEAs, but these should be looked at within the context of individual MEAs. It would be valuable to explore commonalities, effectiveness of current models. It is not clear how an environmental

ombudsman would differ from the typical references in MEAs to good offices. Should it be raised, the idea of a comprehensive international instrument on dispute settlement would seem premature. Canada was not successful in creating a compulsory and legally binding procedure in the PIC Convention, and is garnering little support for the same initiative within Basel. While supportive overall of this type of work, it is of a lesser priority than Canada's work on compliance work. Note, too, that the dispute settlement provisions of MEAs have never been used.

Note: Australia does not see a need for new international instruments to be negotiated as a means of avoiding potential bilateral disputes

- para (b): sub paras should be reordered. It makes more sense to study the experience (ii), and most effective mechanisms (iii) before studying the potential role of international bodies (i)
- para (b)(iv): add "with international obligations" after "non-compliance"

5. Strengthening and development of international environmental law

Position: Canadian delegation should support the intent of this component, and its focus on improving coherence in the current international legal framework.

- Strategy should be recast as "To identify and make recommendations on how to address gaps and weaknesses in existing international environmental law and to respond to new environmental challenges". Comment: current phrasing ("Encourage national action to address gaps and weaknesses...") is overly strong given the types of actions envisioned. Most of the actions identified are consistent with this advisory role.
- para (a) A gap analysis is important and Canadian delegation should retain.
- para (b) whilst this could be helpful, more appropriate for states to decide what is needed.
- para (c): Problematic. It is not clear where "strengthening respect" for Rio and Stockholm Declarations would lead. Canadian delegation should work to have this deleted (not within UNEP's) mandate or to soften significantly by deleting "and identify means of strengthening respect for them" and replacing it with "and disseminate such information to States". This would serve to provide States with information on how the various principles are evolving, which would make it easier to assess those that have developed into customary international law.
- para (d): acceptable
- para (e): acceptable
- para (f): acceptable

6. Harmonization and coordination

Position: Canada strongly supports the coordination aspects in the objective and strategy; however, several of the references to "harmonize" need clarification. If "harmonization of approaches" means that all countries introduce the same domestic legislation or enforcement systems/programs, for example, this may be problematic. Focus should be on results achieved, and ability to assess the effectiveness of the approach, not the approach itself.

- Strategy: replace “consolidation” with “coherence”.
- para (a): Add “upon request” after “Assist states”
- para (a)(i): Support idea of harmonizing standards “upward”. Replace “on a global and regional level” with “to international standards”. Strongly support improving coherence between environmental laws and other laws and regulations (read: trade and environment, economic instruments, sustainable development and management of resources).
- para (c): Canadian del can support in principle the harmonization of reporting obligations, but clarification is needed for “otherwise rationalizing” reporting and whether document is referring to rationalization within an MEA or between MEAs. Suggest addition “where appropriate” after “rationalizing” Comment: As with dispute settlement, this type of common approach is premature. Plus, reporting obligations are obligation-dependent, so whether the MEA has a detailed provision (as in Basel) or a generic one (as in POPs), the responsible COP will ultimately develop forms and timing of reports. The forms will be obligation-dependent and will attempt to gather information that will be relevant to tracking compliance with key obligations. Therefore, harmonization might have to flow from institutions, ie UNEP Secretariats, so that the same questions are not repeated unnecessarily.

7. Public Participation

Position: Canada supports the objective and strategy. With our own laws and practices domestically with respect to environmental assessment, development of legislation and regulations, Canada is on a strong footing here. The *Canadian Environmental Assessment Act* and *Canadian Environmental Protection Act 1999*, for example, both ensure opportunities for public participation/comment. *CEPA* also includes provisions for information-sharing through the Environmental Registry. The Registry provides on-line access to public documents related to the administration of the *Act* and increases opportunities for the Canadian public to participate in consultation and decision-making under the Act. Canada supports increased transparency and appropriate public participation in international institutions, and has been urging this through a variety of international fora. It should be noted that none of the actions proposed specifically address transparency.

- para (a): add “of all countries” after “the law and practice”
- para (c): should specify reference is to domestic law. Delete “Explore means to” and replace with “Study the law and practice...”
- para (d) add at end “including the timely provision of information for international meetings” as this will be an opportunity to reinforce the critical role that early documentation plays in facilitating public participation in preparations for international meetings. For example, Canada consults widely but this process is difficult because of a lack of timeliness of documentation.
- paras (b) and (e): should be grouped together
- para (f): replace “identify” with “canvass” or “consider” or something more consultative. Comment: Canada is not a signatory to Aarhus, but we live up to the spirit of it (little benefit to Canada in revamping its domestic system). Canada is not interested in pursuing a global instrument.

8. Information Technology

Position: See previous comments relating to Canada's domestic work on public participation and access to information. Although it not stated, presumption is that this section refers to both information technology and communications technology.

- general comment: many of the actions seems to be strategies "promote... support" etc. It would be helpful if these were more specific on what/how.
- para (a)(i): replace "development" with "elaboration"
- para (a)(iv): add "of international obligations" after "compliance"
- para (b): Text should be amended to clarify whether para refers to processes or IT (hardware and software) systems or both
- para (c): this reference to "environmental law" would be appropriate to refer to both domestic and international environmental law
- para (d): would benefit by some indication how this is to be achieved
- paras (e) and (f): acceptable

9. Innovative Approaches to environmental law

Position: Canada strongly supports. Canada has excellent domestic examples and a good record of innovative experimenting with non-regulatory initiatives.

- para (a) Add at start "In collaboration with other international institutions, assess state practice..." This addition reflects the fact that OECD has already compiled tax instruments applied in OECD countries and, has a project with European Commission, to expand its monitoring to "economic instruments".
- para (b): assessment of effectiveness (indicators?) of voluntary codes should be done before UNEP begins promoting their development.
- para (c): Replace "encourage" with "study". It is not clear what is intended. For example, would "representatives" be advocates and have the right to sue on behalf of the environment?
- para (d): Delete "including human rights". Comment: Not clear whether the intent here is to learn from human rights from a procedural perspective (i.e. re reporting and compliance) or substantive (right to a healthy environment)
- para (e): Replace "Consider" with "Study" and add "embodying" before "traditional lifestyles. Comment: Not clear what is envisaged by "consider". Other change is to conform with Art 8(j) of the CBD which refers to "indigenous and local communities embodying traditional lifestyles" relevant to the conservation and sustainable use of biodiversity;
- para (f) great. Canadian delegation may wish to indicate that Canada has developed the Environmental Valuation Reference Inventory; a computerized repository of environmental valuation studies. The project has been expanded with US support, and we are currently developing a partnership with the US, the European Commission and selected European countries to continue to expand the facility to include European valuation studies and to make all the information available to partners. Canada would be willing to collaborate with UNEP to explore the possibility to further expand the database and to make the tool available world wide.
- para (g) interesting proposal. CIDA should comment. Reference to legal frameworks likely too strong

10. Freshwater resources

Position: Most water issues occur at national and sub-regional levels. UNEP's work in this area should be consistent with the mandate given it by the Governing Council and the context of the UNEP water policy. Canada did not attach a formal pledge to the Ministerial Hague Declaration, believing there is a need to more carefully consider the specific implications of certain concepts. For example, the concepts of "water as a human right", "equitable vs equal allocation" of transboundary water resources and "restricted water sovereignty" are subjects of diverse opinions and deserving of greater discussion. These issues also have repercussions on related water issues such as pricing and on how water might be managed in other jurisdictions. Regarding the suggestion of setting regional and national targets/strategies, this is another area that Canada will need to further assess in terms of implications and rationale.

- para (c): further clarification needed as not clear where global review will lead or how this fits with UNEP's mandate. Should be amended to "Cooperate with states to review the international watercourses..."

11. Coastal and marine ecosystems

Position: Awaiting input from DFO, although section is acceptable from Env. Canada perspective .

- strategy: delete "and domestic laws"
- Add reference to the IMO by adding "collaborate with the IMO as appropriate in the protection of the marine environment".

12. Soils

Position: Canada does not support a study by UNEP of domestic laws and we do not see the need for new legal instruments (on latter point, Australians share similar concern) as these would have little impact on soil conservation. Policies and programmes that help farmers deal with the financial and practical realities likely to be more effective than a top-down legalistic or regulatory approach.

- para (a) replace "review domestic land use laws" with "Encourage states to review their domestic land use laws"
- add: "Encourage states and non-state actors to explore how legal instruments to support emissions trading under the Kyoto Protocol could be used to harness market forces to provide new revenues to encourage soil conservation".

13. Forests

Position: Awaiting input from NRC

14. Biological Diversity

Position: UNEP should endeavour to work with the Secretariat (and in turn Parties) to ensure consistency with the direction of the CBD, and to ensure that there are synergies drawn between both organizations.

- para (a): Canada del should try to add a specific reference to the domestic implementation of the biosafety protocol. Suggested language: "Promote the development and application of domestic laws for the conservation and sustainable use of biological diversity in situ and ex situ, and for the implementation of obligations under the Biosafety Protocol, including through ecosystem management and land use policies."
- para (c): question inclusion as issue is already being dealt with by CBD COP and UNEP should be coordinating with COP.

15. Pollution Prevention and Control

Position: Whilst some countries have expressed interest in having an omnibus Global Chemicals Convention, Canada has resisted this approach, as it would be an undertaking that could lead to extremely complicated negotiations. Canada has preferred an approach which would allow for specific initiatives (like POPs) where the focus is clear and there is a reasonable expectation of expeditious negotiations.

- para (c): Add "Upon request of States" before "develop and promote"
- para (e): Add "in cooperation with the COPs and as requested". Add reference to Basel
- paras (f) and (h): excellent
- para (i): Add at the end "and wastes;"
- para (j): replace "international" with "regional" Comment: re environmental assessment
 - Canada is a party to the Espoo convention under the UN ECE; not sure that a global agreement would be of interest to Canada (or anyone else) since the focus is on potential transboundary impacts, so regional management more appropriate.

16. Production and consumption patterns

Position: The area of production and consumption patterns is an emerging area of international focus where there is a need for enhanced work to which UNEP could add value.

- paras (a) and (b): suggest reordering as more logical to study best practices before they are identified
- para (b) Strengthen para by citing examples: "Study best practices and innovative laws and policies that define the role and duties of the producer (**for example, Extended Producer Responsibility**) as well as the consumer (**for example, eco-labelling schemes**) in achieving sustainable production and consumption"
- add para (d): "Work for and support strategies such as life cycle management which aim to enhance resource and energy efficiencies in both the manufacture and use of products."
- add para (e) "Develop and encourage product focused policies which use a mix of regulations, economic and social instruments, procurement policies and initiatives"
- add para (f) "Support the development and encourage the use of both micro (firm, organization level) and macro (national) level indicators to benchmark and measure

enhanced environmental performance.” Comment: addition is to focus on the need for performance measures. Canada is sponsoring work on both of these fronts

17. Environmental emergencies and natural disasters

Position: The approach outlined is complementary to provisions under Part 8 of CEPA and the draft Federal Disaster Mitigation Strategy being spearheaded by Emergency Preparedness Canada. Examples of actions to support mitigation could include developing frameworks to promote international cooperation in clean-up of environmental disasters.

- para (b) amend as follows: “Promote international cooperation in establishing **and maintaining** mechanisms for disaster prevention and preparedness, including early warning systems for environmental emergencies.” Comment: amendment makes reference to reconstruction of early warning systems after an event. The Meteorological community is looking at ways and means of developing a disaster response team that would assess the Met and hydrological infrastructure to determine what needs to be done to ensure 1) the safe transport of goods and relief operations (i.e. observations and telecommunications at airports to allow for relief flights) and then to look at medium and long term needs. Donor countries, aid agencies and IFI's would be engaged in these activities.

III. Relationships with Other Fields

18. Trade, Investment and Finance

Position: Canada strongly supports the work that UNEP has been doing in the area of trade and environment and we would urge UNEP to do more. Their work with the WTO has been particularly valuable. Canada has been doing some of its own thinking in this area, especially on the relationship between multilateral environmental agreements and the WTO. With respect to the work programme, the main goal should be policy coherence between trade and the environment rather than focusing on legal instruments. Law is one approach to addressing environmental challenge and it should complement/be integrated with policy goals.

- paras (b) and (g): ok
- para (c): replace “or incoherence” with “and promote coherence”

19. Environmental Security

Position: Acceptable

- para (b): add “where appropriate” after “environmental security and”

20. Military Activities and the Environment

Position: UNEP needs to provide clarification. Not clear whether the intent of this section is to apply existing environmental laws to the military or to develop a protocol to the law of armed conflict which addresses environmental issues. There are already international agreements regarding the protection of the environment (e.g. rivers and lakes used for water supply) during a conflict. There is also a distinction to be drawn between domestic and international

military activities; there is a difference in the way the environment can be protected for training activities in Canada and for peacekeeping activities in a foreign country after the conflict has ended. From a domestic point of view, the text is consistent with the spirit of Canada's Code of Environmental Stewardship and Guide to Green Government. DND should be addressing environmental impacts of Canada's military operations through their environmental management system and as part of their sustainable development strategy.



*First Intergovernmental Review on the Implementation of the
Global Programme of Action for the Protection of the
Marine Environment from Land-based Activities*

November 26 – 30, 2001

DELEGATE HANDBOOK

*Fourth Meeting of the Open-ended
Intergovernmental Group of Ministers or their Representatives
on International Environmental Governance*

November 30 – December 1, 2001

Montréal, Québec, Canada

Host Country

Pays hôte

Canada 

Environmental Responsibility

At the Rio de Janeiro Earth Summit in 1992, Canada and more than 175 other nations committed to the principles of sustainable development. In 1995, Canada implemented its strategy to "green" its operations and ensure that all policies and programs support the principles of sustainable development.

Environmental protection is a major component of Canada's sustainable development strategy. The host departments for the GPA /IGR and the IEG, Environment Canada and Fisheries and Oceans Canada, have taken specific measures to ensure that preparations for this Meeting were consistent with the strategy for sustainable development and the policy for "greening" operations.

As a delegate or participant, we ask that you help our efforts to protect the environment by applying the principle of the "three R's": reduce, reuse and recycle, and by using the recycling bins provided at the International Civil Aviation Organization and your hotels.

IMPORTANT TELEPHONE NUMBERS

Emergencies 9-1-1

Accommodation Information

Fairmont Queen Elizabeth Hotel 861-3511
Delta Hotel Centre-Ville 879-1370
Inter-Continental Hotel 987-9900

City of Montréal Information

Taxi Services

Diamond 273-6331
Coop de Montréal 725-9885

Tourist Information 873-2015
Weather Information 283-3010



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AS EXECUTIVE DIRECTOR of the United Nations Environment Programme, it is my great pleasure to welcome you to Montréal for the first Intergovernmental Review Meeting (IGR) on the Implementation of the Global Programme of Action for the Protection of the Marine Environment from Land-based Activities (GPA) and to the Meeting of the Open-Ended Intergovernmental Group of Ministers or Their Representatives, on International Environmental Governance.

The GPA is one of the more recent, non-binding, global agreements for which UNEP is the Secretariat. Nonetheless, the pace of the GPA's implementation is accelerating. It is my wish and hope that this meeting will galvanize this growing momentum and give the Programme another major push forward. I believe that it can do so by increasing awareness of the benefits the implementation of the GPA can bring, mobilizing political will, identifying new and creative sources of funding, agreeing on concrete steps forward, and putting activities, including those facilitated by the GPA Coordination Office, into a higher gear. This conference is the beginning of a new era for the Programme and all of us are here to give it direction and impetus.

The process culminating in this Intergovernmental Review Meeting, as well as its outcome, is in many respects, a continuum of the current debate on the requirement for a more coherent and more effective international environmental governance regime. As you are aware, the UNEP Governing Council at its 21st Session in February 2001 established the Open-ended Intergovernmental Group of Ministers or Their Representatives to undertake a comprehensive policy-oriented assessment of existing institutional weaknesses as well as future needs for strengthening International Environmental Governance. The Group, whose members are also participating in this meeting of the GPA, will be considering, at this same venue, on 30th November and 1st December 2001, the proposals of Minister Anderson of Canada, in his capacity as the President of the UNEP Governing Council, for (a) improving coherence in policy-making in the environment field, (b) strengthening the role, authority and the financial situation of UNEP, (c) improving co-ordination and coherence between multilateral environmental agreements, (d) enhancing capacity building, technology transfer and country level co-ordination for environment and sustainable development.

We also hope that the outcomes of this meeting will provide a major input to other conferences and major international environmental events on related matters that will be taking place within the very near future; the International Conference on Freshwater, and the Global Conference on Oceans and Coasts, both taking place next week, in Bonn and Paris respectively. Looking a little farther into the future, the outcomes of this meeting, which impact on key matters of Agenda 21 and action thereon could also figure at the World Summit on Sustainable Development in South Africa in September 2002, and the 3rd World Water Forum to be held in Japan in 2003.

The oceans cover 71 per cent of our planet's surface, regulate its climate, and provide its ultimate waste disposal system. Humanity's future, just like its past, will continue to depend on the oceans and coasts, and on the intricate interchanges between the land and the water. The work of this meeting is vital; we cannot afford to fail. I trust we will all strive – with utmost dedication – toward the goal of ensuring that we have a successful conference, with positive and action-oriented outcomes. The well being of the oceans demands nothing short of our most vigorous efforts and single-mindedness of purpose. Indeed, the future health and sustainability of our water planet requires nothing less.

Klaus Töpfer

United Nations Under-Secretary General
Executive Director, United Nations Environment Programme



WELCOME TO CANADA



WE ARE PLEASED to welcome you to Canada for the first Intergovernmental Review Meeting (IGR) on the Implementation of the Global Programme of Action for the Protection of the Marine Environment from Land-based Activities (GPA).

The protection of the world's oceans is a very broad responsibility – one that is shared among many countries, including Canada. The response of the United Nations Environment Programme with the development of the GPA initiative in 1995 is critical to our efforts to conserve the marine environment and to ensure that it is used responsibly for the benefit of present and future generations.

Canada is proud to be the first country to have developed a National Programme of Action (NPA), which serves to protect the marine environment through co-ordinated actions at the local, regional, national and international levels.

Canada is equally proud to be the first country to have passed a comprehensive *Oceans Act* – legislation that spells out the federal government's responsibilities for implementing an integrated management approach to conserve ocean resources and use them sustainably.

We look forward to sharing Canada's experiences in oceans conservation during the IGR Meeting and to participating in the fourth Intergovernmental Meeting of International Environmental Governance.

Once again, welcome to Canada. We hope that you enjoy your stay in Montréal, and find time to explore the diverse cultural and historical activities that make this city a popular site for international events and tourists alike.

The Honourable David Anderson
Minister of the Environment

The Honourable Herb Dhaliwal
Minister of Fisheries and Oceans

TABLE OF CONTENTS

Message from the Executive Director of UNEP	1
Message from Canada	3
Agenda	5
Intergovernmental Review Meeting (GPA/IGR)	5
International Environmental Governance (IGM/IEG)	8
Participant	9
Participating Governments	9
Administrative Arrangements	10
Business Centre	10
Cafeteria	10
Cybercentre	10
Document Distribution1	10
Forum Romanum – Exhibits	10
Lost and Found	10
Media Area	10
Medical Facilities	11
Registration and Access	11
Side Events	11
Telephone Systems and Services	11
Travel Arrangements	12
General Information	12
Airline Services	12
Airports	12
Climate and Clothing	13
Coat Racks	13
Consulate Offices in Montréal	13
Electricity	14
Foreign Exchange, Banking and Currency	14
Local Transportation	14
Newspapers and Magazines	15
Restaurants	15
Sales Taxes and Rebates	15
Smoking	15
Time Zones	15
Tipping	15
Tourist Information	16
Geography, Population and City of Montréal	16
What to Do?	16
Floor Plans	19

**First Intergovernmental Review on the Implementation
of the Global Programme of Action for the Protection of
the Marine Environment from Land-based Activities
November 26 – 30, 2001**

**International Civil Aviation Organization (ICAO)
999 University Street**

AGENDA * *Subject to change*

Sunday, November 25

12:00 – 18:00 Registration
 Lower Atrium

Monday, November 26

08:00 – 15:00 Registration
 Lower Atrium

09:00 – 10:00 Morning Coffee hosted by the Government of Canada
 Plenary Room 4 foyer, Level 4

10:00 – 11:15 **Session One: Welcome, Opening, Organization**
 Opening Remarks by:
 Mr. Donald Kaniaru, Director of UNEP's Division
 for Policy Implementation
 The Honourable Herb Dhaliwal, Canada's Minister
 of Fisheries and Oceans
 Plenary Room 4, Level 4

11:30 – 13:00 **Session One: Global, Regional and National
Accomplishments**
 Plenary Room 4, Level 4

13:00 – 15:00 Lunch Break

13:30 – 14:30 Regional Seas One
 Plenary Room 4, Level 4

 Forum Romanum I
 Room 1, Level 1

15:00 – 18:00 **Session Two: Strategic Action Plan on Municipal
Wastewater**
 Plenary Room 4, Level 4

18:30 – 20:00 Government of Canada WELCOME RECEPTION
 ICAO Facilities, location to be determined

Tuesday, November 27

- 08:00 – 15:00 Registration
Lower Atrium
- 09:00 – 10:00 Regional Seas Two
Plenary Room 4, Level 4
- 10:00 – 13:00 **Session Three: Costed GPA Work Programme**
Plenary Room 4, Level 4
- 13:00 – 15:00 Lunch Break
- 13:30 – 14:30 Regional Seas Three
Plenary Room 4, Level 4
- SANICON
Plenary Room 3, Level 1
- Forum Romanum II
Room 1, Level 1
- 15:00 – 18:00 **Session Four: Coastal and Ocean Governance**
Plenary Room 4, Level 4
- 18:15 – 19:30 New IUCN Report: International Ocean Governance and
State of the Reefs: The New World Atlas of Coral Reefs
Rooms 1 & 2, Level 1
- GEF
Plenary Room 3, Level 1

Wednesday, November 28

- 08:00 – 15:00 Registration
Lower Atrium
- 09:00 – 10:00 Regional Seas Four
Plenary Room 4, Level 4
- 10:00 – 13:00 **Session Five: Financing Implementation of the GPA**
Plenary Room 4, Level 4
- 13:00 – 15:00 Lunch Break
- 13:30 – 14:30 National Programmes of Action (Country Reports)
Plenary Room 4, Level 4
- Forum Romanum III
Room 1, Level 1
- 15:00 – 18:00 **Session Six: Recommendations to Ministerial
High-Level Segment**
Plenary Room 4, Level 4

- 18:15 – 19:30 Voluntary Initiatives
Plenary Room 4, Level 4
- Launch of the Global Marine Litter Clearing-House Node
Plenary Room 3, Level 1
- Commission on Environmental Co-operation
Room 5, Level 3

Thursday, November 29

- 08:00 – 15:00 Registration
Lower Atrium
- 09:00 – 10:00 GPA Clearing-House Mechanism
Plenary Room 4, Level 4

MINISTERIAL HIGH-LEVEL SEGMENT

- 10:00 – 13:00 **Session Seven: Opening, Governance Structures**
Plenary Room 4, Level 4
- 13:00 – 15:00 Lunch Break
- 13:30 – 14:30 National Programmes of Action (Sub-Saharan Africa)
Plenary Room 4, Level 4
- Non-Governmental Organizations
Plenary Room 3, Level 1
- Forum Romanum IV
Room 1, Level 1
- 15:00 – 18:00 **Session Seven: Leveraging Resources**
Plenary Room 4, Level 4
- 18:15 – 19:30 The International Ocean Institute Virtual University
and Web-based Learning Demonstration
Plenary Room 3, Level 1
- 19:30 – 21:00 Ministerial Dinner (By invitation only)
Fairmont Queen Elizabeth Hotel, Beaver Club
Transportation from ICAO

Friday, November 30

- 08:00 – 15:00 Registration
Lower Atrium
- 09:00 – 10:00 UN Agencies
Plenary Room 4, Level 4

MINISTERIAL HIGH-LEVEL SEGMENT

- 10:00 – 13:00 **Session Seven: The Montréal Declaration**
Plenary Room 4, Level 4

- 13:00 – 15:00 Lunch Break
- 13:15 – 13:45 UNEP Media Briefing
Room 5, Level 3
- 15:00 – 18:00 **Session Eight: Adoption of Report, Closure**
Plenary Room 3, Level 1

**Fourth Meeting of the Open-ended
Intergovernmental Group of Ministers or their Representatives
on International Environmental Governance
November 30 – December 1, 2001**

AGENDA **Subject to change*

Friday, November 30

- 08:00 – 15:00 Registration
Lower Atrium

Plenary Room 4, Level 4

- 15:00 – 18:00 Opening Session
- 18:00 – 19:30 Government of Canada WELCOME RECEPTION
(By invitation only)
Plenary Room 4 foyer, Level 4
- 19:30 – 22:00 Evening Session

Saturday, December 1

- 08:00 – 12:00 Registration
Lower Atrium

Plenary Room 4, Level 4

- 10:00 – 11:30 Working Session
- 11:30 – 11:45 Coffee Break hosted by the Government of Canada
Plenary Room 4 foyer, Level 4
- 11:45 – 13:00 Working Session
- 13:00 – 15:00 Luncheon hosted by the Government of Canada
Plenary Room 4 foyer, Level 4
- 15:00 – 16:30 Working Session
- 16:45 – 18:00 Working Session – Closure of the meeting

PARTICIPANTS

In 1995, 108 governments and the European Commission declared their commitment to protect and preserve the marine environment from the adverse environmental impacts of land-based activities, through the adoption of the Washington Declaration. UNEP was tasked to lead the co-ordination effort and to establish a GPA Co-ordination Office.

Participating Governments

Antigua and Barbuda	Gambia	Philippines
Argentina	Georgia	Poland
Australia	Germany	Republic of Korea
Austria	Ghana	Romania
Bahrain	Greece	Russian Federation
Bangladesh	Honduras	Rwanda
Belarus	Iceland	Saint Lucia
Belgium	India	Samoa
Belize	Indonesia	Sao Tome And Principe
Benin	Israel	Saudi Arabia
Bhutan	Italy	Senegal
Botswana	Jamaica	Seychelles
Brazil	Japan	Sierra Leone
Bulgaria	Jordan	Slovenia
Burkina Faso	Kazakstan	South Africa
Burundi	Kenya	Spain
Cambodia	Kiribati	Sri Lanka
Cameroon	Kuwait	Sweden
Canada	Malawi	Switzerland
Chad	Malaysia	Thailand
Chile	Maldives	Togo
China	Malta	Tunisia
Colombia	Marshall Islands	Turkmenistan
Comoros	Mauritius	Uganda
Congo	Mexico	United Kingdom
Costa Rica	Micronesia	United Republic of
Cote D'Ivoire	Monaco	Tanzania
Croatia	Mozambique	United States of
Cuba	Nauru	America
Denmark	Netherlands	Uruguay
Dominica	New Zealand	Vanuatu
Ecuador	Nicaragua	Venezuela
Egypt	Niger	Yemen
Estonia	Nigeria	Zaire
Ethiopia	Norway	Zambia
Finland	Pakistan	Zimbabwe
France	Peru	

ADMINISTRATIVE ARRANGEMENTS

Business Centre

The Business Centre, located on *Level 1*, provides on-site services to delegates on a commercial basis, including photocopy, fax, and laser prints. Courier and other mail services, including the sale of postage stamps will be offered, as well as the sale of long-distance calling cards.

Business Centre personnel can also arrange cellular telephone and pager rentals, and the production of colour photocopies, acetate production, large-size reprography and document digitalization for delivery within four working hours.

Cafeteria

Due to increased security measures at the ICAO facilities, the cafeteria will not be open to GPA/IGR Meeting participants. Please refer to the *Restaurant* section of this handbook for information about food courts located closely to ICAO

Cybercentre

Located on *Level 1* in the *Upper Atrium*, delegates have access to personal computers, printers, laptop and modem connections for Internet use.

Please note that Cybercentre computers are for Internet access only and do not support other software applications. *To reach the Cybercentre, delegates must use the stairs in the Lower Atrium.*

Document Distribution

Official documents are available at the Document Distribution centre by the elevator entrance on *Level 4*. The Centre will open at **12:00 on Sunday, November 25.**

Forum Romanum – Exhibits

To actively involve a wider group of stakeholders representing relevant actors of the private and NGO sectors, an exclusive exhibition called the *Forum Romanum* was organized as a parallel event to the GPA/IGR. These exhibits are situated throughout ICAO and are in operation from **November 26 to December 1, from 09:00 to 18:30.**

Lost and Found

Any articles found should be handed to Business Centre personnel on *Level 1*.

Media Area

Accredited media representatives may observe the GPA/IGR sessions from the observation galleries located on *Level 5*. Offices for the UNEP and local Media Relations Co-ordinators, a small briefing theatre and a media working area are also situated on *Level 5*

Ministers or delegates who would like to speak to the media should call **392-1186** or speak to one of the Media Relations Co-ordinators. Requests from journalists for interviews with Meeting participants will be given to Document Distribution

Medical Facilities

A nurse is on duty on *Level 4, Room 4.25* from **08:00 to 18:00**, Monday to Friday. The nurse can also be reached by calling **954-8219, ext. 8212**.

If you require immediate medical assistance, approach any ICAO security staff. These persons have been trained for all such emergencies.

There are two medical centres open during the day that are located near ICAO: one at Central Station (entrance at University and de la Gauchetière Streets) and the second, beneath the Bell building across from ICAO (Viger and University Streets). Participants seeking medical attention can obtain the location and telephone number of a doctor in the hotel or nearby by calling hotel management.

Note: Medical services in Canada are of great quality but may be expensive. The Government of Canada does not assume responsibility for these services.

Registration and Access

All GPA/IGR and IGM/IEG participants must be properly registered by UNEP, and in possession of an official badge. On-site registration will take place in the Lower Atrium of ICAO:

November 25	12:00 – 18:00
November 26-30	08:00 – 15:00
December 1	08:00 – 12:00

The colour code for badges is:

United Nations:	Gray	Media:	Orange
Secretariat:	Blue	Exhibitor:	Violet
Government:	Purple	Industry:	Yellow
Minister:	Green	NGO:	Pink
IGO:	Light Brown		

Side Events

Delegates wishing to book a meeting room to hold a bilateral meeting or a side event must first register their request with personnel located in *Room B, Level 1*, or by dialing extension **7113** from an ICAO in-house telephone.

Telephone Systems and Services

Public telephones are located in the Lower Atrium, at a cost of CAN\$0.25 for local calls. Dial **0** to reach the long-distance operator to charge long-distance calls to a credit card. Long-distance calling cards can be purchased

at the Business Centre or in the gift shops located in the lobbies of your hotel. Local and long-distance calls from hotel rooms are subject to hotel rates.

To dial international numbers (excluding the United States and most Caribbean countries): dial 011 + the country code + the area code + the telephone number. Country codes are listed at the beginning of telephone books placed in every hotel room.

Travel Arrangements

Personnel from the designated travel agency, MKI Travel of Ottawa, Canada are available on *Level 1* to assist participants with confirmation of tickets and travel arrangements in general.

For confirmations of onward travel only, delegates are encouraged to call the airlines directly. Local and toll-free telephone numbers of major airlines have been listed below under the *General Information* section of this handbook.

GENERAL INFORMATION

Airline Services

Air Canada	1-888-247-2262
Air France	1-800-667-2747
Alitalia	1-800-361-8336
American Airlines	1-800-433-7300
British Airways	1-800-668-1055
Delta Airlines	1-800-361-1970
El Al Israel Airlines	1-800-361-6174
Finnair	1-800-461-8651
Japan Airlines	1-800-525-3663
KLM	1-800-361-5073
Lufthansa	1-800-563-5954
Northwest Airlines	1-800-345-7458
Olympic Airways	878-9691
Sabena Belgian Airlines	1-800-955-2000
Swissair	1-800-267-9477
United Airlines	1-800-241-6522
US Airways	1-800-428-4322

Note: 1-800 and 1-888 telephone numbers in Canada are toll-free.

Airports

Special bus service from major downtown hotels is available from **05:00 to 23:00**. Arrangements can be made through the concierge desk at your hotel.

The City Centre Air Terminal, Aéroports de Montréal, 777 de la Gauchetière Street West, offers bus service to Dorval airport every 20 minutes on weekdays and every 30 minutes on weekends. Information on fares and schedules may be obtained at **394-7369**.

A taxi from Dorval airport costs approximately CAN\$30.

Note: Passengers must pay a CAN\$10 airport improvement fee upon departure.

Climate and Clothing

In late November, Montréal experiences cold weather, particularly in the evening and there is a moderate possibility of snow. The average temperature is between +5 and -5 degrees Celsius during the day, and is cooler at night. Warm coats, walking shoes and/or winter boots, a hat and gloves, will ensure your stay is pleasant and comfortable.

Coat Racks

Coat racks have been placed on each level of the ICAO Facilities. Please consult the *Floor Plans* section of this handbook to determine their locations.

Consulate Offices in Montréal

Consulate General of Austria	845-8661
Consulate General of Belgium	849-7394
Consulate General of Brazil	499-0968
Consulate General of Chile	499-0405
Consulate General of Colombia	849-4852
Consulate General of Costa Rica	393-1057
Consulate General of Cuba	843-8897
Consulate General of Czech Republic	849-4495
Consulate General of Denmark	877-3060
Consulate General of Ecuador	874-4071
Consulate General of the Arab Republic of Egypt	866-8455
Consulate General of El Salvador	861-6515
Consulate General of France	878-4385
Consulate General of the Federal Republic of Germany	931-2277
Consulate General of Great Britain.	866-5863
Consulate General of Greece	875-2119
Consulate General of Haiti	499-1919
Consulate General of Honduras	937-1138
Consulate General of the Republic of Hungary	393-1048
Consulate General of Israel	940-8500
Consulate General of Italy	849-8351
Consulate General of Japan	866-3429
Consulate General of the Republic of Korea	845-3243
Consulate General of Lebanon	276-2638
Consulate General of Mexico	288-2502

Consulate General of Monaco	849-0589
Consulate General of Kingdom of Morocco	288-8750
Consulate General of the Netherlands	849-4247
Consulate General of Norway	874-9087
Consulate General of Pakistan	845-2297
Consulate General of Panama	874-1929
Consulate General of Poland	937-9481
Consulate General of Portugal	499-0359
Consulate General of Romania	876-1792
Consulate General of South Africa	878-9217
Consulate General of Spain	935-5235
Consulate General of Sweden	345-2727
Consulate General of Switzerland	932-7181
Consulate General of Thailand	878-4466
Consulate General of Tunisia	844-6909
Consulate General of the United States of America	398-9695
Consulate General of Venezuela	842-3417
Russian Federation General Consulate	843-5901

Electricity

Voltage in Canada is 110/115 AC/60 cycles. Transformers are not normally available from hotels.

Foreign Exchange, Banking and Currency

The official currency in Canada is the Canadian dollar, which is divided into 100 cents. At the time of printing, it was valued at CAN\$1.00 = US\$0.63. US currency is also widely accepted in Canada. Traveller's cheques are accepted in most major foreign currencies by banks, which are usually open from **10:00 to 16:00** on weekdays. The following banks are closely located to ICAO:

National Bank of Canada

600 de la Gauchetière Street West
Tel.: 394-4385

Royal Bank of Canada

1 Ville-Marie Place
Tel.: 874-7222

CIBC

1155 René-Lévesque Boulevard West
Tel.: 876-2323

Toronto Dominion Bank

500 St. Jacques Street West
Tel.: 289-0799

Currency exchange facilities are available at Dorval airport and downtown foreign exchange offices. Major credit cards are accepted in most hotels, restaurants, department stores and shops.

Local Transportation

The underground subway system in Montréal, the Metro, is a clean, safe and economical way to reach many of the city's hotels and attractions.

A one-way bus or Metro ticket costs CAN\$2. Special one-day, three-day

or weekly public transit passes can be purchased at most Metro stations for CAN\$7, \$14 and \$12.50 respectively.

Taxi service in Montréal is readily available from any location and can even be hailed from the street. The set fare starts at CAN\$2.50 and every kilometre travelled costs CAN\$0.97. There are two leading taxi companies in Montréal: Diamond Taxi and Taxi Coop. See the inside cover of this handbook for telephone numbers.

Newspapers and Magazines

The Metropolitan News Agency, located at 1109 Cypress Street, off Peel Street just south of St. Catherine Street, carries a wide range of international newspapers, magazines and other publications, including street maps.

Restaurants

Food courts offer a wide variety of cuisines for the low cost of CAN\$6 to \$10. Two fast-food courts are within a short walking distance from the ICAO facilities. The first is located in the Bell Office Tower at 700 de la Gauchetière Street West, open weekdays until **18:00** only. The second is in the Central Train Station at 895 de la Gauchetière Street West, which is open 7 days per week until **20:00**. University Street is the cross-street of both food courts. Designated smoking areas are provided.

The concierge at your hotel can assist in choosing restaurants and making reservations for evening dining.

Sales Taxes and Rebates

The federal tax (GST) of 7% is levied on most goods and services in Canada. In addition, a 7.5% provincial tax (PST) is levied on products and services in Québec. Non-residents can apply for a GST rebate on most goods purchased for use outside Canada as well as on short-term accommodation. Details are given in the "GST Rebate for Visitors" booklet published by Canada Customs and Revenue Agency, available on the plane, Business Centre at ICAO, Dorval airport, or your hotel.

Smoking

Smoking is permitted in designated areas only in Québec, including restaurants. There is a no smoking policy at ICAO.

Time Zones

There are several different time zones in Canada. In Montréal the time zone is Greenwich Mean Time +5 hours.

Tipping

The standard tip at restaurants is 15 per cent before taxes, and many restaurants and large hotels will automatically add 15 per cent when serving larger groups. Tipping for hotel porter service is generally CAN\$1 per bag, and for taxi service, add 10 per cent to the total taxi cost.

TOURIST INFORMATION

All major hotels provide tourist information on points of interest in Montréal and its vicinity. *Tourisme Québec*, located at the *Centre Infotouriste* at 1001 Square Dorchester, offers tourist information for Montréal and the province of Québec. Open weekdays from **08:30 to 19:00** and weekends from **09:00 to 17:00**, the office can also be reached at **873-2015**.

Geography, Population and the City of Montréal

Canada is the second largest country in the world, with an area covering 10 million square kilometres and a population of 30 million inhabitants. Extending from the Atlantic to the Pacific Ocean and northward to the Arctic Ocean, Canada is a diverse land, both geographically and culturally. The majority of the Canadian population resides near the United States border to the south.

Québec is one of Canada's ten provinces and three territories. Over 75 per cent of Québec's 7 million inhabitants are French-speaking. Canada's official languages are English and French. Both are commonly used in Montréal.

Montréal, the city of "joie de vivre," is known worldwide for its gastronomy, shopping and scenic attractions. Located on an island in the majestic St. Lawrence River, Montréal is an international cultural centre with a European flair and a North American way of life that makes it an ideal city in which to reside and to visit. Participants are sure to be enchanted by the striking contrasts that shape this 350-year-old metropolis, centuries old cathedrals shadowed by modern day skyscrapers.

What to do?

Looking for an interesting way to spend an hour or two during the GPA/IGR or IEG? You don't have to look very far! Special events, sites and shopping that you may find enjoyable, are all within a short walking distance of the ICAO facilities:

Old Montréal and the Old Port

Tourist Information Centre
174 Notre-Dame Street East

Museums, boutiques, sidewalk cafés and outdoor activities are just a few of things to see and do in Old Montréal. An area rich in history, a short walking tour demonstrates the many architectural changes that shaped this area over the past four centuries – from French colony winding paths to modern-day skyscrapers. The Old Port runs along the St. Lawrence River and is the site of the IMAX theatre.

From ICAO's main door on University Street, turn left on St. Antoine Street and walk to Côte du Beaver Hall, where you turn right. Continue walking until you reach Notre-Dame Street, then you turn left. Jacques-Cartier Place, the heart of Old Montréal, is just a few blocks down. The Old Port is south of Jacques-Cartier Place.

Underground Pedestrian Network

Commonly referred to as the "underground city", Montréal's vast indoor pedestrian network extends some 30 km (18 miles). Over 500,000 people a day circulate the myriad of corridors linking Metro subway stations to a variety of boutiques, major department stores, restaurants, cinemas, theatres and exhibition halls in this 3.6 million m² (4.3 million sq. yds) indoor network.

The Underground Pedestrian Network is accessible from ICAO.

St. Catherine Street

Montréal's downtown area has always been identified with St. Catherine Street – a renowned commercial thoroughfare. Running 15 kilometres east to west across the city, the Street is lined with major department stores, shops and restaurants that have been the pride of Montréal for more than a century.

From ICAO's main door on University Street, turn right until you reach St. Catherine Street.

Delegates of the GPA/IGR and the IEG may also wish to visit some of the city's greatest tourist attractions during their stay in Canada, including:

Montréal Botanical Garden

4101 Sherbrooke Street East

Open daily from 09:00 to 17:00

Metro Station: Pie-IX

Tel.: 872-1400

Founded in 1931, the Montréal Botanical Garden is one of the largest of its kind in the world. Explore ten exhibition greenhouses and some thirty outdoor gardens. Soak up the exotic charms of the Chinese and Japanese gardens, and be sure to visit the new First Nations Garden to learn about the 11 Amerindian and Inuit nations of Québec and their plant world, past and present.

The Montréal Botanical Garden is easy to reach by taxi or metro. Square-Victoria Metro: From ICAO's main door on University Street, turn left on St. Antoine Street and walk one block to McGill. Bonaventure Metro: Place Bonaventure, across from ICAO, hosts an indoor corridor that has access to this metro station.

Montréal Biodôme

4777 Pierre de Coubertin Avenue

Open daily from 09:00 to 17:00

Metro Station: Viau

Tel.: 868-3000

Experience ecology in the heart of Montréal! Four natural ecosystems create an environmental museum inside the Biodôme. Rocky landscapes, tumbling waterfalls and majestic trees are home to birds, mammals and fish that fly, climb and swim through their natural habitats: the tropical forest, the Laurentian forest, the St. Lawrence marine environment and the polar world.

Access to the Biodôme is easy to reach by taxi or metro. For directions to the Metro subway station, refer to the directions listed under the Montréal Botanical Garden.

Montréal Museum of Fine Arts

1379 - 1380 Sherbrooke Street West

Open Tuesday through Sunday
from 11:00 to 18:00

Metro Station: Peel / Guy-Concordia

Free admission to the permanent
collection only

Tel.: 285-2000

Founded in 1860, the Montréal Museum of Fine Arts is one of Canada's oldest and most important institutions. The permanent collection contains works of art from antiquity to the modern day. A collection of decorative art ranging from the Renaissance to the contemporary periods is now showing in the temporary collection.

From ICAO's main door on University Street, turn right until you reach Sherbrooke Street (5-10 minute walk). Turn left. The museum is just a few blocks down (10 minutes).

FLOOR PLANS

The site for the GPA/IGR and the IEG is the **International Civil Aviation Organization**, located on 999 University Street in Montréal. Delegates should access the building through the *Atrium* entrance.

Atriums

Upper

Cybercentre

Forum Romanum – Exhibits

Lower

Registration

Public Telephones

Level 1

Business Centre

Delegate Lounge

Forum Romanum – Exhibits

GPA Offices

GPA Secretariat

GPA Side Events: Room 1

GPA Side Events: Room 2

Plenary Room 3

Travel Desk

Level 3

GPA Side Events: Room 6

GPA Side Events: Room 7B

Local Co-ordinators' Office

Media Briefing / GPA Side Events: Room 5

Level 4

Document Distribution

Government of Canada booth

GPA Side Events: Room 8

Plenary Room 4

Level 5

Briefing Theatre

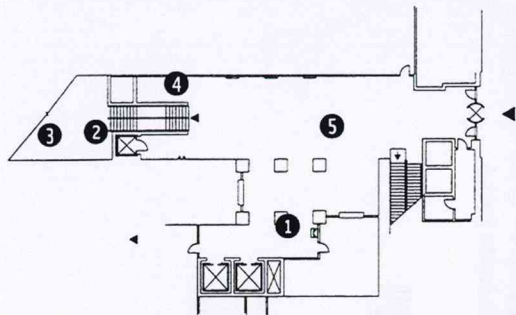
GPA / IEG Media Co-ordinator

Local Media Co-ordinator

Media Observation Gallery

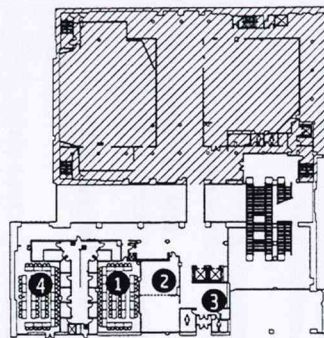
Media Work Area

Upper and Lower Atriums • Atriums supérieur et inférieur



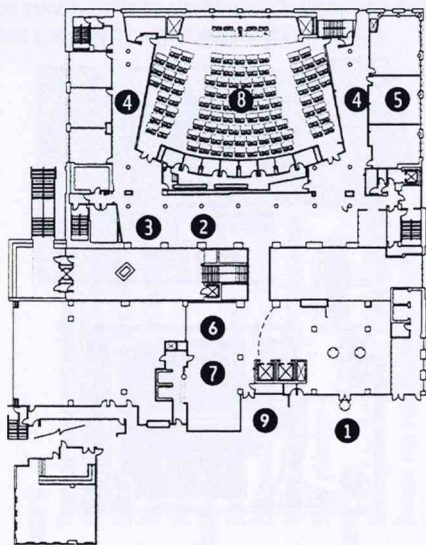
1. Coat Racks – Vestiaires
2. Cybercentre
3. Exhibits – Expositions
4. Public Telephones – Téléphones publics
5. Registration – Inscription

Level 3 • Niveau 3



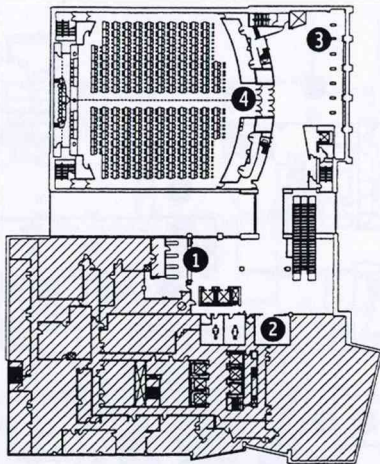
1. GPA Side Events: Room 6 – Événements parallèles du GPA: Salle 6
2. GPA Side Events: Room 7B – Événements parallèles du GPA: Salle 7B
3. Local Co-ordinators' Office – Bureau des coordonnateurs locaux
4. Media Briefing / GPA Side Events: Room 5
Breffage des médias / Événements parallèles: Salle 5

Level 1 • Niveau 1



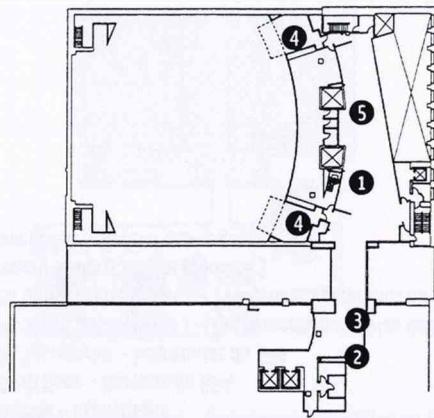
1. Business Centre – Centre d'affaires
2. Delegate Lounge – Salon des délégués
3. Exhibits – Expositions
4. GPA Offices – Bureaux du GPA
5. GPA Secretariat – Secrétariat du GPA
6. GPA Side Events: Room 1 – Événements parallèles du GPA: Salle 1
7. GPA Side Events: Room 2 – Événements parallèles du GPA: Salle 2
8. Plenary Room 3 – Salle plénière 3
9. Travel Desk – Bureau des voyages

Level 4 • Niveau 4



1. Document Distribution – Distribution des documents
2. GPA Side Events: Room 8 – Événements parallèles du GPA: Salle 8
3. Government of Canada booth – Kiosque du gouvernement du Canada
4. Plenary Room 4 – Salle plénière 4

Level 5 • Niveau 5



1. Briefing Theatre – Salle de breffage
2. GPA / IEG Media Co-ordinator – Coordonnateur des médias GPA / IEG
3. Local Media Co-ordinator – Coordonnateur des médias locaux
4. Media Observation Gallery – Galerie d'observation des médias
5. Media Work Area – Espace de travail pour les médias



Première réunion intergouvernementale chargée d'examiner la mise en oeuvre du Programme d'action mondial pour la protection du milieu marin contre la pollution due aux activités terrestres

26 - 30 novembre 2001

CARNET DU DÉLÉGUÉ

Quatrième réunion du Groupe intergouvernemental de ministres ou de représentants de ministres à composition non limitée sur la Gouvernance internationale en matière d'environnement

30 novembre - 1^{er} décembre 2001

Montréal (Québec) Canada

Pays hôte

Host Country

Canada 

Responsabilité environnementale

Au Sommet de la Terre tenu à Rio de Janeiro en 1992, le Canada et plus de 175 autres pays se sont engagés à respecter les principes de développement durable. En 1995, le Canada a mis en œuvre sa stratégie visant à « écologiser » ses opérations et à s'assurer que l'ensemble des politiques et des programmes soutiennent les principes de développement durable.

La protection de l'environnement est un volet important de la stratégie de développement durable du Canada. Vos hôtes, Environnement Canada et Pêches et Océans Canada, ont adopté des mesures particulières afin de garantir que les préparatifs en vue de la Réunion soient conformes à la stratégie de développement durable et à la politique d'« écologisation » des opérations.

À titre de délégués ou de participants, vous êtes invités à contribuer à nos efforts pour protéger l'environnement en appliquant le principe des « trois R » (c'est-à-dire réduction, réutilisation et recyclage) et en utilisant les bacs de recyclage installés à cet effet au Organisation internationale de l'aviation civile et à vos hôtels.

NUMÉROS DE TÉLÉPHONE IMPORTANTS

Urgence 9-1-1

Renseignements sur l'hébergement

Hôtel Fairmont Queen Elizabeth 861-3511
Hôtel Delta Centre-Ville 879-1370
Hôtel Inter-Continental 987-9900

Renseignements touchant la ville de Montréal

Taxis

Diamond 273-6331
Coop de Montréal 725-9885

Centre d'information touristique 873-2015
Renseignements météorologiques 283-3010



Papier fait de 15 % de matières recyclées.

Remarque : Les renseignements que contient le carnet du délégué étaient précis au moment de l'impression et peuvent faire l'objet de modifications.



EN TANT QUE DIRECTEUR du Programme des Nations Unies pour l'environnement, c'est avec grand plaisir que je vous souhaite la bienvenue à Montréal, à l'occasion de la première Réunion intergouvernementale chargée d'examiner la mise en oeuvre du Programme d'action mondial pour la protection du milieu marin contre la pollution due aux activités terrestres, et de la Réunion du Groupe intergouvernemental de ministres à composition non limitée sur la gouvernance internationale en matière d'environnement.

Le Programme d'action mondial est l'un des plus récents accords mondiaux non contraignants dont le PNUE est le secrétariat. Mais sa mise en oeuvre se fait maintenant à un rythme accéléré. J'ose espérer que cette réunion profitera de cette lancée et lui donnera une nouvelle impulsion. Je crois que nous arriverons à insuffler un nouveau dynamisme au programme en faisant mieux connaître les avantages de la mise en oeuvre du Programme d'action mondial, en mobilisant la volonté politique, en déterminant des sources de financement nouvelles et créatives, en nous entendant sur les étapes concrètes à suivre et en accélérant la réalisation des activités, notamment celles dont le bureau de coordination du Programme d'action mondial est responsable. Cette conférence marque le début d'une nouvelle ère pour le Programme, et nous tous ici présents contribueront à lui donner une orientation et un élan.

Le processus qui a mené à la réunion intergouvernementale, ainsi que les résultats de cette réunion s'inscrivent, à bien des égards, dans la continuité du débat actuel sur la nécessité d'établir un régime de gouvernance internationale plus unifié en matière d'environnement. Vous savez sans doute que, lors de sa 21^e session, qui a eu lieu en février 2001, le Conseil d'administration du PNUE a chargé le Groupe intergouvernemental de ministres à composition non-limitée ou leurs représentants d'effectuer une évaluation stratégique exhaustive des lacunes institutionnelles existantes ainsi que des besoins futurs sur le plan de la gouvernance internationale en matière d'environnement. Le 30 novembre et le 1^{er} décembre 2001, le Groupe, dont les membres participent également à cette réunion du Programme d'action mondial, examinera les propositions présentées par le Ministre de l'environnement du Canada, M. David Anderson, en sa qualité de président du Conseil d'administration du PNUE, et visant à a) renforcer la cohésion de l'élaboration de politiques dans le domaine de l'environnement, b) renforcer le rôle, le pouvoir et la situation financière du PNUE, c) améliorer la coordination et la cohérence entre les accords multilatéraux liés à l'environnement, (d) améliorer le développement des capacités, les transferts technologiques et la coordination nationale pour l'environnement et le développement durable.

Nous espérons également que les résultats de cette réunion contribueront grandement aux autres conférences et aux activités environnementales internationales sur des questions connexes comme la Conférence internationale sur l'eau douce et la Conférence internationale sur les océans et les côtes, qui auront lieu la semaine prochaine à Bonn et à Paris, respectivement. À long terme, les résultats de cette réunion, qui influenceront les principales questions de l'Agenda 21 et les actions qui en découleront, pourraient également figurer au programme du Sommet mondial sur le développement durable prévu en septembre 2002 et du Troisième Forum mondial sur l'eau, qui se tiendra au Japon en 2003.

Les océans couvrent 71 p. 100 de la surface de la planète; ils contribuent à équilibrer le climat, et constituent l'ultime système d'évacuation des déchets. À l'avenir, tout comme par le passé, l'humanité continuera de dépendre des océans et des côtes, ainsi que des échanges complexes entre la terre et l'eau. Les travaux que nous réaliserons dans le cadre de cette réunion sont essentiels; nous ne pouvons nous permettre d'échouer. Je suis convaincu que nous déploierons les plus grands efforts pour faire de cette conférence un succès, et que ses résultats seront positifs et axés sur l'action. Pour assurer la santé de nos océans, nous devons nous atteler à la tâche et faire preuve de détermination. En fait, la santé et la viabilité des océans de notre planète l'exigent.

Klaus Töpfer

Sous-secrétaire général des Nations Unies

Directeur exécutif, Programme des Nations Unies pour l'environnement



BIENVENUE AU CANADA



NOUS SOMMES HEUREUX de vous souhaiter la bienvenue au Canada à l'occasion de la première Réunion intergouvernementale chargée d'examiner la mise en oeuvre du Programme d'action mondial pour la protection du milieu marin contre la pollution due aux activités terrestres.

La protection des océans du monde est une responsabilité très vaste que partagent de nombreux pays, dont le Canada. La réponse du Programme des Nations Unies pour l'environnement par la mise en place du Programme d'action mondial en 1995 est essentielle à nos efforts pour protéger le milieu marin et pour nous assurer que ce milieu est utilisé judicieusement pour le bien des générations présentes et futures.

Le Canada est fier d'être le premier pays à avoir élaboré un Programme d'action national qui sert à protéger le milieu marin grâce à des mesures concertées aux niveaux local, régional, national et international.

Le Canada est fier également d'être le premier pays à avoir adopté une *Loi sur les océans* exhaustive, texte qui énonce les responsabilités du gouvernement fédéral concernant la mise en oeuvre d'un mode intégré de gestion en vue de préserver les ressources océaniques et de les utiliser durablement.

Nous nous réjouissons de partager les expériences du Canada dans le domaine de la préservation des océans pendant la Programme d'action mondial et de participer à la quatrième Réunion intergouvernementale sur la gouvernance internationale en matière d'environnement.

Encore une fois, soyez les bienvenus au Canada. Nous espérons que vous apprécierez votre séjour à Montréal et que vous pourrez profiter des nombreuses activités culturelles et historiques qui font de cette ville un haut lieu du tourisme et d'événements internationaux.

L'honorable David Anderson
Ministre de l'Environnement

L'honorable Herb Dhaliwal
Ministre des Pêches et des Océans

TABLE DES MATIÈRES

Message du directeur exécutif du PNUE	1
Message du Canada	3
Ordre du jour	5
Réunion intergouvernementale d'examen (PAM/RIE)	5
Gouvernance internationale en matière d'environnement	8
Participants	9
Gouvernements participants	9
Arrangements administratifs	10
Aire des médias	10
Cafétéria	10
Centre d'affaires	10
Cybercentre	10
Distribution des documents	10
Événements parallèles	11
Forum Romanum – Expositions	11
Inscription et accès	11
Installations médicales	11
Objets trouvés	12
Préparatifs de voyage	12
Systèmes et services d'appel	12
Renseignements généraux	12
Aéroports	12
Climat et habillement	12
Consulats à Montréal	13
Devises, taux de change et services bancaires	14
Droit de fumer	14
Électricité	14
Fuseaux horaires	14
Journaux et magazines	14
Moyens de transport locaux	14
Pourboires	15
Restaurants	15
Services de transport aérien	15
Taxes de vente et remboursement de taxe	16
Vestiaires	16
Renseignements touristiques	16
Géographie, population et ville de Montréal	16
Que faire?	17
Plans d'étages	20

Première Réunion intergouvernementale chargée d'examiner la mise en oeuvre du Programme d'action mondial pour la protection du milieu marin contre la pollution due aux activités terrestres
26 - 30 novembre 2001

Organisation de l'aviation civile internationale (OACI)
999, rue University

ORDRE DU JOUR * *Sujet à changement*

Dimanche 25 novembre

12 h - 18 h InSCRIPTION
Atrium inférieur

Lundi 26 novembre

8 h - 15 h InSCRIPTION
Atrium inférieur

9 h - 10 h Pause-café du matin offerte par le gouvernement du Canada
Foyer de la Salle plénière 4, niveau 4

10 h - 11 h 15 Mots de bienvenue :
Donald Kaniaru, directeur, Division de la mise en oeuvre des politiques, PNUE
L'honorable Herb Dhaliwal, ministre des Pêches et des Océans du Canada

11 h 30 - 13 h **Séance 1 : Réalisations mondiales, régionales et nationales**
Salle plénière 4, niveau 4

13 h - 15 h Déjeuner

13 h 30 - 14 h 30 Mers régionales I
Salle plénière 4, niveau 4

Forum Romanum I
Salle 1, niveau 1

15 h - 18 h **Séance 2 : Plan d'action stratégique sur les eaux d'égouts urbains**
Salle plénière 4, niveau 4

18 h 30 - 20 h RÉCEPTION DE BIENVENUE du gouvernement du Canada
OACI, lieu à confirmer

Mardi 27 novembre

8 h - 15 h InSCRIPTION
Atrium inférieur

- 9 h - 10 h Mers régionales II
Salle plénière 4, niveau 4
- 10 h - 13 h **Séance 3 : Programme de travail du PAM portant indication des frais**
Salle plénière 4, niveau 4
- 13 h - 15 h Déjeuner
- 13 h 30 - 14 h 30 Mers régionales III
Salle plénière 4, niveau 4
- SANICON
Salle plénière 3, niveau 1
- Forum Romanum II
Salle 1, niveau 1
- 15 h - 18 h **Séance 4 : Gestion des côtes et des océans**
Salle plénière 4, niveau 4
- 18 h 15 - 19 h 30 Nouveau rapport de l'UICN sur la gouvernance internationale des océans et l'état des récifs coralliens : The New World Atlas of Coral Reefs
Salles 1 et 2, niveau 1
- GEF
Salle plénière 3, niveau 1

Mercredi 28 novembre

- 8 h - 15 h Inscription
Atrium inférieur
- 9 h - 10 h Mers régionales IV
Salle plénière 4, niveau 4
- 10 h - 13 h **Séance 5 : Mise en œuvre du financement du PAM**
Salle plénière 4, niveau 4
- 13 h - 15 h' Déjeuner
- 13 h 30 - 14 h 30 Programmes d'action nationaux (Rapports des pays)
Salle plénière 4, niveau 4
- Forum Romanum III
Salle 1, niveau 1
- 15 h - 18 h **Séance 6 : Recommandations à la réunion ministérielle et de haut niveau**
Salle plénière 4, niveau 4

- 18 h 15 – 19 h 30 Initiatives volontaires
Salle plénière 4, niveau 4
- Lancement du centre mondial d'échange
d'information sur les débris marins
(Global Marine Litter Clearing-House Node)
Salle plénière 3, niveau 1
- Commission de coopération environnementale
Salle 5, niveau 3

Jeudi 29 novembre

- 8 h – 15 h Inscription
Atrium inférieur
- 9 h – 10 h Mécanisme de coordination du GPA
Salle plénière 4, niveau 4

RÉUNION MINISTÉRIELLE DE HAUT NIVEAU

- 10 h – 13 h **Séance 7 : Ouverture, structures de gouvernance**
Salle plénière 4, niveau 4
- 13 h – 15 h Déjeuner
- 13 h 30 – 14 h 30 Programme d'action national (Afrique subsaharienne)
Salle plénière 4, niveau 4
- Organisations non gouvernementales
Salle plénière 3, niveau 1
- Forum Romanum IV
Salle 1, niveau 1
- 15 h – 18 h **Séance 7 : Optimisation des ressources**
Salle plénière 4, niveau 4
- 18 h 15 – 19 h 30 Université virtuelle de l'Institut international de
l'Océan et démonstration d'enseignement virtuel
Salle plénière 3, niveau 1
- 19 h 30 – 21 h Dîner et réception (sur l'invitation seulement)
Hôtel Fairmont Le Reine Elizabeth, Beaver Club
Transport à partir de l'OACI

Vendredi 30 novembre

- 8 h – 15 h Inscription
Atrium inférieur
- 9 h – 10 h Organismes de l'ONU
Salle plénière 4, niveau 4

RÉUNION MINISTÉRIELLE DE HAUT NIVEAU

- 10 h - 13 h **Séance 7 : La Déclaration de Montréal**
Salle plénière 4, niveau 4
- 13 h - 15 h Déjeuner
- 13 h 15 - 13 h 45 Conférence de presse du PNUE
Salle 5, niveau 3
- 15 h - 18 h **Séance 8 : Adoption du Rapport, Clôture**
Salle plénière 3, niveau 1

Quatrième Réunion du Groupe intergouvernemental de ministres ou de leurs représentants à composition non limitée sur la gouvernance internationale en matière d'environnement 30 novembre - 1^{er} décembre 2001

ORDRE DU JOUR *Sujet à changement

Vendredi 30 novembre

- 8 h - 15 h Inscription
Atrium inférieur

Salle plénière 4, niveau 4

- 15 h - 18 h Séance d'ouverture
- 18 h - 19 h 30 RÉCEPTION D'ACCUEIL du gouvernement du Canada
(sur l'invitation seulement)
Foyer de la Salle plénière 4, niveau 4
- 19 h 30 - 22 h Séance du soir

Samedi 1^{er} décembre

- 8 h - 12 Inscription
Atrium inférieur

Salle plénière 4, niveau 4

- 10 h - 11 h 30 Séance de travail
- 11 h 30 - 11 h 45 Pause-café offerte par le gouvernement du Canada
Foyer de la Salle plénière 4, niveau 4
- 11 h 45 - 13 h Séance de travail
- 13 h - 15 h 5 Déjeuner offert par le gouvernement du Canada
Foyer de la Salle plénière 4, niveau 4
- 15 h - 16 h 30 Séance de travail
- 16 h 45 - 18 h Séance de travail, Clôture de la réunion

PARTICIPANTS

En 1995, 108 gouvernements et la Commission européenne ont déclaré leur engagement à protéger et à préserver le milieu marin contre les incidences environnementales néfastes des activités terrestres, par l'adoption de la Déclaration de Washington. Le PNUE a été chargé de piloter l'effort de concertation et d'établir un Bureau de coordination du GPA.

Gouvernements participants

Afrique du Sud	Estonie	Niger
Allemagne	États-Unis d'Amérique	Nigéria
Antigua-et-Barbuda	Éthiopie	Norvège
Arabie saoudite	Fédération de Russie	Ouganda
Argentine	Finlande	Pakistan
Australie	France	Pays-Bas
Autriche	Gambie	Pérou
Bahreïn	Géorgie	Philippines
Bangladesh	Ghana	Pologne
Bélarus	Grèce	République de Corée
Belgique	Honduras	Roumanie
Belize	Îles Marshall	Royaume-Uni
Bénin	Islande	Rwanda
Bhoutan	Inde	Sainte-Lucie
Botswana	Indonésie	Samoa
Brésil	Israël	Sao-Tomé-et-Principe
Bulgarie	Italie	Sénégal
Burkina Faso	Jamaïque	Seychelles
Burundi	Japon	Sierra Leone
Cambodge	Jordanie	Slovénie
Cameroun	Kazakhstan	Sri Lanka
Canada	Kenya	Suède
Chili	Kiribati	Suisse
Chine	Koweït	Tchad
Colombie	Malawi	Thaïlande
Comores	Malaisie	Togo
Congo	Maldives	Tunisie
Costa Rica	Malte	Turkménistan
Côte d'Ivoire	Maurice	Uruguay
Croatie	Mexique	Vanuatu
Cuba	Micronésie	Venezuela
Danemark	Monaco	Yémen
Dominique	Mozambique	Zaïre
Égypte	Nauru	Zambie
Équateur	Nouvelle-Zélande	Zimbabwe
Espagne	Nicaragua	

DISPOSITIONS ADMINISTRATIVES

Aire des médias

Les représentants accrédités des médias peuvent observer les séances de la Réunion à partir des galeries situées au *niveau 5*. Les bureaux du PNUE et les coordonnateurs locaux des relations avec les médias, une petite salle de breffage et un espace de travail pour les médias se trouvent également au *niveau 5*.

Les délégués ou les ministres qui souhaitent s'adresser aux médias doivent appeler au **392-1186** ou communiquer avec un des coordonnateurs des relations avec les médias. Les demandes que les journalistes présenteront pour faire des entrevues avec les participants à la Réunion seront remises à la Distribution des documents.

Cafétéria

En raison du renforcement des mesures de sécurité aux installations de l'OACI, la cafétéria n'est pas ouverte aux participants à la Réunion. Veuillez vous reporter à la rubrique *Restaurants* de ce carnet pour de plus amples renseignements sur les aires de restauration voisines de l'OACI.

Centre d'affaires

Le Centre d'affaires au *niveau 1* fournit aux délégués des services commerciaux sur place, y compris la photocopie, la télécopie et l'impression au laser. On offrira des services de messageries et d'autres services de courrier et l'on vendra des cartes d'appels interurbains.

Le personnel du Centre d'affaires peut également s'occuper des locations de téléphones portables et de téléavertisseurs ainsi que de la production de photocopies couleur et d'acétates, de reprographie grand format et de numérisation des documents à remettre pendant les heures de travail.

Cybercentre

Situé au *niveau 1* de l'*Atrium supérieur*, cette aire de travail donne aux délégués accès à des ordinateurs personnels, à des imprimantes et à des prises pour ordinateurs portables, ainsi qu'à des connexions de modems à Internet. **Veillez noter que les ordinateurs du Cybercentre ne servent qu'à accéder à Internet et ne sont pas configurés pour exécuter d'autres applications logicielles.** *Pour se rendre au Cybercentre, les délégués doivent emprunter l'escalier de l'Atrium inférieur.*

Distribution des documents

Les documents produits pendant la Réunion sont accessibles au Centre de distribution des documents situé près de l'entrée de l'ascenseur au *niveau 4*. Le Centre ouvrira à midi, le **dimanche 25 novembre**.

Événements parallèles

Les délégués qui souhaitent réserver une salle pour tenir une réunion bilatérale ou un événement parallèle doivent d'abord inscrire leur demande auprès du personnel en se rendant à la *salle B du niveau 1* ou en communiquant avec le poste **7113** à partir d'un téléphone à usage interne de l'OACI.

Forum Romanum

Afin de faire participer activement un groupe élargi d'intervenants représentant des membres pertinents du secteur privé et des ONG, une exposition privée, baptisée Forum Romanum a été organisée parallèlement à la GIE. Les éléments d'exposition seront répartis un peu partout à l'OACI et seront accessibles du 26 novembre au 1^{er} décembre, de **9 h à 18 h 30**.

Inscription et accès

Tous les participants à la Réunion du Programme d'action mondial et à la RIG/GIE doivent être dûment inscrits par le PNUE et être en possession d'un insigne officiel. L'inscription sur place se fera à l'Atrium inférieur de l'OACI

25 novembre	12 h - 18 h
26 - 30 novembre	8 h - 16 h
1^{er} décembre	8 h - 12 h

Les couleurs des insignes sont les suivantes :

Nations Unies :	Gris	Médias :	Orange
Secrétariat :	Bleu	Exposants :	Violet
Gouvernement :	Mauve	Industrie :	Jaune
Ministre :	Vert	ONG :	Rose
OGI :	Brun pâle		

Installations médicales

Une infirmière est en fonction au *niveau 4, pièce 4.25*, de **8 h à 18 h**, du lundi au vendredi. Vous pouvez la joindre en composant le **954-8219**, poste **8812**. Si vous avez besoin d'aide médicale immédiate, adressez-vous au personnel de sécurité de l'OACI, qui a été formé à cette fin.

En outre, deux centres médicaux jouxtent l'OACI, l'un à la Gare centrale (entrée au coin des rues University et de la Gauchetière), et l'autre au sous-sol de l'édifice Bell, en face de l'OACI (rues Viger et University). Les participants qui ont besoin de soins médicaux peuvent obtenir, en appelant à la direction de leur hôtel, l'adresse et le numéro de téléphone d'un médecin à l'hôtel ou dans les environs.

Remarque : Les soins médicaux donnés au Canada sont de tout premier ordre, mais ils peuvent être coûteux. Le gouvernement du Canada n'en assume pas la responsabilité.

Objets trouvés

Tout article trouvé doit être remis au personnel du Centre d'affaires situé au *niveau 1*.

Préparatifs de voyage

Du personnel de l'agence de voyage désignée, MKI Travel of Ottawa, Canada, se trouve au niveau 1 pour faciliter aux participants la confirmation de leurs billets et leurs préparatifs de voyage.

Pour les confirmations des correspondances seulement, les délégués sont encouragés à appeler directement les compagnies aériennes. Les numéros de téléphone locaux et sans frais des principales compagnies aériennes sont indiqués ci-dessous à la rubrique *Renseignements généraux*.

Systèmes et services d'appel

Vous trouverez des téléphones publics dans l'*Atrium inférieur*. Les appels locaux coûtent 0,25 \$CAN. Faites le **0** pour joindre la téléphoniste pour porter les appels interurbain à une carte de crédit. Vous pouvez acheter des cartes d'appel interurbain au Centre d'affaires ou dans les boutiques de cadeaux situées dans le hall de votre hôtel. Les appels faits à partir des chambres d'hôtel sont facturés au taux de l'établissement.

Pour composer des numéros internationaux (à l'exception des États-Unis et de la plupart des pays des Caraïbes), faites le 011 + le code de pays + l'indicatif régional + le numéro de téléphone. Les codes de pays sont indiqués au début des annuaires téléphoniques placés dans chaque chambre d'hôtel.

RENSEIGNEMENTS GÉNÉRAUX

Aéroports

Un service spécial de navette à partir des principaux hôtels du centre-ville est offert de **5 h à 23 h**. Vous pouvez passer prendre des dispositions au comptoir du concierge.

L'aérogare du centre-ville, Aéroport de Montréal, 777, rue de la Gauchetière Ouest, offre un service de navette vers l'aéroport de Dorval toutes les 20 minutes en semaine et toutes les 30 minutes la fin de semaine. Vous pouvez obtenir des renseignements sur les tarifs et les horaires au **394-7369**.

Un taxi à partir de l'aéroport de Dorval coûte environ 30 \$CAN.

Remarque : Les passagers doivent payer des frais d'améliorations aéroportuaires de 10 \$CAN au départ.

Climat et habillement

Fin novembre, à Montréal, il fait froid, particulièrement le soir, et il neige parfois. La température moyenne varie de +4 à -3°C le jour et descend plus

bas la nuit. Si vous prévoyez un manteau chaud, des chaussures de marche et/ou des bottes d'hiver, un chapeau et des gants, vous vous assurerez un séjour plaisant et confortable.

Consulats à Montréal

Consulat général d'Autriche	845-8661
Consulat général de Belgique	849-7394
Consulat général du Brésil	499-0968
Consulat général du Chili	499-0405
Consulat général de Colombie	849-4852
Consulat général du Costa Rica	393-1057
Consulat général de Cuba	843-8897
Consulat général du Danemark	877-3060
Consulat général d'Espagne	935-5235
Consulat général des États-Unis d'Amérique	398-9695
Consulat général de France	878-4385
Consulat général de Grande-Bretagne	866-5863
Consulat général de Grèce	875-2119
Consulat général d'Haïti	499-1919
Consulat général du Honduras	937-1138
Consulat général d'Israël	940-8500
Consulat général d'Italie	849-8351
Consulat général du Japon	866-3429
Consulat général de la Fédération de Russie	843-5901
Consulat général de la République arabe d'Égypte	866-8455
Consulat général de la République de Corée	845-3243
Consulat général de la République de Hongrie	393-1048
Consulat général de la République fédérale d'Allemagne	931-2277
Consulat général de la République tchèque	849-4495
Consulat général de l'Afrique du Sud	878-9217
Consulat général de l'Équateur	874-4071
Consulat général du Liban	276-2638
Consulat général du Mexique	288-2502
Consulat général de Monaco	849-0589
Consulat général de Norvège	874-9087
Consulat général du Pakistan	845-2297
Consulat général de Panama	874-1929
Consulat général des Pays-Bas	849-4247
Consulat général des Philippines	876-9888
Consulat général de Pologne	937-9481
Consulat général du Portugal	499-0359
Consulat général de Roumanie	876-1792
Consulat général du Royaume du Maroc	288-8750
Consulat général du Salvador	861-6515

Consulat général de Suède	345-2727
Consulat général de Suisse	932-7181
Consulat général de Thaïlande	985-0666
Consulat général de Tunisie	844-6909
Consulat général du Venezuela	842-3417

Devises, taux de change et services bancaires

La devise officielle au Canada est le dollar canadien, qui se divise en 100 cents. Au moment de l'impression du présent document, sa valeur était la suivante : 1 \$CAN = 0,63 \$US. On accepte presque partout la devise américaine au Canada. Les banques, habituellement ouvertes de 10 h à 16 h en semaine, acceptent la plupart des chèques de voyage en devises étrangères. Voici celles qui sont situées près de l'OACI.

Banque nationale du Canada

600, rue de la Gauchetière Ouest
Tél. : 394-4385

Banque Royale du Canada

1, Place Ville-Marie
Tél. : 874-7222

Banque CIBC

1155, boul. René-Lévesque Ouest
Tél. : 876-2323

Banque Toronto Dominion

500, rue St-Jacques Ouest
Tél. : 289-0799

Il y a des bureaux de change à l'aéroport de Dorval et dans le centre-ville. La plupart des hôtels, des restaurants, des grands magasins et des boutiques acceptent les principales cartes de crédit.

Droit de fumer

Au Québec, on ne peut fumer que dans des secteurs désignés, y compris dans les restaurants. À l'OACI, il existe une politique interdisant de fumer.

Électricité

Au Canada, la tension électrique est de 110/115 c.a./60 cycles. La plupart des hôtels n'offrent pas de transformateurs.

Fuseaux horaires

Il existe plusieurs fuseaux horaires au Canada. À Montréal, le fuseau horaire est le suivant : temps universel + 5 heures.

Journaux et magazines

La **Metropolitan News Agency**, située au 1109, rue Cypress, près de la rue Peel, au sud de la rue Sainte-Catherine, offre un large éventail de publications, de journaux et de magazines internationaux, y compris des plans de la ville.

Moyens de transport locaux

Le métro de Montréal est un moyen propre, sûr et économique de se rendre à de nombreux hôtels et attractions touristiques de la ville. Un ticket de

méto ou d'autobus coûte 2 \$CAN. Vous pouvez acheter, dans la plupart des stations de méto, des cartes autobus-méto (CAM) d'une journée, de trois jours ou d'une semaine au coût de 7 \$, 14 \$ et 12,50 \$CAN respectivement.

Des services de taxi sont disponibles partout, et l'on peut même héler un taxi dans la rue. Le tarif commence à 2,50 \$CAN, et chaque kilomètre parcouru coûte 0,97 \$CAN. Il y a deux grandes compagnies de taxi : Diamond et Coop de Montréal. Vous trouverez les numéros de téléphone sur la face intérieure de la couverture du présent livret.

Pourboires

Dans la plupart des restaurants, le pourboire est de 15 p. 100 en sus du prix de la facture avant taxes. Plusieurs restaurants ajoutent automatiquement 15 p. 100 pour une facture de groupe. Dans les hôtels, donnez 1\$CAN par valise et environs 10 p. 100 en sus du tarif pour les taxis.

Restaurants

Les aires de restauration offrent un large éventail de cuisines pour la modique somme de 6 à 10 \$CAN. Deux aires de restauration rapide sont situées à deux pas des installations de l'OACI. La première se trouve dans la tour Bell, au 700, rue de la Gauchetière Ouest, et est ouverte du lundi au vendredi jusqu'à 18 h seulement, et la deuxième, à la Gare centrale, au 895, rue de la Gauchetière Ouest, et est ouverte sept jours sur sept jusqu'à 20 h. La rue University croise ces deux rues. On y trouve des endroits désignés pour les fumeurs.

Le concierge de votre hôtel peut vous aider à choisir un restaurant et à faire une réservation pour dîner, le soir.

Services de transport aérien

Air Canada	1 888 247-2262
Air France	1 800 667-2747
Alitalia	1 800 361-8336
American Airlines	1 800 433-7300
British Airways	1 800 668-1055
Delta Airlines	1 800 361-1970
El Al Israel Airlines	1 800 361-6174
Finnair	1 800 461-8651
Japan Airlines	1 800 525-3663
KLM	1 800 361-5073
Lufthansa	1 800 563-5954
Northwest Airlines	1 800 345-7458
Olympic Airways	878-9691
Sabena Belgian Airlines	1 800 955-2000

Swissair	1 800 267-9477
United Airlines	1 800 241-6522
US Airways	1 800 428-4322

Remarque : Au Canada, les appels effectués à l'aide d'un numéro de téléphone 1 800 ou 1 888 sont traités comme des appels locaux.

Taxes de vente et remboursement de taxe

Au Canada, on perçoit une taxe fédérale (TPS) de 7 p. 100 sur la plupart des biens et services. En outre, le Québec perçoit une taxe provinciale (TVQ) de 7,5 p. 100 sur les produits et services. Les non-résidents peuvent demander un remboursement de la TPS et de la TVQ sur la plupart des articles achetés qui seront utilisés à l'extérieur du Canada et sur la plupart des services d'hébergement à court terme (sauf exception).

Vous trouverez tous les renseignements à cet égard dans la brochure *Remboursement de la TPS aux visiteurs* publiée par Revenu Canada, Douanes et Accise, disponible dans l'avion, au Centre d'affaires de l'OACI, à l'aéroport de Dorval et à votre hôtel.

Vestiaires

Il y a un vestiaire à tous les niveaux de l'immeuble de l'OACI. Veuillez consulter les plans d'étage figurant dans le présent document pour connaître leur emplacement.

RENSEIGNEMENTS TOURISTIQUES

Tous les grands hôtels fournissent aux touristes des renseignements sur les attraits touristiques de Montréal et de ses environs. Tourisme Québec, situé au Centre Infotouriste, au 1001, square Dorchester, offre des renseignements touristiques sur Montréal et sur le Québec. Ce bureau, dont le numéro de téléphone est le 873-2015, est ouvert du lundi au vendredi de **8 h 30 à 19 h** et les fins semaines de **9 h à 17 h**.

Géographie, population et ville de Montréal

Le Canada est le deuxième plus grand pays du monde, avec une superficie de dix millions de km². Il compte 30 millions d'habitants. S'étendant de l'océan Pacifique à l'océan Atlantique et vers le nord, à l'océan Arctique, il est diversifié sur les plans géographique et culturel. La plupart des Canadiens habitent dans le sud, près de la frontière des États-Unis.

Le Québec fait partie des dix provinces et des trois territoires du Canada. Plus de 75 p. 100 des sept millions de Québécois sont francophones. Les langues officielles du Canada sont l'anglais et le français. Elles sont largement parlées à Montréal.

Montréal, ville de la joie de vivre, est reconnue mondialement pour sa gastronomie, ses magasins et ses attraits panoramiques. Situé sur une île du majestueux fleuve Saint-Laurent, Montréal est un centre culturel international dont le cachet européen et le mode de vie nord-américain font une ville idéale pour les résidents et les touristes. Les participants seront certainement enchantés par les contrastes saisissants qui caractérisent cette ville de 350 ans parsemée de vieilles cathédrales blotties à l'ombre de gratte-ciel modernes.

Que faire?

Vous cherchez une façon agréable de passer une heure ou deux pendant la Réunion de la Programme d'action mondiale ou la GIE? Ne cherchez plus! Événements, sites et magasins intéressants se trouvent à quelques pas de l'OACI :

Le Vieux-Montréal et le Vieux-Port

*Bureau d'information touristique
174, rue Notre-Dame Est*

Musées, boutiques, restaurants, café-terrasses et places publiques foisonnent d'activités dans le Vieux-Montréal. Une promenade dans la Cité historique vous permettra de constater l'évolution architecturale à toutes les époques des quatre derniers siècles – vous pourrez suivre le tracé sinueux des rues de la colonie française où se dressent maintenant des gratte-ciel modernes. Le Vieux-Port longe le fleuve Saint-Laurent et on y trouve entre autres le cinéma IMAX.

À partir de l'entrée principale de l'OACI sur la rue University, prenez à gauche sur la rue Saint-Antoine et dirigez-vous jusqu'à la Côte du Beaver Hall, où vous tournerez à droite. Continuez à marcher jusqu'à la rue Notre-Dame, puis tournez à gauche. La Place Jacques-Cartier, au cœur même du Vieux-Montréal, est à quelques rues seulement. Le Vieux-Port est situé au sud de la Place Jacques-Cartier.

Le Réseau piétonnier souterrain

Communément appelé la « Ville souterraine », le vaste réseau piétonnier intérieur de Montréal s'étend sur quelque 30 km (18 milles). Plus de 500 000 personnes y circulent chaque jour empruntant des myriades de couloirs reliant les stations de métro à une variété de boutiques, de grands magasins, de restaurants, de cinémas, de théâtres et de salles d'exposition qui composent ce réseau intérieur de 3,6 millions de m² (4,3 millions de verges carrées).

Le Réseau piétonnier souterrain est accessible à partir de l'OACI.

Rue Sainte-Catherine

On a de tout temps associé le centre-ville de Montréal à la rue Sainte-Catherine, une artère commerciale célèbre qui traverse la ville d'est

en ouest sur quelque 15 kilomètres. Cette rue est bordée de grands magasins à rayons, de boutiques et de restaurants qui font l'orgueil de la ville depuis plus de 100 ans. À partir de l'entrée principale de l'OACI sur la rue University, prenez à droite jusqu'à ce que vous atteigniez la rue Sainte-Catherine.

Les délégués à la GAP ou la GIE voudront peut-être visiter certaines des plus grandes attractions touristiques de la ville pendant leur séjour au Canada. Voici quelques suggestions :

Jardin botanique de Montréal

4101, rue Sherbrooke Est

Ouvert tous les jours, de 9 h à 17 h

Station de métro : Pie-IX

Tél. : 872-1400

Le Jardin botanique de Montréal, fondé en 1931, est considéré comme l'un des plus importants au monde. Parcourez ses dix serres d'exposition et sa trentaine de jardins et laissez-vous envoûter par l'exotisme du Jardin de Chine et du Jardin japonais. Ne ratez pas le tout nouveau Jardin des Premières Nations où vous découvrirez les liens qu'entretenaient et qu'entretiennent toujours les 11 nations amérindiennes et inuites du Québec avec le monde des plantes.

Le Jardin botanique de Montréal est facilement accessible en taxi ou en métro.

Métro Square-Victoria : à partir de l'entrée principale de l'OACI, sur la rue University, prenez à gauche sur la rue Saint-Antoine et marchez jusqu'à la rue suivante, la rue McGill. Métro Bonaventure : à l'intérieur de la Place Bonaventure, en face de l'OACI, un couloir mène à cette station de métro.

Biodôme de Montréal

4777, avenue Pierre-de-Coubertin

Ouvert tous les jours, de 9 h à 17 h

Station de métro : Viau

Tél. : 868-3000

Vivez une expérience écologique au cœur même de Montréal. Quatre écosystèmes naturels composent un musée de l'environnement à l'intérieur du Biodôme. Des paysages rocheux, des chutes bondissantes et des arbres majestueux sont devenus les habitats de divers oiseaux, mammifères et poissons qui volent, grimpent et nagent dans leur milieu naturel : la forêt tropicale, la forêt laurentienne, le Saint-Laurent marin ou le monde polaire.

Le Biodôme est facilement accessible en taxi ou en métro. Pour vous rendre à la station de métro la plus proche, suivez les instructions pour le Jardin botanique de Montréal.

Musée des beaux-arts de Montréal

1379 - 1380, rue Sherbrooke Ouest

*Ouvert du mardi au dimanche
de 11 h à 18 h*

*Station de métro : Peel / Guy-Concordia
Tél. : 285-2000*

*Entrée libre pour la collection
permanente seulement*

Fondé en 1860, le Musée des beaux-arts de Montréal est l'un des plus anciens musées d'art du Canada et l'un des établissements muséaux les plus importants du pays. Sa collection permanente encyclopédique, regroupe toutes les formes d'art, de l'Antiquité à nos jours. Le musée vous invite présentement à venir admirer sa collection d'objets d'arts décoratifs de la Renaissance à nos jours.

À partir de l'entrée principale de l'OACI sur la rue University, prenez à droite jusqu'à ce que vous atteigniez la rue Sherbrooke (5 à 10 de marche). Tournez à gauche. Le musée est à quelques pâtés de maison (10 minutes).

PLANS D'ÉTAGES

Le lieu de la GPA et de la GIE est l'**Organisation de l'aviation civile internationale**, 999, rue University, Montréal. Les délégués sont priés d'accéder à l'immeuble par l'entrée de l'**Atrium**.

Niveau 5

- Coordonnateur des médias GPA / IEG
- Coordonnateur des médias locaux
- Galerie d'observation des médias
- Espace de travail pour les médias
- Salle de breffage

Niveau 4

- Distribution des documents
- Événements parallèles du GPA: Salle 8
- Kiosque du gouvernement du Canada
- Salle plénière 4

Niveau 3

- Breffage des médias / Événements parallèles: Salle 5
- Bureau des coordonnateurs locaux
- Événements parallèles du GPA: Salle 6
- Événements parallèles du GPA: Salle 7B

Niveau 1

- Bureau des voyages
- Bureaux du GPA
- Centre d'affaires
- Événements parallèles du GPA: Salle 1
- Événements parallèles du GPA: Salle 2
- Expositions
- Salle plénière 3
- Salon des délégués
- Secrétariat du GPA

Atriums supérieur et inférieur

- Cybercentre
- Expositions
- Inscription
- Téléphones publics



UNEP

United Nations Environment Programme
The Environmental Conscience of the World

P.O. Box 30552, Nairobi, Kenya; Fax: (254 2) 62 3692; Phone: (254 2) 62 3084/88/89, E-mail: cpiinfo@unep.org; Website: <http://www.unep.org>

AMERICAN ENVIRONMENTALIST, HUEY JOHNSON, WINS UNITED NATIONS PREMIER ENVIRONMENT PRIZE

**Award ceremony to be held at UN Headquarters in New York
on 19 November 2001**

Nairobi/New York, 12 November 2001 - Huey D. Johnson, the distinguished environmentalist known for his pioneering work on protecting and managing the Earth's natural resources, has been selected as the winner of this year's United Nations Environment Programme (UNEP) Sasakawa Environment Prize.

The Prize, worth US\$ 200,000 and considered one of the most prestigious environmental awards in the world, will be presented at the United Nations Headquarters in New York on 19 November 2001.

Mr. Johnson, who has helped spearhead green management plans both nationally and internationally to save water, reduce energy use and cut pollution, said he was "deeply honoured" and applauded UNEP for the Sasakawa prize.

"I have boxes full of prizes and awards for career recognition, however, this one is the ultimate prize. It is recognition from my peer group. Receiving this is beyond all my expectations and has come as a total surprise," he said.

At the award ceremony, Her Majesty Queen Noor of Jordan will deliver the Pastrana Borrero Lecture, which was established by UNEP in 1999 to enhance the current environment agenda in the true spirit of the late Chairman of the UNEP Sasakawa Environment Prize Selection Committee and former President of Colombia, H.E. Misael Pastrana Arango.

"Johnson has been a catalyst and a champion for environmental protection for more than 40 years. His contributions richly deserve to be recognized," said Lord Clinton-Davis Chairman of the Selection Committee.

"Through the numerous organizations he has created and the countless people he has supported, Johnson has emphasized and clearly demonstrated that the problems we face both environmentally and socially, require a global and systematic approach," said UNEP's Executive Director, Klaus Toepfer.

Johnson, who has worked in the corporate, non-governmental and governmental sectors, was pivotal in the creation of the Trust for Public Land (TPL), a non-profit land acquisition corporation, founded in 1972, whose aim is to save open spaces for America's urban centers. To date, TPL has conserved more than 1.3 million acres of land in the United States.

As Secretary of Natural Resources in California in the early 1980s, Johnson crafted statewide programmes and policies, for the preservation of natural resources such as water, forestry and soil, which have been emulated internationally. More specifically Johnson instituted the Investing For Prosperity programme (IFP) - a 100-year initiative, which channels funds into investments to enhance long-term productivity of California's natural resource assets. The IFP initiative provided for the reinvestment of proceeds from the sale of public natural resources into programmes designed to fund maintenance and improvement of the state's natural resources. Urban forestry, the enhancement of fisheries, waterways and parklands and investment in alternative energy benefited greatly from IFP.

One of the most dramatic successes of the IFP programme was the development of cost-effective renewable energy technologies that have since been emulated around the world. A report by the Rand Corporation showed that energy conservation efforts have saved Californians some US\$ 34 billion since the late 1970s (roughly US\$ 1,000 for each resident) and have played a significant role in helping the State's economy expand. Under Johnson's guidance, the California Resources Agency implemented a number of energy saving policies that are responsible for these savings. For his efforts in this area, Johnson received the President's Award for Sustainable Development in 1996.

"I was fortunate to have been in a position in government to fulfil a personal dream of developing and implementing a 100-year plan to manage and improve the state's natural resources. The successes have been many. We tripled salmon stocks, significantly cut water use and saved a tremendous amount of energy. It confirmed my belief that we can manage the environment and restore it," said Mr. Johnson.

"What one learnt from this, is that you cannot manage elements of the environment individually, one by one, or all your best efforts will unravel. The environment is like a house. You can't say you'll fix the leaky roof this year, repair the walls next year and care for the garden in three years time. You must have a plan that manages all of these issues at the same time," he added.

In 1985, to further the achievement of sustainable development and develop better management of natural resources in the United States and internationally, Johnson founded the Resource Renewal Institute (RRI), an NGO whose mission is to catalyze the development of green plans both nationally and internationally. RRI developed the Campaign for a Sustainable Future, which targets policy makers and opinion leaders and is designed to mobilize diverse constituencies strong enough to secure green plans and secure a momentum for a national green plan.

RRI also works with foreign nations to develop green plans. At present this involves working with Mexico. Pressing environmental problems associated with water and air quality, natural resource depletion and land-use planning among others, call for Mexico to build a broad constituency for the green planning approach and to develop a strategy for its implementation. The goal of RRI's work in Mexico is to catalyze the green planning process at state and local levels, while working to advance the country's national environmental policy agenda.

Under the RRI umbrella, Johnson developed the Grand Canyon Trust - an independent conservation organization dedicated to protecting and restoring the Canyon area of the Colorado plateau.

Johnson has been involved with the development and support of many international organizations that promote environmental protection and productive information exchange. One such organization is the well-known Nairobi-based environmental watchdog organization Environmental Liaison Center International (ELCI).

Johnson is also the founder of Green Belt Movement International (GBMI) whose aim is to promote citizen-based tree planting worldwide as a way of mobilizing people to restore the environment and break the cycle of poverty and environmental degradation. GBMI provides a network for tree planting activists, raises funds to promote successful models of tree planting and supports international policies to promote ecological balance and economic and democratic empowerment.

Johnson said he plans to use the Prize money to further his interests in the environment: "We need a plan to manage and implement the restoration of the Earth's natural resources. Whether you are designing a computer, a bridge or a new aircraft, you have to have a plan, otherwise you cannot raise the funds needed to turn it into a reality. Let us hope that such a plan can emerge when world leaders meet for the World Summit on Sustainable Development (WSSD) taking place in Johannesburg, South Africa, later next year".

Note to editors

- A complete biography and photograph of Mr. Huey D. Johnson are available.
- The UNEP Sasakawa Environment Prize, sponsored by The Nippon Foundation and founded by the late Mr. Ryoichi Sasakawa, has been awarded annually since 1984 to individuals who have made outstanding global contributions to the management and protection of the environment.
- Past winners include: Nobel Laureate, Professor Mario J. Molina for discovering a new reaction sequence involving chlorine peroxide, which accounts for most of the ozone destruction in the Antarctic; Chico Mendes, the rubber tapper from Brazil who died leading the fight against cattle ranchers' destruction of the rainforest; Lester Brown, former Director of the Worldwatch Institute, whose writings were instrumental in alerting the world about the threats to the biosphere; Dr. M. S. Swaminathan of India, father of the economic ecology movement; and Ian Kiernan of Australia, founder of the Clean Up the World Campaign in which more than 120 countries participate.
- The 2001 Prize winner was selected on 2 July 2001 by an independent and distinguished panel of international leaders and environmentalists chaired by Lord Clinton-Davis, Chairman of Europe 21, Joint President of the Society of Labour Lawyers, a Life Peer of the House of Lords and former Minister of State, Department of Trade and Industry in the United Kingdom.

For more information and to obtain 2002 nomination forms, please contact:

Tore J. Brevik, Spokesman/Director, UNEP Division of Communications and Public Information on tel: (254-2) 62 3292, fax: (254-2) 62 3927, e-mail: tore.brevik@unep.org or Elisabeth Guilbaud-Cox, Secretary, UNEP Sasakawa Environment Prize, P. O. 30552, Nairobi, Kenya, tel: (254-2) 62 3401, fax: (254-2) 62 3692, e-mail: elisabeth.guilbaud-cox@unep.org

In New York, contact UNEP's Information Officer, Jim Sniffen on tel: 1 (212) 963-8094, e-mail: sniffenj@un.org

HUEY D. JOHNSON

Environmental Achievements

Huey D. Johnson's commitment to environmental protection has been demonstrated in his work in both the governmental and non-governmental sectors. In 1963, he was appointed Western Regional Director of The Nature Conservancy. At that time he was the organization's only employee west of the Mississippi River. During his tenure, he was responsible for more than 50 projects, including the preservation of Hawaii's Seven Sacred Pools.

After building up the Nature Conservancy, one of the most influential environmental organizations in the world, he focused more on the urban community. In 1972 Johnson co-founded the Trust for Public Land (TPL) and then served as its President until 1977. TPL is a non-profit land acquisition corporation that saves open space for America's urban centers. TPL, the fifth largest environmental organization in the United States, continues to promote the conservation of land for recreation and spiritual nourishment and to improve the health and quality of life of American communities. To date, it has saved more than 1.3 million acres of public land for future generations. Utilizing the experience he gained at The Nature Conservancy and the Trust for Public Land, Johnson continues to advise individuals and institutions seeking to preserve land, both in America and internationally.

From 1978 to 1982, Johnson served as the Secretary of Natural Resources in California under the Jerry Brown Administration. While in office, he crafted policy and programmes that left a legacy of environmental protection in California and which have been studied and emulated internationally. More specifically, Mr. Johnson instituted the Investing for Prosperity (IFP) programme. This hundred-year programme channelled funds into investments to enhance long-term productivity of California's natural resource assets. It comprised five major initiatives approved by state legislature between 1978 and 1980. These five initiatives provided for the reinvestment of proceeds from the sale of public natural resources into programmes designed to fund maintenance and improvement of the state's natural resources. Programmes such as urban forestry, enhancement of fisheries, waterways and parklands, and investment in alternative energy benefitted from IFP.

Because the IFP programme addressed the wide scope of resource issues under a management plan, a diverse group of people and interests were able to relate to the programme and consequently it enjoyed broad support. This support provided IFP with economic and political force, which allowed it to become a successful programme rather than simply a good idea. In forestry, IFP worked to achieve greater results by promoting stewardship of forest lands. It did this by subsidizing those small landowners who had created a productivity plan for the long-term use of their total acreage. The result was that foresters took a long-term view of their land rather than thinking only in terms of short-term productivity. In water conservation, IFP established the Department of Water Conservation (DWC) that contributed to the year's conservation of an estimated quarter of the six million-acre allocated feet to California cities at that time. The DWC also created a state-wide irrigation water saving computer programme that has since become the basic method of water management in California and has been copied internationally. By measuring the exact amount of water needed per day, based on local conditions and concerns, the system resulted in significant water conservation on a daily basis.

In 1986, an evaluation of the IFP programme found that significant economic benefits would be derived from continuation of the IFP program, including significant revenues from increased jobs and consumer savings.¹

One of the most dramatic successes of the IFP programme was the development of cost-effective renewable energy technologies that have since been emulated around the world. A report by the Rand Corporation showed that energy conservation efforts have saved Californians US\$34 billion since the

¹ Professor Sin Meng Srun, Forestry Department, Humboldt State University, Arcata, CA, "An Evaluation of the California Forest Improvement Programme", March 1986

late 1970s (roughly US\$1,000 for each resident) and have played a significant role in helping the State's economy expand. The study, which was commissioned by the California Energy Commission, stated that the bulk of the statewide savings came between 1975 and 1985, when energy prices soared and government, industry and consumers sought ways to cut back on costs. Under Johnson's guidance, the California Resources Agency implemented a number of energy saving programmes and policies that are responsible for these savings.²

In 1996, Johnson and his IFP programme received the President's Award for Sustainable Development from the President's Council on Sustainable Development for excellence in promoting the sustainable use of natural resources. He was one of 15 awardees - selected from 1,800 nominees - representing environmental programmes nationwide.

After leaving his position as Secretary of Resources for California, Johnson studied models of environmental management and governance that were working towards achieving sustainability worldwide. He discovered that the Netherlands, New Zealand, Canada and Singapore were excelling in developing systemic and cooperative management strategies for sustained prosperity and were well ahead of the United States in achieving this goal. These policies - which Canada had termed green plans - provided working models of sustainability that could help other places in the world to develop better management of natural resources. To further the achievement of sustainable development in the U.S and internationally, Johnson founded the Resource Renewal Institute (RRI) in 1985.

RRI is a policy institute that works to catalyze the development of green plans nationally and internationally. RRI has developed the Campaign for a Sustainable Future - an unprecedented programme to secure lasting protection of the environment in the United States. The Campaign fuses advocacy and education to advance green planning. The advocacy arm of the Campaign - The States Campaign - is designed to mobilize a diverse constituency strong enough to secure green plans within individual states and create a momentum for a national green plan.

In each state targeted, RRI is galvanizing broad and influential support for green planning through direct outreach to policymakers and opinion leaders. These same leaders are then equipped with a working knowledge of the principles and practice of green planning through RRI's Green Plan Leadership Programme - an educational effort that utilizes the experience of international green plan experts.

A significant portion of RRI's promotion of green plans is dedicated to both learning and information sharing internationally. This is achieved through various means, including the Institute's Green Plan Center, and a virtual library of green planning best practices. Currently RRI's Green Plan Center (www.rri.org) catalogues 10,000 user sessions per month from more than 70 countries. An international film, *Green Plans*, documents the success that several nations are enjoying with green planning. RRI has also hosted many international conferences that have brought together international leaders and practitioners in the field of green planning to share knowledge and experiences. The success of these conferences has served to advance the idea of green planning and its potential to remedy environmental problems both nationally and internationally.

RRI also works with foreign nations to develop green plans. At present, this involves working in Mexico. Pressing environmental problems associated with water and air quality, natural resource depletion, and land use planning among others, call for Mexico to build a broad constituency for the green planning approach and to develop a strategy for its implementation. One of the key themes of the Mexican plan is the decentralization of environmental decision-making to the level of authority closest to the problem-states and municipalities. The goal of RRI's work in Mexico is to catalyze the green planning process at state and local levels, while working to advance Mexico's national environmental policy agenda.

RRI's relationship with Mexico officially began in 1997 when Mr. Johnson met with Mr. Juan Carlos Belausteguigoitia, Unidad de Analisis Economico y Socia Lateral Anillo Periferico. He was informed then that his book, *Green Plans: Green Print for Sustainability* had been an important resource for the development of Mexico's National Environmental Programme.

In late 1998 and early 1999, RRI began assessing the timing and capacity of working in Mexico to advance the green plan concept through a series of outreach visits with government, business and NGO leaders. RRI staff met with the Mexican Ministry of Environment, Natural Resources and Fishing (SEMARNAP), as well as business and NGO representatives. These

² *Berstein, Mark "Public Benefit of California's Investment in Energy Efficiency", Rand Corporation for the California Energy Commission, March 2000.*

initial meetings served to educate and inform a diverse group of individuals about the attributes and implementation of green plans, while highlighting the relevance of green planning to the environmental, political, social, and economic landscape of Mexico. In 1999, SEMARNAP and RRI co-hosted the "First Annual Conference of Government Environmental Planning", whose aim was to introduce the green plan approach and discuss its potential application in Mexico at the state and regional levels.

RRI has since been contacted by three Mexican states to work on developing green plans. Plans over the next three years include: conducting additional outreach visits to several Mexican states; co-hosting the second annual conference with SEMARNAP; convening state level workshops to bring together the three sectors - government, business and NGOs; providing updated information about best practices and linking green plan with their Mexican counterparts; and leading a "Seeing is Believing" policy tour to green plan nations for national and state level delegations. To enhance RRI's green plan advocacy and educational efforts in Mexico, and for the Spanish-speaking population elsewhere, RRI has translated many of its documents.

In his work promoting green plans, Johnson has also been involved in international networks for sustainable development. In 1992, the International Network of Green Planners (INGP) was created by a small group of policy experts drawn from the Environmental Ministries of Canada and the Netherlands, from Malaysia, UNDP, UNEP and OECD. The purpose of INGP was to encourage professionalism amongst practitioners in the field of sustainable development and to support the development of tools and techniques that may be applied in differing socio-economic situations. The INGP was founded as a forum for policy makers around the world to learn from each other and to promote the development of practical tools and techniques. Activities include an annual global conference, regional meetings, and networking and information sharing, between the members.

Johnson's focus on green planning and environmental protection has also led him to become engaged at the community level and in various issues that he believes deserve critical attention. For example, Johnson became a founding member of the organization, Partners for Livable Places, led by Bob McNulty who is currently the organization's Executive Director. Over a weekend discussion about directions in the environmental community, Johnson and a few friends of McNulty developed the structure of Partners for Livable Places, now called Partners for Livable Futures. Later, a group of 21 individuals representing NGOs convened under the umbrella of the Partners for Livable Communities to discuss how they could help communities develop in a livable manner by sharing information and expertise. The group believed that the cultural resources of the built environment, such as urban planning, design, architecture and landscaping were important to the mental and physical health of a community's citizens. An alliance that was developed from the initial conversation concentrated on "livability" and addressing peoples concerns about a high quality of life at the community level. Partners for Livable Communities has since been incorporated as a non-profit organization in the United States to advance a higher quality.

Because of his ability to see and address unfulfilled problems within the environmental movement, Johnson allowed space for this consideration when he created RRI. While RRI's primary focus is green planning, Johnson has dedicated 20 per cent of the organization's energy to developing environmentally relevant ideas into working institutions that can then independently support and promote environmental protection both domestically and internationally.

One organization Johnson conceived of and then worked to develop into institutional form under the RRI umbrella is The Grand Canyon Trust. He developed the Board member body, raised the funds to launch the programme and then served as a Board member for two years before retiring and allowing the organization to flourish independently. The Grand Canyon Trust is currently an independent conservation organization dedicated to protecting and restoring the canyon area of the Colorado plateau. Another organization that Johnson is working to develop is the Water Heritage Trust (WHT) - an entity designed to promote the conservation and restoration of in-stream flows of water that are vital to wildlife, natural resources and human communities and Johnson proposes to achieve this goal through an innovative process of water acquisition and reallocation.

Johnson has also been intimately involved with the development and support of many international organizations that promote environmental protection and productive information exchange. One such organization is the Environmental Liaison Center International (ELCI) - which serves as a networking hub for numerous international NGOs as well as the watchdog organization for UNEP.

In 1972, Johnson represented the Nature Conservancy at the United Nations Conference on the Human Environment in Stockholm, Sweden where UNEP was born. At this conference, the International Assembly of Non-Governmental Organizations Concerned with the Human Environment (INASEN) was also created. The aim of INASEN was to provide an independent NGO voice and lobby to accompany and compliment the role of the new UNEP.

Following the conference in Stockholm, Johnson served as Vice Chairman to Chairman Margaret Mead at the Conference on Non-Governmental Organizations Concerned with the Human Environment in New York. At this conference, an organization called the Spirit of Stockholm was created with the purpose of maintaining the vitality of the UN Conference in Stockholm.

Johnson also became involved with another important international organization, the Green Belt Movement (GBM) of Kenya. Created by Professor Wangari Maathai, the GBM is an indigenous grassroots environmental campaign that empowers people through tree planting. GBM has planted and monitored over 10 million trees in Kenya. Over 1,000 tree nurseries have been established, supplying millions of seedlings to small-scale farmers, schools and churches for planting. More than 50,000 women are involved at nursery sites. Local people become experts and advisors, mobilizing others in their community to plant trees where they live. The Movement has served as a model throughout Africa and other nations around the world.

The effectiveness of GBM in promoting domestic programmes that support environmental protection led Johnson to develop Green Belt Movement International (GBMI). GBMI was established by Johnson to provide support and financial assistance to the efforts of the Green Belt Movement and consequently to promote citizen-based tree planting worldwide as a way to mobilize people to restore the environment and break the cycle of human poverty and environmental devastation. GBMI provides a network for tree planting activists, raises funds to promote successful models of tree planting and supports international policies to promote ecological balance and economic and democratic empowerment. In 1992, Johnson attended the United Nations Conference on Environment and Development in Rio as a delegate representing the Green Belt Movement.

In the 1980s, Johnson participated in the Banff Center for Management's Environmental Leadership Programme, a world renowned institute in Canada dedicated to discussing relevant global environmental policy issues. At the request of the Center's Executive Director, Johnson served as a board advisor to the center.

Johnson also served as a Board member of the International Institute for Environment and Development (IIED) in the 1980s. IIED is an independent, NGO organization with a mission to promote sustainable patterns of world development - through collaborative research, policy studies, consensus building and public information. Over the past 10 years, IIED has gathered a vast amount of information in these areas and initiated a global network of partner Resource Centers to supply reliable information and training support to Southern organizations.

Johnson also provided support for the development of the Ladakh Project on the Indian subcontinent. This project provided the seed for development of the International Society for Ecology and Culture (ISEC), an important organization that is working on three continents to promote ecological regeneration, community renewal and economic localization.

In 1969, Johnson served as the Chairman of the UNESCO conference on "Man and his Environment: A View Towards Survival" in San Francisco, California. At the conclusion of that conference, Johnson compiled and edited the proceedings into a book called No Deposit, No Return, a textbook that has subsequently been used in many universities.

Johnson has also published numerous papers and delivered many speeches that focus on issues of international scope. He served as Loeb Fellowship Annual Lecturer at Harvard University in Cambridge, Massachusetts (1978) and as an Exemplars of Innovation Lecturer at the Yale School of Organization and Management in New Haven, Connecticut (1987).

HUEY D. JOHNSON

Resource Renewal Institute
Fort Mason Center, Pier One
San Francisco, CA 94123
United States of America
Tel: (415) 928 3774
Fax: (415) 928 6529
E-mail: hdi@rri.org

55 Elm Street
Mill Valley
CA 94941
United States of America
Tel: (415) 928 3774
Fax: (415) 928 6529
E-mail: hdi@rri.org

PRESENT

RESOURCE RENEWAL INSTITUTE
FOUNDER & PRESIDENT

1997-1983

THE RESOURCES AGENCY, STATE OF CALIFORNIA
SECRETARY FOR RESOURCES

Administered 14 statewide departments with 14,000 employees and an annual budget of US\$900 million. As a Cabinet member, advised the governor on programme and policy formulation. Created long-range Investing for Prosperity programme to upgrade the productivity of California's natural systems.

1972-1977

TRUST FOR PUBLIC LAND
CO-FOUNDER AND PRESIDENT

Administered the private, non-profit, land acquisition corporation that is now the nation's fifth largest environmental group. Worked with private landowners, corporations, public agencies, and community groups to acquire and preserve the nation's open space. Emphasis on urban areas.

1963-1972

THE NATURE CONSERVANCY
WESTERN REGIONAL DIRECTOR

Responsible for the activities of 13 western states. Included land acquisition and management of holdings, coordination of volunteers, membership development; served as liaison with industry and government agencies. Successes include Hawaii's Seven Sacred Pools and numerous other programmes.

PRIOR TO 1963

Diverse work background including corporate experience, technical sales, teaching and research, both in the United States and overseas.

EDUCATION

B.S. Biology, Western Michigan University
M.S. Wildlife Biology, Utah State University

PROFESSIONAL ACTIVITIES

Regents Lecturer

Environmental Studies, University of California, Santa Cruz
Spring Quarter, 1983.

President and Founder

Unify, non-profit organization which combines art and ecology to achieve public environmental awareness.

Delegate

United Nations meeting that established the United Nations Environment Programme, Stockholm, Sweden, 1972.
Representing the Nature Conservancy

Conference on Non-Governmental Organizations concerned with the Human Environment, New York, 1972. Vice
Chairman to the Chair Margaret Mead

United Nations Environment Programme, Nairobi, 1974. Representing the Trust for Public Land

Chairman

UNESCO conference on "Man and His Environment: A View Towards Survival", San Francisco, 1969.

Council on Economic Priorities, Chairman/Treasurer, New York 1970-1975.

Current Board Affiliates

Urban Habitat, San Francisco, CA
The Grand Canyon Trust, Colorado

Past Board Affiliates

The International Institute for Environment and Development, London, U.K.
The Zen Center, San Francisco, CA
American Society of Landscape Architects, Washington, D.C.
Californians Against Waste Foundation, Sacramento, CA
Defenders of Wildlife, Washington, D.C.
Earth Island Institute, San Francisco, CA
Institute for Human Ecology, Sausalito, CA
International Rivers Network, San Francisco, CA
League to Save Lake Tahoe, South Lake Tahoe, CA
Partners for Livable Places, Trustee Emeritus, Washington, D.C.
The Point Foundation, Sausalito, CA
The Wilderness Society, Washington D.C.
CURE, Consumer Organization Advocating the Public's Right to Know, Oakland, CA

PUBLICATIONS

Environmental Quality as a National Purpose in Environmentalism at the Crossroads, Island Press, Nov. 1988.

Towards a Green Century, Earth Island Journal, Volume 2, #2, Spring 1987.

One Bears and Beggars, Foundation News, April 1987.

The Role of Public Attitude and Involvement in the Preservation Movement, Connecticut Law Review, Vol. 8:370, 1976.

Editor/Author, No Deposit, No Return, Textbook Published by Addison-Wesley, 1970.

Author, Green Plans: Greenprint for Sustainability, University of Nebraska Press, 1995.

SELECTED PAPERS

"Water Rights and Water Wrongs" Keynote Speech, Institute for Environmental Studies, University of Washington, Seattle, 1989.

"Building Human Ecology into Political Action: A Challenge" Speech, The Society For Human Ecology Conference, San Francisco, October 1988.

"The Coming Renaissance" Keynote Speech, Environmental Design Research Association National Conference, Institute for Environmental Design, Pomona, CA 1988.

"Vitality and Diversity in Institutions", Exemplars of Innovation Lecturer, Yale School of Organization and Management, New Haven, CT 1987.

"Environmental Systems and the Politics of Hope: A Plan to End Famines", Speech, Princeton University, 1986.

"The Struggle to Maintain Environmental Quality in Exploding Third World Nations", International Conference "Politiclas de Dossarrollo Ecologico", sponsored by the Secretary of Ecology and the College of Mexico, Mexico City, 1984.

"The Future of the Mackenzie River", keynote speech at Canadian Policy Conference, Banff Center School of Management, 1984. Banff, Alberta, Canada.

"A Pacific Basin Trust" PATA Conference, Kyoto, Japan, 1973.

PROFESSIONAL RECOGNITION

President's Award for Sustainable Development, *President's Council on Sustainable Development, 1996*

Environmental Achiever, *Friends of the United Nations Environment Programme, 1987*

Wild Rivers Award, *Environmental Defense Fund, 1984*

Special Award, Sierra Club, *Annual Meeting 1983*

Certificate of Achievement, *Association of Environmental Professionals, 1983*

U.S. Forest Service Career Recognition Award, 1982

Annual Award, *Society of American Foresters, Southern California Chapter, 1982*

Annual Award, *California Council of Landscape Architects, 1981*

Audubon Society, *Sacramento Chapter, 1980*

Quixote Award, *The Trust for Public Land, 1977*

Oak Leaf Award, *The Nature Conservancy, 1974*

American Motors Conservation Award, 1970



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Chapter 13 - Managing Fragile Ecosystems: Sustainable Mountain Development

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This is a final, advanced version of a chapter of Agenda 21, as adopted by the Plenary in Rio de Janeiro, on June 14, 1992. This document will be further edited, translated into the official languages, and published by the United Nations for the General Assembly this autumn.

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INTRODUCTION

13.1. Mountains are an important source of water, energy and biological diversity. Furthermore, they are a source of such key resources as minerals, forest products and agricultural products and of recreation. As a major ecosystem representing the complex and interrelated ecology of our planet, mountain environments are essential to the survival of the global ecosystem. Mountain ecosystems are, however, rapidly changing. They are susceptible to accelerated soil erosion, landslides and rapid loss of habitat and genetic diversity. On the human side, there is widespread poverty among mountain inhabitants and loss of indigenous knowledge. As a result, most global mountain areas are experiencing environmental degradation. Hence, the proper management of mountain resources and socio-economic development of the people deserves immediate action.

13.2. About 10/per/cent of the world's population depends on mountain resources. A much larger percentage draws on other mountain resources, including and especially water. Mountains are a storehouse of biological diversity and endangered species.

13.3. Two programme areas are included in this chapter to further elaborate the problem of fragile ecosystems with regard to all mountains of the world. These are:

(a) Generating and strengthening knowledge about the ecology and sustainable development of mountain ecosystems;

(b) Promoting integrated watershed development and alternative livelihood opportunities.

PROGRAMME AREAS

A. Generating and strengthening knowledge about the ecology and sustainable development of mountain ecosystems

Basis for action

13.4. Mountains are highly vulnerable to human and natural ecological imbalance. Mountains are the areas most sensitive to all climatic changes in the atmosphere. Specific information on ecology, natural resource potential and socio-economic activities is essential. Mountain and hillside areas hold a rich variety of ecological systems. Because of their vertical dimensions, mountains create gradients of temperature, precipitation and insolation. A given mountain slope may include several climatic systems - such as tropical, subtropical, temperate and alpine/- each of which represents a microcosm of a larger habitat diversity. There is, however, a lack of knowledge of mountain ecosystems. The creation of a global mountain database is therefore vital for launching programmes that contribute to the sustainable development of mountain ecosystems.

Objectives

13.5. The objectives of this programme area are:

(a) To undertake a survey of the different forms of soils, forest, water use, crop, plant and animal resources of mountain ecosystems, taking into account the work of existing international and regional organizations;

(b) To maintain and generate database and information systems to facilitate the integrated management and environmental assessment of mountain ecosystems, taking into account the work of existing international and regional organizations;

(c) To improve and build the existing land/water ecological knowledge base regarding technologies and agricultural and conservation practices in the mountain regions of the world, with the participation of local communities;

(d) To create and strengthen the communications network and information clearing-house for existing organizations concerned with mountain issues;

(e) To improve coordination of regional efforts to protect fragile mountain ecosystems through the consideration of appropriate mechanisms, including regional legal and other instruments;

(f) To generate information to establish databases and information systems to facilitate an evaluation of environmental risks and natural disasters in mountain ecosystems.

Activities

(a) Management-related activities

13.6. Governments at the appropriate level, with the support of the relevant international and regional organizations, should:

(a) Strengthen existing institutions or establish new ones at local, national and regional levels to generate a multidisciplinary land/water ecological knowledge base on mountain ecosystems;

(b) Promote national policies that would provide incentives to local people for the use and transfer of environment-friendly technologies and farming and conservation practices;

(c) Build up the knowledge base and understanding by creating mechanisms for cooperation and information exchange among national and regional institutions working on fragile ecosystems;

(d) Encourage policies that would provide incentives to farmers and local people to undertake conservation and regenerative measures;

(e) Diversify mountain economies, inter/alia, by creating and/or strengthening tourism, in accordance with integrated management of mountain areas;

(f) Integrate all forest, rangeland and wildlife activities in such a way that specific mountain ecosystems are maintained;

(g) Establish appropriate natural reserves in representative species-rich sites and areas.

(b) Data and information

13.7. Governments at the appropriate level, with the support of the relevant international and regional organizations, should:

(a) Maintain and establish meteorological, hydrological and physical monitoring analysis and capabilities that would encompass the climatic diversity as well as water distribution of various mountain regions of the world;

(b) Build an inventory of different forms of soils, forests, water use, and crop, plant and animal genetic resources, giving priority to those under threat of extinction. Genetic resources should be protected in situ by maintaining and establishing protected areas and improving traditional farming and animal husbandry activities and establishing programmes for evaluating the potential value of the resources;

(c) Identify hazardous areas that are most vulnerable to erosion, floods, landslides, earthquakes, snow avalanches and other natural hazards;

(d) Identify mountain areas threatened by air pollution from neighbouring industrial and urban areas.

(c) International and regional cooperation

13.8. National Governments and intergovernmental organizations should:

(a) Coordinate regional and international cooperation and facilitate an exchange of information and experience among the specialized agencies, the World Bank, IFAD and other international and regional organizations, national Governments, research institutions and non-governmental organizations working on mountain development;

(b) Encourage regional, national and international networking of people's initiatives and the activities of international, regional and local non-governmental organizations working on mountain development, such as the United Nations University (UNU), the Woodland Mountain Institutes (WMI), the International Center for Integrated Mountain Development (ICIMOD), the International Mountain Society (IMS), the African Mountain Association and the Andean Mountain Association, besides supporting those organizations in exchange of information and experience;

(c) Protect Fragile Mountain Ecosystem through the consideration of appropriate mechanisms including regional legal and other instruments.

Means of implementation

(a) Financing and cost evaluation

13.9. The Conference secretariat has estimated the average total annual cost (1993-2000) of implementing the activities of this programme to be about \$50 million from the international community on grant or concessional terms. These are indicative and order of magnitude estimates only and have not been reviewed by Governments. Actual costs and financial terms, including any that are non-concessional, will depend upon, inter alia, the specific strategies and programmes Governments decide upon for implementation.

(b) Scientific and technological means

13.10. Governments at the appropriate level, with the support of the relevant international and regional organizations, should strengthen scientific research and technological development programmes, including diffusion through national and regional institutions, particularly in meteorology, hydrology, forestry, soil sciences and plant sciences.

(c) Human resource development

13.11. Governments at the appropriate level, and with the support of the relevant international and regional organizations, should:

(a) Launch training and extension programmes in environmentally appropriate technologies and practices that would be suitable to mountain ecosystems;

(b) Support higher education through fellowships and research grants for environmental studies in mountains and hill areas, particularly for candidates from indigenous mountain populations;

(c) Undertake environmental education for farmers, in particular for women, to help the rural population better understand the ecological issues regarding the sustainable development of mountain ecosystems.

(d) Capacity-building

13.12. Governments at the appropriate level, with the support of the relevant international and regional organizations, should build up national and regional institutional bases that could carry out research, training and dissemination of information on the sustainable development of the

economies of fragile ecosystems.

B. Promoting integrated watershed development and alternative livelihood opportunities

Basis for action

13.13. Nearly half of the world's population is affected in various ways by mountain ecology and the degradation of watershed areas. About 10/per/cent of the Earth's population lives in mountain areas with higher slopes, while about 40/per/cent occupies the adjacent medium- and lower-watershed areas. There are serious problems of ecological deterioration in these watershed areas. For example, in the hillside areas of the Andean countries of South America a large portion of the farming population is now faced with a rapid deterioration of land resources. Similarly, the mountain and upland areas of the Himalayas, South-East Asia and East and Central Africa, which make vital contributions to agricultural production, are threatened by cultivation of marginal lands due to expanding population. In many areas this is accompanied by excessive livestock grazing, deforestation and loss of biomass cover.

13.14. Soil erosion can have a devastating impact on the vast numbers of rural people who depend on rainfed agriculture in the mountain and hillside areas. Poverty, unemployment, poor health and bad sanitation are widespread. Promoting integrated watershed development programmes through effective participation of local people is a key to preventing further ecological imbalance. An integrated approach is needed for conserving, upgrading and using the natural resource base of land, water, plant, animal and human resources. In addition, promoting alternative livelihood opportunities, particularly through development of employment schemes that increase the productive base, will have a significant role in improving the standard of living among the large rural population living in mountain ecosystems.

Objectives

13.15. The objectives of this programme area are:

(a) By the year 2000, to develop appropriate land-use planning and management for both arable and non-arable land in mountain-fed watershed areas to prevent soil erosion, increase biomass production and maintain the ecological balance;

(b) To promote income-generating activities, such as sustainable tourism, fisheries and environmentally sound mining, and to improve infrastructure and social services, in particular to protect the livelihoods of local communities and indigenous people;

(c) To develop technical and institutional arrangements for affected countries to mitigate the effects of natural disasters through hazard-prevention measures, risk zoning, early-warning systems, evacuation plans and emergency supplies.

Activities

(a) Management-related activities

13.16. Governments at the appropriate level, with the support of the relevant international and regional organizations, should:

(a) Undertake measures to prevent soil erosion and promote erosion-control activities in all sectors;

(b) Establish task forces or watershed development committees, complementing existing institutions, to coordinate integrated services to support local initiatives in animal husbandry, forestry, horticulture and rural development at all administrative levels;

(c) Enhance popular participation in the management of local resources through appropriate legislation;

(d) Support non-governmental organizations and other private groups assisting local organizations and communities in the preparation of projects that would enhance participatory development of local people;

(e) Provide mechanisms to preserve threatened areas that could protect wildlife, conserve

biological diversity or serve as national parks;

(f) Develop national policies that would provide incentives to farmers and local people to undertake conservation measures and to use environment-friendly technologies;

(g) Undertake income-generating activities in cottage and agro-processing industries, such as the cultivation and processing of medicinal and aromatic plants;

(h) Undertake the above activities, taking into account the need for full participation of women, including indigenous people and local communities, in development.

(b) Data and information

13.17. Governments at the appropriate level, with the support of the relevant international and regional organizations, should:

(a) Maintain and establish systematic observation and evaluation capacities at the national, state or provincial level to generate information for daily operations and to assess the environmental and socio-economic impacts of projects;

(b) Generate data on alternative livelihoods and diversified production systems at the village level on annual and tree crops, livestock, poultry, beekeeping, fisheries, village industries, markets, transport and income-earning opportunities, taking fully into account the role of women and integrating them into the planning and implementation process.

(c) International and regional cooperation

13.18. Governments at the appropriate level, with the support of the relevant international and regional organizations, should:

(a) Strengthen the role of appropriate international research and training institutes such as the Consultative Group on International Agricultural Research Centers (CGIAR) and the International Board for Soil Research and Management (IBSRAM), as well as regional research centres, such as the Woodland Mountain Institutes and the International Center for Integrated Mountain Development, in undertaking applied research relevant to watershed development;

(b) Promote regional cooperation and exchange of data and information among countries sharing the same mountain ranges and river basins, particularly those affected by mountain disasters and floods;

(c) Maintain and establish partnerships with non-governmental organizations and other private groups working in watershed development.

Means of implementation

(a) Financial and cost evaluation

13.19. The Conference secretariat has estimated the average total annual cost (1993-2000) of implementing the activities of this programme to be about \$13 billion including about \$1.9 billion from the international community on grant or concessional terms. These are indicative and order of magnitude estimates only and have not been reviewed by Governments. Actual costs and financial terms, including any that are non-concessional, will depend upon, inter alia, the specific strategies and programmes Governments decide upon for implementation.

13.20. Financing for the promotion of alternative livelihoods in mountain ecosystems should be viewed as part of a country's anti-poverty or alternative livelihoods programme, which is also discussed in chapter/3 (Combating poverty) and chapter/14 (Promoting sustainable agriculture and rural development) of Agenda 21.

(b) Scientific and technical means

13.21. Governments at the appropriate level, with the support of the relevant international and regional organizations, should:

(a) Consider undertaking pilot projects that combine environmental protection and development functions with particular emphasis on some of the traditional environmental management practices or systems that have a good impact on the environment;

(b) Generate technologies for specific watershed and farm conditions through a participatory approach involving local men and women, researchers and extension agents who will carry out experiments and trials on farm conditions;

(c) Promote technologies of vegetative conservation measures for erosion prevention, in situ moisture management, improved cropping technology, fodder production and agroforestry that are low-cost, simple and easily adopted by local people.

(c) Human resource development

13.22. Governments at the appropriate level, with the support of the relevant international and regional organizations, should:

(a) Promote a multidisciplinary and cross-sectoral approach in training and the dissemination of knowledge to local people on a wide range of issues, such as household production systems, conservation and utilization of arable and non-arable land, treatment of drainage lines and recharging of groundwater, livestock management, fisheries, agroforestry and horticulture;

(b) Develop human resources by providing access to education, health, energy and infrastructure;

(c) Promote local awareness and preparedness for disaster prevention and mitigation, combined with the latest available technology for early warning and forecasting.

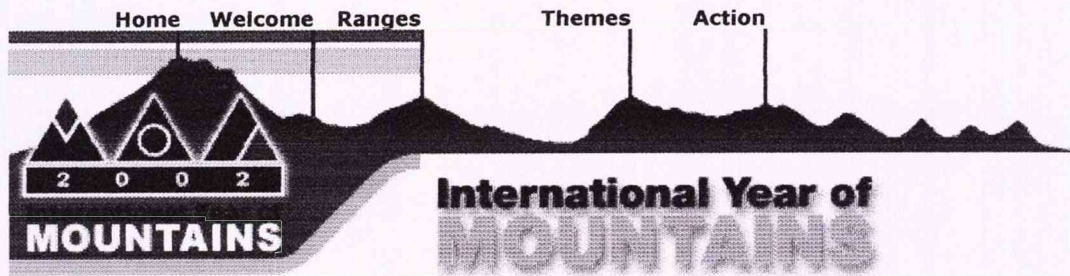
(d) Capacity-building

13.23. Governments at the appropriate level, with the support of the relevant international and regional organizations, should develop and strengthen national centres for watershed management to encourage a comprehensive approach to the environmental, socio-economic, technological, legislative, financial and administrative aspects and provide support to policy makers, administrators, field staff and farmers for watershed development.

13.24. The private sector and local communities, in cooperation with national Governments, should promote local infrastructure development, including communication networks, mini- or micro-hydro development to support cottage industries, and access to markets. A21: Mountain (Ch. 13), Advance CopyPage 1

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Global IYM launch highlights peace

Armed conflict and hunger must be eradicated to protect the world's fragile mountain ecosystems and alleviate the desperate poverty that exists in many mountain communities, said Jacques Diouf, Director-General of the Food and Agriculture Organization of the United Nations (FAO) in his keynote address to the 11 December global launch of International Year of Mountains at the UN headquarters in New York.

"Mountain areas are home to most of the armed conflicts in the world as well as many of the world's poorest and least food-secure populations," said Dr. Diouf. "As we begin commemorating the International Year of Mountains, conflict may be the single greatest obstacle to achieving our goals. Without peace, we cannot reduce poverty. Without peace, we cannot ensure secure food supplies. Without peace, we cannot even consider sustainable development."

FAO and the 15 member nations of International Year of Mountains Focus Group at the UN organized the launch. It was attended by world leaders, representatives of mountain people, mountain scientists and many others who care about mountain people and ecosystems.

Adolf Ogi, Special Adviser to the Secretary-General on Sport for Development and Peace and former President, Swiss Confederation, welcomed participants. Murari Raj Sharma, Acting President, fifty-sixth session of the General Assembly made opening remarks. Nitin Desai, Under-Secretary-General for Economic and Social Affairs delivered a message from the UN Secretary-General. Other speakers included:

- Kurmanbek Bakiev, Prime Minister, Kyrgyz Republic
- Alan Wagner, Ambassador of Peru to the United States and former Peruvian Minister for Foreign Affairs
- Antonio Gagliardi, Under-Secretary-General of State for Regional Affairs, Prime Minister's Office, Italy
- Gerard Pfanzelter, Ambassador of Austria to the UN
- Louis Besson, Member of Parliament for and Mayor of Chambéry, and Member, IYM National Committee, France

Mr Desai moderated a roundtable discussion on sustainability in mountain development with roundtable participants:

"Wherever we may come from, however high or small the hills or mountains may be in the land of our birth, we are all mountain people. We are all dependent on mountains, connected to them, and affected by them, in ways we may never have previously imagined."

Jacques Diouf,
Director-General of the Food and
Agriculture Organization of the United
Nations

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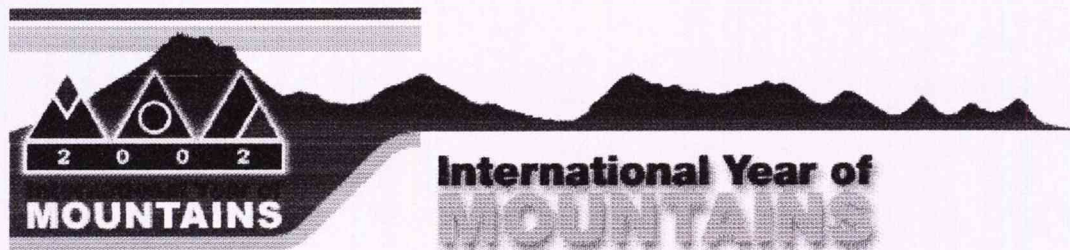
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- Jim Enote, Leader, Zuni Nation
- Yolanda Kakabadse, former Minister for Environment, Ecuador, and President, World Conservation Union
- Uma Lele, Senior Adviser, World Bank

Visit the web site of the International Institute for Sustainable Development for more coverage.



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Find out what IYM is all about and consult important background documents

Welcome

Information on the world's mountain ranges and the development challenges they face

Ranges

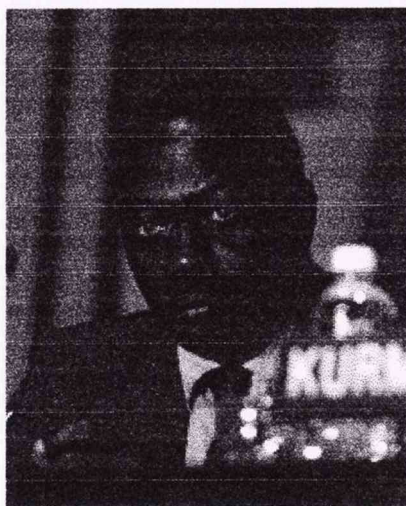
Sustainable mountain development encompasses a broad range of complex issues. We have prepared articles on key mountain development themes

Themes

Read about what is being done to make IYM a success, with a special emphasis on the work of IYM national committees

Action

Global IYM launch highlights peace



"As we begin commemorating the International Year of Mountains, conflict may be the single greatest obstacle to achieving our goals. Without peace, we cannot reduce poverty. Without peace, we cannot ensure secure food supplies. Without peace, we cannot even consider sustainable development."

This was one of the points Jacques Diouf, Director-General of the Food and Agriculture Organization of the United Nations (FAO) made in his keynote address to the 11 December global launch of International Year of Mountains at the UN headquarters in New York.

For more information on the launch, click [here](#).

The aim of IYM is to ensure the well-being of mountain and lowland communities by promoting the conservation and

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promoting the conservation and sustainable development of mountain regions. FAO, the lead agency for IYM, is working closely with UN and other organizations to make sure the broadest possible range of expertise is focused on reaching the goals of sustainable mountain development.



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Home > Terrestrial Ecosystems > Wetlands

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- ▶ Marine Environments
- ▶ Marine ecosystems
- ▶ Coastal ecosystems
- ▶ Living marine resources
- ▶ Environmental Managemen
- ▶ Resources management
- ▶ United Nations

Related Links

Documents

- ▶ Agenda 21

This is a final, advanced version of a chapter of Agenda 21, as adopted by the Plenary in Rio de Janeiro, on June 14, 1992. This document will be further edited, translated into the official languages, and published by the United Nations for the General Assembly this autumn.

INTRODUCTION

17.1. The marine environment - including the oceans and all seas and adjacent coastal areas - forms an integrated whole that is an essential component of the global life - support system and a positive asset that presents opportunities for sustainable development. International law, as reflected in the provisions of the United Nations Convention on the Law of the Sea 1/, 2/ referred to in this chapter of Agenda 21, sets forth rights and obligations of States and provides the international basis upon which to pursue the protection and sustainable development of the marine and coastal environment and its resources. This requires new approaches to marine and coastal area management and development, at the national, subregional, regional and global levels, approaches that are integrated in content and are precautionary and anticipatory in ambit, as reflected in the following programme areas: 3/

- (a) Integrated management and sustainable development of coastal areas, including exclusive economic zones;
- (b) Marine environmental protection;
- (c) Sustainable use and conservation of marine living resources of the high seas;
- (d) Sustainable use and conservation of marine living resources under national jurisdiction;
- (e) Addressing critical uncertainties for the management of the marine environment and climate change;
- (f) Strengthening international, including regional, cooperation and coordination;
- (g) Sustainable development of small islands.

17.2. The implementation by developing countries of the activities set forth below shall be commensurate with their individual technological and financial capacities and priorities in allocating resources for development needs and ultimately depends on the technology transfer and financial resources required and made available to them.

PROGRAMME AREAS

A. Integrated management and sustainable development of coastal and marine areas, including exclusive economic zones

Basis for action

17.3. The coastal area contains diverse and productive habitats important for human

settlements, development and local subsistence. More than half the world's population lives within 60 km of the shoreline, and this could rise to three quarters by the year 2020. Many of the world's poor are crowded in coastal areas. Coastal resources are vital for many local communities and indigenous people. The exclusive economic zone (EEZ) is also an important marine area where the States manage the development and conservation of natural resources for the benefit of their people. For small island States or countries, these are the areas most available for development activities.

17.4. Despite national, subregional, regional and global efforts, current approaches to the management of marine and coastal resources have not always proved capable of achieving sustainable development, and coastal resources and the coastal environment are being rapidly degraded and eroded in many parts of the world.

Objectives

17.5. Coastal States commit themselves to integrated management and sustainable development of coastal areas and the marine environment under their national jurisdiction. To this end, it is necessary to, *inter alia*:

- (a) Provide for an integrated policy and decision-making process, including all involved sectors, to promote compatibility and a balance of uses;
- (b) Identify existing and projected uses of coastal areas and their interactions;
- (c) Concentrate on well-defined issues concerning coastal management;
- (d) Apply preventive and precautionary approaches in project planning and implementation, including prior assessment and systematic observation of the impacts of major projects;
- (e) Promote the development and application of methods, such as national resource and environmental accounting, that reflect changes in value resulting from uses of coastal and marine areas, including pollution, marine erosion, loss of resources and habitat destruction;
- (f) Provide access, as far as possible, for concerned individuals, groups and organizations to relevant information and opportunities for consultation and participation in planning and decision-making at appropriate levels.

Activities

(a) Management-related activities

17.6. Each coastal State should consider establishing, or where necessary strengthening, appropriate coordinating mechanisms (such as a high-level policy planning body) for integrated management and sustainable development of coastal and marine areas and their resources, at both the local and national levels. Such mechanisms should include consultation, as appropriate, with the academic and private sectors, non-governmental organizations, local communities, resource user groups, and indigenous people. Such national coordinating mechanisms could provide, *inter alia*, for:

- (a) Preparation and implementation of land and water use and siting policies;
- (b) Implementation of integrated coastal and marine management and sustainable development plans and programmes at appropriate levels;
- (c) Preparation of coastal profiles identifying critical areas, including eroded zones, physical processes, development patterns, user conflicts and specific priorities for management;
- (d) Prior environmental impact assessment, systematic observation and follow-up of major projects, including the systematic incorporation of results in decision-making;
- (e) Contingency plans for human induced and natural disasters, including likely effects of potential climate change and sealevel rise, as well as contingency plans for degradation and pollution of anthropogenic origin, including spills of oil and other materials;

(f) Improvement of coastal human settlements, especially in housing, drinking water and treatment and disposal of sewage, solid wastes and industrial effluents;

(g) Periodic assessment of the impacts of external factors and phenomena to ensure that the objectives of integrated management and sustainable development of coastal areas and the marine environment are met;

(h) Conservation and restoration of altered critical habitats;

(i) Integration of sectoral programmes on sustainable development for settlements, agriculture, tourism, fishing, ports and industries affecting the coastal area;

(j) Infrastructure adaptation and alternative employment;

(k) Human resource development and training;

(l) Public education, awareness and information programmes; (m) Promoting environmentally sound technology and sustainable practices;

(n) Development and simultaneous implementation of environmental quality criteria.

17.7. Coastal States, with the support of international organizations, upon request, should undertake measures to maintain biological diversity and productivity of marine species and habitats under national jurisdiction. Inter alia, these measures might include: surveys of marine biodiversity, inventories of endangered species and critical coastal and marine habitats; establishment and management of protected areas; and support of scientific research and dissemination of its results.

(b) Data and information

17.8. Coastal States, where necessary, should improve their capacity to collect, analyse, assess and use information for sustainable use of resources, including environmental impacts of activities affecting the coastal and marine areas. Information for management purposes should receive priority support in view of the intensity and magnitude of the changes occurring in the coastal and marine areas. To this end, it is necessary to, inter alia:

(a) Develop and maintain databases for assessment and management of coastal areas and all seas and their resources;

(b) Develop socio-economic and environmental indicators;

(c) Conduct regular environmental assessment of the state of the environment of coastal and marine areas;

(d) Prepare and maintain profiles of coastal area resources, activities, uses, habitats and protected areas based on the criteria of sustainable development;

(e) Exchange information and data.

17.9. Cooperation with developing countries, and, where applicable, subregional and regional mechanisms, should be strengthened to improve their capacities to achieve the above.

(c) International and regional cooperation and coordination

17.10. The role of international cooperation and coordination on a bilateral basis and, where applicable, within a subregional, interregional, regional or global framework, is to support and supplement national efforts of coastal States to promote integrated management and sustainable development of coastal and marine areas.

17.11. States should cooperate, as appropriate, in the preparation of national guidelines for integrated coastal zone management and development, drawing on existing experience. A global conference to exchange experience in the field could be held before 1994.

Means of implementation

(a) Financing and cost evaluation

17.12. The Conference secretariat has estimated the average total annual cost (1993-2000) of implementing the activities of this programme to be about \$6 billion including about \$50 million from the international community on grant or concessional terms. These are indicative and order of magnitude estimates only and have not been reviewed by governments. Actual costs and financial terms, including any that are non-concessional, will depend upon, inter alia, the specific strategies and programmes governments decide upon for implementation.

(b) Scientific and technological means

17.13. States should cooperate in the development of necessary coastal systematic observation, research and information management systems. They should provide access to and transfer environmentally safe technologies and methodologies for sustainable development of coastal and marine areas to developing countries. They should also develop technologies and endogenous scientific and technological capacities.

17.14. International organizations, whether subregional, regional or global, as appropriate, should support coastal States, upon request, in these efforts, as indicated above, devoting special attention to developing countries.

(c) Human resource development

17.15. Coastal States should promote and facilitate the organization of education and training in integrated coastal and marine management and sustainable development for scientists, technologists, managers including community-based managers and users, leaders, indigenous peoples, fisherfolk, women and youth, among others. Management, development, as well as environmental protection concerns and local planning issues should be incorporated in educational curricula and public awareness campaigns, with due regard to traditional ecological knowledge and socio-cultural values.

17.16. International organizations, whether subregional, regional or global, as appropriate, should support coastal States, upon request, in the areas indicated above, devoting special attention to developing countries.

(d) Capacity-building

17.17. Full cooperation should be extended, upon request, to coastal States in their capacity-building efforts and, where appropriate, capacity-building should be included in bilateral and multilateral development cooperation. Coastal States may consider, inter alia:

(a) Ensuring capacity-building at the local level;

(b) Consulting on coastal and marine issues with local administrations, the business community, the academic sector, resource user groups and the general public;

(c) Coordinating sectoral programmes while building capacity;

(d) Identifying existing and potential capabilities, facilities and needs for human resources development and scientific and technological infrastructure;

(e) Developing scientific and technological means and research;

(f) Promoting and facilitating human resource development and education;

(g) Supporting "centres of excellence" in integrated coastal and marine resource management;

(h) Supporting pilot demonstration programmes and projects in integrated coastal and marine management.

B. Marine environmental protection

Basis for action

17.18. Degradation of the marine environment can result from a wide range of sources. Land-based sources contribute 70 per cent of marine pollution, while maritime transport and dumping-at-sea activities contribute 10 per cent each. The contaminants that pose the greatest threat to the marine environment are, in variable order of importance and depending on differing national or regional situations: sewage, nutrients, synthetic organic compounds, sediments, litter and plastics, metals, radionuclides, oil/hydrocarbons and polycyclic aromatic hydrocarbons (PAHs). Many of the polluting substances originating from land-based sources are of particular concern to the marine environment since they exhibit at the same time toxicity, persistence and bioaccumulation in the food chain. There is currently no global scheme to address marine pollution from land-based sources.

17.19. Degradation of the marine environment can also result from a wide range of activities on land. Human settlements, land use, construction of coastal infrastructure, agriculture, forestry, urban development, tourism and industry can affect the marine environment. Coastal erosion and siltation are of particular concern.

17.20. Marine pollution is also caused by shipping and sea-based activities. Approximately 600,000 tons of oil enter the oceans each year as a result of normal shipping operations, accidents and illegal discharges. With respect to offshore oil and gas activities, currently machinery space discharges are regulated internationally and six regional conventions to control platform discharges have been under consideration. The nature and extent of environmental impacts from offshore oil exploration and production activities generally account for a very small proportion of marine pollution.

17.21. A precautionary and anticipatory rather than a reactive approach is necessary to prevent the degradation of the marine environment. This requires, inter alia, the adoption of precautionary measures, environmental impact assessments, clean production techniques, recycling, waste audits and minimization, construction and/or improvement of sewage treatment facilities, quality management criteria for the proper handling of hazardous substances, and a comprehensive approach to damaging impacts from air, land and water. Any management framework must include the improvement of coastal human settlements and the integrated management and development of coastal areas.

Objectives

17.22. States, in accordance with the provisions of the United Nations Convention on the Law of the Sea on protection and preservation of the marine environment, commit themselves, in accordance with their policies, priorities and resources, to prevent, reduce and control degradation of the marine environment so as to maintain and improve its life-support and productive capacities. To this end, it is necessary to:

- (a) Apply preventive, precautionary and anticipatory approaches so as to avoid degradation of the marine environment, as well as to reduce the risk of long-term or irreversible adverse effects upon it;
- (b) Ensure prior assessment of activities that may have significant adverse impacts upon the marine environment;
- (c) Integrate protection of the marine environment into relevant general environmental, social and economic development policies;
- (d) Develop economic incentives, where appropriate, to apply clean technologies and other means consistent with the internalization of environmental costs, such as the polluter pays principle, so as to avoid degradation of the marine environment;
- (e) Improve the living standards of coastal populations, particularly in developing countries, so as to contribute to reducing the degradation of the coastal and marine environment.

17.23. States agree that provision of additional financial resources, through appropriate international mechanisms, as well as access to cleaner technologies and relevant research, would be necessary to support action by developing countries to implement this commitment.

Activities

(a) Management-related activities

Prevention, reduction and control of degradation of the marine environment from land-based activities

17.24. In carrying out their commitment to deal with degradation of the marine environment from land-based activities, States should take action at the national level and, where appropriate, at the regional and subregional levels, in concert with action to implement programme area A, and take account of the Montreal Guidelines for the Protection of the Marine Environment from Land-Based Sources.

17.25. To this end, States, with the support of the relevant international environmental, scientific, technical and financial organizations, should cooperate, *inter alia*, to:

(a) Consider updating, strengthening and extending the Montreal Guidelines, as appropriate;

(b) Assess the effectiveness of existing regional agreements and action plans, where appropriate, with a view to identifying means of strengthening action, where necessary, to prevent, reduce and control marine degradation caused by land-based activities;

(c) Initiate and promote the development of new regional agreements, where appropriate;

(d) Develop means of providing guidance on technologies to deal with the major types of pollution of the marine environment from land-based sources, according to the best scientific evidence;

(e) Develop policy guidance for relevant global funding mechanisms;

(f) Identify additional steps requiring international cooperation.

17.26. The UNEP Governing Council is invited to convene, as soon as practicable, an intergovernmental meeting on protection of the marine environment from land-based activities.

17.27. As concerns sewage, priority actions to be considered by States may include:

(a) Incorporating sewage concerns when formulating or reviewing coastal development plans, including human settlement plans;

(b) Building and maintaining sewage treatment facilities in accordance with national policies and capacities and international cooperation available;

(c) Locating coastal outfalls so as to maintain an acceptable level of environmental quality and to avoid exposing shell fisheries, water intakes and bathing areas to pathogens;

(d) Promoting environmentally sound co-treatments of domestic and compatible industrial effluents, with the introduction, where practicable, of controls on the entry of effluents that are not compatible with the system;

(e) Promoting primary treatment of municipal sewage discharged to rivers, estuaries and the sea, or other solutions appropriate to specific sites;

(f) Establishing and improving local, national, subregional and regional, as necessary, regulatory and monitoring programmes to control effluent discharge, using minimum sewage effluent guidelines and water quality criteria and giving due consideration to the characteristics of receiving bodies and the volume and type of pollutants.

17.28. As concerns other sources of pollution, priority actions to be considered by States may include:

- (a) Establishing or improving, as necessary, regulatory and monitoring programmes to control effluent discharges and emissions, including the development and application of control and recycling technologies;
- (b) Promoting risk and environmental impact assessments to help ensure an acceptable level of environmental quality;
- (c) Promoting assessment and cooperation at the regional level, where appropriate, with respect to the input of point source pollutants from new installations;
- (d) Eliminating the emission or discharge of organohalogen compounds that threaten to accumulate to dangerous levels in the marine environment;
- (e) Reducing the emission or discharge of other synthetic organic compounds that threaten to accumulate to dangerous levels in the marine environment;
- (f) Promoting controls over anthropogenic inputs of nitrogen and phosphorus that enter coastal waters where problems, such as eutrophication threaten the marine environment or its resources;
- (g) Cooperating with developing countries, through financial and technological support, to maximize the best practicable control and reduction of substances and wastes that are toxic, persistent or liable to bio-accumulate and to establish environmentally sound land-based waste disposal alternatives to sea dumping;
- (h) Cooperating in the development and implementation of environmentally sound land-use techniques and practices to reduce run-off to water-courses and estuaries which would cause pollution or degradation of the marine environment;
- (i) Promoting the use of environmentally less harmful pesticides and fertilizers and alternative methods for pest control, and considering the prohibition of those found to be environmentally unsound;
- (j) Adopting new initiatives at national, subregional and regional levels for controlling the input of non-point source pollutants, which require broad changes in sewage and waste management, agricultural practices, mining, construction and transportation.

17.29. As concerns physical destruction of coastal and marine areas causing degradation of the marine environment, priority actions should include control and prevention of coastal erosion and siltation due to anthropogenic factors related to, inter alia, land-use and construction techniques and practices. Watershed management practices should be promoted so as to prevent, control and reduce degradation of the marine environment.

Prevention, reduction and control of degradation of the marine environment from sea-based activities

17.30. States, acting individually, bilaterally, regionally or multilaterally and within the framework of IMO and other relevant international organizations, whether subregional, regional or global, as appropriate, should assess the need for additional measures to address degradation of the marine environment:

(a) From shipping, by:

- (i) Supporting wider ratification and implementation of relevant shipping conventions and protocols;
- (ii) Facilitating the processes in (i), providing support to individual States upon request to help them overcome the obstacles identified by them;
- (iii) Cooperating in monitoring marine pollution from ships, especially from illegal discharges, (e.g., aerial surveillance), and enforcing MARPOL discharge, provisions more rigorously;
- (iv) Assessing the state of pollution caused by ships in particularly sensitive areas identified by

IMO and taking action to implement applicable measures, where necessary, within such areas to ensure compliance with generally accepted international regulations;

(v) Taking action to ensure respect of areas designated by coastal States, within their exclusive economic zones, consistent with international law, in order to protect and preserve rare or fragile ecosystems, such as coral reefs and mangroves;

(vi) Considering the adoption of appropriate rules on ballast water discharge to prevent the spread of non-indigenous organisms;

(vii) Promoting navigational safety by adequate charting of coasts and ship-routing, as appropriate;

(viii) Assessing the need for stricter international regulations to further reduce the risk of accidents and pollution from cargo ships (including bulk carriers);

(ix) Encouraging IMO and IAEA to work together to complete consideration of a code on the carriage of irradiated nuclear fuel in flasks on board ships;

(x) Revising and updating the IMO Code of Safety for Nuclear Merchant Ships and considering how best to implement a revised code;

(xi) Supporting the ongoing activity within IMO regarding development of appropriate measures for reducing air pollution from ships;

(xii) Supporting the ongoing activity within IMO regarding the development of an international regime governing the transportation of hazardous and noxious substances carried by ships and further considering whether the compensation funds similar to the ones established under the Fund Convention would be appropriate in respect of pollution damage caused by substances other than oil;

(b) From dumping, by:

(i) Supporting wider ratification, implementation and participation in relevant Conventions on dumping at sea, including early conclusion of a future strategy for the London Dumping Convention;

(ii) Encouraging the London Dumping Convention parties to take appropriate steps to stop ocean dumping and incineration of hazardous substances;

(c) From offshore oil and gas platforms, by assessing existing regulatory measures to address discharges, emissions and safety and the need for additional measures;

(d) From ports, by facilitating establishment of port reception facilities for the collection of oily and chemical residues and garbage from ships, especially in MARPOL special areas, and promoting the establishment of smaller scale facilities in marinas and fishing harbours.

17.31. IMO and as appropriate, other competent United Nations organizations, when requested by the States concerned, should assess, where appropriate, the state of marine pollution in areas of congested shipping, such as heavily used international straits, with a view to ensuring compliance with generally accepted international regulations, particularly those related to illegal discharges from ships, in accordance with the provisions of Part III of the United Nations Convention on the Law of the Sea.

17.32. States should take measures to reduce water pollution caused by organotin compounds used in anti-fouling paints.

17.33. States should consider ratifying the Convention on Oil Pollution Preparedness, Response and Cooperation, which addresses, inter alia, the development of contingency plans on the national and international level, as appropriate, including provision of oil-spill response material and training of personnel, including its possible extension to chemical spill response.

17.34. States should intensify international cooperation to strengthen or establish, where necessary, regional oil/chemical-spill response centres and/or, as appropriate, mechanisms in cooperation with relevant subregional, regional or global intergovernmental organizations and,

where appropriate, industry-based organizations.

(b) Data and information

17.35. States should, as appropriate, and in accordance with the means at their disposal and with due regard for their technical and scientific capacity and resources, make systematic observations on the state of the marine environment. To this end, States should, as appropriate, consider:

(a) Establishing systematic observation systems to measure marine environmental quality, including causes and effects of marine degradation, as a basis for management;

(b) Regularly exchanging information on marine degradation caused by land-based and sea-based activities and on actions to prevent, control and reduce such degradation;

(c) Supporting and expanding international programmes for systematic observations such as the mussel watch programme, building on existing facilities with special attention to developing countries;

(d) Establishing a clearing-house on marine pollution control information, including processes and technologies to address marine pollution control and to support their transfer to developing countries and other countries with demonstrated needs;

(e) Establishing a global profile and database providing information on the sources, types, amounts and effects of pollutants reaching the marine environment from land-based activities in coastal areas and sea-based sources;

(f) Allocating adequate funding for capacity-building and training programmes to ensure the full participation of developing countries, in particular, in any international scheme under the organs and organizations of the United Nations system for the collection, analysis and use of data and information.

Means of implementation

(a) Financing and cost evaluation

17.36. The Conference secretariat has estimated the average total annual cost (1993-2000) of implementing the activities of this programme to be about \$200 million from the international community on grant or concessional terms. These are indicative and order of magnitude estimates only and have not been reviewed by governments. Actual costs and financial terms, including any that are non-concessional, will depend upon, inter alia, the specific strategies and programmes governments decide upon for implementation.

(b) Scientific and technological means

17.37. National, subregional and regional action programmes will, where appropriate, require technology transfer in conformity with chapter 34 and financial resources, particularly where developing countries are concerned, including:

(a) Assistance to industries in identifying and adopting clean production or cost-effective pollution control technologies;

(b) Planning development and application of low-cost and low-maintenance sewage installation and treatment technologies for developing countries;

(c) Equipment of laboratories to observe systematically human and other impacts on the marine environment;

(d) Identification of appropriate oil- and chemical-spill control materials, including low-cost locally available materials and techniques, suitable for pollution emergencies in developing countries;

(e) Study of the use of persistent organohalogens that are liable to accumulate in the marine environment to identify those that cannot be adequately controlled and to provide a basis for a decision on a time schedule for phasing them out as soon as practicable;

(f) Establishment of a clearing-house for information on marine pollution control, including processes and technologies to address marine pollution control, and support for their transfer to developing and other countries with demonstrated needs.

(c) Human resource development

17.38. States individually or in cooperation with each other and with the support of international organizations, whether subregional, regional or global, as appropriate, should:

(a) Provide training for critical personnel required for the adequate protection of the marine environment as identified by training needs' surveys at the national, regional or subregional levels;

(b) Promote the introduction of marine environmental protection topics into the curriculum of marine studies programmes;

(c) Establish training courses for oil- and chemical-spill response personnel, in cooperation, where appropriate, with the oil and chemical industries;

(d) Conduct workshops on environmental aspects of port operations and development;

(e) Strengthen and provide secure financing for new and existing specialized international centres of professional maritime education;

(f) States should, through bilateral and multilateral cooperation, support and supplement the national efforts of developing countries as regards human resource development in relation to prevention and reduction of degradation of the marine environment.

(d) Capacity-building

17.39. National planning and coordinating bodies should be given the capacity and authority to review all land-based activities and sources of pollution for their impacts on the marine environment and to propose appropriate control measures.

17.40. Research facilities should be strengthened or, where appropriate, developed in developing countries for systematic observation of marine pollution, environmental impact assessment and development of control recommendations and should be managed and staffed by local experts.

17.41. Special arrangements will be needed to provide adequate financial and technical resources to assist developing countries in preventing and solving problems associated with activities that threaten the marine environment.

17.42. An international funding mechanism should be created for the application of appropriate sewage treatment technologies and building sewage treatment facilities, including grants or concessional loans from international agencies and appropriate regional funds, replenished at least in part on a revolving basis by user fees.

17.43. In carrying out these programme activities, particular attention needs to be given to the problems of developing countries that would bear an unequal burden because of their lack of facilities, expertise or technical capacities.

C. Sustainable use and conservation of marine living resources of the high seas

Basis for action

17.44. Over the last decade, fisheries on the high seas have considerably expanded and currently represent approximately 5 per cent of total world landings. The provisions of the United Nations Convention on the Law of the Sea on the marine living resources of the high seas sets forth rights and obligations of States with respect to conservation and utilization of those resources.

17.45. However, management of high seas fisheries, including the adoption, monitoring and enforcement of effective conservation measures, is inadequate in many areas and some resources are overutilized. There are problems of unregulated fishing, overcapitalization,

excessive fleet size, vessel reflagging to escape controls, insufficiently selective gear, unreliable databases and lack of sufficient cooperation between States. Action by States whose nationals and vessels fish on the high seas, as well as cooperation at the bilateral, subregional, regional and global levels, is essential particularly for highly migratory species and straddling stocks. Such action and cooperation should address inadequacies in fishing practices, as well as in biological knowledge, fisheries statistics and improvement of systems for handling data. Emphasis should also be on multi-species management and other approaches that take into account the relationships among species, especially in addressing depleted species, but also in identifying the potential of underutilized or unutilized populations.

Objectives

17.46. States commit themselves to the conservation and sustainable use of marine living resources on the high seas. To this end, it is necessary to:

- (a) Develop and increase the potential of marine living resources to meet human nutritional needs, as well as social, economic and development goals;
- (b) Maintain or restore populations of marine species at levels that can produce the maximum sustainable yield as qualified by relevant environmental and economic factors, taking into consideration relationships among species;
- (c) Promote the development and use of selective fishing gear and practices that minimize waste in the catch of target species and minimize by-catch of non-target species;
- (d) Ensure effective monitoring and enforcement with respect to fishing activities;
- (e) Protect and restore endangered marine species;
- (f) Preserve habitats and other ecologically sensitive areas;
- (g) Promote scientific research with respect to the marine living resources in the high seas;

17.47. Nothing in paragraph 17.46 above restricts the right of a State or the competence of an international organization, as appropriate, to prohibit, limit or regulate the exploitation of marine mammals on the high seas more strictly than provided for in that paragraph. States shall cooperate with a view to the conservation of marine mammals and, in the case of cetaceans, shall in particular work through the appropriate international organizations for their conservation, management and study.

17.48. The ability of developing countries to fulfil the above objectives is dependent upon their capabilities, including the financial, scientific and technological means at their disposal. Adequate financial, scientific and technological cooperation should be provided to support action by them to implement these objectives.

Activities

(a) Management-related activities

17.49. States should take effective action, including bilateral and multilateral cooperation, where appropriate at the subregional, regional and global levels, to ensure that high seas fisheries are managed in accordance with the provisions of the United Nations Convention on the Law of the Sea. In particular, they should:

- (a) Give full effect to these provisions with regard to fisheries populations whose ranges lie both within and beyond exclusive economic zones (straddling stocks);
- (b) Give full effect to these provisions with regard to highly migratory species;
- (c) Negotiate, where appropriate, international agreements for the effective management and conservation of fishery stocks;
- (d) Define and identify appropriate management units;

17.50. States, should convene, as soon as possible, an intergovernmental conference under United Nations auspices, taking into account relevant activities at the subregional, regional and global levels, with a view to promoting effective implementation of the provisions of the United Nations Convention on the Law of the Sea on straddling fish stocks and highly migratory fish stocks. The conference, drawing inter alia on scientific and technical studies by FAO, should identify and assess existing problems related to the conservation and management of such fish stocks, and consider means of improving cooperation on fisheries among States, and formulate appropriate recommendations. The work and the results of the conference should be fully consistent with the provisions of UNCLOS, in particular the rights and obligations of coastal states and states fishing on the high seas.

17.51. States should ensure that fishing activities by vessels flying their flags on the high seas take place in a manner so as to minimize incidental catch.

17.52. States should take effective action consistent with international law to monitor and control fishing activities by vessels flying their flags on the high seas to ensure compliance with applicable conservation and management rules, including full, detailed, accurate and timely reporting of catches and effort.

17.53. States should take effective action, consistent with international law, to deter reflagging of vessels by their nationals as a means of avoiding compliance with applicable conservation and management rules for fishing activities on the high seas.

17.54. States should prohibit dynamiting, poisoning and other comparable destructive fishing practices.

17.55. States should fully implement General Assembly resolution 46/215 on large-scale pelagic drift-net fishing.

17.56. States should take measures to increase the availability of marine living resources as human food by reducing wastage, post-harvest losses and discards, and improving techniques of processing, distribution and transportation.

(b) Data and information

17.57. States, with the support of international organizations, whether subregional, regional or global, as appropriate, should cooperate to:

(a) Promote enhanced collection of data necessary for the conservation and sustainable use of the marine living resources of the high seas;

(b) Exchange on a regular basis up-to-date data and information adequate for fisheries assessment;

(c) Develop and share analytical and predictive tools, such as stock assessment and bioeconomic models;

(d) Establish or expand appropriate monitoring and assessment programmes.

(c) International and regional cooperation and coordination

17.58. States, through bilateral and multilateral cooperation and within the framework of subregional and regional fisheries bodies, as appropriate, and with the support of other international intergovernmental agencies, should assess high seas resource potentials and develop profiles of all stocks (target and non-target).

17.59. States should, where and as appropriate, ensure adequate levels of coordination and cooperation in enclosed and semi-enclosed seas and between subregional, regional and global intergovernmental fisheries bodies.

17.60. Effective cooperation within existing subregional, regional or global fisheries bodies should be encouraged. Where such organizations do not exist, States should, as appropriate, cooperate to establish such organizations.

17.61. States with an interest in a high seas fishery regulated by an existing subregional and/or regional high seas fisheries organization of which they are not members should be encouraged to join that organization, where appropriate.

17.62. States recognize:

(a) The responsibility of the International Whaling Commission for the conservation and management of whale stocks and the regulation of whaling pursuant to the 1946 International Convention for the Regulation of Whaling;

(b) The work of the International Whaling Commission Scientific Committee in carrying out studies of large whales in particular, as well as of other cetaceans;

(c) The work of other organizations, such as the Inter-American Tropical Tuna Commission and the Agreement on Small Cetaceans in the Baltic and North Sea under the Bonn Convention, in the conservation, management and study of cetaceans and other marine mammals.

17.63. States should cooperate for the conservation, management and study of cetaceans.

Means of implementation

(a) Financing and cost evaluation

17.64. The Conference secretariat has estimated the average total annual cost (1993-2000) of implementing the activities of this programme to be about \$12 million from the international community on grant or concessional terms. These are indicative and order of magnitude estimates only and have not been reviewed by governments. Actual costs and financial terms, including any that are non-concessional, will depend upon, inter alia, the specific strategies and programmes governments decide upon for implementation.

(b) Scientific and technological means

17.65. States, with the support of relevant international organizations, where necessary, should develop collaborative technical and research programmes to improve understanding of the life cycles and migrations of species found on the high seas, including identifying critical areas and life stages.

17.66. States, with the support of relevant international organizations, whether subregional, regional or global, as appropriate, should:

(a) Develop databases on the high seas marine living resources and fisheries;

(b) Collect and correlate marine environmental data with high seas marine living resources data, including the impacts of regional and global changes brought about by natural causes and by human activities;

(c) Cooperate in coordinating research programmes to provide the knowledge necessary to manage high seas resources.

(c) Human resources development

17.67. Human resources development at the national level should be targeted at both development and management of high seas resources, including training in high seas fishing techniques and in high seas resource assessment, strengthening cadres of personnel to deal with high seas resource management and conservation and related environmental issues, and training observers and inspectors to be placed on fishing vessels.

(d) Capacity-building

17.68. States, with the support, where appropriate, of relevant international organizations, whether subregional, regional or global, should cooperate to develop or upgrade systems and institutional structures for monitoring, control and surveillance, as well as the research capacity for assessment of marine living resource populations.

17.69. Special support, including cooperation among States, will be needed to enhance the capacities of developing countries in the areas of data and information, scientific and technological means, and human resource development in order to participate effectively in the conservation and sustainable utilization of high seas marine living resources.

D. Sustainable use and conservation of marine living resources under national jurisdiction

Basis for action

17.70. Marine fisheries yield 80 to 90 million tons of fish and shellfish per year, 95 per cent of which is taken from waters under national jurisdiction. Yields have increased nearly fivefold over the past four decades. The provisions of the United Nations Convention on the Law of the Sea on marine living resources of the exclusive economic zone and other areas under national jurisdiction set forth rights and obligations of States with respect to conservation and utilization of those resources.

17.71. Marine living resources provide an important source of protein in many countries and their use is often of major importance to local communities and indigenous people. Such resources provide food and livelihoods to millions of people and, if sustainably utilized, offer increased potential to meet nutritional and social needs, particularly in developing countries. To realize this potential requires improved knowledge and identification of marine living resource stocks, particularly of underutilized and unutilized stocks and species, use of new technologies, better handling and processing facilities to avoid wastage, and improved quality and training of skilled personnel to manage and conserve effectively the marine living resources of the exclusive economic zone and other areas under national jurisdiction. Emphasis should also be on multi-species management and other approaches that take into account the relationships among species.

17.72. Fisheries in many areas under national jurisdiction face mounting problems, including local overfishing, unauthorized incursions by foreign fleets, ecosystem degradation, overcapitalization and excessive fleet sizes, undervaluation of catch, insufficiently selective gear, unreliable databases, and increasing competition between artisanal and large-scale fishing, and between fishing and other types of activities.

17.73. Problems extend beyond fisheries. Coral reefs and other marine and coastal habitats, such as mangroves and estuaries, are among the most highly diverse, integrated and productive of the Earth's ecosystems. They often serve important ecological functions, provide coastal protection, and are critical resources for food, energy, tourism and economic development. In many parts of the world, such marine and coastal systems are under stress or are threatened from a variety of sources, both human and natural.

Objectives

17.74. Coastal States, particularly developing countries and States whose economies are overwhelmingly dependent on the exploitation of the marine living resources of their exclusive economic zones, should obtain the full social and economic benefits from sustainable utilization of marine living resources within their exclusive economic zones and other areas under national jurisdiction.

17.75. States commit themselves to the conservation and sustainable use of marine living resources under national jurisdiction. To this end, it is necessary to:

- (a) Develop and increase the potential of marine living resources to meet human nutritional needs, as well as social, economic and development goals;
- (b) Take into account traditional knowledge and interests of local communities, small-scale artisanal fisheries and indigenous people in development and management programmes;
- (c) Maintain or restore populations of marine species at levels that can produce the maximum sustainable yield as qualified by relevant environmental and economic factors, taking into consideration relationships among species;
- (d) Promote the development and use of selective fishing gear and practices that minimize waste in the catch of target species and minimize by-catch of non-target species;

(e) Protect and restore endangered marine species;

(f) Preserve rare or fragile ecosystems, as well as habitats and other ecologically sensitive areas.

17.76. Nothing in paragraph 17.75 above restricts the right of a coastal State or the competence of an international organization, as appropriate, to prohibit, limit or regulate the exploitation of marine mammals more strictly than provided for in that paragraph. States shall cooperate with a view to the conservation of marine mammals and in the case of cetaceans shall in particular work through the appropriate international organizations for their conservation, management and study.

17.77. The ability of developing countries to fulfil the above objectives is dependent upon their capabilities, including the financial, scientific and technological means at their disposal. Adequate financial, scientific and technological cooperation should be provided to support action by them to implement these objectives.

Activities

(a) Management-related activities

17.78. States should ensure that marine living resources of the exclusive economic zone and other areas under national jurisdiction are conserved and managed in accordance with the provisions of the United Nations Convention on the Law of the Sea.

17.79. Coastal States, individually or through bilateral and/or multilateral cooperation and with the support, as appropriate of international organizations, whether subregional, regional or global, should inter alia:

(a) Assess the potential of marine living resources, including underutilized or unutilized stocks and species, by developing inventories, where necessary, for their conservation and sustainable use;

(b) Implement strategies for the sustainable use of marine living resources, taking into account the special needs and interests of small-scale artisanal fisheries, local communities and indigenous people to meet human nutritional and other development needs;

(c) Implement, in particular in developing countries, mechanisms to develop mariculture, aquaculture and small-scale, deep-sea and oceanic fisheries within areas under national jurisdiction where assessments show that marine living resources are potentially available;

(d) Strengthen their legal and regulatory frameworks, where appropriate, including management, enforcement and surveillance capabilities, to regulate activities related to the above strategies;

(e) Take measures to increase the availability of marine living resources as human food by reducing wastage, post-harvest losses and discards, and improving techniques of processing, distribution and transportation;

(f) Develop and promote the use of environmentally sound technology under criteria compatible with the sustainable use of marine living resources, including assessment of the environmental impact of major new fishery practices;

(g) Enhance the productivity and utilization of their marine living resources for food and income.

17.80. States, in implementing the provisions of the United Nations Convention on the Law of the Sea, should address the issues of straddling stocks and highly migratory species, and taking fully into account the objective set out in paragraph 17.74, access to the surplus of allowable catches. 17.81. Coastal States should explore the scope for expanding recreational and tourist activities based on marine living resources, including those for providing alternative sources of income. Such activities should be compatible with conservation and sustainable development policies and plans.

17.82. Coastal States should support the sustainability of small-scale artisanal fisheries. To this end, they should, as appropriate:

(a) Integrate small-scale artisanal fisheries development in marine and coastal planning, taking into account the interests and, where appropriate, encouraging representation of fishermen, small-scale fisherworkers, women, local communities and indigenous people;

(b) Recognize the rights of small-scale fishworkers and the special situation of indigenous people and local communities, including their rights to utilization and protection of their habitats on a sustainable basis;

(c) Develop systems for the acquisition and recording of traditional knowledge concerning marine living resources and environment and promote the incorporation of such knowledge into management systems.

17.83. Coastal States should ensure that, in the negotiation and implementation of international agreements on the development or conservation of marine living resources, the interests of local communities and indigenous people are taken into account, in particular their right to subsistence.

17.84. Coastal States, with the support, as appropriate, of international organizations should conduct analyses of the potential for aquaculture in marine and coastal areas under national jurisdiction and apply appropriate safeguards as to the introduction of new species.

17.85. States should prohibit dynamiting, poisoning and other comparable destructive fishing practices.

17.86. States should identify marine ecosystems exhibiting high levels of biodiversity and productivity and other critical habitat areas and provide necessary limitations on use in these areas, through, inter alia, designation of protected areas. Priority should be accorded, as appropriate, to:

(a) Coral reef ecosystems;

(b) Estuaries;

(c) Temperate and tropical wetlands, including mangroves;

(d) Seagrass beds;

(e) Other spawning and nursery areas.

(b) Data and information

17.87. States, individually or through bilateral and multilateral cooperation and with the support, as appropriate, of international organizations, whether subregional, regional or global, should:

(a) Promote enhanced collection and exchange of data necessary for the conservation and sustainable use of the marine living resources under national jurisdiction;

(b) Exchange on a regular basis up-to-date data and information necessary for fisheries assessment;

(c) Develop and share analytical and predictive tools, such as stock assessment and bioeconomic models;

(d) Establish or expand appropriate monitoring and assessment programmes;

(e) Complete/update marine biodiversity, marine living resource and critical habitat profiles of exclusive economic zones and other areas under national jurisdiction, taking account of changes in the environment brought about by natural causes as well as human activities.

(c) International and regional cooperation and coordination

17.88. States, through bilateral and multilateral cooperation, and with the support of relevant United Nations and other international organizations, should cooperate to:

(a) Develop financial and technical cooperation to enhance the capacities of developing countries in small-scale and oceanic fisheries, as well as in coastal aquaculture and mariculture;

(b) Promote the contribution of marine living resources to eliminate malnutrition and to achieve food self-sufficiency in developing countries, inter alia, by minimizing post-harvest losses and managing stocks for guaranteed sustainable yields;

(c) Develop agreed criteria for the use of selective fishing gear and practices to minimize waste in the catch of target species and minimize by-catch of non-target species;

(d) Promote seafood quality, including through national quality assurance systems for seafood, in order to promote access to markets, improve consumer confidence and maximize economic returns.

17.89. States should, where and as appropriate, ensure adequate coordination and cooperation in enclosed and semi-enclosed seas and between subregional, regional and global intergovernmental fisheries bodies.

17.90. States recognize:

(a) The responsibility of the International Whaling Commission for the conservation and management of whale stocks and the regulation of whaling pursuant to the 1946 International Convention for the Regulation of Whaling;

(b) The work of the International Whaling Commission Scientific Committee in carrying out studies of large whales in particular, as well as of other cetaceans;

(c) The work of other organizations, such as the Inter-American Tropical Tuna Commission and the Agreement on Small Cetaceans in the Baltic and North Sea under the Bonn Convention, in the conservation, management and study of cetaceans and other marine mammals.

17.91. States should cooperate for the conservation, management and study of cetaceans.

Means of implementation

(a) Financing and cost evaluation

17.92. The Conference secretariat has estimated the average total annual cost (1993-2000) of implementing the activities of this programme to be about \$6 billion including about \$60 million from the international community on grant or concessional terms. These are indicative and order of magnitude estimates only and have not been reviewed by governments. Actual costs will depend upon, inter alia, the specific strategies and programmes governments decide upon for implementation.

(b) Scientific and technological means

17.93. States, with the support of relevant intergovernmental organizations, as appropriate, should:

(a) Provide for the transfer of environmentally sound technologies to develop fisheries, aquaculture and mariculture, particularly to developing countries;

(b) Accord special attention to mechanisms for transferring resource information and improved fishing and aquaculture technologies to fishing communities at the local level;

(c) Promote the study, scientific assessment and use of appropriate traditional management systems;

(d) Consider observing, as appropriate, the FAO/ICES Code of Practice for Consideration of

Transfer and Introduction of Marine and Freshwater Organisms;

(e) Promote scientific research on marine areas of particular importance for marine living resources, such as areas of high diversity, endemism and productivity and migratory stopover points.

(c) Human resource development

17.94. States individually, or through bilateral and multilateral cooperation and with the support of relevant international organizations, whether subregional, regional or global, as appropriate, should encourage and provide support for developing countries, inter alia, to:

(a) Expand multidisciplinary education, training and research on marine living resources, particularly in the social and economic sciences;

(b) Create training opportunities at national and regional levels to support artisanal including subsistence fisheries, to develop small-scale use of marine living resources and to encourage equitable participation of local communities, small-scale fishworkers, women and indigenous people;

(c) Introduce topics relating to the importance of marine living resources in educational curricula at all levels.

(d) Capacity-building

17.95. Coastal States, with the support of relevant subregional, regional and global agencies, where appropriate, should:

(a) Develop research capacities for assessment of marine living resource populations and monitoring;

(b) Provide support to local fishing communities, in particular those that rely on fishing for subsistence, indigenous people and women, including, as appropriate, the technical and financial assistance to organize, maintain, exchange and improve traditional knowledge of marine living resources and fishing techniques, and upgrade knowledge on marine ecosystems;

(c) Establish sustainable aquaculture development strategies, including environmental management in support of rural fish-farming communities;

(d) Develop and strengthen, where the need may arise, institutions capable of implementing the objectives and activities related to the conservation and management of marine living resources.

17.96. Special support, including cooperation among States, will be needed to enhance the capacities of developing countries in the areas of data and information, scientific and technological means and human resource development in order to enable them to participate effectively in the conservation and sustainable use of marine living resources under national jurisdiction.

E. Addressing critical uncertainties for the management of the marine environment and climate change

Basis for action

17.97. The marine environment is vulnerable and sensitive to climate and atmospheric changes. Rational use and development of coastal areas, all seas and marine resources, as well as conservation of the marine environment, requires the ability to determine the present state of these systems and to predict future conditions. The high degree of uncertainty in present information inhibits effective management and limits the ability to make predictions and assess environmental change. Systematic collection of data on marine environmental parameters will be needed to apply integrated management approaches and to predict effects of global climate change and of atmospheric phenomena, such as ozone depletion, on living marine resources and the marine environment. In order to determine the role of the oceans and all seas in driving global systems and to predict natural and human-induced changes in marine and coastal environments, the mechanisms to collect, synthesize and disseminate information from research and systematic observation activities need to be restructured and reinforced considerably.

17.98. There are many uncertainties about climate change and particularly about sealevel rise. Small increases in sealevel have the potential of causing significant damage to small islands and low-lying coasts. Response strategies should be based on sound data. A long-term cooperative research commitment is needed to provide the data required for global climate models and to reduce uncertainty. Meanwhile, precautionary measures should be undertaken to diminish the risks and effects, particularly on small islands and on low-lying and coastal areas of the world.

17.99. Increased ultraviolet radiation derived from ozone depletion has been reported in some areas of the world. An assessment of its effects in the marine environment is needed to reduce uncertainty and to provide a basis for action.

Objectives

17.100. States, in accordance with provisions of the United Nations Convention on the Law of the Sea on marine scientific research, commit themselves to improve the understanding of the marine environment and its role on global processes. To this end, it is necessary to:

(a) Promote scientific research on and systematic observation of the marine environment within the limits of national jurisdiction and high seas, including interactions with atmospheric phenomena, such as ozone depletion;

(b) Promote exchange of data and information resulting from scientific research and systematic observation and from traditional ecological knowledge and ensure its availability to policy makers and the public at the national level;

(c) Cooperate with a view to the development of standard inter-calibrated procedures, measuring techniques, data storage and management capabilities for scientific research on and systematic observation of the marine environment.

Activities

(a) Management-related activities

17.101. States should consider, inter alia:

(a) Coordinating national and regional observation programmes for coastal and near-shore phenomena related to climate change and for research parameters essential for marine and coastal management in all regions;

(b) Providing improved forecasts of marine conditions for the safety of inhabitants of coastal areas and for the efficiency of maritime operations;

(c) Cooperating with a view to adopting special measures to cope with and adapt to potential climate change and sealevel rise, including the development of globally accepted methodologies for coastal vulnerability assessment, modelling and response strategies particularly for priority areas, such as small islands and low-lying and critical coastal areas;

(d) Identifying ongoing and planned programmes of systematic observation of the marine environment, with a view to integrating activities and establishing priorities to address critical uncertainties for oceans and all seas;

(e) Initiating a programme of research to determine the marine biological effects of increased levels of ultraviolet rays due to the depletion of the stratospheric ozone layer and to evaluate the possible effects.

17.102. Recognizing the important role that oceans and all seas play in attenuating potential climate change, IOC and other relevant competent United Nations agencies, with the support of countries having the resources and expertise, should carry out analysis, assessments and systematic observation of the role of oceans as a carbon sink.

(b) Data and information

17.103. States should consider, inter alia:

(a) Increasing international cooperation particularly with a view to strengthening national scientific and technological capabilities for analysing, assessing and predicting global climate and environmental change;

(b) Supporting the role of the IOC in cooperation with WMO, UNEP and other international organizations in the collection, analysis and distribution of data and information from the oceans and all seas, including as appropriate, through the proposed Global Ocean Observing System, giving special attention to the need for IOC to develop fully the strategy for providing training and technical assistance for developing countries through its Training, Education and Mutual Assistance (TEMA) programme;

(c) Creating national multisectoral information bases, covering the results of research and systematic observation programmes;

(d) Linking these databases to existing data and information services and mechanisms, such as World Weather Watch and Earthwatch;

(e) Cooperating with a view to the exchange of data and information and its storage and archiving through the world and regional data centres;

(f) Cooperating to ensure full participation of developing countries, in particular, in any international scheme under the organs and organizations of the United Nations system for the collection, analysis and use of data and information.

(c) International and regional cooperation and coordination

17.104. States should consider bilaterally and multilaterally and in cooperation with international organizations, whether subregional, regional, interregional or global, where appropriate:

(a) Providing technical cooperation in developing the capacity of coastal and island States for marine research and systematic observation and for using its results;

(b) Strengthening existing national institutions and creating, where necessary, international analysis and prediction mechanisms in order to prepare and exchange regional and global oceanographic analyses and forecasts and to provide facilities for international research and training at national, subregional and regional levels, where applicable.

17.105. In recognition of the value of Antarctica as an area for the conduct of scientific research, in particular research essential to understanding the global environment, States carrying out such research activities in Antarctica should, as provided for in Article III of the Antarctic Treaty, continue to:

(a) Ensure that data and information resulting from such research are freely available to the international community;

(b) Enhance access of the international scientific community and specialized agencies of the United Nations to such data and information, including the encouragement of periodic seminars and symposia.

17.106. States should strengthen high-level inter-agency, subregional, regional and global coordination, as appropriate, and review mechanisms to develop and integrate systematic observation networks. This would include:

(a) Review of existing regional and global databases;

(b) Mechanisms to develop comparable and compatible techniques, validate methodologies and measurements, organize regular scientific reviews, develop options for corrective measures, agree on formats for presentation and storage, and communicate the information gathered to potential users;

(c) Systematic observation of coastal habitats and sealevel changes, inventories of marine pollution sources and reviews of fisheries statistics;

(d) Organization of periodic assessments of ocean and all seas and coastal area status and trends.

17.107. International cooperation, through relevant organizations within the United Nations system, should support countries to develop and integrate regional systematic long-term observation programmes, when applicable, into the Regional Seas Programmes in a coordinated fashion to implement, where appropriate, subregional, regional and global observing systems based on the principle of exchange of data. One aim should be the predicting of the effects of climate-related emergencies on existing coastal physical and socio-economic infrastructure.

17.108. Based on the results of research on the effects of the additional ultraviolet radiation reaching the Earth's surface, in the fields of human health, agriculture and marine environment, States and international organizations should consider taking appropriate remedial measures.

Means of implementation

(a) Financing and cost evaluation 17.109. The Conference secretariat has estimated the average total annual cost (1993-2000) of implementing the activities of this programme to be about \$750 million including about \$480 million from the international community on grant or concessional terms. These are indicative and order of magnitude estimates only and have not been reviewed by governments. Actual costs and financial terms, including any that are non-concessional, will depend upon, inter alia, the specific strategies and programmes governments decide upon for implementation.

17.110. Developed countries should provide the financing for the further development and implementation of the Global Ocean Observing System.

(b) Scientific and technological means

17.111. To address critical uncertainties through systematic coastal and marine observations and research, coastal States should cooperate in the development of procedures that allow for comparable analysis and soundness of data. They should also cooperate on a subregional and regional basis, through existing programmes where applicable, share infrastructure and expensive and sophisticated equipment, develop quality assurance procedures and develop human resources jointly. Special attention should be given to transfer of scientific and technological knowledge and means to support States, particularly developing countries, in the development of endogenous capabilities.

17.112. International organizations should support, when requested, coastal countries in implementing research projects on the effects of additional ultraviolet radiation.

(c) Human resource development

17.113. States, individually or through bilateral and multilateral cooperation and with the support, as appropriate, of international organizations whether subregional, regional or global, should develop and implement comprehensive programmes, particularly in developing countries, for a broad and coherent approach to meeting their core human resource needs in the marine sciences.

(d) Capacity-building

17.114. States should strengthen or establish as necessary, national scientific and technological oceanographic commissions or equivalent bodies to develop, support and coordinate marine science activities and work closely with international organizations.

17.115. States should use existing subregional and regional mechanisms, where applicable, to develop knowledge of the marine environment, exchange information, organize systematic observations and assessments, and make the most effective use of scientists, facilities and equipment. They should also cooperate in the promotion of endogenous research capabilities in developing countries.

F. Strengthening international, including regional, cooperation and coordination

Basis for action

17.116. It is recognized that the role of international cooperation is to support and supplement national efforts. Implementation of strategies and activities under the programme areas relative to marine and coastal areas and seas requires effective institutional arrangements at national, subregional, regional and global levels, as appropriate. There are numerous national and international, including regional, institutions, both within and outside the United Nations system, with competence in marine issues, and there is a need to improve coordination and strengthen links among them. It is also important to ensure that an integrated and multisectoral approach to marine issues is pursued at all levels.

Objectives

17.117. States commit themselves, in accordance with their policies, priorities and resources, to promote institutional arrangements necessary to support the implementation of the programme areas in this chapter. To this end, it is necessary, as appropriate, to:

(a) Integrate relevant sectoral activities addressing environment and development in marine and coastal areas at national, subregional, regional and global levels, as appropriate;

(b) Promote effective information exchange and, where appropriate, institutional linkages between bilateral and multilateral national, regional, subregional and interregional institutions dealing with environment and development in marine and coastal areas;

(c) Promote within the United Nations system, regular intergovernmental review and consideration of environment and development issues with respect to marine and coastal areas;

(d) Promote the effective operation of coordinating mechanisms for the components of the United Nations system dealing with issues of environment and development in marine and coastal areas, as well as links with relevant international development bodies.

Activities

(a) Management-related activities

Global17.118. The General Assembly should provide for regular consideration, within the United Nations system, at the intergovernmental level of general marine and coastal issues, including environment and development matters, and should request the Secretary-General and executive heads of United Nations agencies and organizations to:

(a) Strengthen coordination and develop improved arrangements among the relevant United Nations organizations with major marine and coastal responsibilities, including their subregional and regional components;

(b) Strengthen coordination between those organizations and other United Nations organizations, institutions and specialized agencies dealing with development, trade and other related economic issues, as appropriate;

(c) Improve representation of United Nations agencies dealing with the marine environment in United Nations system-wide coordination efforts;

(d) Promote, where necessary, greater collaboration between the United Nations agencies and subregional and regional coastal and marine programmes;

(e) Develop a centralized system to provide for information on legislation and advice on implementation of legal agreements on marine environmental and development issues.

17.119. States recognize that environmental policies should deal with the root causes of environmental degradation, thus preventing environmental measures from resulting in unnecessary restrictions to trade. Trade policy measures for environmental purposes should not constitute a means of arbitrary or unjustifiable discrimination or a disguised restriction on international trade. Unilateral actions to deal with environmental challenges outside the jurisdiction of the importing country should be avoided. Environmental measures addressing international environmental problems should, as far as possible, be based on an international consensus. Domestic measures targeted to achieve certain environmental objectives may need trade measures to render them effective. Should trade policy measures be found necessary for

the enforcement of environmental policies, certain principles and rules should apply. These could include, inter alia, the principle of non-discrimination; the principle that the trade measure chosen should be the least trade-restrictive necessary to achieve the objectives; an obligation to ensure transparency in the use of trade measures related to the environment and to provide adequate notification of national regulations; and the need to give consideration to the special conditions and development requirements of developing countries as they move towards internationally agreed environmental objectives.

Subregional and regional

17.120. States should consider, as appropriate:

(a) Strengthening, and extending where necessary, intergovernmental regional cooperation, the Regional Seas Programmes of UNEP, regional and subregional fisheries organizations and regional commissions;

(b) Introduce, where necessary, coordination among relevant United Nations and other multilateral organizations at the subregional and regional levels, including consideration of co-location of their staff;

(c) Arrange for periodic intraregional consultations;

(d) Facilitate access to and use of expertise and technology through relevant national bodies to subregional and regional centres and networks, such as the Regional Centres for Marine Technology.

(b) Data and information

17.121. States should, where appropriate:

(a) Promote exchange of information on marine and coastal issues;

(b) Strengthen the capacity of international organizations to handle information and support the development of national, subregional and regional data and information systems, where appropriate. This could also include networks linking countries with comparable environmental problems;

(c) Further develop existing international mechanisms such as Earthwatch and GESAMP.

Means of implementation

(a) Financing and cost evaluation

17.122. The Conference secretariat has estimated the average total annual cost (1993-2000) of implementing the activities of this programme to be about \$50 million from the international community on grant or concessional terms. These are indicative and order of magnitude estimates only and have not been reviewed by governments. Actual costs and financial terms, including any that are non-concessional, will depend upon, inter alia, the specific strategies and programmes governments decide upon for implementation.(b) Scientific and technological means, human resource development and capacity-building

17.123. The means of implementation outlined in the other programme areas on marine and coastal issues, under the sections on Scientific and technological means, human resource development and capacity-building are entirely relevant for this programme area as well. Additionally, States should, through international cooperation, develop a comprehensive programme for meeting the core human resource needs in marine sciences at all levels.

G. Sustainable development of small islands

Basis for action

17.124. Small island developing States, and islands supporting small communities are a special case both for environment and development. They are ecologically fragile and vulnerable. Their small size, limited resources, geographic dispersion and isolation from markets, place them at a

disadvantage economically and prevent economies of scale. For small island developing States the ocean and coastal environment is of strategic importance and constitutes a valuable development resource.

17.125. Their geographic isolation has resulted in their habitation of a comparatively large number of unique species of flora and fauna, giving them a very high share of global biodiversity. They also have rich and diverse cultures with special adaptations to island environments and knowledge of the sound management of island resources.

17.126. Small island developing States have all the environmental problems and challenges of the coastal zone concentrated in a limited land area. They are considered extremely vulnerable to global warming and sealevel rise, with certain small low-lying islands facing the increasing threat of the loss of their entire national territories. Most tropical islands are also now experiencing the more immediate impacts of increasing frequency of cyclones, storms and hurricanes associated with climate change. These are causing major set-backs to their socio-economic development.

17.127. Because small island development options are limited, there are special challenges to planning for and implementing sustainable development. Small island developing States will be constrained in meeting these challenges without the cooperation and assistance of the international community.

Objectives

17.128. States commit themselves to addressing the problems of sustainable development of small island developing States. To this end, it is necessary:

(a) To adopt and implement plans and programmes to support the sustainable development and utilization of their marine and coastal resources, including meeting essential human needs, maintaining biodiversity and improving the quality of life for island people;

(b) To adopt measures which will enable small island developing States to cope effectively, creatively and sustainably with environmental change and to mitigate impacts and reduce the threats posed to marine and coastal resources.

Activities

(a) Management-related activities

17.129. Small island developing States, with the assistance as appropriate of the international community and on the basis of existing work of national and international organizations, should:

(a) Study the special environmental and developmental characteristics of small islands, producing an environmental profile and inventory of their natural resources, critical marine habitats and biodiversity;

(b) Develop techniques for determining and monitoring the carrying capacity of small islands under different development assumptions and resource constraints;

(c) Prepare medium- and long-term plans for sustainable development that emphasize multiple use of resources, integrate environmental considerations with economic and sectoral planning and policies, define measures for maintaining cultural and biological diversity and conserve endangered species and critical marine habitats;

(d) Adapt coastal area management techniques, such as planning, siting and environmental impact assessments, using Geographical Information Systems (GIS), suitable to the special characteristics of small islands, taking into account the traditional and cultural values of indigenous people of island countries;

(e) Review the existing institutional arrangements and identify and undertake appropriate institutional reforms essential to the effective implementation of sustainable development plans, including intersectoral coordination and community participation in the planning process;

(f) Implement sustainable development plans, including the review and modification of existing unsustainable policies and practices;

(g) Based on precautionary and anticipatory approaches, design and implement rational response strategies to address the environmental, social and economic impacts of climate change and sealevel rise, and prepare appropriate contingency plans;

(h) Promote environmentally sound technology for sustainable development within small island developing States and identify technologies that should be excluded because of their threats to essential island ecosystems.

(b) Data and information

17.130. Additional information on the geographic, environmental, cultural and socio-economic characteristics of islands should be compiled and assessed to assist in the planning process. Existing island databases should be expanded and geographic information systems developed and adapted to suit the special characteristics of islands.

(c) International and regional cooperation and coordination

17.131. Small island developing States, with the support, as appropriate, of international organizations, whether subregional, regional or global, should develop and strengthen inter-island, regional and interregional cooperation and information exchange, including periodic regional and global meetings on sustainable development of small island developing States with the first global conference on the sustainable development of small island developing States, to be held in 1993.

17.132. International organizations, whether subregional, regional or global, must recognize the special development requirements of small island developing States and give adequate priority in the provision of assistance, particularly with respect to the development and implementation of sustainable development plans.

Means of implementation

(a) Financing and cost evaluation

17.133. The Conference secretariat has estimated the average total annual cost (1993-2000) of implementing the activities of this programme to be about \$130 million including about \$50 million from the international community on grant or concessional terms. These are indicative and order of magnitude estimates only and have not been reviewed by governments. Actual costs and financial terms, including any that are non-concessional, will depend upon, inter alia, the specific strategies and programmes governments decide upon for implementation.

(b) Scientific and technical means

17.134. Centres for the development and diffusion of scientific information and advice on technical means and technologies appropriate to small island developing States, especially with reference to the management of the coastal zone, the exclusive economic zone and marine resources, should be established or strengthened, as appropriate, on a regional basis.

(c) Human resource development

17.135. Since populations of small island developing States cannot maintain all necessary specializations, training for integrated coastal management and development should aim to produce cadres of managers or scientists, engineers and coastal planners able to integrate the many factors that need to be considered in integrated coastal management. Resource users should be prepared to execute both management and protection functions and to apply the polluter pays principle and support the training of their personnel. Educational systems should be modified to meet these needs and special training programmes developed in integrated island management and development. Local planning should be integrated in educational curricula of all levels and public awareness campaigns developed with the assistance of non-governmental organizations and indigenous coastal populations.

(d) Capacity-building

17.136. The total capacity of small island developing States will always be limited. Existing capacity must therefore be restructured to meet efficiently the immediate needs for sustainable

development and integrated management. At the same time, adequate and appropriate assistance from the international community must be directed at strengthening the full range of human resources needed on a continuous basis to implement sustainable development plans.

17.137. New technologies that can increase the output and range of capability of the limited human resources should be employed to increase the capacity of very small populations to meet their needs. The development and application of traditional knowledge to improve the capacity of countries to implement sustainable development should be fostered.

Notes

1/ References to the United Nations Convention on the Law of the Sea in this chapter of Agenda 21 do not prejudice the position of any State with respect to signature, ratification of or accession to the Convention.

2/ References to the United Nations Convention on the Law of the Sea in this chapter of Agenda 21 do not prejudice the position of States which view the Convention as having a unified character.

3/ Nothing in the programme areas of this chapter should be interpreted as prejudicing the rights of the States involved in a dispute of sovereignty or in the delimitation of the maritime areas concerned.

A21: Protection of Oceans (Ch. 17), Advance CopyPage 1

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Home > Freshwater

Friday, January 1

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This is a final, advanced version of a chapter of Agenda 21, as adopted by the Plenary in Rio de Janeiro, on June 14, 1992. This document will be further edited, translated into the official languages, and published by the United Nations for the General Assembly this autumn.

INTRODUCTION

18.1. Freshwater resources are an essential component of the earth's hydrosphere and an indispensable part of all terrestrial ecosystems. The freshwater environment is characterized by the hydrological cycle, including floods and droughts, which in some regions have become more extreme and dramatic in their consequences. Global climate change and atmospheric pollution could also have an impact on freshwater resources and their availability and, through sea-level rise, threaten low-lying coastal areas and small island ecosystems.

18.2. Water is needed in all aspects of life. The general objective is to make certain that adequate supplies of water of good quality are maintained for the entire population of this planet, while preserving the hydrological, biological and chemical functions of ecosystems, adapting human activities within the capacity limits of nature and combating vectors of water-related diseases. Innovative technologies, including the improvement of indigenous technologies, are needed to fully utilize limited water resources and to safeguard those resources against pollution.

18.3. The widespread scarcity, gradual destruction and aggravated pollution of freshwater resources in many world regions, along with the progressive encroachment of incompatible activities, demand integrated water resources planning and management. Such integration must cover all types of interrelated freshwater bodies, including both surface water and groundwater, and duly consider water quantity and quality aspects. The multisectoral nature of water resources development in the context of socio-economic development must be recognized, as well as the multi-interest utilization of water resources for water supply and sanitation, agriculture, industry, urban development, hydropower generation, inland fisheries, transportation, recreation, low and flat lands management and other activities. Rational water utilization schemes for the development of surface and underground water-supply sources and other potential sources have to be supported by concurrent water conservation and wastage minimization measures. Priority, however, must be accorded to flood prevention and control measures, as well as sedimentation control, where required.

18.4. Transboundary water resources and their use are of great importance to riparian States. In this connection, cooperation among those States may be desirable in conformity with existing agreements and/or other relevant arrangements, taking into account the interests of all riparian States concerned.

18.5. The following programme areas are proposed for the freshwater sector:

- (a) Integrated water resources development and management;
- (b) Water resources assessment;
- (c) Protection of water resources, water quality and aquatic ecosystems;
- (d) Drinking-water supply and sanitation;

- (e) Water and sustainable urban development;
- (f) Water for sustainable food production and rural development;
- (g) Impacts of climate change on water resources.

PROGRAMME AREAS

A. Integrated water resources development and management

Basis for action

18.6. The extent to which water resources development contributes to economic productivity and social well-being is not usually appreciated, although all social and economic activities rely heavily on the supply and quality of freshwater. As populations and economic activities grow, many countries are rapidly reaching conditions of water scarcity or facing limits to economic development. Water demands are increasing rapidly, with 70-80 per cent required for irrigation, less than 20 per cent for industry and a mere 6 per cent for domestic consumption. The holistic management of freshwater as a finite and vulnerable resource, and the integration of sectoral water plans and programmes within the framework of national economic and social policy, are of paramount importance for action in the 1990s and beyond. The fragmentation of responsibilities for water resources development among sectoral agencies is proving, however, to be an even greater impediment to promoting integrated water management than had been anticipated. Effective implementation and coordination mechanisms are required.

Objectives

18.7. The overall objective is to satisfy the freshwater needs of all countries for their sustainable development.

18.8. Integrated water resources management is based on the perception of water as an integral part of the ecosystem, a natural resource and a social and economic good, whose quantity and quality determine the nature of its utilization. To this end, water resources have to be protected, taking into account the functioning of aquatic ecosystems and the perennality of the resource, in order to satisfy and reconcile needs for water in human activities. In developing and using water resources, priority has to be given to the satisfaction of basic needs and the safeguarding of ecosystems. Beyond these requirements, however, water users should be charged appropriately.

18.9. Integrated water resources management, including the integration of land- and water-related aspects, should be carried out at the level of the catchment basin or sub-basin. Four principal objectives should be pursued, as follows:

(a) To promote a dynamic, interactive, iterative and multisectoral approach to water resources management, including the identification and protection of potential sources of freshwater supply, that integrates technological, socio-economic, environmental and human health considerations;

(b) To plan for the sustainable and rational utilization, protection, conservation and management of water resources based on community needs and priorities within the framework of national economic development policy;

(c) To design, implement and evaluate projects and programmes that are both economically efficient and socially appropriate within clearly defined strategies, based on an approach of full public participation, including that of women, youth, indigenous people, local communities, in water management policy-making and decision-making;

(d) To identify and strengthen or develop, as required, in particular in developing countries, the appropriate institutional, legal and financial mechanisms to ensure that water policy and its implementation are a catalyst for sustainable social progress and economic growth.

18.10. In the case of transboundary water resources, there is a need for riparian States to formulate water resources strategies, prepare water resources action programmes and consider, where appropriate, the harmonization of those strategies and action programmes.

18.11. All States, according to their capacity and available resources, and through bilateral or multilateral cooperation, including the United Nations and other relevant organizations as appropriate, could set the following targets:

(a) By the year 2000:

(i) To have designed and initiated costed and targeted national action programmes, and have put in place appropriate institutional structures and legal instruments;

(ii) To have established efficient water-use programmes to attain sustainable resource utilization patterns;

(b) By the year 2025:

(i) To have achieved subsectoral targets of all freshwater programme areas.

It is understood that the fulfilment of the targets quantified in (i) and (ii) above will depend upon new and additional financial resources that will be made available to developing countries in accordance with the relevant provisions of General Assembly resolution 44/228.

Activities

18.12. All States, according to their capacity and available resources, and through bilateral or multilateral cooperation, including the United Nations and other relevant organizations as appropriate, could implement the following activities to improve integrated water resources management:

(a) Formulation of costed and targeted national action plans and investment programmes;

(b) Integration of measures for the protection and conservation of potential sources of freshwater supply, including the inventorying of water resources, with land-use planning, forest resource utilization, protection of mountain slopes and riverbanks and other relevant development and conservation activities;

(c) Development of interactive databases, forecasting models, economic planning models and methods for water management and planning, including environmental impact assessment methods;

(d) Optimization of water resources allocation under physical and socio-economic constraints;

(e) Implementation of allocation decisions through demand management, pricing mechanisms and regulatory measures;

(f) Flood and drought management, including risk analysis and environmental and social impact assessment;

(g) Promotion of schemes for rational water use through public awareness-raising, educational programmes and levying of water tariffs and other economic instruments;

(h) Mobilization of water resources, particularly in arid and semi-arid areas;

(i) Promotion of international scientific research cooperation on freshwater resources;

(j) Development of new and alternative sources of water-supply such as sea-water desalination, artificial groundwater recharge, use of marginal-quality water, waste-water reuse and water recycling; (k) Integration of water (including surface and underground water resources) quantity and quality management;

(l) Promotion of water conservation through improved water-use efficiency and wastage minimization schemes for all users, including the development of water-saving devices;

(m) Support to water-users groups to optimize local water resources management;

(n) Development of public participatory techniques and their implementation in decision-making, particularly the enhancement of the role of women in water resources planning and management;

(o) Development and strengthening, as appropriate, of cooperation, including mechanisms where appropriate, at all levels concerned, namely:

(i) At the lowest appropriate level, delegation of water resources management, generally, to such a level, in accordance with national legislation, including decentralization of government services to local authorities, private enterprises and communities;

(ii) At the national level, integrated water resources planning and management in the framework of the national planning process and, where appropriate, establishment of independent regulation and monitoring of freshwater, based on national legislation and economic measures;

(iii) At the regional level, consideration, where appropriate, of the harmonization of national strategies and action programmes;

(iv) At the global level, improved delineation of responsibilities, division of labour and coordination of international organizations and programmes, including facilitating discussions and sharing of experiences in areas related to water resources management;

(p) Dissemination of information, including operational guidelines, and promotion of education for water users, including the consideration by the United Nations of a World Water Day.

Means of implementation

(a) Financing and cost evaluation

18.13. The Conference secretariat has estimated the average total annual cost (1993-2000) of implementing the activities of this programme to be about \$115 million from the international community on grant or concessional terms. These are indicative and order of magnitude estimates only and have not been reviewed by Governments. Actual costs and financial terms, including any that are non-concessional, will depend upon, inter alia, the specific strategies and programmes Governments decide upon for implementation.

(b) Scientific and technological means

18.14. The development of interactive databases, forecasting methods and economic planning models appropriate to the task of managing water resources in an efficient and sustainable manner will require the application of new techniques such as geographical information systems and expert systems to gather, assimilate, analyse and display multisectoral information and to optimize decision-making. In addition, the development of new and alternative sources of water-supply and low-cost water technologies will require innovative applied research. This will involve the transfer, adaptation and diffusion of new techniques and technology among developing countries, as well as the development of endogenous capacity, for the purpose of being able to deal with the added dimension of integrating engineering, economic, environmental and social aspects of water resources management and predicting the effects in terms of human impact.

18.15. Pursuant to the recognition of water as a social and economic good, the various available options for charging water users (including domestic, urban, industrial and agricultural water-user groups) have to be further evaluated and field-tested. Further development is required for economic instruments that take into account opportunity costs and environmental externalities. Field studies on the willingness to pay should be conducted in rural and urban situations.

18.16. Water resources development and management should be planned in an integrated manner, taking into account long-term planning needs as well as those with narrower horizons, that is to say, they should incorporate environmental, economic and social considerations based on the principle of sustainability; include the requirements of all users as well as those relating to the prevention and mitigation of water-related hazards; and constitute an integral part of the socio-economic development planning process. A prerequisite for the sustainable management of water as a scarce vulnerable resource is the obligation to acknowledge in all planning and development its full costs. Planning considerations should reflect benefits investment,

environmental protection and operation costs, as well as the opportunity costs reflecting the most valuable alternative use of water. Actual charging need not necessarily burden all beneficiaries with the consequences of those considerations. Charging mechanisms should, however, reflect as far as possible both the true cost of water when used as an economic good and the ability of the communities to pay.

18.17. The role of water as a social, economic and life-sustaining good should be reflected in demand management mechanisms and implemented through water conservation and reuse, resource assessment and financial instruments.

18.18. The setting afresh of priorities for private and public investment strategies should take into account (a) maximum utilization of existing projects, through maintenance, rehabilitation and optimal operation; (b) new or alternative clean technologies; and (c) environmentally and socially benign hydropower.

(c) Human resources development

18.19. The delegation of water resources management to the lowest appropriate level necessitates educating and training water management staff at all levels and ensuring that women participate equally in the education and training programmes. Particular emphasis has to be placed on the introduction of public participatory techniques, including enhancement of the role of women, youth, indigenous people and local communities. Skills related to various water management functions have to be developed by municipal government and water authorities, as well as in the private sector, local/national non-governmental organizations, cooperatives, corporations and other water-user groups. Education of the public regarding the importance of water and its proper management is also needed.

18.20. To implement these principles, communities need to have adequate capacities. Those who establish the framework for water development and management at any level, whether international, national or local, need to ensure that the means exist to build those capacities. The means will vary from case to case. They usually include:

(a) Awareness-creation programmes, including mobilizing commitment and support at all levels and initiating global and local action to promote such programmes;

(b) Training of water managers at all levels so that they have an appropriate understanding of all the elements necessary for their decision-making;

(c) Strengthening of training capacities in developing countries;

(d) Appropriate training of the necessary professionals, including extension workers;

(e) Improvement of career structures;

(f) Sharing of appropriate knowledge and technology, both for the collection of data and for the implementation of planned development including non-polluting technologies and the knowledge needed to extract the best performance from the existing investment system.

(d) Capacity-building

18.21. Institutional capacity for implementing integrated water management should be reviewed and developed when there is a clear demand. Existing administrative structures will often be quite capable of achieving local water resources management, but the need may arise for new institutions based upon the perspective, for example, of river catchment areas, district development councils and local community committees. Although water is managed at various levels in the socio-political system, demand-driven management requires the development of water-related institutions at appropriate levels, taking into account the need for integration with land-use management.

18.22. In creating the enabling environment for lowest-appropriate-level management, the role of Government includes mobilization of financial and human resources, legislation, standard-setting and other regulatory functions, monitoring and assessment of the use of water and land resources, and creating of opportunities for public participation. International agencies and donors have an important role to play in providing support to developing countries in creating the required enabling environment for integrated water resources management. This should include, as appropriate, donor support to local levels in developing countries, including community-based

institutions, non-governmental organizations and women's groups.

B. Water resources assessment

Basis for action

18.23. Water resources assessment, including the identification of potential sources of freshwater supply, comprises the continuing determination of sources, extent, dependability and quality of water resources and of the human activities that affect those resources. Such assessment constitutes the practical basis for their sustainable management and a prerequisite for evaluation of the possibilities for their development. There is, however, growing concern that at a time when more precise and reliable information is needed about water resources, hydrologic services and related bodies are less able than before to provide this information, especially information on groundwater and water quality. Major impediments are the lack of financial resources for water resources assessment, the fragmented nature of hydrologic services and the insufficient numbers of qualified staff. At the same time, the advancing technology for data capture and management is increasingly difficult to access for developing countries. Establishment of national databases is, however, vital to water resources assessment and to mitigation of the effects of floods, droughts, desertification and pollution.

Objectives

18.24. Based upon the Mar del Plata Action Plan, this programme area has been extended into the 1990s and beyond with the overall objective of ensuring the assessment and forecasting of the quantity and quality of water resources, in order to estimate the total quantity of water resources available and their future supply potential, to determine their current quality status, to predict possible conflicts between supply and demand and to provide a scientific database for rational water resources utilization. 18.25. Five specific objectives have been set accordingly, as follows:

(a) To make available to all countries water resources assessment technology that is appropriate to their needs, irrespective of their level of development, including methods for the impact assessment of climate change on freshwaters;

(b) To have all countries, according to their financial means, allocate to water resources assessment financial resources in line with the economic and social needs for water resources data;

(c) To ensure that the assessment information is fully utilized in the development of water management policies;

(d) To have all countries establish the institutional arrangements needed to ensure the efficient collection, processing, storage, retrieval and dissemination to users of information about the quality and quantity of available water resources at the level of catchments and groundwater aquifers in an integrated manner;

(e) To have sufficient numbers of appropriately qualified and capable staff recruited and retained by water resources assessment agencies and provided with the training and retraining they will need to carry out their responsibilities successfully.

18.26. All States, according to their capacity and available resources, and through bilateral or multilateral cooperation, including cooperation with the United Nations and other relevant organizations, as appropriate, could set the following targets:

(a) By the year 2000, to have studied in detail the feasibility of installing water resources assessment services;

(b) As a long-term target, to have fully operational services available based upon high-density hydrometric networks.

Activities

18.27. All States, according to their capacity and available resources, and through bilateral or multilateral cooperation, including the United Nations and other relevant organizations as appropriate, could undertake the following activities:

(a) Institutional framework:

(i) Establish appropriate policy frameworks and national priorities;

(ii) Establish and strengthen the institutional capabilities of countries, including legislative and regulatory arrangements, that are required to ensure the adequate assessment of their water resources and the provision of flood and drought forecasting services;

(iii) Establish and maintain effective cooperation at the national level between the various agencies responsible for the collection, storage and analysis of hydrologic data;

(iv) Cooperate in the assessment of transboundary water resources, subject to the prior agreement of each riparian State concerned;

(b) Data systems:

(i) Review existing data-collection networks and assess their adequacy, including those that provide real-time data for flood and drought forecasting;

(ii) Improve networks to meet accepted guidelines for the provision of data on water quantity and quality for surface and groundwater, as well as relevant land-use data;

(iii) Apply standards and other means to ensure data compatibility;

(iv) Upgrade facilities and procedures used to store, process and analyse hydrologic data and make such data and the forecasts derived from them available to potential users;

(v) Establish databases on the availability of all types of hydrologic data at the national level;

(vi) Implement "data rescue" operations, for example, establishment of national archives of water resources;

(vii) Implement appropriate well-tried techniques for the processing of hydrologic data;

(viii) Derive area-related estimates from point hydrologic data;

(ix) Assimilate remotely sensed data and the use, where appropriate, of geographical information systems;

(c) Data dissemination:

(i) Identify the need for water resources data for various planning purposes;

(ii) Analyse and present data and information on water resources in the forms required for planning and management of countries' socio-economic development and for use in environmental protection strategies and in the design and operation of specific water-related projects;

(iii) Provide forecasts and warnings of flood and drought to the general public and civil defence;

(d) Research and development:

(i) Establish or strengthen research and development programmes at the national, subregional, regional and international levels in support of water resources assessment activities;

(ii) Monitor research and development activities to ensure that they make full use of local expertise and other local resources and that they are appropriate for the needs of the country or countries concerned.

Means of implementation

(a) Financing and cost evaluation

18.28. The Conference secretariat has estimated the average total annual cost (1993-2000) of implementing the activities of this programme to be about \$355 million, including about \$145 million from the international community on grant or concessional terms. These are indicative and order of magnitude estimates only and have not been reviewed by Governments. Actual costs and financial terms, including any that are non-concessional will depend upon, inter alia, the specific strategies and programmes Governments decide upon for implementation.

(b) Scientific and technological means

18.29. Important research needs include (a) development of global hydrologic models in support of analysis of climate change impact and of macroscale water resources assessment; (b) closing of the gap between terrestrial hydrology and ecology at different scales, including the critical water-related processes behind loss of vegetation and land degradation and its restoration; and (c) study of the key processes in water-quality genesis, closing the gap between hydrologic flows and biogeochemical processes. The research models should build upon hydrologic balance studies and also include the consumptive use of water. This approach should also, when appropriate, be applied at the catchment level.

18.30. Water resources assessment necessitates the strengthening of existing systems for technology transfer, adaptation and diffusion, and the development of new technology for use under field conditions, as well as the development of endogenous capacity. Prior to inaugurating the above activities, it is necessary to prepare catalogues of the water resources information held by government services, the private sector, educational institutes, consultants, local water-use organizations and others.

(c) Human resource development

18.31. Water resources assessment requires the establishment and maintenance of a body of well-trained and motivated staff sufficient in number to undertake the above activities. Education and training programmes designed to ensure an adequate supply of these trained personnel should be established or strengthened at the local, national, subregional or regional level. In addition, the provision of attractive terms of employment and career paths for professional and technical staff should be encouraged. Human resource needs should be monitored periodically, including all levels of employment. Plans have to be established to meet those needs through education and training opportunities and international programmes of courses and conferences.

18.32. Because well-trained people are particularly important to water resources assessment and hydrologic forecasting, personnel matters should receive special attention in this area. The aim should be to attract and retain personnel to work on water resources assessment who are sufficient in number and adequate in their level of education to ensure the effective implementation of the activities that are planned. Education may be called for at both the national and the international level, with adequate terms of employment being a national responsibility.

18.33. Recommended actions include:

(a) Identifying education and training needs geared to the specific requirements of countries;

(b) Establishing and strengthening education and training programmes on water-related topics, within an environmental and developmental context, for all categories of staff involved in water resources assessment activities, using advanced educational technology, where appropriate, and involving both men and women;

(c) Developing sound recruitment, personnel and pay policies for staff of national and local water agencies.

(d) Capacity-building

18.34. The conduct of water resources assessment on the basis of operational national hydrometric networks requires an enabling environment at all levels. The following national support action is necessary for enhanced national capacities:

(a) Review of the legislative and regulatory basis of water resources assessment;

(b) Facilitation of close collaboration among water sector agencies, particularly between information producers and users;

(c) Implementation of water management policies based upon realistic appraisals of water resources conditions and trends;

(d) Strengthening of the managerial capabilities of water-user groups, including women, youth, indigenous people and local communities, to improve water-use efficiency at the local level.

C. Protection of water resources, water quality and aquatic ecosystems

Basis for action

18.35. Freshwater is a unitary resource. Long-term development of global freshwater requires holistic management of resources and a recognition of the interconnectedness of the elements related to freshwater and freshwater quality. There are few regions of the world that are still exempt from problems of loss of potential sources of freshwater supply, degraded water quality and pollution of surface and groundwater sources. Major problems affecting the water quality of rivers and lakes arise, in variable order of importance according to different situations, from inadequately treated domestic sewage, inadequate controls on the discharges of industrial waste waters, loss and destruction of catchment areas, ill-considered siting of industrial plants, deforestation, uncontrolled shifting cultivation and poor agricultural practices. This gives rise to the leaching of nutrients and pesticides. Aquatic ecosystems are disturbed and living freshwater resources are threatened. Under certain circumstances, aquatic ecosystems are also affected by agricultural water resource development projects such as dams, river diversions, water installations and irrigation schemes. Erosion, sedimentation, deforestation and desertification have led to increased land degradation, and the creation of reservoirs has, in some cases, resulted in adverse effects on ecosystems. Many of these problems have arisen from a development model that is environmentally destructive and from a lack of public awareness and education about surface and groundwater resource protection. Ecological and human health effects are the measurable consequences, although the means to monitor them are inadequate or non-existent in many countries. There is a widespread lack of perception of the linkages between the development, management, use and treatment of water resources and aquatic ecosystems. A preventive approach, where appropriate, is crucial to the avoiding of costly subsequent measures to rehabilitate, treat and develop new water supplies.

Objectives

18.36. The complex interconnectedness of freshwater systems demands that freshwater management be holistic (taking a catchment management approach) and based on a balanced consideration of the needs of people and the environment. The Mar del Plata Action Plan has already recognized the intrinsic linkage between water resource development projects and their significant physical, chemical, biological, health and socio-economic repercussions. The overall environmental health objective was set as follows: "to evaluate the consequences which the various users of water have on the environment, to support measures aimed at controlling water-related diseases, and to protect ecosystems". 1/

18.37. The extent and severity of contamination of unsaturated zones and aquifers have long been underestimated owing to the relative inaccessibility of aquifers and the lack of reliable information on aquifer systems. The protection of groundwater is therefore an essential element of water resource management.

18.38. Three objectives will have to be pursued concurrently to integrate water-quality elements into water resource management:

(a) Maintenance of ecosystem integrity, according to a management principle of preserving aquatic ecosystems, including living resources, and of effectively protecting them from any form of degradation on a drainage basin basis;

(b) Public health protection, a task requiring not only the provision of safe drinking-water but also the control of disease vectors in the aquatic environment;

(c) Human resources development, a key to capacity-building and a prerequisite for implementing water-quality management.

18.39. All States, according to their capacity and available resources, through bilateral or multilateral cooperation, including the United Nations and other relevant organizations as appropriate, could set the following targets:

(a) To identify the surface and groundwater resources that could be developed for use on a sustainable basis and other major developable water-dependent resources and, simultaneously, to initiate programmes for the protection, conservation and rational use of these resources on a sustainable basis;

(b) To identify all potential sources of water-supply and prepared outlines for their protection, conservation and rational use;

(c) To initiate effective water pollution prevention and control programmes, based on an appropriate mixture of pollution reduction-at-source strategies, environmental impact assessments and enforceable standards for major point-source discharges and high-risk non-point sources, commensurate with their socio-economic development;

(d) To participate, as far as appropriate, in international water-quality monitoring and management programmes such as the Global Water Quality Monitoring Programme (GEMS/WATER), the UNEP Environmentally Sound Management of Inland Waters (EMINWA), the FAO regional inland fishery bodies, and the Convention on Wetlands of International Importance Especially as Waterfowl Habitat (Ramsar Convention);

(e) To reduce the prevalence of water-associated diseases, starting with the eradication of dracunculiasis (guinea worm disease) and onchocerciasis (river blindness) by the year 2000;

(f) To establish, according to capacities and needs, biological, health, physical and chemical quality criteria for all water bodies (surface and groundwater), with a view to an ongoing improvement of water quality;

(g) To adopt an integrated approach to environmentally sustainable management of water resources, including the protection of aquatic ecosystems and freshwater living resources;

(h) To put in place strategies for the environmentally sound management of freshwaters and related coastal ecosystems, including consideration of fisheries, aquaculture, animal grazing, agricultural activities and biodiversity.

Activities

18.40. All States, according to their capacity and available resources, and through bilateral or multilateral cooperation, including United Nations and other relevant organizations as appropriate, could implement the following activities:

(a) Water resources protection and conservation:

(i) Establishment and strengthening of technical and institutional capacities to identify and protect potential sources of water-supply within all sectors of society;

(ii) Identification of potential sources of water-supply and preparation of national profiles;

(iii) Preparation of national plans for water resources protection and conservation;

(iv) Rehabilitation of important, but degraded, catchment areas, particularly on small islands;

(v) Strengthening of administrative and legislative measures to prevent encroachment on existing and potentially usable catchment areas;

(b) Water pollution prevention and control:

(i) Application of the "polluter pays" principle, where appropriate, to all kinds of sources, including on-site and off-site sanitation;

(ii) Promotion of the construction of treatment facilities for domestic sewage and industrial effluents and the development of appropriate technologies, taking into account sound traditional and indigenous practices;

(iii) Establishment of standards for the discharge of effluents and for the receiving waters;

(iv) Introduction of the precautionary approach in water-quality management, where appropriate, with a focus on pollution minimization and prevention through use of new technologies, product and process change, pollution reduction at source and effluent reuse, recycling and recovery, treatment and environmentally safe disposal;

(v) Mandatory environmental impact assessment of all major water resource development projects potentially impairing water quality and aquatic ecosystems, combined with the delineation of appropriate remedial measures and a strengthened control of new industrial installations, solid waste landfills and infrastructure development projects;

(vi) Use of risk assessment and risk management in reaching decisions in this area and ensuring compliance with those decisions;

(vii) Identification and application of best environmental practices at reasonable cost to avoid diffuse pollution, namely, through a limited, rational and planned use of nitrogenous fertilizers and other agrochemicals (pesticides, herbicides) in agricultural practices;

(viii) Encouragement and promotion of the use of adequately treated and purified waste waters in agriculture, aquaculture, industry and other sectors;

(c) Development and application of clean technology:

(i) Control of industrial waste discharges, including low-waste production technologies and water recirculation, in an integrated manner and through application of precautionary measures derived from a broad-based life-cycle analysis;

(ii) Treatment of municipal waste water for safe reuse in agriculture and aquaculture;

(iii) Development of biotechnology, inter alia, for waste treatment, production of biofertilizers and other activities; (iv) Development of appropriate methods for water pollution control, taking into account sound traditional and indigenous practices;

(d) Groundwater protection:

(i) Development of agricultural practices that do not degrade groundwaters;

(ii) Application of the necessary measures to mitigate saline intrusion into aquifers of small islands and coastal plains as a consequence of sealevel rise or overexploitation of coastal aquifers;

(iii) Prevention of aquifer pollution through the regulation of toxic substances that permeate the ground and the establishment of protection zones in groundwater recharge and abstraction areas;

(iv) Design and management of landfills based upon sound hydrogeologic information and impact assessment, using the best practicable and best available technology;

(v) Promotion of measures to improve the safety and integrity of wells and well-head areas to reduce intrusion of biological pathogens and hazardous chemicals into aquifers at well sites;

(vi) Water-quality monitoring, as needed, of surface and groundwaters potentially affected by sites storing toxic and hazardous materials;

(e) Protection of aquatic ecosystems:

(i) Rehabilitation of polluted and degraded water bodies to restore aquatic habitats and

ecosystems;

(ii) Rehabilitation programmes for agricultural lands and for other users, taking into account equivalent action for the protection and use of groundwater resources important for agricultural productivity and for the biodiversity of the tropics;

(iii) Conservation and protection of wetlands (owing to their ecological and habitat importance for many species), taking into account social and economic factors;

(iv) Control of noxious aquatic species that may destroy some other water species;

(f) Protection of freshwater living resources:

(i) Control and monitoring of water quality to allow for the sustainable development of inland fisheries;

(ii) Protection of ecosystems from pollution and degradation for the development of freshwater aquaculture projects;

(g) Monitoring and surveillance of water resources and waters receiving wastes:

(i) Establishment of networks for the monitoring and continuous surveillance of waters receiving wastes and of point and diffuse sources of pollution;

(ii) Promotion and extension of the application of environmental impact assessments of geographical information systems;

(iii) Surveillance of pollution sources to improve compliance with standards and regulations and to regulate the issue of discharge permits;

(iv) Monitoring of the utilization of chemicals in agriculture that may have an adverse environmental effect;

(v) Rational land use to prevent land degradation, erosion and siltation of lakes and other water bodies;

(h) Development of national and international legal instruments that may be required to protect the quality of water resources, as appropriate, particularly for:

(i) Monitoring and control of pollution and its effects in national and transboundary waters;

(ii) Control of long-range atmospheric transport of pollutants;

(iii) Control of accidental and/or deliberate spills in national and/or transboundary water bodies;

(iv) Environmental impact assessment.

Means of implementation

(a) Financing and cost evaluation

18.41. The Conference secretariat has estimated the average total annual cost (1993-2000) of implementing the activities of this programme to be about \$1 billion, including about \$340 million from the international community on grant or concessional terms. These are indicative and order of magnitude estimates only and have not been reviewed by Governments. Actual costs and financial terms, including any that are non-concessional, will depend upon, inter alia, the specific strategies and programmes Governments decide upon for implementation.

(b) Scientific and technological means

18.42. States should undertake cooperative research projects to develop solutions to technical problems that are appropriate for the conditions in each watershed or country. States should

consider strengthening and developing national research centres linked through networks and supported by regional water research institutes. The North-South twinning of research centres and field studies by international water research institutions should be actively promoted. It is important that a minimum percentage of funds for water resource development projects is allocated to research and development, particularly in externally funded projects.

18.43. Monitoring and assessment of complex aquatic systems often require multidisciplinary studies involving several institutions and scientists in a joint programme. International water-quality programmes, such as GEMS/WATER, should be oriented towards the water-quality of developing countries. User-friendly software and Geographical Information Systems (GIS) and Global Resource Information Database (GRID) methods should be developed for the handling, analysis and interpretation of monitoring data and for the preparation of management strategies.

(c) Human resource development

18.44. Innovative approaches should be adopted for professional and managerial staff training in order to cope with changing needs and challenges. Flexibility and adaptability regarding emerging water pollution issues should be developed. Training activities should be undertaken periodically at all levels within the organizations responsible for water-quality management and innovative teaching techniques adopted for specific aspects of water-quality monitoring and control, including development of training skills, in-service training, problem-solving workshops and refresher training courses.

18.45. Suitable approaches include the strengthening and improvement of the human resource capabilities of local Governments in managing water protection, treatment and use, particularly in urban areas, and the establishment of national and regional technical and engineering courses on the subjects of water-quality protection and control at existing schools and education/training courses on water resources protection and conservation for laboratory and field technicians, women and other water-user groups.

(d) Capacity-building

18.46. The effective protection of water resources and ecosystems from pollution requires considerable upgrading of most countries' present capacities. Water-quality management programmes require a certain minimum infrastructure and staff to identify and implement technical solutions and to enforce regulatory action. One of the key problems today and for the future is the sustained operation and maintenance of these facilities. In order not to allow resources gained from previous investments to deteriorate further, immediate action is required in a number of areas.

D. Drinking-water supply and sanitation

Basis for action

18.47. Safe water-supplies and environmental sanitation are vital for protecting the environment, improving health and alleviating poverty. Safe water is also crucial to many traditional and cultural activities. An estimated 80 per cent of all diseases and over one third of deaths in developing countries are caused by the consumption of contaminated water, and on average as much as one tenth of each person's productive time is sacrificed to water-related diseases. Concerted efforts during the 1980s brought water and sanitation services to hundreds of millions of the world's poorest people. The most outstanding of these efforts was the launching in 1981 of the International Drinking Water Supply and Sanitation Decade, which resulted from the Mar del Plata Action Plan adopted by the United Nations Water Conference in 1977. The commonly agreed premise was that "all peoples, whatever their stage of development and their social and economic conditions, have the right to have access to drinking water in quantities and of a quality equal to their basic needs". 2/ The target of the Decade was to provide safe drinking-water and sanitation to underserved urban and rural areas by 1990, but even the unprecedented progress achieved during the Decade was not enough. One in three people in the developing world still lacks these two most basic requirements for health and dignity. It is also recognized that human excreta and sewage are important causes of the deterioration of water-quality in developing countries, and the introduction of available technologies, including appropriate technologies, and the construction of sewage treatment facilities could bring significant improvement.

Objectives

18.48. The New Delhi Statement (adopted at the Global Consultation on Safe Water and Sanitation for the 1990s, which was held in New Delhi from 10 to 14 September 1990) formalized the need to provide, on a sustainable basis, access to safe water in sufficient quantities and

proper sanitation for all, emphasizing the "some for all rather than more for some" approach. Four guiding principles provide for the programme objectives:

- (a) Protection of the environment and safeguarding of health through the integrated management of water resources and liquid and solid wastes;
- (b) Institutional reforms promoting an integrated approach and including changes in procedures, attitudes and behaviour, and the full participation of women at all levels in sector institutions; (c) Community management of services, backed by measures to strengthen local institutions in implementing and sustaining water and sanitation programmes;
- (d) Sound financial practices, achieved through better management of existing assets, and widespread use of appropriate technologies.

18.49. Past experience has shown that specific targets should be set by each individual country. At the World Summit for Children, in September 1990, heads of State or Government called for both universal access to water-supply and sanitation and the eradication of guinea worm disease by 1995. Even for the more realistic target of achieving full coverage in water-supply by 2025, it is estimated that annual investments must reach double the current levels. One realistic strategy to meet present and future needs, therefore, is to develop lower-cost but adequate services that can be implemented and sustained at the community level.

Activities

18.50. All States, according to their capacity and available resources, and through bilateral or multilateral cooperation, including the United Nations and other relevant organizations as appropriate, could implement the following activities:

(a) Environment and health:

- (i) Establishment of protected areas for sources of drinking-water supply;
- (ii) Sanitary disposal of excreta and sewage, using appropriate systems to treat waste waters in urban and rural areas;
- (iii) Expansion of urban and rural water-supply and development and expansion of rainwater catchment systems, particularly on small islands, in addition to the reticulated water-supply system;
- (iv) Building and expansion, where appropriate, of sewage treatment facilities and drainage systems;
- (v) Treatment and safe reuse of domestic and industrial waste waters in urban and rural areas;
- (vi) Control of water-associated diseases;

(b) People and institutions:

- (i) Strengthening of the functioning of Governments in water resources management and, at the same time, giving of full recognition to the role of local authorities;
- (ii) Encouragement of water development and management based on a participatory approach, involving users, planners and policy makers at all levels;
- (iii) Application of the principle that decisions are to be taken at the lowest appropriate level, with public consultation and involvement of users in the planning and implementation of water projects;
- (iv) Human resource development at all levels, including special programmes for women;
- (v) Broad-based education programmes, with particular emphasis on hygiene, local management and risk reduction;

- (vi) International support mechanisms for programme funding, implementation and follow-up;
- (c) National and community management:
 - (i) Support and assistance to communities in managing their own systems on a sustainable basis;
 - (ii) Encouragement of the local population, especially women, youth, indigenous people and local communities, in water management;
 - (iii) Linkages between national water plans and community management of local waters;
 - (iv) Integration of community management of water within the context of overall planning;
 - (v) Promotion of primary health and environmental care at the local level, including training for local communities in appropriate water management techniques and primary health care;
 - (vi) Assistance to service agencies in becoming more cost-effective and responsive to consumer needs;
 - (vii) Providing of more attention to underserved rural and low-income periurban areas;
 - (viii) Rehabilitation of defective systems, reduction of wastage and safe reuse of water and waste water; (ix) Programmes for rational water use and ensured operation and maintenance;
 - (x) Research and development of appropriate technical solutions;
 - (xi) Substantially increase urban wastewater treatment capacity commensurate with increasing loads;
- (d) Awareness creation and public information/participation:
 - (i) Strengthening of sector monitoring and information management at subnational and national levels;
 - (ii) Annual processing, analysis and publication of monitoring results at national and local levels as a sector management and advocacy/awareness creation tool;
 - (iii) Use of limited sector indicators at regional and global levels to promote the sector and raise funds;
 - (iv) Improvement of sector coordination, planning and implementation, with the assistance of improved monitoring and information management, to increase the sector's absorptive capacity, particularly in community-based self-help projects.

Means of implementation

(a) Financing and cost evaluation

18.51. The Conference secretariat has estimated the average total annual cost (1993-2000) of implementing the activities of this programme to be about \$20 billion, including about \$7.4 billion from the international community on grant or concessional terms. These are indicative and order of magnitude estimates only and have not been reviewed by Governments. Actual costs and financial terms, including any that are non-concessional, will depend upon, inter alia, the specific strategies and programmes Governments decide upon for implementation.

(b) Scientific and technological means

18.52. To ensure the feasibility, acceptability and sustainability of planned water-supply services, adopted technologies should be responsive to the needs and constraints imposed by the conditions of the community concerned. Thus, design criteria will involve technical, health, social, economic, provincial, institutional and environmental factors that determine the characteristics,

magnitude and cost of the planned system. Relevant international support programmes should address the developing countries concerning, inter alia: (a) Pursuit of low-cost scientific and technological means, as far as practicable;

(b) Utilization of traditional and indigenous practices, as far as practicable, to maximize and sustain local involvement;

(c) Assistance to country-level technical/scientific institutes to facilitate curricula development to support fields critical to the water and sanitation sector.

(c) Human resource development

18.53. To effectively plan and manage water-supply and sanitation at the national, provincial, district and community level, and to utilize funds most effectively, trained professional and technical staff must be developed within each country in sufficient numbers. To do this, countries must establish manpower development plans, taking into consideration present requirements and planned developments. Subsequently, the development and performance of country-level training institutions should be enhanced so that they can play a pivotal role in capacity-building. It is also important that countries provide adequate training for women in the sustainable maintenance of equipment, water resources management and environmental sanitation.

(d) Capacity-building

18.54. The implementation of water-supply and sanitation programmes is a national responsibility. To varying degrees, responsibility for the implementation of projects and the operating of systems should be delegated to all administrative levels down to the community and individual served. This also means that national authorities, together with the agencies and bodies of the United Nations system and other external support agencies providing support to national programmes, should develop mechanisms and procedures to collaborate at all levels. This is particularly important if full advantage is to be taken of community-based approaches and self-reliance as tools for sustainability. This will entail a high degree of community participation, involving women, in the conception, planning, decision-making, implementation and evaluation connected with projects for domestic water-supply and sanitation.

18.55. Overall national capacity-building at all administrative levels, involving institutional development, coordination, human resources, community participation, health and hygiene education and literacy, has to be developed according to its fundamental connection both with any efforts to improve health and socio-economic development through water-supply and sanitation and with their impact on the human environment. Capacity-building should therefore be one of the underlying keys in implementation strategies. Institutional capacity-building should be considered to have an importance equal to that of the sector supplies and equipment component so that funds can be directed to both. This can be undertaken at the planning or programme/project formulation stage, accompanied by a clear definition of objectives and targets. In this regard, technical cooperation among developing countries owing to their available wealth of information and experience and the need to avoid "reinventing the wheel", is crucial. Such a course has proved cost-effective in many country projects already.

E. Water and sustainable urban development

Basis for action

18.56. Early in the next century, more than half of the world's population will be living in urban areas. By the year 2025, that proportion will have risen to 60 per cent, comprising some 5 billion people. Rapid urban population growth and industrialization are putting severe strains on the water resources and environmental protection capabilities of many cities. Special attention needs to be given to the growing effects of urbanization on water demands and usage and to the critical role played by local and municipal authorities in managing the supply, use and overall treatment of water, particularly in developing countries for which special support is needed. Scarcity of freshwater resources and the escalating costs of developing new resources have a considerable impact on national industrial, agricultural and human settlement development and economic growth. Better management of urban water resources, including the elimination of unsustainable consumption patterns, can make a substantial contribution to the alleviation of poverty and improvement of the health and quality of life of the urban and rural poor. A high proportion of large urban agglomerations are located around estuaries and in coastal zones. Such an arrangement leads to pollution from municipal and industrial discharges combined with overexploitation of available water resources and threatens the marine environment and the supply of freshwater resources.

Objectives

18.57. The development objective of this programme is to support local and central Governments' efforts and capacities to sustain national development and productivity through environmentally sound management of water resources for urban use. Supporting this objective is the identification and implementation of strategies and actions to ensure the continued supply of affordable water for present and future needs and to reverse current trends of resource degradation and depletion.

18.58. All States, according to their capacity and available resources, and through bilateral or multilateral cooperation, including the United Nations and other relevant organizations as appropriate, could set the following targets:

(a) By the year 2000, to have ensured that all urban residents have access to at least 40 litres per capita per day of safe water and that 75 per cent of the urban population are provided with on-site or community facilities for sanitation;

(b) By the year 2000, to have established and applied quantitative and qualitative discharge standards for municipal and industrial effluents; (c) By the year 2000, to have ensured that 75 per cent of solid waste generated in urban areas are collected and recycled or disposed of in an environmentally safe way.

Activities

18.59. All States, according to their capacity and available resources, and through bilateral or multilateral cooperation, including the United Nations and other relevant organizations as appropriate, could implement the following activities:

(a) Protection of water resources from depletion, pollution and degradation:

(i) Introduction of sanitary waste disposal facilities based on environmentally sound low-cost and upgradable technologies;

(ii) Implementation of urban storm-water run-off and drainage programmes;

(iii) Promotion of recycling and reuse of waste water and solid wastes;

(iv) Control of industrial pollution sources to protect water resources;

(v) Protection of watersheds with respect to depletion and degradation of their forest cover and from harmful upstream activities;

(vi) Promotion of research into the contribution of forests to sustainable water resources development;

(vii) Encouragement of the best management practices for the use of agrochemicals with a view to minimizing their impact on water resources;

(b) Efficient and equitable allocation of water resources:

(i) Reconciliation of city development planning with the availability and sustainability of water resources;

(ii) Satisfaction of the basic water needs of the urban population;

(iii) Introduction of water tariffs, taking into account the circumstances in each country and where affordable, that reflect the marginal and opportunity cost of water, especially for productive activities;

(c) Institutional/legal/management reforms:

- (i) Adoption of a city-wide approach to the management of water resources;
- (ii) Promotion at the national and local level of the elaboration of land-use plans that give due consideration to water resources development;
- (iii) Utilization of the skills and potential of non-governmental organizations, the private sector and local people, taking into account the public's and strategic interests in water resources;
- (d) Promotion of public participation:
 - (i) Initiation of public-awareness campaigns to encourage the public's move towards rational water utilization;
 - (ii) Sensitization of the public to the issue of protecting water quality within the urban environment;
 - (iii) Promotion of public participation in the collection, recycling and elimination of wastes;
- (e) Support to local capacity-building:
 - (i) Development of legislation and policies to promote investments in urban water and waste management, reflecting the major contribution of cities to national economic development;
 - (ii) Provision of seed money and technical support to the local handling of materials supply and services;
 - (iii) Encouragement, to the extent possible, of autonomy and financial viability of city water, solid waste and sewerage utilities;
 - (iv) Creation and maintenance of a cadre of professionals and semi-professionals, for water, waste-water and solid waste management;
- (f) Provision of enhanced access to sanitary services:
 - (i) Implementation of water, sanitation and waste management programmes focused on the urban poor;
 - (ii) Making available of low-cost water-supply and sanitation technology choices;
 - (iii) Basing of choice of technology and service levels on user preferences and willingness to pay;
 - (iv) Mobilization and facilitation of the active involvement of women in water management teams;
 - (v) Encouragement and equipment of local water associations and water committees to manage community water-supply systems and communal latrines, with technical back-up available when required;
 - (vi) Consideration of the merits and practicality of rehabilitating existing malfunctioning systems and of correcting operation and maintenance inadequacies.

Means of implementation

(a) Financing and cost evaluation

18.60. The Conference secretariat has estimated the average total annual cost (1993-2000) of implementing the activities of this programme to be about \$20 billion, including about \$4.5 billion from the international community on grant or concessional terms. These are indicative and order of magnitude estimates only and have not been reviewed by Governments. Actual costs and financial terms, including any that are non-concessional, will depend upon, inter alia, the specific strategies and programmes Governments decide upon for implementation.

(b) Scientific and technological means

18.61. The 1980s saw considerable progress in the development and application of low-cost water-supply and sanitation technologies. The programme envisages continuation of this work, with particular emphasis on development of appropriate sanitation and waste disposal technologies for low-income high-density urban settlements. There should also be international information exchange, to ensure a widespread recognition among sector professionals of the availability and benefits of appropriate low-cost technologies. The public-awareness campaigns will also include components to overcome user resistance to second-class services by emphasizing the benefits of reliability and sustainability.

(c) Human resource development

18.62. Implicit in virtually all elements of this programme is the need for progressive enhancement of the training and career development of personnel at all levels in sector institutions. Specific programme activities will involve the training and retention of staff with skills in community involvement, low-cost technology, financial management, and integrated planning of urban water resources management. Special provision should be made for mobilizing and facilitating the active participation of women, youth, indigenous people and local communities in water management teams and for supporting the development of water associations and water committees, with appropriate training of such personnel as treasurers, secretaries and caretakers. Special education and training programmes for women should be launched with regard to the protection of water resources and water-quality within urban areas.(d) Capacity-building

18.63. In combination with human resource development, strengthening of institutional, legislative and management structures are key elements of the programme. A prerequisite for progress in enhancing access to water and sanitation services is the establishment of an institutional framework that ensures that the real needs and potential contributions of currently unserved populations are reflected in urban development planning. The multisectoral approach, which is a vital part of urban water resources management, requires institutional linkages at the national and city levels, and the programme includes proposals for establishing intersectoral planning groups. Proposals for greater pollution control and prevention depend for their success on the right combination of economic and regulatory mechanisms, backed by adequate monitoring and surveillance and supported by enhanced capacity to address environmental issues on the part of local Governments.

18.64. Establishment of appropriate design standards, water-quality objectives and discharge consents is therefore among the proposed activities. The programme also includes support for strengthening the capability of water and sewerage agencies and for developing their autonomy and financial viability. Operation and maintenance of existing water and sanitation facilities have been recognized as entailing a serious shortcoming in many countries. Technical and financial support are needed to help countries correct present inadequacies and build up the capacity to operate and maintain rehabilitated and new systems.

F. Water for sustainable food production and rural development

Basis for action

18.65. Sustainability of food production increasingly depends on sound and efficient water use and conservation practices consisting primarily of irrigation development and management, including water management with respect to rain-fed areas, livestock water-supply, inland fisheries and agro-forestry. Achieving food security is a high priority in many countries, and agriculture must not only provide food for rising populations, but also save water for other uses. The challenge is to develop and apply water-saving technology and management methods and, through capacity-building, enable communities to introduce institutions and incentives for the rural population to adopt new approaches, for both rain-fed and irrigated agriculture. The rural population must also have better access to a potable water-supply and to sanitation services. It is an immense task but not an impossible one, provided appropriate policies and programmes are adopted at all levels - local, national and international. While significant expansion of the area under rain-fed agriculture has been achieved during the past decade, the productivity response and sustainability of irrigation systems have been constrained by problems of waterlogging and salinization. Financial and market constraints are also a common problem. Soil erosion, mismanagement and overexploitation of natural resources and acute competition for water have all influenced the extent of poverty, hunger and famine in the developing countries. Soil erosion caused by overgrazing of livestock is also often responsible for the siltation of lakes. Most often, the development of irrigation schemes is supported neither by environmental impact assessments identifying hydrologic consequences within watersheds of interbasin transfers, nor by the assessment of social impacts on peoples in river valleys.

18.66. The non-availability of water-supplies of suitable quality is a significant limiting factor to livestock production in many countries, and improper disposal of animal wastes can in certain circumstances result in pollution of water-supplies for both humans and animals. The drinking-water requirements of livestock vary according to species and the environment in which they are kept. It is estimated that the current global livestock drinking-water requirement is about 60 billion litres per day and based on livestock population growth estimates, this daily requirement is predicted to increase by 0.4 billion litres per annum in the foreseeable future.

18.67. Freshwater fisheries in lakes and streams are an important source of food and protein. Fisheries of inland waters should be so managed as to maximize the yield of aquatic food organisms in an environmentally sound manner. This requires the conservation of water-quality and quantity, as well as of the functional morphology of the aquatic environment. On the other hand, fishing and aquaculture may themselves damage the aquatic ecosystem; hence their development should conform to guidelines for impact limitation. Present levels of production from inland fisheries, from both fresh and brackish water, are about 7 million tons per year and could increase to 16 million tons per year by the year 2000; however, any increase in environmental stress could jeopardize this rise.

Objectives

18.68. The key strategic principles for holistic and integrated environmentally sound management of water resources in the rural context may be set forth as follows:

(a) Water should be regarded as a finite resource having an economic value with significant social and economic implications reflecting the importance of meeting basic needs;

(b) Local communities must participate in all phases of water management, ensuring the full involvement of women in view of their crucial role in the practical day-to-day supply, management and use of water;

(c) Water resource management must be developed within a comprehensive set of policies for (i) human health; (ii) food production, preservation and distribution; (iii) disaster mitigation plans; (iv) environmental protection and conservation of the natural resource base;

(d) It is necessary to recognize and actively support the role of rural populations, with particular emphasis on women.

18.69. An International Action Programme on Water and Sustainable Agricultural Development (IAP-WASAD) has been initiated by FAO in cooperation with other international organizations. The main objective of the Action Programme is to assist developing countries in planning, developing and managing water resources on an integrated basis to meet present and future needs for agricultural production, taking into account environmental considerations.

18.70. The Action Programme has developed a framework for sustainable water use in the agricultural sector and identified priority areas for action at national, regional and global levels. Quantitative targets for new irrigation development, improvement of existing irrigation schemes and reclamation of waterlogged and salinized lands through drainage for 130 developing countries are estimated on the basis of food requirements, agro-climatic zones and availability of water and land.

18.71. FAO global projections for irrigation, drainage and small-scale water programmes by the year 2000 for 130 developing countries are as follows: (a) 15.2 million hectares of new irrigation development; (b) 12 million hectares of improvement/modernization of existing schemes; (c) 7 million hectares installed with drainage and water control facilities; and (d) 10 million hectares of small-scale water programmes and conservation.

18.72. The development of new irrigation areas at the above-mentioned level may give rise to environmental concerns in so far as it implies the destruction of wetlands, water pollution, increased sedimentation and a reduction in biodiversity. Therefore, new irrigation schemes should be accompanied by an environmental impact assessment, depending upon the scale of the scheme, in case significant negative environmental impacts are expected. When considering proposals for new irrigation schemes, consideration should also be given to a more rational exploitation, and an increase in the efficiency or productivity, of any existing schemes capable of serving the same localities. Technologies for new irrigation schemes should be thoroughly evaluated, including their potential conflicts with other land uses. The active involvement of water-users groups is a supporting objective.

18.73. It should be ensured that rural communities of all countries, according to their capacities and available resources and taking advantage of international cooperation as appropriate, will have access to safe water in sufficient quantities and adequate sanitation to meet their health needs and maintain the essential qualities of their local environments.

18.74. The objectives with regard to water management for inland fisheries and aquaculture include conservation of water-quality and water-quantity requirements for optimum production and prevention of water pollution by aquacultural activities. The Action Programme seeks to assist member countries in managing the fisheries of inland waters through the promotion of sustainable management of capture fisheries as well as the development of environmentally sound approaches to intensification of aquaculture.

18.75. The objectives with regard to water management for livestock supply are twofold: provision of adequate amounts of drinking-water and safeguarding of drinking-water quality in accordance with the specific needs of different animal species. This entails maximum salinity tolerance levels and the absence of pathogenic organisms. No global targets can be set owing to large regional and intra-country variations.

Activities

18.76. All States, according to their capacity and available resources, and through bilateral or multilateral cooperation, including the United Nations and other relevant organizations as appropriate, could implement the following activities:

(a) Water-supply and sanitation for the unserved rural poor:

(i) Establish national policies and budget priorities with regard to increasing service coverage;

(ii) Promote appropriate technologies;

(iii) Introduce suitable cost-recovery mechanisms, taking into account efficiency and equity through demand management mechanisms;

(iv) Promote community ownership and rights to water-supply and sanitation facilities;

(v) Establish monitoring and evaluation systems;

(vi) Strengthen the rural water-supply and sanitation sector with emphasis on institutional development, efficient management and an appropriate framework for financing of services;

(vii) Increase hygiene education and eliminate disease transmission foci;

(viii) Adopt appropriate technologies for water treatment;

(ix) Adopt wide-scale environmental management measures to control disease vectors;

(b) Water-use efficiency:

(i) Increase of efficiency and productivity in agricultural water use for better utilization of limited water resources; (ii) Strengthen water and soil management research under irrigation and rain-fed conditions;

(iii) Monitor and evaluate irrigation project performance to ensure, inter alia, the optimal utilization and proper maintenance of the project;

(iv) Support water-users groups with a view to improving management performance at the local level;

(v) Support the appropriate use of relatively brackish water for irrigation;

(c) Waterlogging, salinity control and drainage:

(i) Introduce surface drainage in rain-fed agriculture to prevent temporary waterlogging and flooding of lowlands;

(ii) Introduce artificial drainage in irrigated and rain-fed agriculture;

(iii) Encourage conjunctive use of surface and groundwaters, including monitoring and water-balance studies;

(iv) Practise drainage in irrigated areas of arid and semi-arid regions;

(d) Water-quality management:

(i) Establish and operate cost-effective water-quality monitoring systems for agricultural water uses;

(ii) Prevent adverse effects of agricultural activities on water-quality for other social and economic activities and on wetlands, inter alia, through optimal use of on-farm input and the minimization of the use of external input in agricultural activities;

(iii) Establish biological, physical and chemical water-quality criteria for agricultural water-users and for marine and riverine ecosystems;

(iv) Minimize soil run-off and sedimentation;

(v) Dispose properly of sewage from human settlements and of manure produced by intensive livestock breeding;

(vi) Minimize adverse effects from agricultural chemicals by use of integrated pest management;

(vii) Educate communities about the pollution-related impacts of the use of fertilizers and chemicals on water-quality, food safety and human health;

(e) Water resources development programmes:

(i) Develop small-scale irrigation and water-supply for humans and livestock and for water and soil conservation;

(ii) Formulate large-scale and long-term irrigation development programmes, taking into account their effects on the local level, the economy and the environment;

(iii) Promote local initiatives for the integrated development and management of water resources;

(iv) Provide adequate technical advice and support and enhancement of institutional collaboration at the local community level;

(v) Promote a farming approach for land and water management that takes account of the level of education, the capacity to mobilize local communities and the ecosystem requirements of arid and semi-arid regions;

(vi) Plan and develop multi-purpose hydroelectric power schemes, making sure that environmental concerns are duly taken into account;

(f) Scarce water resources management:

(i) Develop long-term strategies and practical implementation programmes for agricultural water use under scarcity conditions with competing demands for water;

(ii) Recognize water as a social, economic and strategic good in irrigation planning and management;

(iii) Formulate specialized programmes focused on drought preparedness, with emphasis on food scarcity and environmental safeguards;

(iv) Promote and enhance waste-water reuse in agriculture;

(g) Water-supply for livestock:

(i) Improve quality of water available to livestock, taking into account their tolerance limits;

(ii) Increase the quantity of water sources available to livestock, in particular those in extensive grazing systems, in order to both reduce the distance needed to travel for water and to prevent overgrazing around water sources;

(iii) Prevent contamination of water sources with animal excrement in order to prevent the spread of diseases, in particular zoonosis;

(iv) Encourage multiple use of water-supplies through promotion of integrated agro-livestock-fishery systems;

(v) Encourage water spreading schemes for increasing water retention of extensive grasslands to stimulate forage production and prevent run-off;

(h) Inland fisheries:

(i) Develop the sustainable management of fisheries as part of national water resources planning;

(ii) Study specific aspects of the hydrobiology and environmental requirements of key inland fish species in relation to varying water regimes;

(iii) Prevent or mitigate modification of aquatic environments by other users or rehabilitate environments subjected to such modification on behalf of the sustainable use and conservation of biological diversity of living aquatic resources;

(iv) Develop and disseminate environmentally sound water resources development and management methodologies for the intensification of fish yield from inland waters;

(v) Establish and maintain adequate systems for the collection and interpretation of data on water quality and quantity and channel morphology related to the state and management of living aquatic resources, including fisheries;

(i) Aquaculture development:

(i) Develop environmentally sound aquaculture technologies that are compatible with local, regional and national water resources management plans and take into consideration social factors;

(ii) Introduce appropriate aquaculture techniques and related water development and management practices in countries not yet experienced in aquaculture;

(iii) Assess environmental impacts of aquaculture with specific reference to commercialized culture units and potential water pollution from processing centres;

(iv) Evaluate economic feasibility of aquaculture in relation to alternative use of water, taking into consideration the use of marginal-quality water and investment and operational requirements.

Means of implementation

(a) Financing and cost evaluation

18.77. The Conference secretariat has estimated the average total annual cost (1993-2000) of implementing the activities of this programme to be about \$13.2 billion, including about \$4.5

billion from the international community on grant or concessional terms. These are indicative and order of magnitude estimates only and have not been reviewed by Governments. Actual costs and financial terms, including any that are non-concessional, will depend upon, inter alia, the specific strategies and programmes Governments decide upon for implementation.

(b) Scientific and technological means

18.78. There is an urgent need for countries to monitor water resources and water-quality, water and land use and crop production; compile inventories of type and extent of agricultural water development and of present and future contributions to sustainable agricultural development; evaluate the potential for fisheries and aquaculture development; and improve the availability and dissemination of data to planners, technicians, farmers and fishermen. Priority requirements for research are as follows:

(a) Identification of critical areas for water-related adaptive research;

(b) Strengthening of the adaptive research capacities of institutions in developing countries;

(c) Enhancement of translation of water-related farming and fishing systems research results into practical and accessible technologies and provision of the support needed for their rapid adoption at the field level.

18.79. Transfer of technology, both horizontal and vertical, needs to be strengthened. Mechanisms to provide credit, input supplies, markets, appropriate pricing and transportation must be developed jointly by countries and external support agencies. Integrated rural water-supply infrastructure, including facilities for water-related education and training and support services for agriculture, should be expanded for multiple uses and should assist in developing the rural economy.

(c) Human resource development

18.80. Education and training of human resources should be actively pursued at the national level through: (a) assessment of current and long-term human resources management and training needs; (b) establishment of a national policy for human resources development; and (c) initiation and implementation of training programmes for staff at all levels as well as for farmers. The necessary actions are as follows:

(a) Assess training needs for agricultural water management;

(b) Increase formal and informal training activities;

(c) Develop practical training courses for improving the ability of extension services to disseminate technologies and strengthen farmers' capabilities, with special reference to small-scale producers;

(d) Train staff at all levels, including farmers, fishermen and members of local communities, with particular reference to women;

(e) Increase the opportunities for career development to enhance the capabilities of administrators and officers at all levels involved in land- and water-management programmes.

(d) Capacity-building

18.81. The importance of a functional and coherent institutional framework at the national level to promote water and sustainable agricultural development has generally been fully recognized at present. In addition, an adequate legal framework of rules and regulations should be in place to facilitate actions on agricultural water-use, drainage, water-quality management, small-scale water programmes and the functioning of water-users' and fishermen's associations. Legislation specific to the needs of the agricultural water sector should be consistent with, and stem from, general legislation for the management of water resources. Actions should be pursued in the following areas:

(a) Improvement of water-use policies related to agriculture, fisheries and rural development and of legal frameworks for implementing such policies;

(b) Review, strengthening and restructuring, if required, of existing institutions in order to enhance their capacities in water-related activities, while recognizing the need to manage water resources at the lowest appropriate level;

(c) Review and strengthening, where necessary, of organizational structure, functional relationships and linkages among ministries and departments within a given ministry;

(d) Provision of specific measures that require support for institutional strengthening, inter alia, through long-term programme budgeting, staff training, incentives, mobility, equipment and coordination mechanisms;

(e) Enhancement of involvement of the private sector, where appropriate, in human resource development and provision of infrastructure;

(f) Transfer of existing and new water-use technologies by creating mechanisms for cooperation and information exchange among national and regional institutions.

G. Impacts of climate change on water resources

Basis for action

18.82. There is uncertainty with respect to the prediction of climate change at the global level. Although the uncertainties increase greatly at the regional, national and local levels, it is at the national level that the most important decisions would need to be made. Higher temperatures and decreased precipitation would lead to decreased water-supplies and increased water demands; they might cause deterioration in the quality of freshwater bodies, putting strains on the already fragile balance between supply and demand in many countries. Even where precipitation might increase, there is no guarantee that it would occur at the time of year when it could be used; in addition, there might be a likelihood of increased flooding. Any rise in sealevel will often cause the intrusion of salt water into estuaries, small islands and coastal aquifers and the flooding of low-lying coastal areas; this puts low-lying countries at great risk.

18.83. The Ministerial Declaration of the Second World Climate Conference states that "the potential impact of such climate change could pose an environmental threat of an up to now unknown magnitude ... and could even threaten survival in some small island States and in low-lying coastal, arid and semi-arid areas" (A/45/696/Add.1, annex III, preamble, para. 2). The Conference recognized that among the most important impacts of climate change were its effects on the hydrologic cycle and on water management systems and, through these, on socio-economic systems. Increase in incidence of extremes, such as floods and droughts, would cause increased frequency and severity of disasters. The Conference therefore called for a strengthening of the necessary research and monitoring programmes and the exchange of relevant data and information, these actions to be undertaken at the national, regional and international levels.

Objectives

18.84. The very nature of this topic calls first and foremost for more information about and greater understanding of the threat being faced. This topic may be translated into the following objectives, consistent with the United Nations Framework Convention on Climate Change:

(a) To understand and quantify the threat of the impact of climate change on freshwater resources;

(b) To facilitate the implementation of effective national countermeasures, as and when the threatening impact is seen as sufficiently confirmed to justify such action;

(c) To study the potential impacts of climate change on areas prone to droughts and floods.

Activities

18.85. All States, according to their capacity and available resources, and through bilateral or multilateral cooperation, including the United Nations and other relevant organizations as appropriate, could implement the following activities:

- (a) Monitor the hydrologic regime, including soil moisture, groundwater balance, penetration and transpiration of water-quality, and related climate factors, especially in the regions and countries most likely to suffer from the adverse effects of climate change and where the localities vulnerable to these effects should therefore be defined;
- (b) Develop and apply techniques and methodologies for assessing the potential adverse effects of climate change, through changes in temperature, precipitation and sealevel rise, on freshwater resources and the flood risk;
- (c) Initiate case-studies to establish whether there are linkages between climate changes and the current occurrences of droughts and floods in certain regions;
- (d) Assess the resulting social, economic and environmental impacts;
- (e) Develop and initiate response strategies to counter the adverse effects that are identified, including changing groundwater levels and to mitigate saline intrusion into aquifers;
- (f) Develop agricultural activities based on brackish-water use;
- (g) Contribute to the research activities under way within the framework of current international programmes.

Means of implementation

(a) Financing and cost evaluation

18.86. The Conference secretariat has estimated the average total annual cost (1993-2000) of implementing the activities of this programme to be about \$100 million, including about \$40 million from the international community on grant or concessional terms. These are indicative and order of magnitude estimates only and have not been reviewed by Governments. Actual costs and financial terms, including any that are non-concessional, will depend upon, inter alia, the specific strategies and programmes Governments decide upon for implementation.

(b) Scientific and technological means

18.87. Monitoring of climate change and its impact on freshwater bodies must be closely integrated with national and international programmes for monitoring the environment, in particular those concerned with the atmosphere, as discussed under other sections of Agenda 21, and the hydrosphere, as discussed under programme area B above. The analysis of data for indication of climate change as a basis for developing remedial measures is a complex task. Extensive research is necessary in this area and due account has to be taken of the work of the Intergovernmental Panel on Climate Change (IPCC), the World Climate Programme, the International Geosphere-Biosphere Programme (IGBP) and other relevant international programmes.

18.88. The development and implementation of response strategies requires innovative use of technological means and engineering solutions, including the installation of flood and drought warning systems and the construction of new water resource development projects such as dams, aqueducts, well fields, waste-water treatment plants, desalination works, levees, banks and drainage channels. There is also a need for coordinated research networks such as the International Geosphere-Biosphere Programme/Global Change System for Analysis, Research and Training (IGBP/START) network.

(c) Human resource development

18.89. The developmental work and innovation depend for their success on good academic training and staff motivation. International projects can help by enumerating alternatives, but each country needs to establish and implement the necessary policies and to develop its own expertise in the scientific and engineering challenges to be faced, as well as a body of dedicated individuals who are able to interpret the complex issues concerned for those required to make policy decisions. Such specialized personnel need to be trained, hired and retained in service, so that they may serve their countries in these tasks.

(d) Capacity-building

18.90. There is a need, however, to build a capacity at the national level to develop, review and implement response strategies. Construction of major engineering works and installation of forecasting systems will require significant strengthening of the agencies responsible, whether in the public or the private sector. Most critical is the requirement for a socio-economic mechanism that can review predictions of the impact of climate change and possible response strategies and make the necessary judgements and decisions.

Notes

1/ Report of the United Nations Water Conference, Mar del Plata, 14-25 March 1977 (United Nations publication, Sales No. E.77.II.A.12), part one, chap. I, sect. C, para. 35.

2/ Ibid., part one, chap. I, resolution II.

A21: Freshwater (Ch. 18), Advance CopyPage 1

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2002

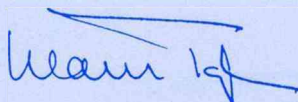
UNEP SASAKAWA ENVIRONMENT PRIZE

NOMINATION FORM

It is with great pleasure that I invite you to submit nominations for the prestigious UNEP Sasakawa Environment Prize, which honours individuals who have distinguished themselves by making outstanding contributions to the management and protection of the environment.

Far more significant than the words that describe the eligibility criteria for the Prize is the larger idea that lies behind it. At its core is the recognition that those honoured with this Prize represent a quest for excellence and a unique commitment to a contract with humanity. The laureates display these qualities to an uncommon degree. Their remarkable examples suggest that there is a hunger in the world for people with values and the willingness to assert them.

In honouring them, the United Nations Environment Programme hopes to encourage them to continue their work and to inspire others to join the global coalition dedicated to protecting the environment.



Klaus Toepfer
Executive Director
United Nations Environment Programme



United Nations Environment Programme

THE SELECTION CRITERIA

ELIGIBILITY

NO CANDIDATE MAY NOMINATE HIMSELF OR HERSELF.

The Prize is awarded to individuals who have made outstanding global contributions to the management and protection of the environment consistent with the policies, aims and objectives of UNEP. Candidates can be associated with any field of the environment. Those eligible to make nominations include, but are not limited to, specialists in environmental sciences, academies of science, engineering and research, members of the United Nations system, governments, inter-governmental organizations, trade unions and non-governmental organizations.

PAST RECIPIENTS CANNOT BE RENOMINATED

LENGTH OF CANDIDACY

Nominees will be considered on an annual basis. A new letter of nomination and updated description of achievements is required every year.

NOMINATION PROCEDURES

Identify nominee by completing the attached nomination form. Include name, professional and home mailing address, present occupational title and institutional affiliation and date and place of birth. Enclose a curriculum vitae.

SUMMARY OF ACCOMPLISHMENTS

Provide a summary of no more than two pages (500 words) of the individual's achievements in the field(s) for which the award is proposed. Be precise and factual.

DESCRIPTION OF CONTRIBUTIONS

Provide a detailed explanation of the contributions and explain why each is valuable and effective. Describe how each was accomplished. Mention any significant involvement of others.

REFERENCES

Referees who might be contacted by the Selection Committee.

EVIDENCE OF ACHIEVEMENTS

The Selection Committee reserves the right to request examples of publications or other evidence which demonstrate the candidate's contributions to the environment. Such materials will be retained by UNEP unless otherwise requested.

Nomination form (see following page).

Nomination forms may be obtained from:
The Secretary
UNEP Sasakawa Environment Prize
United Nations Environment Programme
Division of Communications and Public Information
P. O. Box 30552, Nairobi, Kenya
Tel: (254 2) 62 3401/62 3128
Fax: (254 2) 62 3692/62 3927
E-mail: cpiinfo@unep.org

DEADLINE FOR NOMINATIONS

Nominations, related credentials, information in support of the nomination and letters of reference must be received no later than **30 April 2002**.

NOMINATION FORM 2002

UNEP Sasakawa Environment Prize

NO PERSON MAY NOMINATE HIMSELF OR HERSELF

NOMINEE (name in full) _____

DATE OF BIRTH _____

PLACE OF BIRTH _____

NATIONALITY _____

ADDRESS _____

Telephone: _____ Telefax: _____ E-mail: _____

PRESENT OCCUPATION _____

EDUCATION _____

CURRICULUM VITAE (please attach an up-to-date Curriculum Vitae)

HONOURS / AWARDS _____

PUBLICATIONS (list publications considered most relevant for the purpose of the Prize)

SUMMARY Provide below a brief summary (of 500 words) explaining why the nominee should receive the Prize



NOMINATOR

NAME (in full) _____

ADDRESS _____

Telephone: _____ Telefax: _____ E-mail: _____

PROFESSION _____

DATE _____

SIGNATURE _____

References: Provide three persons, not related to the nominee, who are familiar with the nominee's qualifications and work.

REFEREE

NAME (in full) _____

ADDRESS _____

PROFESSION _____

Telephone: _____ Telefax: _____ E-mail: _____

REFEREE

NAME (in full) _____

ADDRESS _____

PROFESSION _____

Telephone: _____ Telefax: _____ E-mail: _____

REFEREE

NAME (in full) _____

ADDRESS _____

PROFESSION _____

Telephone: _____ Telefax: _____ E-mail: _____

Deadline for submission: 30 April 2002

Please send the nomination form (typed or in block letters) and relevant materials to:

*The Secretary
UNEP Sasakawa Environment Prize
United Nations Environment Programme
Division of Communications and Public Information
P.O. Box 30552, Nairobi, Kenya
Tel: (254 2) 62 3401 or 62 3128
Fax: (254 2) 62 3692 or 62 3927
E-mail: cpinfo@unep.org
Web site: <http://www.unep.org>*

2002

UNEP SASAKAWA
ENVIRONMENT PRIZE



UNEP

UNITED NATIONS ENVIRONMENT PROGRAMME



2002

UNEP SASAKAWA
ENVIRONMENT PRIZE



UNEP

UNITED NATIONS ENVIRONMENT PROGRAMME

CONTENTS



<i>Message from the Executive Director</i>	1
<i>The Prize in Brief</i>	2
<i>The Laureates</i>	3
<i>The Selection Criteria</i>	4
<i>The Nippon Foundation</i>	5
<i>The Members of the 2001 Selection Committee</i>	6
<i>The Achievements of the Laureates</i>	12
<i>The Nomination Form</i>	37



Bernard Wahihia/UNEP

Mr. Klaus Toepfer
UNEP Executive Director

It is with great pleasure that I invite you to submit nominations for the prestigious UNEP Sasakawa Environment Prize, which honours individuals who have distinguished themselves by making outstanding contributions to the management and protection of the environment.

Far more significant than the words that describe the eligibility criteria for the Prize is the larger idea that lies behind it. At its core is the recognition that those honoured with this Prize represent a quest for excellence and a unique commitment to a contract with humanity. The laureates, profiled in the next few pages, display these qualities to an uncommon degree. Their remarkable examples suggest that there is a hunger in the world for people with values and the willingness to assert them.

In honouring them, the United Nations Environment Programme hopes to encourage them to continue their work and to inspire others to join the global coalition dedicated to protecting the environment.

MESSAGE FROM THE EXECUTIVE DIRECTOR



Audrey Ringler/Design Line Limited

Klaus Toepfer

THE PRIZE IN BRIEF

The United Nations Environment Programme (UNEP) Sasakawa Environment Prize

The UNEP Sasakawa Environment Prize is one of the most prestigious environmental awards in the world.

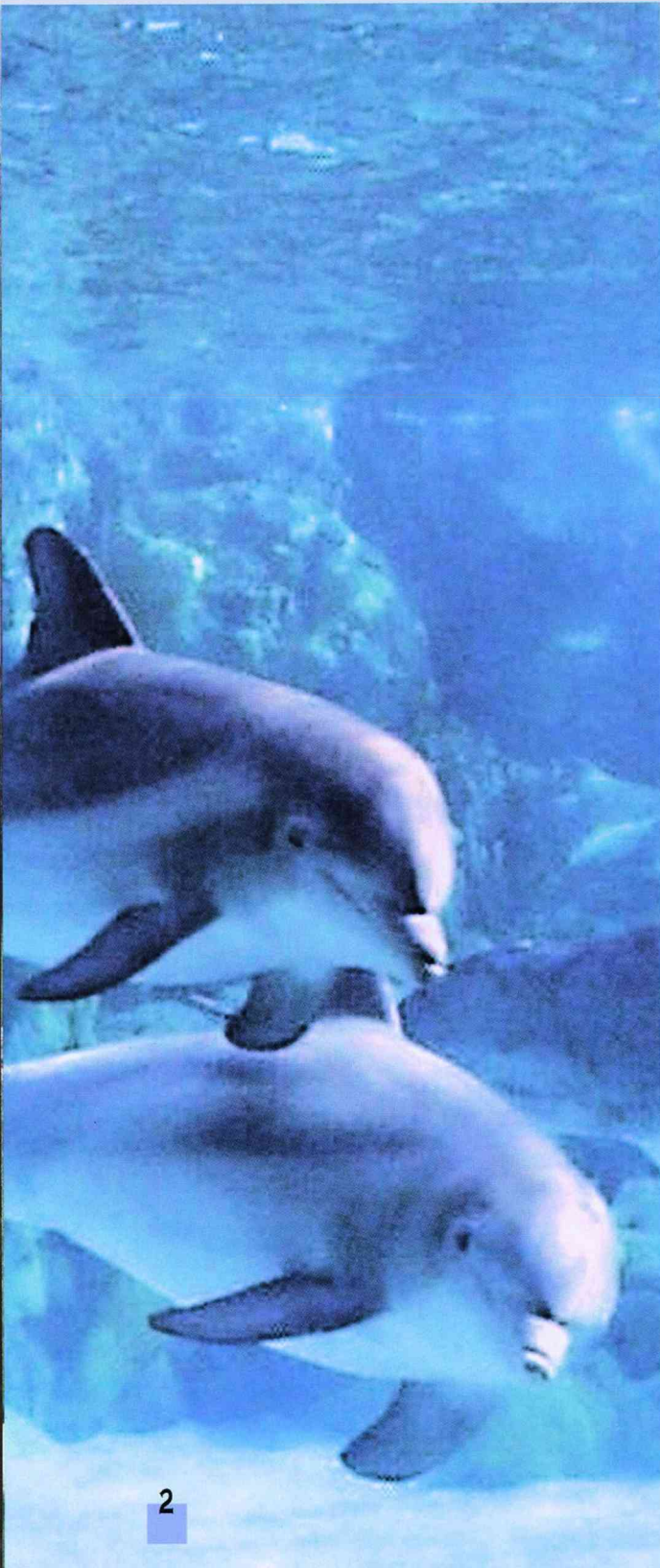
The establishment of an international environment prize was recommended at the United Nations Conference on the Human Environment held in Stockholm in 1972. This Prize, then known as the Pahlavi Prize, was first awarded in 1976.

In 1982, the UNEP Governing Council accepted an endowment of US\$1 million from the Japan Shipbuilding Industry Foundation to finance the Sasakawa International Environment Prize, which would be administered by UNEP.

Now known as the UNEP Sasakawa Environment Prize, it is awarded annually to leading environmentalists and recognizes the work of these individuals at the global level.

Since its inception, interest in the award has increased significantly as attested by the growing number of nominations. After serious deliberations and in the light of the kind of nominations received over the years, the Selection Committee recommended that all nominations be considered on an annual basis and that the Prize be awarded solely to **“individuals who have made outstanding global contributions to the management and protection of the environment”**. The Prize aims to encourage environmental achievement in any field of the environment.

The annual award of \$50,000 was increased to \$200,000 in 1990, making it one of the world's most valuable environmental prizes.

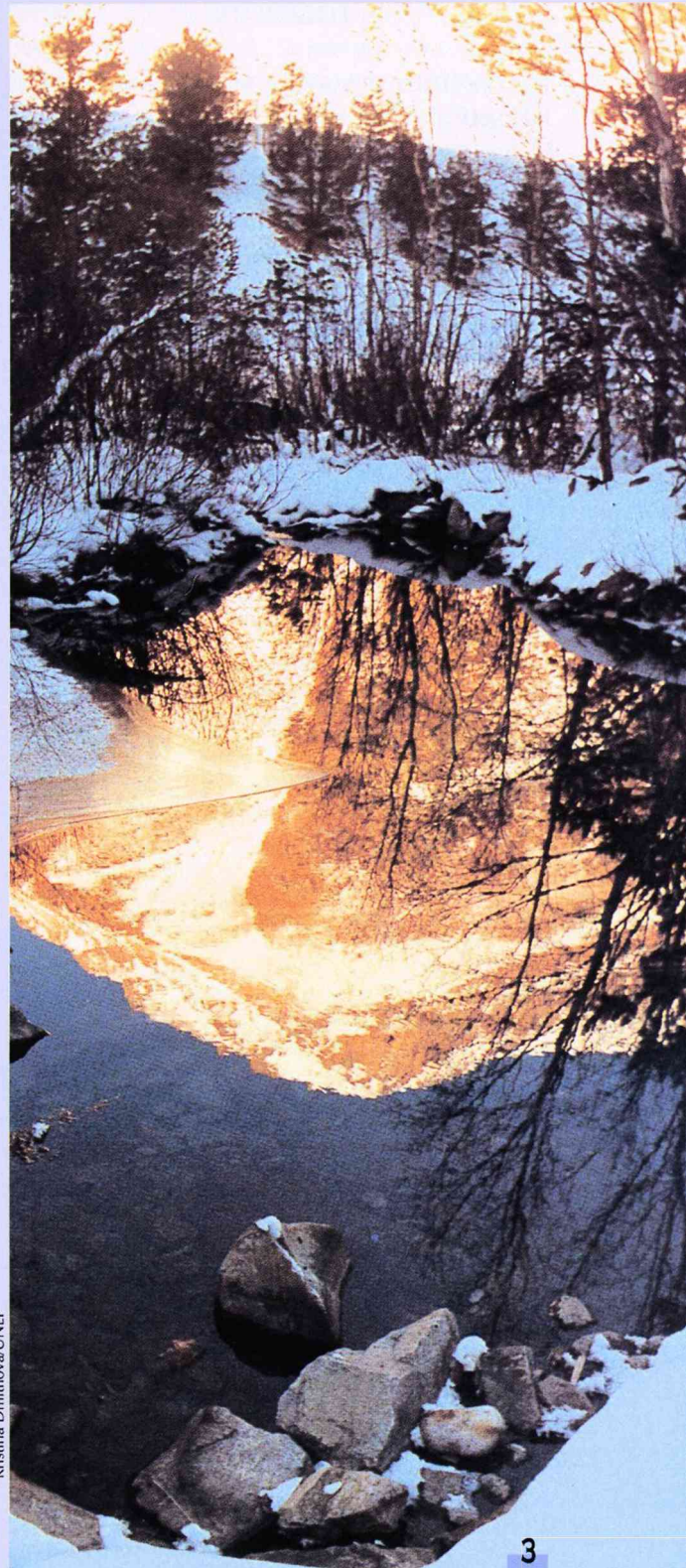


Matthew Warner/UNEP

THE LAUEATES

2001	Huey D. Johnson
2000	Michel Batisse
1999	Mario J. Molina
1998	Ian Bruce Carrick Kiernan
1997	Barbara Pyle
1996	Triloki Nath Khoshoo
1995	Canaganayagan Suryakumaran, Norman Myers and Peter Raven
1994	M. S. Swaminathan Paul and Anne Ehrlich
1993	Mostafa Kamal Tolba
1992	Qu Geping Yuri Izrael
1991	Wolfgang Burhenne Françoise Burhenne-Guilmin
1990	Francisco "Chico" Mendes (deceased)
1989	Lester R. Brown
1988	World Commission on Environment and Development Royal Commission for Jubail and Yanbu, Saudi Arabia
1987	Elizabeth Mann Borgese Nicholas Polunin (deceased)
1986	Mweka College of African Wildlife Management
1985	Hassan Asmaz Gilbert R. White
1984	Aurelio Peccei (deceased)
*1976	Maurice F. Strong
*1977	Jacques-Yves Cousteau (deceased)
*1978	Mohammed El-Kassas Thor Heyerdahl

**Pahlavi Prize*



Kristina Dmitrova/UNEP

THE SELECTION CRITERIA

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E-mail: cpiinfo@unep.org

DEADLINE FOR NOMINATIONS

Nominations, related credentials, information in support of the nomination and letters of reference must be received no later than **30 April 2002**.



Ryoichi Sasakawa

Ryoichi Sasakawa, who died in July 1995, was the founding Chairman of the Nippon Foundation (formerly the Sasakawa Foundation). As the Chairman, for more than three decades, Mr. Sasakawa contributed to social and public initiatives both within and outside Japan, one of which was the establishment of the UNEP Sasakawa Environment Prize in 1982.



Founded in 1962, The Nippon Foundation is an independent, non-profit, grant organization with an annual spending of approximately US\$650 million – a sum which represents 3.3% of the revenues of motorboat racing. These funds have been set aside for philanthropic purposes and are allocated to support domestic and international projects.

In keeping with its founding spirit, the Foundation oversees cooperative assistance geared towards the

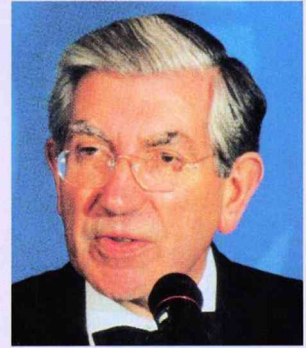
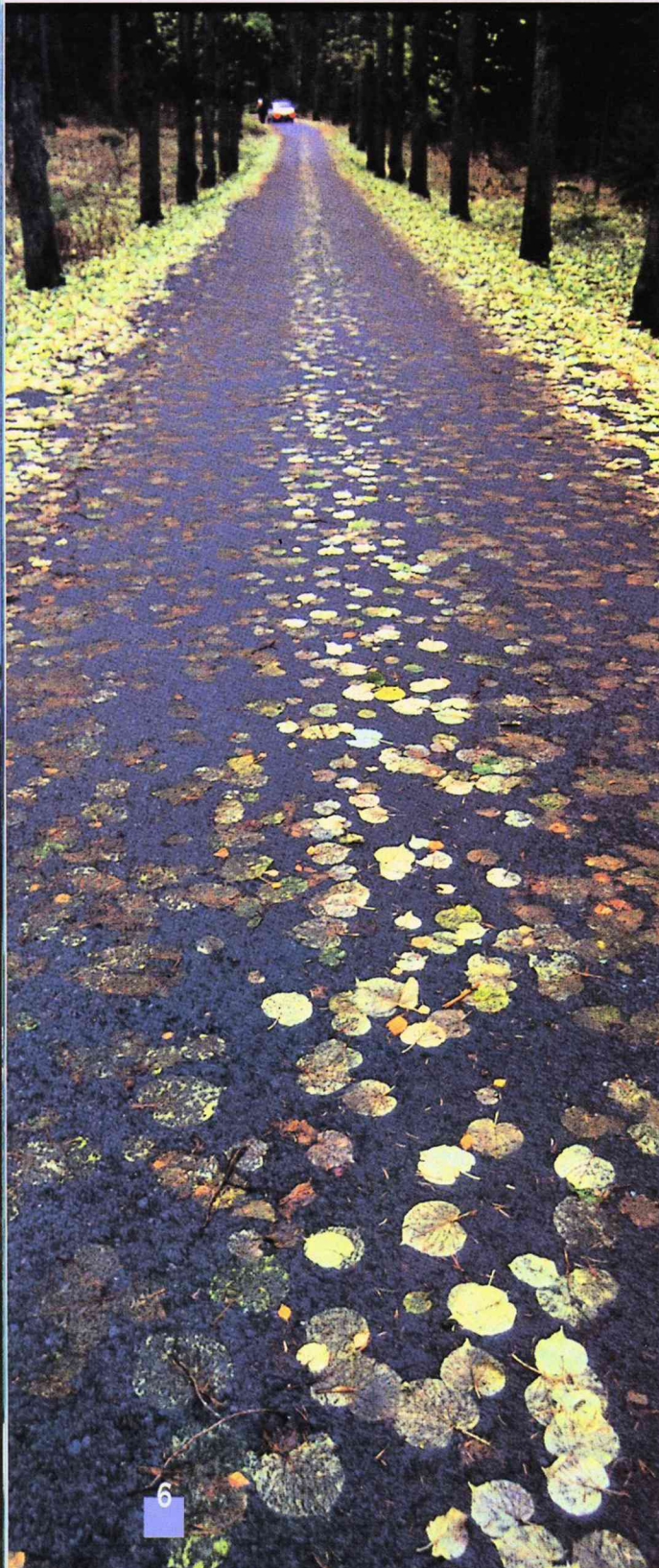
THE FOUNDER

In 1979, Mr. Sasakawa took part in the United Nations Educational, Scientific and Cultural Organization (UNESCO) Peace Forum in Paris as a member of the delegation from Japan. In the same year, he received the United Nations Scroll of Appreciation, which cited his “personal support and excellent philanthropy in the cause of improved international standing and cooperation.” That was also the year he instituted the Sasakawa Memorial Health Foundation, which contributed greatly to the campaign to eradicate smallpox. In 1982, the then United Nations Secretary-General, Javier Perez de Cuellar, presented him with the United Nations Peace Medal.

THE NIPPON FOUNDATION

improvement of basic human needs, human resources development and the promotion of international collaborative undertakings. Grants are given to initiatives and programmes in areas such as health care, support of disabled persons, population - related issues, agricultural and community development, the environment, refugee aid, higher education, as well as cultural, social and intellectual exchange.

THE SELECTION COMMITTEE



Lord Clinton-Davis
Chairman

Lord Clinton-Davis, Chairman of Europe 21 and Joint President of the Society of Labour Lawyers, was made a Life Peer of The House of Lords in May 1990. Prior to being appointed a member of Her Majesty's Privy Council in July 1998, he was the United Kingdom's Minister of State, Department of Trade and Industry. From November 1990 to May 1997, he led for the Labour Opposition in Transport, and from 1994 to 1997, he was President of the British Airlines Pilots Association (BALPA) and he was recently reappointed to that position. From 1984 to 1985 and from 1989 to 1997, he was Chairman of the Advisory Committee on the Protection of the Seas (ACOPS) and in September 1998, he was re-elected as Joint Chairman.

From 1985 to 1989, he was a member of the Commission of the European Communities with responsibility for Transport, Environment and Nuclear Safety. From 1970 to 1983, he was the Labour Member of Parliament for Hackney Central where he was also Mayor from 1968 to 1969. He has also served as Parliamentary Under Secretary of State in the Department of Trade from 1974 to 1979, as opposition spokesman on trade, prices and consumer protection from 1979 to 1981, and then on foreign affairs from 1981 to 1983. In 1989, he was awarded the Grand Cross of the Order of Leopold II by His Majesty the King of Belgium for services to the European Community, and in 1988, he was the first person to be awarded the European Medal for Animal Welfare.



*Professor
Wangari Maathai*

Professor Wangari Maathai was Kenya's first woman Ph.D. In 1976 she became Chair of the Department of Veterinary Anatomy at the University of Nairobi and in 1977, an associate Professor – in both cases the first woman in the region to attain these positions.

Maathai was active in the National Council of Women of Kenya from 1976 and was its chairman from 1981 to 1987. It was through the Council that she introduced the idea of planting trees with the people and developed it into a broad-based, grassroots organization designed to conserve the environment and improve women's quality of life.

She is the founder and Coordinator of the Green Belt Movement in Kenya, which now operates in 12 African countries and through which more than 20 million trees have been planted to combat deforestation and desertification. In 1986, the Movement established a Pan African Green Belt Network which led to the adoption of Green Belt methods in Tanzania, Uganda, Malawi, Lesotho, Ethiopia, Zimbabwe and other countries in the region.

Professor Maathai, known as the "Tree Woman of Kenya", is recognized as one of Africa's leading environmentalists. In recent years, her work has also focused on human rights issues in Kenya. She has won numerous awards, among them: the "Alternative Nobel Prize, The Right Livelihood Award", (1984), the Hunger Project's Africa Prize for Leadership (1992), and the Goldman Prize for Environmental Activity (1991).

Joseph Earnest Shumaker III/UNEP





Say Boon Foto/UNEP



Dr. Russell W. Peterson

Dr. Russell W. Peterson is President Emeritus of the National Audubon Society. He served as Vice-President and Regional Councillor of the World Conservation Fund until 1990 and is now President Emeritus of the International Council for Bird Preservation. He has also served as Vice-Chairman and President of the Better World Society. He was Governor of the State of Delaware from 1969 to 1973 and Chairman, from 1973 to 1976, of the President's Council on Environmental Quality, which led to the creation of the Environmental Industry Council. He was Director of the United States Congress of Technology Assessment, from 1977 to 1979.

He is a former Vice-Chairman of United States delegations to the United Nations Conference on Human Settlements and to the United Nations World Population Conference. Among his many accolades is the National Wildlife Federation's "Conservationist of the Year" award which he received in 1971 and the Green Century Award from the Resource Renewal Institute, which he received in 1999.



Mrs. Maneka Gandhi

Mrs. Maneka Gandhi, a Member of Parliament and Minister of State for Culture in the Government of India, is the founder and Chairperson of People for Animals, a registered trust, which champions the cause of animal welfare and boasts the largest membership in India. She is Chairperson of the Committee on the Control and Supervision of Experiment on Animals established by India's Central Government and founder and Patron of Greenline, the only non-governmental organization that plants trees in cities with financial support from the private sector. She is Managing Trustee of the Ruth Cowell Foundation, which runs the New Delhi-based Sanjay Gandhi Memorial Animal Care Center, the largest animal welfare facility in India. She is Chairperson of the Delhi Society for the Prevention of Cruelty to Animals (SPCA) and Patron-for-Life of the SPCA and of the animal welfare society Compassion Unlimited Plus Action.

During her tenure as Minister of Environment and Forest, Mrs. Gandhi initiated and piloted legislation on the Wildlife Protection Act and the Public Liability Act for Hazardous Chemicals. She negotiated the Montreal Protocol on behalf of her Government, set standards for environmental pollution and designed the environmental tribunals of India and the comparative testing scheme for eco-friendly products called Eco Mark.

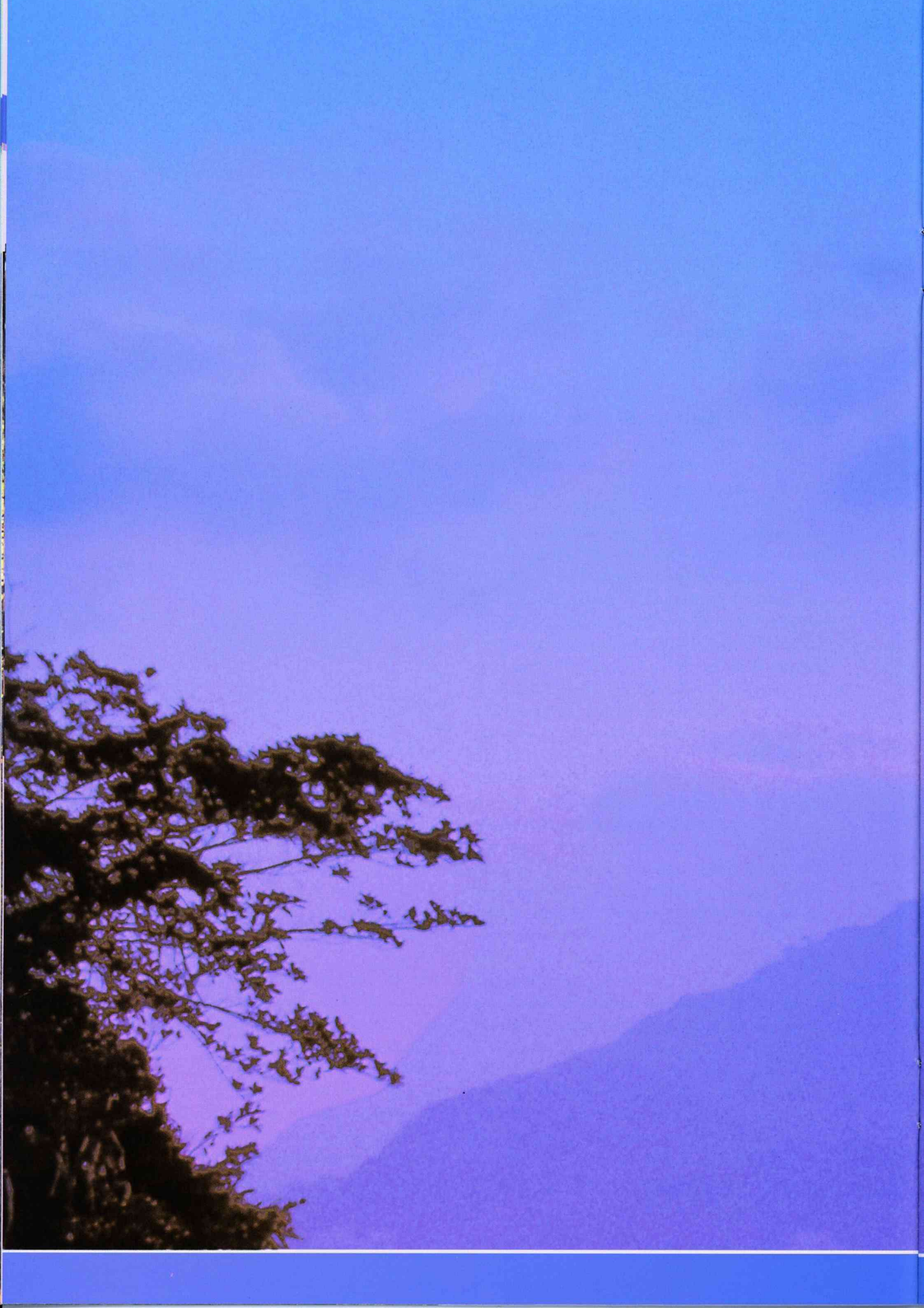
She successfully initiated public interest litigation in the Supreme Court of India to protect animals, and was responsible for path-breaking judgements on: stopping the municipal killing of dogs and starting their vaccination and sterilization; stopping the inhumane and unhealthy slaughter in Delhi's



Chaudhuri/UNEP

only slaughterhouse; stopping the use of animals for entertainment in circuses; and the banning of travelling zoos in India. She also headed the Government of Delhi Committee to find solutions for stray cattle in the city.

Mrs. Gandhi is writer and coordinator of numerous national television programmes and the author of a number of books on plants, animals and etymology. She is the recipient of many awards, including the Lord Erskine Award from the Royal Society for the Prevention of Cruelty to Animals, the Maharana Uday Singh Award for services in the field of the environment, the Prani Mira Award from the Animal Welfare Board of India and the Marching Prize from the Marching Animal Welfare Trust of Great Britain.





AND THE WINNERS ARE . . .

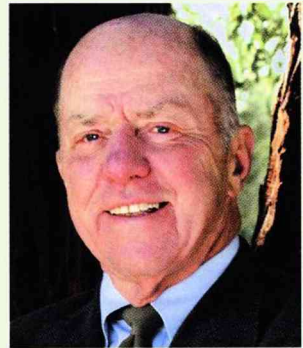
WINNER 2001

Huey D. Johnson has passionately worked to protect the environment for more than four decades. His career has been dedicated to developing better ways of understanding how to manage and allocate natural resources. He has supported people and developed organizations that work to enhance environmental protection through better management of natural resources and the advancement of sustainable development worldwide.

Johnson began his career in the corporate sector, however, he quickly recognized that his passion lay elsewhere. For two and a half years, he travelled around the world studying cultures, religions, history and art. He attributes his conviction and vision to that period when he learned that, historically, conflicts between nations and cultures have been based on natural resource allocation.

Huey D. Johnson
55 Elm Avenue
Mill Valley
California, CA 94941
United States of America

Tel: (415) 928 3774
Fax: (415) 928 6529
E-mail: hdj@rri.org



Huey D. Johnson

In 1963, Johnson was appointed Western Regional Director of the Nature Conservancy – one of the most influential environmental organizations in the world. During his tenure, he was responsible for more than 50 projects, including the preservation of Hawaii's Seven Sacred Pools. In 1972, he co-founded the *Trust for Public Land (TPL)* – a non-profit land acquisition corporation whose aim is to save open space for America's urban centres – and served as its president until 1977. TPL is now the fifth largest environmental organization in the United States and continues to promote a vision of

conserving land for recreation and spiritual nourishment and to improve the health and quality of life of American communities. To date, TPL has conserved more than 1.3 million acres of land in the United States.

From 1978 to 1982, he served as Secretary of Natural Resources in California. While in office, he developed policies and programmes that left a legacy of environmental protection and which have been studied and emulated internationally. More specifically, he instituted the Investing for Prosperity Programme. This 100-year programme channelled funds into investments to enhance long term productivity of California's natural resources and comprised five initiatives that promoted the reinvestment of proceeds from the sale of public natural resources into programmes designed to fund the maintenance and improvement of the State's natural resources. For his efforts in this area, Johnson received the President's Award for Sustainable Development.

In 1985, Johnson founded the Resource Renewal Institute (RRI), an NGO whose mission is to catalyze the development of green plans nationally and internationally. A main component of RRI's two-pronged strategy, which employs advocacy and education, is to link the three major sectors of society (business, government and NGOs) to international experts implementing green plans, and to catalyze similar success domestically. Currently, RRI has a working relationship with Mexico to promote the development of federal and state-level green plans.

Johnson also played an integral role in the creation of the Nairobi-based Environmental Liaison Centre International (ELCI) – an environmental watchdog organization that was created in response to the development of UNEP in 1972. He also developed Green Belt Movement International (GBMI) to promote citizen-based tree planting worldwide and to mobilize people to restore the environment and break the cycle of poverty and environmental degradation.

Martin Ceperley/UNEP



WINNER 2000

Dr. Michel Batisse's professional life has been devoted to the conservation of the Earth's natural resources. He has been the architect and promoter of some of the most innovative and significant environmental research and training programmes conducted at the global and regional level. He has always used his talent and knowledge to bring large numbers of scientists together to work on common environmental objectives of major importance to humankind.

Dr. Michel Batisse
9 avenue Leonce
Bucquet
92380 Garches
France

Tel: (33-1) 45 68 40 51
Fax: (33-1) 45 68 58 04
E-mail:
m.jardin@unesco.org



Dr. Michel Batisse

One of his greatest contributions was the organization of the Man and the Biosphere (MAB) Conference in Paris in 1968 – a pioneering event which paved the way for the 1972 Stockholm Conference and which advocated what would become known as Sustainable Development. The MAB Conference resulted in the establishment of biosphere reserves where the conservation of biological diversity is combined with research, monitoring and education. These areas are recognized today as the best way of implementing sustainable development and preserving biodiversity in cooperation with local communities. The world network of biosphere reserves now comprise some 368 sites in 91 countries. He is the driving force behind the Mediterranean Blue Plan where all bordering countries and the European Union cooperate towards sustainable development in this crucial region.

Since 1989, he has been on the Board of Directors of Conservation International, a Washington-based organization, which promotes innovative approaches to conservation, particularly as they relate to tropical forests, so as to ensure appropriate participation and economic benefits for local people. Dr. Batisse is an Officer of the French Legion of Honour, a recipient of IUCN's John Phillips Medal and of UNEP's Global 500 Award.



*Professor
Mario J. Molina*

Professor Mario J. Molina
Massachusetts Institute of
Technology (MIT)
Room 54-1814
77 Massachusetts Avenue
Cambridge, MA 02139
United States of America

Tel: (617) 253 5081
Fax: (617) 258 6525
E-mail: mmolina@mit.edu

Professor Mario J. Molina's pioneering contributions to the field of atmospheric chemistry have established him as one of the world's leading authorities on the effect of human activities on the atmosphere, and have led to a better understanding of the issue.

In 1974, he published, with F. Sherwood Rowland, a seminal paper on the threat to the ozone layer from chlorofluorocarbons (CFCs). Under laboratory conditions, he and his colleagues demonstrated a previously unknown chemical reaction whereby chlorine is activated on the surface of ice cloud particles in the polar stratosphere.

Thanks to his leadership, the Montreal Protocol was made a reality. The speed with which countries ratified this international agreement was due in great part to the role he played in communicating the implications of his scientific research. He took the issue to policy makers, the media and to the general public.

For his work, Prof. Molina was awarded the Nobel Prize in Chemistry with Professors Rowland and Paul Crutzen. He donated two thirds of his share of the Prize money to set up fellowships to help scientists from developing countries conduct research in environmental sciences at the Massachusetts Institute of Technology (MIT) and other institutions in industrialized nations.

Prof. Molina continues his research on stratospheric chemistry and is pursuing interdisciplinary work on tropospheric pollution issues, including the pollution problems of rapidly growing cities.

WINNER 1999

In addition to the Nobel Prize, Prof. Molina is the recipient of the NASA Medal for Exceptional Scientific Achievement, the Pew Scholar Award on Conservation and Environment, the Max Planck Research Award, the Walker Prize from the Boston Museum of Science, the Willard Gibbs Medal, and the American Chemical Society's Award for Creative Advances in Environmental Sciences. In 1993, he was elected to the USA's National Academy of Sciences and in 1996 to the Institute of Medicine.



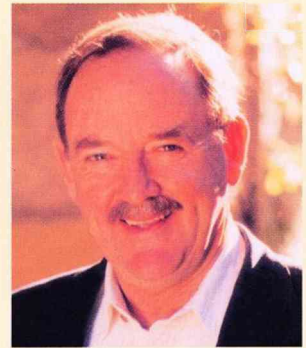
Mitchell Rogers/UNEP

WINNER 1998



Ian Bruce Carrick Kiernan
Founder and Chairman
Clean Up the World
117 Harris Street
Pyrmont, Sydney
NSW 2000
Australia

Tel: (612) 9692 0700
Fax: (612) 9692 0761
E-mail:
cleanup@cleanup.com.au



Ian Kiernan

Mr. Ian Kiernan has communicated in the most visible way and to the world at large, the need to protect the environment. His is a true global success story which gives credence to the belief that one person can make a difference. Who would have thought that when he embarked on a solo journey by sail around the globe in 1987, that he would have captured the imagination of so many and single-handedly done so much to arrest environmental degradation.

As the founder and force behind the Clean Up the World Campaign, Mr. Kiernan has brought together more than 40 million people from more than 120 countries in a progressive clean-up effort. First Sydney Harbour, then Australia and then the world. The results of the Campaign have been wide-ranging, not only in terms of public participation, increased awareness and the removal and disposal of rubbish, but also in helping to bring about long term improvement to waste management and policies. Since the launch of the Clean Up the World in 1993, an estimated 150 million people from every corner of the globe have come together in an inspirational example of community spirit and international cooperation.

Mr. Kiernan has clearly demonstrated that ordinary people – men, women and young people alike – have it in their hands to contribute substantially to a better quality of life for themselves and their communities.



Barbara Pyle

Barbara Y. E. Pyle
4221 Brookview Drive
Atlanta, Georgia 30339
United States of America

Tel: (770) 436 2059
Fax: (770) 436 2109
E-mail: BYEPYLE@aol.com

For more than two decades, **Ms. Barbara Pyle** has encouraged the media to assume a major responsibility for informing and educating the public, including decision makers. Ms. Pyle has brought environmental issues closer to the hearts and minds of people the world over. As a writer, director and producer of numerous television programmes, she has inspired countless individuals to care about the environment and to take responsibility for its protection.

She has produced more than 35 films which have won more than 75 awards. She is the founder of Earth Matters, CNN's daily environmental news feature and founder and Chairman of the Board of the Captain Planet Foundation, an organization which awards grants to children's grassroots environmental projects.

Ms. Pyle's philosophy is "Our planet will not be saved by any one big decision, but many individual choices and the media has an important responsibility to provide the information necessary to enable us to make those choices". Using the unique global reach of CNN, CNN International and World Report, Pyle's work has been seen by some two billion people worldwide.

WINNER 1997



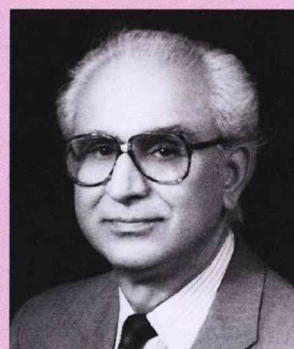
Dario Bitzaya/UNEP

WINNER 1996

Dr. Triloki Nath Khoshoo
No. 103, Pocket -H
Sarita Vihar, New Delhi
India

Tel: (91 11) 460 1550/
462 2246
Fax: (91 11) 462 1770/
463 2609

E-mail: khoshoo@teri.ernet.in



*Dr. Triloki Nath
Khoshoo*

For more than 30 years, **Dr. Triloki Nath Khoshoo** has been an advocate of strong regional environmental planning for long term ecological and economic security, particularly in the developing country context.

His conservation work in cytogenetics, biological diversity, biomass production and environmental research and development have been significant. He has generated considerable new knowledge regarding the genetic-evolution of a number of plants. Based on this knowledge, he delineated, for the first time, their diversity and origin, circumscribed gene pools and standardized procedures for studying the taxonomy of cultivated plants. Dr. Khoshoo has also initiated work on the standardization of herbal drugs and their compound formulation, particularly for rural use and development.

His pre-emptive strategies, while Secretary to the Government of India's Department of Environment, were based on sound scientific analyses and resulted in policies which helped insulate the country from further environmental damage.

His efforts have earned him a place as a leader in the environment field.

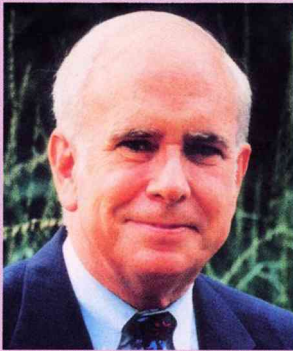




Dr. Norman Myers

Dr. Norman Myers
Upper Meadow
Old Road, Headington
Oxford, OX3 8SZ
United Kingdom

Tel: (44 1865) 750 387
Fax: (44 1865) 741 538
E-mail:
normanmyers@gn.apc.org



Dr. Peter Raven

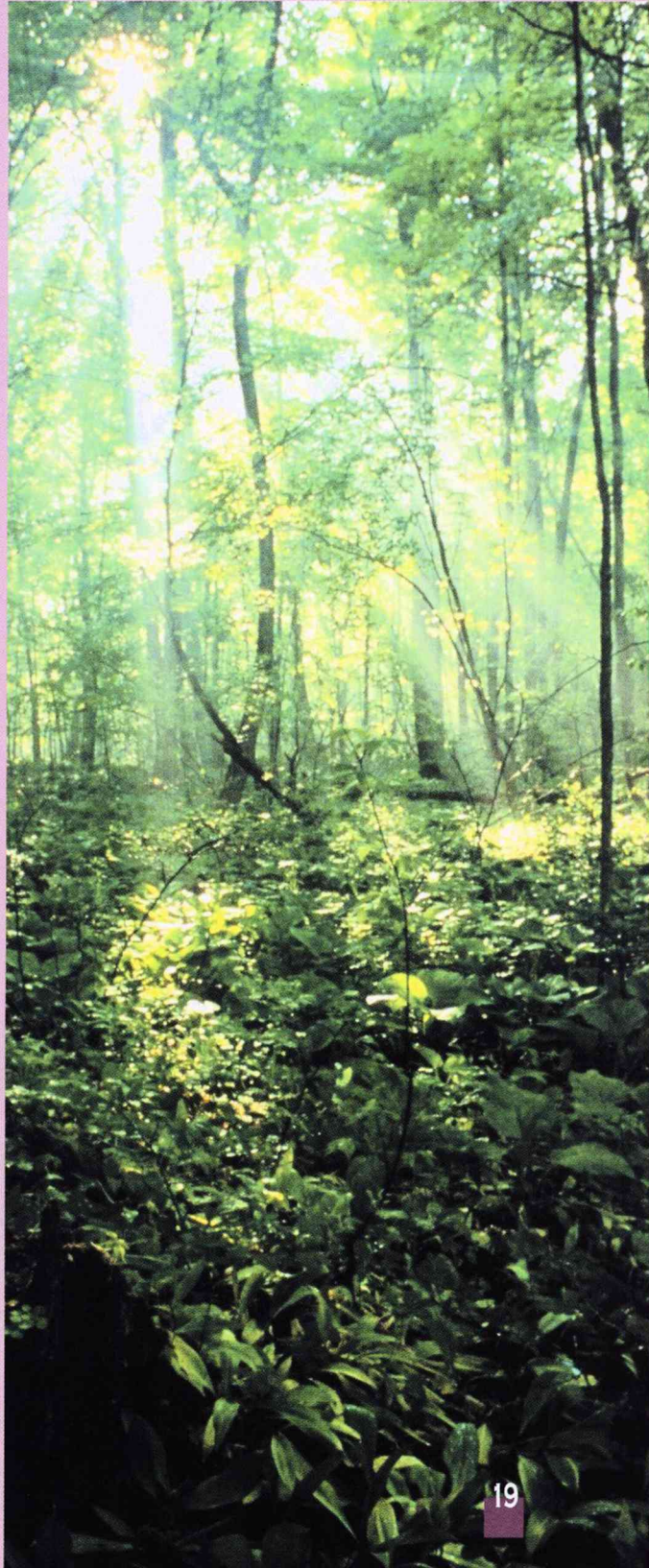
Dr. Peter Raven
Director
Missouri Botanical Garden
P. O. Box 299 St. Louis,
Missouri 63166
United States of America

Tel: (314) 577 5110/1
Fax: (314) 577 9595

Dr. Norman Myers and **Dr. Peter Raven** have been leaders in the environmental field for more than a quarter of a century. Each, in his own way, has worked tirelessly to address two major environmental problems affecting tropical forests and biological diversity. Over the years, they have broadened the scope of their activities to include population, poverty, desertification, global warming, consumption patterns, environmental economics and the North/South dialogue. They have each won a number of awards, and in 1992, their work was once again recognized when they shared the Volvo Environment Prize.

In the early 1970s, Dr. Myers and Dr. Raven undertook detailed research which demonstrated that humankind was indeed witnessing the mass extinction of species, among other forms of biodepletion. They immediately took their findings, together with a set of recommendations, to scientific and environmental leaders of major governments, in both developing and developed countries, and to a host of international agencies. As a result, the two problems which they decided to tackle became firmly established on the global agenda.

CO-WINNERS 1995



CO-WINNER 1995



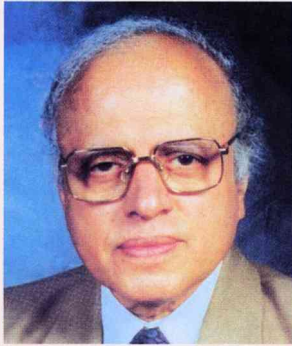
Professor Canaganayagan
Suriyakumaran
19A/2 Alfred Place
Colombo 3
Sri Lanka

Tel: (941) 574 912
Fax: (941) 574 879

*Professor Canaganayagan
Suriyakumaran*

Professor Canaganayagan Suriyakumaran is Chairman of the Centre for Regional Development Studies (CRDS) in his native Sri Lanka and a visiting Professor at the London School of Economics. He is considered a pioneer in the environmental field for shaping the nature of our responses to environmental challenges. He is responsible in great part for the new perception of multi-sectoralism with his observation long ago that "environment is not a sector, but a dimension in all sectors".

For more than 30 years, Professor Suriyakumaran has given his best to the environmental cause. He fostered and encouraged the involvement of non-governmental organizations within the wider context of their societies, and has played a key role in promoting global environmental programmes within the United Nations system. For his outstanding services to Asia, he was honoured by His Royal Highness the King of Thailand as a Knight Commander of the Most Noble Order of the Crown.



Dr. M. S. Swaminathan
Chairman
M. S. Swaminathan
Research Foundation
3rd Cross Street Taramani
Institutional Area
Madras 600113
India

Tel: (91 44) 235 1229/
235 1698
Fax: (91 44) 235 1319

Dr. M. S. Swaminathan

Dr. M. S. Swaminathan, Director of the Centre for Research on Sustainable Agricultural and Rural Development in Madras India has, for more than four decades, played a pivotal role in the conservation of biological diversity. As one of the world's leading agricultural scientists, he has played a catalytic role in his country's green revolution and in agricultural research and development.

Dr. Swaminathan is widely known as the father of the economic ecology movement and his research on the conservation of wild relatives of the potato, wheat and rice led to India developing a strong national food security system.

CO-WINNER 1994



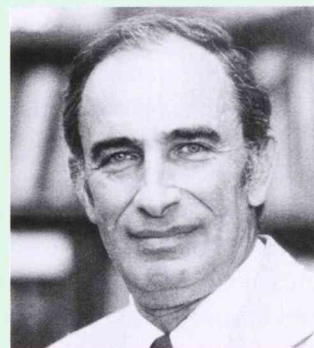
CO-WINNERS 1994

Anne and Paul Ehrlich
Department of Biological
Sciences
Stanford University
Stanford
California 94305-5020
United States of America

Tel: (415) 723 5920/
897 1408
Fax: (415) 493 2092



Anne Ehrlich



Paul Ehrlich

Anne and **Paul Ehrlich** are leading authorities on the issue of population and the environment. They have been an intellectual force whose works have had an unparalleled impact on the field of environmental science and policy. For more than a quarter of a century, they have systematically traced environmental deterioration to its root causes, projected the probable consequences of continued deterioration and proposed and analyzed the relative merits of alternative solutions. The Ehrlichs have always stressed the devastating impact of overconsumption in industrialized nations.

The Ehrlichs were awarded the Prize for greatly improving the quality of life on this planet, with their insightful analysis and articulate communication of environmental, social, scientific, economic and development issues.

Both the Ehrlichs and Dr. Swaminathan believe that gender equity is fundamental to the whole population issue. They have long emphasized the critical need to empower women, giving access to health care, education and economic opportunities.



Shouli Lin/UNEP



Dr. Mostafa Kamal Tolba
23 Fawzy El Ramah Street
Mohandseen 12411
Cairo
Egypt

Tel: (202) 269 5800/
706 044
Fax: (202) 269 1267
E-mail: iced@intouch.com

Dr. Mostafa Kamal Tolba

Dr. Mostafa Kamal Tolba world renowned scientist and for 17 years Executive Director of the United Nations Environment Programme (UNEP), has been an eloquent and tireless defender of the environment for most of his life.

Born in Egypt, a country whose economy depends on the waters of a river that flows through other states, made him aware of the link between environment and politics. He has always believed that common environmental interests should override political differences, even conflicts between nations.

In 1972, he led his country's delegation to the Stockholm Conference on the Human Environment, which gave rise to UNEP. It is to his leadership that much of the credit for directing the environment to the forefront of global thinking and action is due. He applied his belief that environmental decisions are inseparable from socio-political decisions in all his consultations with political leaders.

His negotiating skills and scientific knowledge contributed to UNEP's most widely acclaimed success - the historic 1988 agreement to protect the ozone layer - the Montreal Protocol. The Protocol is recognized as setting a precedent for preventive rather than corrective environmental action.

At the Earth Summit in Brazil, he was at the helm of the negotiations when the Conventions on Climate Change and Biological Diversity were signed. He also successfully worked for treaties to protect the Mediterranean Sea, the Red Sea and

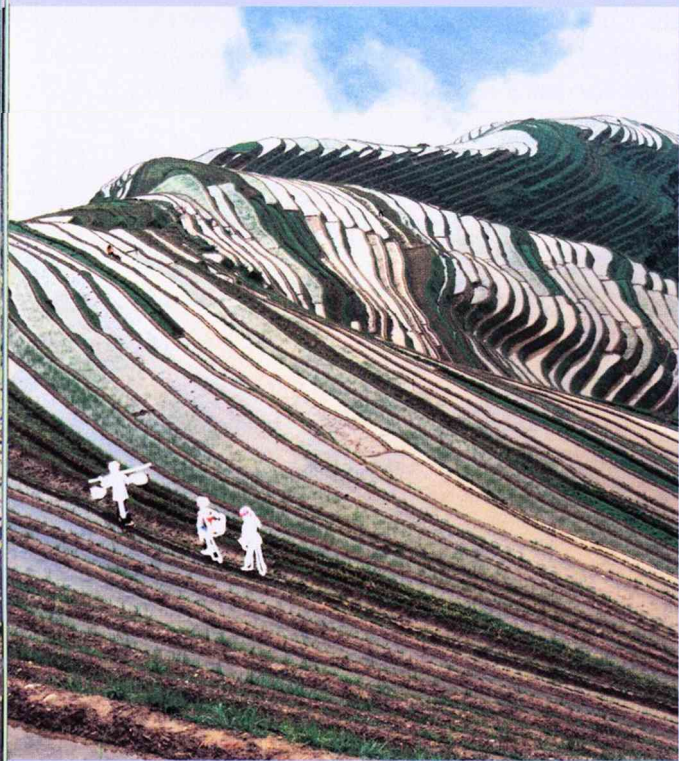
WINNER 1993

the Gulf of Aden. During the Iran-Iraq conflict he often had the warring parties at the same negotiating table discussing common environmental interests.

In making its selection, the Committee noted that although Dr. Mostafa Tolba, as Executive Director of UNEP, was in a privileged position he went far beyond the call of duty in his commitment, dedication and contributions to the protection of the environment.



CO-WINNER 1992



Zhan Huang/UNEP

Professor Qu Geping, currently Chairman of the Committee of Environmental and Natural Resource Conservation, National People's Congress, was for nine years Administrator of the National Environmental Protection Agency of The People's Republic of China. His outstanding contributions in promoting and supporting environmental protection in China have been exemplary.

In a country where industry is still largely underdeveloped, he has, for some 20 years, been instrumental in putting forward measures designed to integrate environmental protection policies within economic and industrial development

Professor Qu Geping
Chairman
Committee of Environmental
and Natural Resource
Conservation
National People's Congress
No. 2 Xihuangchenggen
Beijing 100085
The People's Republic of
China

Tel: (86-10) 6309 8421
Fax: (86-10) 6309 8439



Professor Qu Geping

strategies. His work has embraced environmental management, legislation, education and industrial pollution prevention and reduction.

Through his activities as a lecturer, broadcaster and publisher of many papers he has increased the level of environmental awareness throughout the vast territory of China.

A believer in scientific and technological solutions to environmental problems, Professor Qu Geping's response to the serious environmental problems facing the industrialization of China has been practical and realistic and has served as an example to other developing countries.

The Prize Selection Committee described the 1992 shared award as drawing attention "to the problems caused by rampant and careless industrialization faced by the countries of the newly created Commonwealth of Independent States, and to the challenges of emerging industrialization now being experienced by China, the world's most populous country".

Prof. Qu Geping was also Director-General of the Department of Environmental Protection in the Ministry of Urban and Rural Construction and Environmental Protection and Vice Chairman of the Leading Group of Environmental Protection under the State Council of China.



Professor Yuri Izrael
Pavlik Morozov 12
Moscow
Russian Federation

Tel: (7095) 169 2430
Fax: (7095) 160 0831

Professor Yuri Izrael

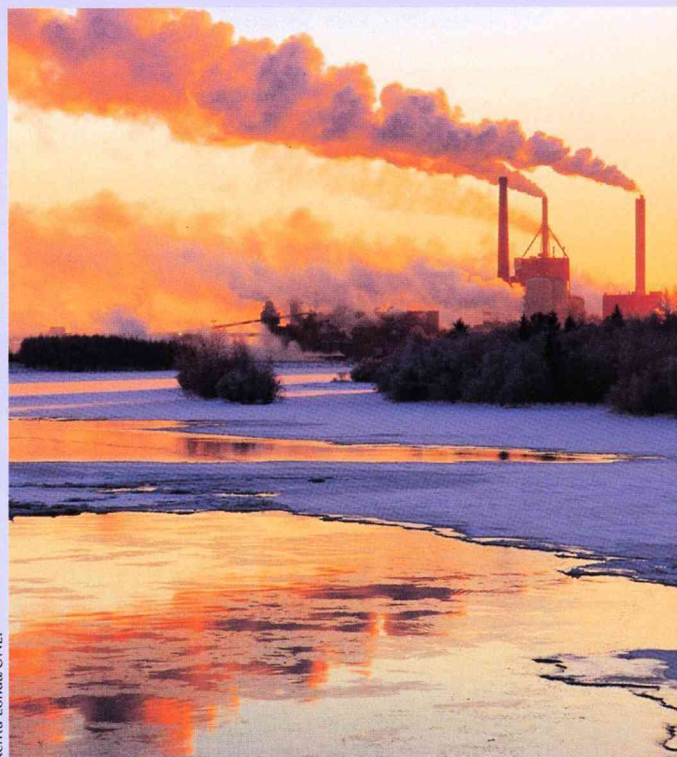
Professor Yuri Izrael, a scientist, is former Chairman of the Committee for Hydrometeorology – the central organization for the provision of natural disaster warnings throughout the former Soviet Union. He is Director of the Institute of Global Climate and Ecology, which is part of the Russian Academy of Sciences.

As the first and two-term Vice-President of the World Meteorological Organization (WMO), he helped to develop World Weather Watch, an international programme designed to improve the weather services of the various nations of the world, particularly developing countries. He is an expert in the fields of ecology, geophysics, chemistry of the atmosphere, oceanology and geography and has devoted many years to the cause of natural environment protection in his country.

He showed remarkable courage in visiting the Chernobyl site on the second day of the disaster. He continued to work in the Chernobyl area, measuring the radiation situation and studying the impact of radioactive contamination on the natural environment - and subsequently spent nearly four months in hospital. Later, President Gorbachev awarded him his country's highest honour.

His scientific and organizational skills have contributed to the success of Working Group II (Impact Assessment) of the Intergovernmental Panel on Climate Change (IPCC), sponsored jointly by WMO and UNEP.

CO-WINNER 1992



Kerstu Lohua/UNEP

WINNERS 1991

No two people have done more to strengthen the position of international and national environmental law as a fundamental element of environmental management, than **Wolfgang Burhenne** and **Françoise Guilmin Burhenne**. They have been directly involved in nearly all the major international conventions concerned with conservation over the past 25 years, and to the development of the World Conservation Union (IUCN) Environmental Law Centre in Bonn. Under the direction of Dr. Burhenne-Guilmin, the Centre has accumulated the world's most extensive collection of environmental legislative texts.

The couple's first venture together was helping the Organization of African Unity (OAU) establish the Algiers Conservation Convention in 1968. Dr. Burhenne was one of 12 signatories to the Morges Manifesto which established the World Wide Fund for Nature (WWF) in 1961. The insights and skills of the Burhennes were essential to the creation of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) in 1973, the World Charter for Nature, adopted by the United Nations General Assembly in 1982, and the Association of South-East Asian Nations (ASEAN) Agreement on the Conservation of Nature and Natural Resources in 1985.

Drs. Wolfgang Burhenne and
Françoise Burhenne-Guilmin
Postfach 120369
Adenauerallee 214
D-53113 Bonn
Germany

Tel: (49 228) 269 2216/
269 2231

Fax: (49 228) 269 2250
/51/52/53

E-mail: <1006511/
317@compuserve.com > or
<iucn.elc@wunsch.com>



*Drs. Wolfgang Burhenne
and Françoise Burhenne-
Guilmin*





*Francisco "Chico"
Mendes*

Francisco "Chico" Mendes
Filho (deceased)
c/o Instituto de
Estudos Amazonicos e
Ambiente - (IEA)
Rua Monte Castelo
380 Taruma, 82530-200
Curitiba Parana
Brazil

Tel: (041) 262 9494
Fax: (041) 264 7152

WINNER 1990

The murder of **Francisco "Chico" Mendes** in December 1988 reinforced the significance of his efforts to protect the Brazilian rainforest. As President of the Rural Workers' Union of Brazil, Chico Mendes led the fight against the cattle ranchers' destruction of the rainforest, on which the livelihoods, and even survival, of the indigenous forest people and rubber tappers depend. He also called for new approaches to land reform and the establishment of special "extractive reserves" within the forests.

He became a world-renowned environmentalist in the mid-1980s as a result of his flair for campaigning and his ability to draw attention to the rubber tappers' plight. His ability to link ecology and society's needs guided future efforts to achieve sustainable development.



Joseph Earnest Shumaker III/UNEP

WINNER 1989

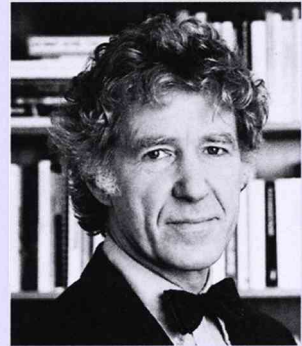
Dr. Lester R. Brown, recipient of a MacArthur Foundation "genius award", has been described as "one of the world's most influential thinkers" by the *Washington Post* and the "guru of the global environmental movement" by *The Telegraph* of Calcutta.

The Library of Congress has requested his personal papers and manuscripts, recognizing the role of his work and that of the Worldwatch Institute under his direction in shaping the global environmental movement. The annual State of the World report published by Dr. Brown has a circulation of more than 100,000 in English alone. It is published in 10 languages by the Worldwatch Institute, which he founded in 1974.

Dr. Brown began his working life as a New Jersey tomato farmer, later becoming an analyst and commentator on international agricultural issues. He has written several books on agriculture and the environment. The UNEP Sasakawa

Dr. Lester R. Brown
Earth Policy Institute
1350 Connecticut Avenue,
NW
Suite 403
Washington, D.C. 20036
United States of America

Tel: (202) 496 9290
E-mail:
rjkauffman@earth-policy.org



Dr. Lester R. Brown

Environment Prize Committee paid tribute to his writings which "over the years have been outstanding in teaching about threats to the biosphere".

In 1974 he founded the Worldwatch Institute. In 1991, he inaugurated the Environmental Alert series of books, with *Saving the Planet: How to Shape an Environmentally Sustainable Global Economy*.

In May 2001, he founded Earth Policy Institute, an organization dedicated to disseminating information on building an environmentally sustainable economy, an eco-economy.



World Commission on
Environment and
Development
c/o Dr. Gro Harlem
Brundtland
World Health
Organization
1211 Geneva 27
Switzerland

Tel: (41-22) 791 21 11
Fax: (41-22) 791 07 46
E-mail:
brundtland@who.ch

*World Commission on
Environment and
Development*

Our Common Future, the 1987 **World Commission on Environment and Development** report, was hailed as the most important document of the decade. The 21-member Commission had been charged by the United Nations General Assembly, on recommendations of the Governing Council of UNEP, with formulating a “global agenda for change”.

CO-WINNER 1988

After hearing evidence from public meetings held on all five continents over three years, its recommendations included environmental strategies for achieving sustainable development by the year 2000 and beyond. The Commission, chaired by former Norwegian Prime Minister Mrs. Gro Harlem Brundtland, was praised by the UNEP Sasakawa Environment Prize Selection Committee for its “valuable analysis of environmental problems and positive guidance for their solution”.

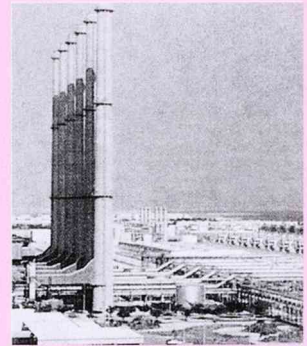
Yanin Tolertmongkol/UNEP



CO-WINNER 1988

Royal Commission for
Jubail and Yanbu, Saudi
Arabia
c/o Meteorology and
Environmental Protection
Administration (MEPA)
P. O. Box 1358
Jeddah
Kingdom of Saudi Arabia

Tel: (966 2) 651 2312
Fax: (966 2) 651 1424



*Royal Commission for
Jubail and Yanbu, Saudi
Arabia*

The towns of **Jubail** and **Yanbu** in Saudi Arabia are believed to be among the most environmentally clean of any comparable urban concentrations in the world – testimony to the work from 1975 of the towns' Royal Commission, which became a blueprint for successful environmentally conscious urban growth in the developing world.

As a result of the Commission's work, monitoring and analysis of air, land and sea takes place constantly in the two towns, located on opposite sides of the Arabian Peninsula. The UNEP Sasakawa Environment Prize Selection Committee honoured the "excellent planning and implementation of environmentally-sound management of the two industrial complexes".



Bernd Blume/UNEP



Prof. Elisabeth Mann
Borgese
c/o Department of
Political Science
Dalhousie University
Halifax, Nova Scotia B3H
3P7
Canada

Tel: (902) 494 1737
Fax: (902) 494 2034
E-mail: ioihfx@dal.ca

Elisabeth Mann Borgese

After escaping from Nazi Germany in 1933, **Elisabeth Mann Borgese**, youngest daughter of the great German writer Thomas Mann, became a world-renowned scholar in the fields of international relations, law of the sea and marine environment. In 1970, she organized the first of many Pacem in Maribus meetings in which she was involved in bringing together more than 200 key figures in law of the sea development. Two years later she was a key participant in the formation of an International Ocean Institute at the Royal University of Malta. She has attended most United Nations meetings on the Law of the Sea since 1968.

Mrs. Mann Borgese is President of the International Ocean Institute and Professor of Political Science at Dalhousie University in Canada. It was in 1967, while serving as a Fellow of the Centre for Democratic Institutions, that she shifted her focus to the law of the sea, which she recognized as an area of growing environmental crisis and a possible testbed for ideas she had developed concerning a common global constitution.

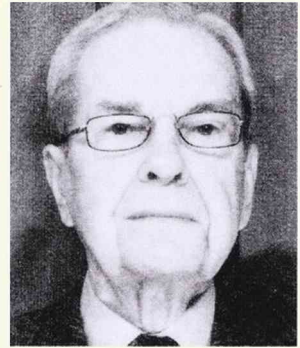
CO-WINNER 1987



CO-WINNER 1987



Pham Nguyen Tung, Nguyen/UNEP



*Professor
Nicholas Polunin*

Professor Nicholas
Polunin (deceased)
7 Chemin Taverney
1218 Grand-Saconnex,
Geneva
Switzerland

Tel: (41 22) 798 2383/
798 2384
Fax: (41 22) 798 2344

Professor Nicholas Polunin has been a towering figure in the environment movement for more than 35 years and has written more than 400 research and scientific papers and books. He has taught at Oxford University in England, lectured at Yale and Brandeis Universities, was Professor of Botany at McGill University and at the Universities of Baghdad and Ife. He is widely recognized as a leading authority on Arctic botany and ecology and has arranged many conferences to seek solutions to problems related to his field.

He created the Foundation for Environment Conservation, whose journal he originally financed and published. He also played a part in establishing the International Society for Environmental Education. His vision has latterly embraced the outer reaches of the biosphere and a culmination of this sustained effort was the creation of an international annual Biosphere Day on 21 September, which started in 1991.



*Mweka College of
African Wildlife
Management*

Mweka College of African
Wildlife Management
P. O. Box 3031
Moshi
United Republic of
Tanzania

Tel: c/o Kibosho 18

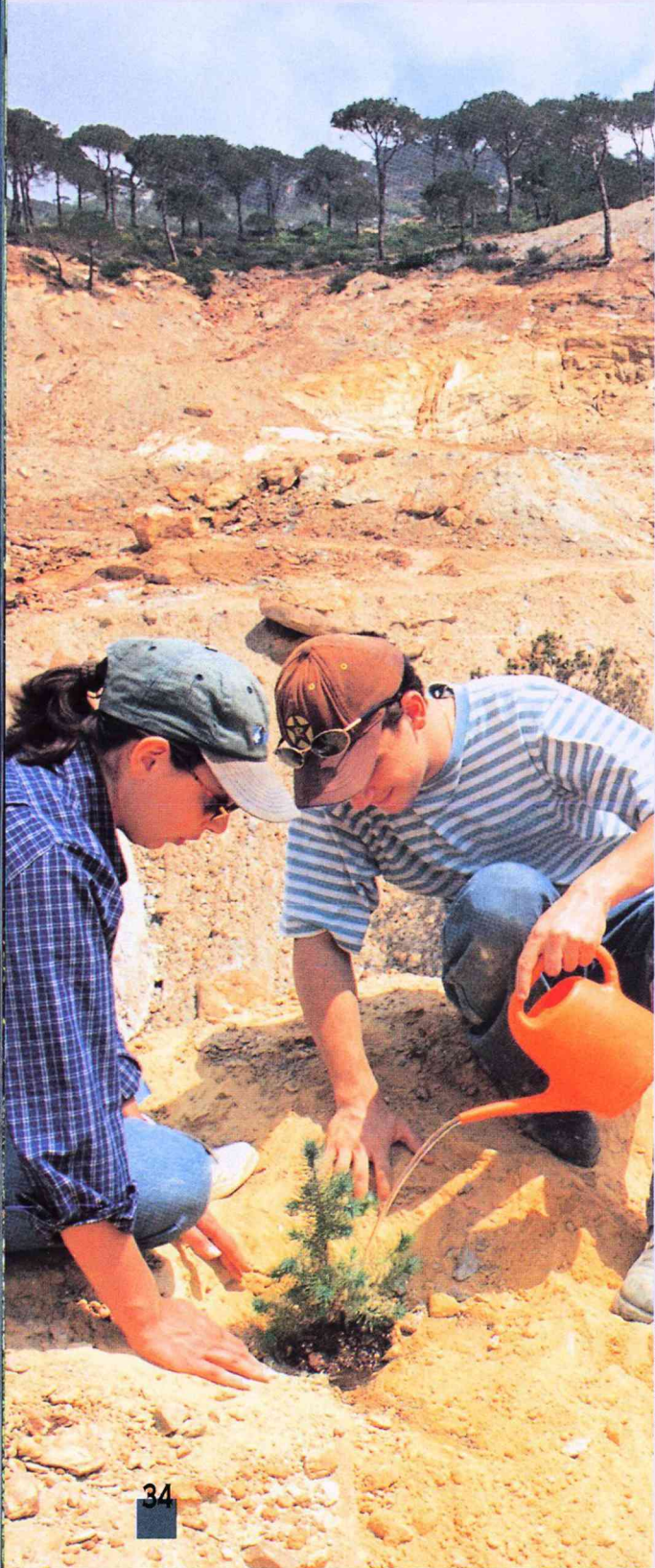
Virtually every east and central African national park has on its staff graduates from **Mweka College** in the United Republic of Tanzania. Sensitive and skilled management is needed for Africa's wildlife population to be sustained as an economic and ecological resource. It was to this end that the College was established in 1963. Today, it runs full-time courses in natural sciences, wildlife management and estate management, and produces a ready and replenishable local source of expertise in wildlife and national park management.

Mweka College operates under the auspices of the Tanzania Ministry of National Resources and Tourism, with funding mainly from fees paid by governments and other bodies to support students at the college and with further assistance provided by UNEP and other international organizations.

WINNER 1986

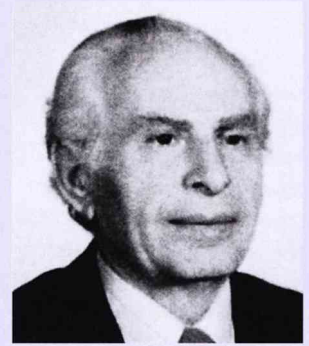


CO-WINNER 1985



Lina Nasr/UNEP

Hassan Asmaz
President
Turkish Association for the
Conservation of
Nature and Natural
Resources
2 CAD No/65/5
Bachcelievler, Ankara
Turkey



Hassan Asmaz

Hassan Asmaz's lifelong campaign to improve the environment of his native Turkey has taken him from the remotest villages to the heart of his national Government. It is largely thanks to him that Turkey's children study nature and conservation as part of their primary and secondary school curriculum. He has led national campaigns to combat soil erosion, has helped prohibit the hunting of several rare and endangered bird and animal species, and has been the driving force behind many other public campaigns to promote environmental awareness in Turkey.

In 1955, he helped establish the Turkish Association for the Conservation of Nature and Natural Resources. It was accepted into the World Conservation Union (IUCN) in 1963 and two years later Mr. Asmaz became its President.

He received the Turkish Prime Minister's Environment, Friendship and Service Award in 1988, and the Turkish Conservation of Nature Reward of Service in 1989.



Prof. Gilbert White
Director
Institute of Behavioural
Science
University of Colorado
Boulder, Colorado 80309
United States of America

Tel: (303) 492 6311

Professor Gilbert White

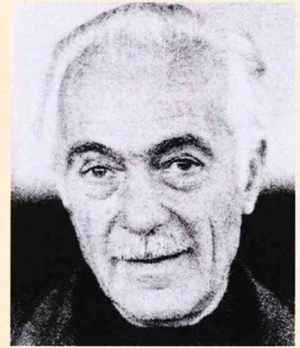
As a member of many advisory groups concerned with greenhouse gases, nuclear waste disposal, water and man's relationship with the biosphere, **Professor Gilbert White** strives to promote understanding of the implications for human welfare of basic environmental processes. Perhaps his most significant contribution in the field of the environment has been his work on the behavioural aspects of natural hazards research.

He has been Director of the Natural Hazards Research Applications and Information Center at Colorado University, President of Haverford College, Professor of Geography at Chicago and Colorado Universities and a visiting Professor at Oxford University in England. He has been active in floodplain management and domestic water usage in developing countries and has collaborated extensively with UNEP, the United Nations Integrated River Development scheme and in World Bank programmes for water and the urban poor.

CO-WINNER 1985



WINNER 1984



Dr. Aurelio Peccei
(deceased)

Dr. Aurelio Peccei

The inaugural UNEP Sasakawa Environment Prize was awarded posthumously to **Dr. Aurelio Peccei**, who died just two months before the Prize Selection Committee announced its decision to recognize the outstanding contribution the former industrialist had made to defend the environment. He saw the urgency of the problems of man's relationship with nature and the dangers of the growing gulf between rich and poor. Dr. Peccei had been a member of the boards of several of Italy's leading companies and in his new role turned the Club of Rome, which he had helped found, into one of the world's leading bodies promoting sustainable and fair development. Dr. Peccei gave tirelessly to the causes which he espoused, as a member of the UNESCO Panel of Counselors on Major World Problems; a member of the Governing Council of the Society for International Development; a member of the Board of Trustees of the Foundation for the International Training for Third World Countries; and as a member of the Friends of the Earth Advisory Council.



Thylen Nguyen/UNEP

NOMINATION FORM 2002

UNEP Sasakawa Environment Prize

N.B. NO PERSON MAY NOMINATE HIMSELF OR HERSELF

NOMINEE (name in full) _____

DATE OF BIRTH _____

PLACE OF BIRTH _____

NATIONALITY _____

ADDRESS _____

Telephone: _____ Telefax: _____ E-mail: _____

PRESENT OCCUPATION _____

EDUCATION _____

CURRICULUM VITAE (please attach an up-to-date Curriculum Vitae)

HONOURS /AWARDS _____

PUBLICATIONS (list publications considered most relevant for the purpose of the Prize)

SUMMARY Provide below a brief summary (of 500 words) explaining why the nominee should receive the Prize

NOMINATION FORM 2002

UNEP Sasakawa Environment Prize

NOMINATOR

NAME (in full) _____

ADDRESS _____

Telephone: _____ Telefax: _____ E-mail: _____

PROFESSION _____

DATE _____

SIGNATURE _____

References: Provide three persons, not related to the nominee, who are familiar with the nominee's qualifications and work.

REFEREE

NAME (in full) _____

ADDRESS _____

PROFESSION _____

Telephone: _____ Telefax: _____ E-mail: _____

REFEREE

NAME (in full) _____

ADDRESS _____

PROFESSION _____

Telephone: _____ Telefax: _____ E-mail: _____

REFEREE

NAME (in full) _____

ADDRESS _____

PROFESSION _____

Telephone: _____ Telefax: _____ E-mail: _____

Deadline for submission: 30 April 2002

Please send the nomination form (typed or in block letters) and relevant materials to:

The Secretary

UNEP Sasakawa Environment Prize

United Nations Environment Programme

Division of Communications and Public Information

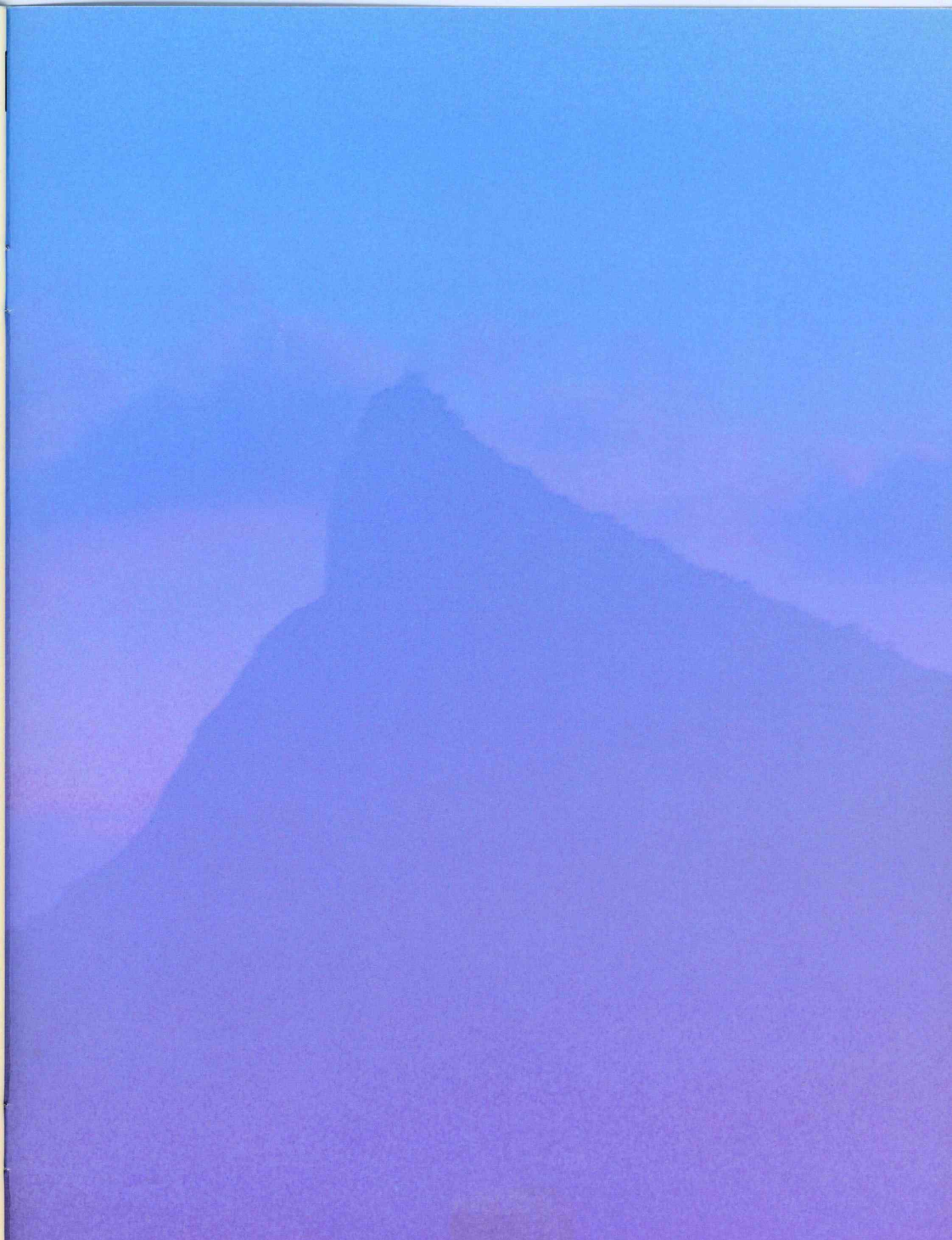
P.O. Box 30552, Nairobi, Kenya

Tel: (254 2) 62 3401 or 62 3128

Fax: (254 2) 62 3692 or 62 3927

E-mail: cpinfo@unep.org

Web site: <http://www.unep.org>



Cover photo: Roberto Gomes/UNEP

**United Nations Environment Programme
Division of Communications and Public Information**

P.O. Box 30552, Nairobi, Kenya

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Web site: <http://www.unep.org>



UNEP



Printed on environmentally-friendly paper

Protocol for the Prevention and Elimination of Pollution of the Mediterranean Sea by Dumping from Ships and Aircraft or Incineration at Sea¹

The Contracting Parties to the present Protocol,

Being Parties to the Convention for the Protection of the Mediterranean Sea against Pollution,

Recognizing the danger posed to the marine environment by the dumping or incineration of wastes or other matter,

Considering that the coastal States of the Mediterranean Sea have a common interest in protecting the marine environment from this danger,

Bearing in mind that Chapter 17 of Agenda 21 of UNCED calls on the Contracting Parties to the Convention on the Prevention of Marine Pollution by Dumping of Wastes and other Matter (London, 1972) to take the necessary measures to end dumping in the ocean and the incineration of hazardous substances,

Taking into account Resolutions LC 49(16) and LC 50(16), approved by the 16th Consultative Meeting of the 1972 London Convention, which prohibit the dumping and incineration of industrial wastes at sea,

Have agreed as follows:

Article 1

The Contracting Parties to this Protocol (hereinafter referred to as "the Parties") shall take all appropriate measures to prevent, abate and eliminate to the fullest extent possible pollution of the Mediterranean Sea caused by dumping from ships and aircraft or incineration at sea.

object

¹ The Protocol for the Prevention of Pollution of the Mediterranean Sea by Dumping from Ships and Aircraft (the Dumping Protocol) was adopted on 16 February 1976 by the Conference of Plenipotentiaries of the Coastal States of the Mediterranean Region for the Protection of the Mediterranean Sea, held in Barcelona. The Protocol entered into force on 12 February 1978.

The original Protocol was modified by amendments adopted on 10 June 1995 by the Conference of Plenipotentiaries on the Convention for the Protection of the Mediterranean Sea against Pollution and its Protocols, held in Barcelona on 9 and 10 June 1995 (UNEP(OCA)/MED IG.6/7). The amended Protocol, recorded as "Protocol for the Prevention and Elimination of Pollution of the Mediterranean Sea by Dumping from Ships and Aircraft or Incineration at Sea", has not yet entered into force.

Article 2

The area to which this Protocol applies shall be the Mediterranean Sea Area as defined in Article 1 of the Convention for the Protection of the Marine Environment and the Coastal Region of the Mediterranean (hereinafter referred to as "the Convention").

Article 3

For the purposes of this Protocol:

1. "Ships and aircraft" means waterborne or airborne craft of any type whatsoever. This expression includes air-cushioned craft and floating craft, whether self-propelled or not, and platforms and other man-made structures at sea and their equipment.
2. "Wastes or other matter" means material and substances of any kind, form or description.
3. "Dumping" means:
- (a) Any deliberate disposal at sea of wastes or other matter from ships or aircraft;
 - (b) Any deliberate disposal at sea of ships or aircraft.
 - (c) Any deliberate disposal or storage and burial of wastes or other matter on the seabed or in the marine subsoil from ships or aircraft.
4. "Dumping" does not include:
- (a) The disposal at sea of wastes or other matter incidental to, or derived from, the normal operations of vessels or aircraft and their equipment, other than wastes or other matter transported by or to vessels or aircraft, operating for the purpose of disposal of such matter, or derived from the treatment of such wastes or other matter on such vessels or aircraft;
 - (b) Placement of matter for a purpose other than the mere disposal thereof, provided that such placement is not contrary to the aims of this Protocol.
5. "Incineration at sea" means the deliberate combustion of wastes or other matter in the maritime waters of the Mediterranean Sea, with the aim of thermal destruction and does not include activities incidental to the normal operations of ships or aircraft.
6. "Organization" means the body referred to in article 17 of the Convention.

definitus

Article 4

1. The dumping of wastes or other matter, with the exception of those listed in paragraph 2 of this Article, is prohibited.

2. The following is the list referred to in the preceding paragraph:

- (a) dredged material;
- (b) fish waste or organic materials resulting from the processing of fish and other marine organisms;
- (c) vessels, until 31 December 2000;
- (d) platforms and other man-made structures at sea, provided that material capable of creating floating debris or otherwise contributing to pollution of the marine environment has been removed to the maximum extent, without prejudice to the provisions of the Protocol concerning Pollution Resulting from Exploration and Exploitation of the Continental Shelf, the Seabed and its Subsoil;
- (e) inert uncontaminated geological materials the chemical constituents of which are unlikely to be released into the marine environment.

Article 5

The dumping of the wastes or other matter listed in Article 4.2 requires a prior special permit from the competent national authorities.

Article 6

1. The permit referred to in Article 5 shall be issued only after careful consideration of the factors set forth in the Annex to this Protocol or the criteria, guidelines and relevant procedures adopted by the meeting of the Contracting Parties pursuant to paragraph 2 below:

2. The Contracting Parties shall draw up and adopt criteria, guidelines and procedures for the dumping of wastes or other matter listed in Article 4.2 so as to prevent, abate and eliminate pollution.

Article 7

Incineration at sea is prohibited.

Article 8

The provisions of articles 4, 5 and 6 shall not apply in case of *force majeure* due to stress of weather or any other cause when human life or the safety of a ship or aircraft is threatened. Such dumpings shall immediately be reported to the Organization and, either through the Organization or directly, to any Party or Parties likely to be affected, together with full details of the circumstances and of the nature and quantities of the wastes or other matter dumped.

Article 9

If a Party in a critical situation of an exceptional nature considers that wastes or other matter not listed in Article 4.2 of this Protocol cannot be disposed of on land without unacceptable danger or damage, above all for the safety of human life, the Party concerned shall forthwith consult the Organization. The Organization, after consulting the Parties to this Protocol, shall recommend methods of storage or the most satisfactory means of destruction or disposal under the prevailing circumstances. The Party shall inform the Organization of the steps adopted in pursuance of these recommendations. The Parties pledge themselves to assist one another in such situations.

Article 10

competent authorities

1. Each Party shall designate one or more competent authorities to:
 - (a) Issue the permits provided for in Article 5;
 - (b) Keep records of the nature and quantities of the wastes or other matter permitted to be dumped and of the location, date and method of dumping.
2. The competent authorities of each Party shall issue the permits provided for in Article 5 in respect of the wastes or other matter intended for dumping:
 - (a) Loaded in its territory;
 - (b) Loaded by a ship or aircraft registered in its territory or flying its flag, when the loading occurs in the territory of a State not Party to this Protocol.

Article 11

jurisdiction



1. Each Party shall apply the measures required to implement this Protocol to all:
 - (a) Ships and aircraft registered in its territory or flying its flag;
 - (b) Ships and aircraft loading in its territory wastes or other matter which are to be dumped;
 - (c) Ships and aircraft believed to be engaged in dumping in areas under its jurisdiction in this matter.

Article 12

current instruments used to enforce:

Each Party undertakes to issue instructions to its maritime inspection ships and aircraft and to other appropriate services to report to its authorities any incidents or conditions in the Mediterranean Sea Area which give rise to suspicions that dumping in contravention of the provisions of this Protocol has occurred or is about to occur. That Party shall, if it considers it appropriate, report accordingly to any other Party concerned.

Article 13

Nothing in this Protocol shall affect the right of each Party to adopt other measures, in accordance with international law, to prevent pollution due to dumping.

Article 14

1. Ordinary meetings of the Parties to this Protocol shall be held in conjunction with ordinary meetings of the Contracting Parties to the Convention held pursuant to article 18 of the Convention. The Parties to this Protocol may also hold extraordinary meetings in conformity with article 18 of the Convention.

2. It shall be the function of the meetings of the Parties to this Protocol:

(a) To keep under review the implementation of this Protocol, and to consider the efficacy of the measures adopted and the need for any other measures, in particular in the form of annexes;

(b) To study and consider the records of the permits issued in accordance with articles 5, 6 and 7 and of the dumping which has taken place;

(c) To review and amend as required any annex to this Protocol;

(d) To discharge such other functions as may be appropriate for the implementation of this Protocol.

3. The adoption of amendments to the Annex to this Protocol pursuant to Article 23 of the Convention shall require a three-fourths majority vote of the Parties.

Article 15

1. The provisions of the Convention relating to any protocol shall apply with respect to the present Protocol.

2. The rules or procedure and the financial rules adopted pursuant to article 24 of the Convention shall apply with respect to this Protocol, unless the Parties to this Protocol agree otherwise.

IN WITNESS WHEREOF the undersigned, being duly authorized by their respective Governments, have signed this Protocol.

DONE at Barcelona on 16 February 1976 in a single copy in the Arabic, English, French and Spanish languages, the four texts being equally authoritative.

ANNEX

The factors to be considered in establishing criteria governing the issue of permits for the dumping of matter at sea taking into account Article 6 include:

A. CHARACTERISTICS AND COMPOSITION OF THE MATTER

1. Total amount and average compositions of matter dumped (e.g. per year).
2. Form (e.g. solid, sludge, liquid or gaseous).
3. Properties: physical (e.g. solubility and density), chemical and biochemical (e.g. oxygen demand, nutrients) and biological (e.g. presence of viruses, bacteria, yeasts, parasites).
4. Toxicity.
5. Persistence: physical, chemical and biological.
6. Accumulation and biotransformation in biological materials or sediments.
7. Susceptibility to physical, chemical and biochemical changes and interaction in the aquatic environment with other dissolved organic and inorganic materials.
8. Probability of production of taints or other changes reducing marketability of resources (fish, shellfish, etc.).

B. CHARACTERISTICS OF DUMPING SITE AND METHOD OF DEPOSIT

1. Location (e.g. coordinates of the dumping area, depth and distance from the coast), location in relation to other areas (e.g. amenity areas, spawning, nursery and fishing areas and exploitable resources).
2. Rate of disposal per specific period (e.g. quantity per day, per week, per month).
3. Methods of packaging and containment, if any.
4. Initial dilution achieved by proposed method of release, particularly the speed of the ship.
5. Dispersal characteristics (e.g. effects of currents, tides and wind on horizontal transport and vertical mixing).
6. Water characteristics (e.g. temperature, pH, salinity, stratification, oxygen indices of pollution-dissolved oxygen (DO), chemical oxygen demand (COD), biochemical oxygen demand (BOD), nitrogen present in organic and mineral form, including ammonia, suspended matter, other nutrients and productivity).

7. Bottom characteristics (e.g. topography, geochemical and geological characteristics and biological productivity).

8. Existence and effects of other dumpings which have been made in the dumping area (e.g. heavy metal background reading and organic carbon content).

9. When issuing a permit for dumping, the Contracting Parties shall endeavour to determine whether an adequate scientific basis exists for assessing the consequences of such dumping in the area concerned, in accordance with the foregoing provisions and taking into account seasonal variations.

C. GENERAL CONSIDERATIONS AND CONDITIONS

1. Possible effects on amenities (e.g. presence of floating or stranded material, turbidity, objectionable odour, discolouration and foaming).

2. Possible effects on marine life, fish and shellfish culture, fish stocks and fisheries, sea-weed harvesting and culture.

3. Possible effects on other uses of the sea (e.g. impairment of water quality for industrial use, underwater corrosion of structures, interference with ship operations from floating materials, interference with fishing or navigation through deposit of waste or solid objects on the sea floor and protection of areas of special importance for scientific or conservation purposes).

4. The practical availability of alternative land-based methods of treatment, disposal or elimination or of treatment to render the matter less harmful for sea dumping.



"UNEP AND THE PRIVATE SECTOR"

Wanda Hoskin
UNEP Division of Technology, Industry and
Economics(DTIE)

*Presentation at Fourth Global Meeting of
Regional Seas Conventions and Action Plans
Montreal, 21-23 November 2001*





UNEP and the private sector

The Business Challenge

*The problems we have today cannot be solved by
thinking the way we thought when we created
them. Einstein*

*Business must be profitable to survive, but it must
also face the call to become sustainable to
enable us all to survive. Brundtland*

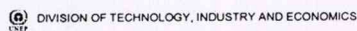




UNEP and the private sector

The Malmo Ministerial Declaration

- ❖ private sector recognized as having significant impact on environmental trends through
- ❖ need for increased private sector commitment
 - ▮ polluter-pays principle
 - ▮ precautionary approach in investment & technology decisions
 - ▮ life cycle economy approach






UNEP and the private sector

Role of the Private Sector

- ❖ technology innovation/transfer/cooperation
- ❖ supply chain management
- ❖ precautionary approach
- ❖ partnerships
- ❖ accountability and transparency
- ❖ new corporate governance
- ❖ equitable sharing of benefits

 DIVISION OF TECHNOLOGY, INDUSTRY AND ECONOMICS



UNEP and the private sector

UNEP's Objective:

encourage decision makers in industry and business to develop policies, strategies and technologies that are:

- ❖ cleaner and safer
- ❖ make efficient use of natural resources
- ❖ reduce risks to human health and the environment

 DIVISION OF TECHNOLOGY, INDUSTRY AND ECONOMICS



UNEP and the private sector

Approach:

- ❖ improve knowledge and raise awareness:
- ❖ build consensus on policies and practices
- ❖ information exchange technology transfer
- ❖ build capacities
- ❖ evaluate

 DIVISION OF TECHNOLOGY, INDUSTRY AND ECONOMICS




UNEP and the private sector

Tools:

publications (paper, CD ROM)

- *Industry and environment review*

- ❖ **Web sites** -MRF, Chemicals, OEF, Chemicals, SANET
- ❖ **regular consultations**
- ❖ **voluntary initiatives**
tourism, telecommunication, financial services...
- ❖ **Global Reporting Initiative (GRI)**

 DIVISION OF TECHNOLOGY, INDUSTRY AND ECONOMICS



UNEP and the private sector

Partnerships:

- ❖ **contribution to the Secretary-General's Global Compact**
- ❖ **partnership building**
 - National Cleaner Production Centers
 - Network of Sustainable Energy Centers
- ❖ **input to WSSD**
catalyze preparation of 22 sectoral reports

 DIVISION OF TECHNOLOGY, INDUSTRY AND ECONOMICS

Tour Operators' Initiative for Sustainable Tourism Development



- **Catalyzes action**
- **Provides neutral platform for discussion**
- **Gives motivation and guidance**



Tour Operators Initiative

- ❖ for tour operators by tour operators
- ❖ fully participatory, self-governing and voluntary
- ❖ big & small operators worldwide
- ❖ neutral & transparent
- ❖ based on internal auditing & self reviewing using recognized reporting principles
- ❖ not for profit

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Tour Operators Initiative



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Cleaner Production

Cleaner Production in GPA

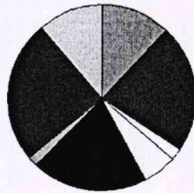
- ❖ GPA is based on an agreement *to apply preventative, precautionary and anticipatory approaches so as to avoid degradation of the marine environment as well as to reduce the risk of long-term or irreversible adverse effects upon it.*
- ❖ GPA recommends CP approaches in its priority areas: sewage; POPs, heavy metals, radioactive substances, oils, nutrients ...

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Cleaner Production Declaration

Signatories by Type



- Academics, Societies and Productivity Councils
- Business, Industry and Professional Associations, Institutes and Consultants
- International Governmental Organization / International Agency
- National Cleaner Production Centres, CP Roundtables, CP Working Group
- National Government
- Non-Governmental Organization
- Private Company
- State/Local Government

UNEP DIVISION OF TECHNOLOGY, INDUSTRY AND ECONOMICS



Finance Initiatives

7 Objectives:

- ❖ Promote integration of environment & sustainability
- ❖ Raise awareness
- ❖ Encourage partnerships
- ❖ Deepen the level of commitment
- ❖ Assist in program development
- ❖ Capacity building
- ❖ Encourage assessment and incentive tools

UNEP DIVISION OF TECHNOLOGY, INDUSTRY AND ECONOMICS



Gold Mining Industry

❖ International Cyanide Management Code for the Gold Mining Industry

- ▮ launched May 2000
- ▮ to be completed December 2001

UNEP DIVISION OF TECHNOLOGY, INDUSTRY AND ECONOMICS



Telecommunications

❖ Global e-Sustainability Initiative

- | launched 5 June 2001
- | 10 companies: (BT, AT&T, Ericsson...)

 DIVISION OF TECHNOLOGY, INDUSTRY AND ECONOMICS



Automotive Industry

❖ Mobility Forum with automotive manufacturers:

- sharing and promulgating best practices for both mobility and environment
- developing sector-specific indicators for sustainability reporting


 DIVISION OF TECHNOLOGY, INDUSTRY AND ECONOMICS



Advertising


❖ Advertising & Communications Forum

- | prompt them to put their sustainability principles into action
- | a new way to differentiate brands
- | launched February 2002

 DIVISION OF TECHNOLOGY, INDUSTRY AND ECONOMICS



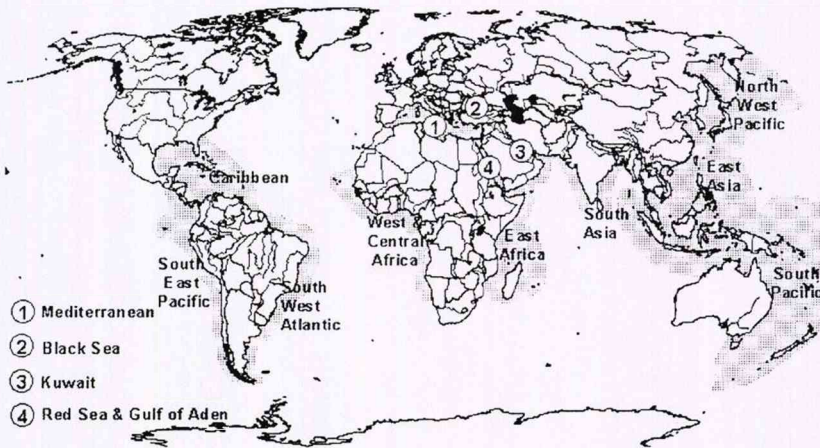
www.uneptie.org

 DIVISION OF TECHNOLOGY, INDUSTRY AND ECONOMICS

Regional Seas Programme

Background

- *The regional seas programme was initiated in 1974, it is part of the United Nations Environment Programme (UNEP)*
- *It was a global programme, but organised by regional divisions*
- *It contains 13 regions and in these regions over 140 coastal states*



The Programme

- *The programme is action-orientated, i.e., looks at causes of environmental problems as well as the ways to eliminate these problems*
- *The programme concerns itself with all kinds of Environmental Areas including pollution, marine life and seabed exploitation*
- *The key to the Regional Seas Programme is the Action Plan, which is a formal agreement between the governments of a particular region to outline the needs in a particular region.*
- *The Action Plan includes the following priorities Environmental Assessment, Environmental Management, Environmental Legislation and institutional strengthening*

Mediterranean Action Plan

An example of the regional seas programme

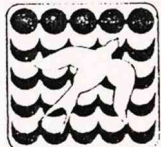
The Future of the Regional Seas Programme

- *The key to a regional programme working is political agreement and in many cases regions do have an action plan and even a convention but no further work has been carried out.*
- *Also in many cases the long-term commitment that is needed is not always there in the governments, which means the realistic goal of regional environmental co-operation will be short lived.*
- *Also three of the regions have just recently adopted an Action Plan, which does indeed show promise for the programme but whether they are carried out is another matter.*
- *Also in furtherance of the programme there has been discussion of making the Arctic a regional sea.*
- *There are areas like the Mediterranean that show that regional environmental co-operation is plausible.*

Resources

www.unep.org , United Nations Environmental Programme

www.unepmap.org , Mediterranean Action Plan



International Ocean Institute

P.O. Box 524 Valletta - Malta

Cables: Interocean

PROJECT
ON ALTERNATIVE MODES OF FUNDING
THE UNEP TRUST FUND FOR THE PROTECTION
OF THE MEDITERRANEAN MARINE ENVIRONMENT

Purpose

- . To find the easiest, most cost-effective way of raising, over the next ten years, \$15 billion needed to make the changes in the coastal management and industrial production systems of States bordering the Mediterranean Sea, to restore and maintain the quality of the Mediterranean environment
- . To study precedents and, set new ones, for funding other activities of the international community essential to human survival, such as the struggle against desertification, coping with climate change, or peace keeping.

Background

The Mediterranean Sea is an endangered sea. Its semi-enclosed geographic parameters, combined with very special hydrographic conditions, slow down the process of water renewal which takes about eighty years.

In 1976 the 17 States bordering the Mediterranean Sea adopted a Convention -- the Barcelona Convention for the Protection of the Marine Environment. This framework Convention has been further developed and strengthened through a series of Protocols, among which the Athens Protocol for the prevention of pollution from land-based sources is the most demanding and costly one, and the establishment of a Trust Fund, administered by UNEP, for the financing of the necessary activities.

The cost of restoring and maintaining the quality of the Mediterranean marine environment has been estimated by

UNEP as roughly \$15 billion over the next ten years.

The UNEP Trust Fund is permanently underfunded. It is unlikely that the situation can be corrected either through very large assessments on States or through voluntary contributions of the needed magnitude. If the protection of the Mediterranean environment is to be pursued in earnest and sustainable development is to be introduced, other ways of financing the operations must be found.

At present, the Mediterranean basin is visited annually by one hundred million tourists. UNEP's Blue plan anticipates, on the basis of major trends, that by the year 2025, there will be:

- . 380 million tourists for the Mediterranean countries as a whole in the case of weak economic growth;

- . 760 million, in the case of strong growth. The number of guest-nights corresponding to these 760 million tourists would be about 11 billion.

In terms of direct land coverage, UNEP estimated that currently site coverage of all tourist lodgings is in the order of 4,000 square km and that this would double by 2000, to reach 8,000 square km, mostly on the coast. Solid waste produced by tourists, currently 2.8 million tonnes per year for the region as a whole, would reach between 8-12 million tonnes in 2025. Sewage discharges would rise from 0.4 billion cubic metres to somewhere around 1.5 billion.

Tourism is an industry which, if unregulated, kills its own resource. It is in the vital interest of each and every tourist that this resource, the environment, be maintained.

Tourism, furthermore, is not a primary or "basic" need like food and housing. Tourism is paid for by income

surpluses and, like all leisure activities, has a certain margin of financial flexibility. On the basis of information with regard to the environmental burden imposed by tourism as a whole, no tourist would refuse the payment of a modest \$1 to \$5 to be applied to the protection of the environment as a tourist resource. On the contrary, every tourist would be happy to make this very small contribution which would not weigh at all on his over-all travel budget.

For the trust fund, however, this would bring in the needed 15 billion dollars over the next ten years, or at least a very substantial part of it.

In the wake of a Conference held in Cairo under the auspices of the Aspen Institute, Italia, the Government of Egypt recently launched an appeal to all countries to levy a tax of \$1 on any foreign travel worldwide. This should be paid to a Fund for Environmental Maintenance and Development which should be established by the United Nations.

Egypt based its proposal on its own internal experience. In 1985, Egypt adopted a law 101, putting a tax of 10 percent on the cost of any plane, train, or bus ticket travelling in Egypt. This revenue has been applied to the protection of the environment. In 1986, this tax was raised to 25 percent, but the allocation to the protection of the environment remained the same, at 10 percent.

Egypt's global proposal is of the highest interest. An alternative would be to decentralise the protection of the environment on a regional basis. This is the direction already taken by UNEP through its Regional Seas Programmes, of which the Mediterranean Action Plan and the Barcelona Convention is the first, and most developed. Decentralisation to the regional level has three advantages: A regional tax system can utilize already existing infrastructure. It is responsive to the very great differences in developmental/environmental

A see also. see paper by James Seelys.

conditions between different regions; and it keeps the taxation scheme closer to those who have to pay -- to the "grass roots," so to speak -- and experience shows that this is more effective.

We therefore propose, to start with, and on an experimental basis, the imposition of a tax of \$1 to \$5 on every tourist in the Mediterranean Basin, to be paid to the UNEP Trust Fund.

Methodology

We propose to undertake a research project to be carried out by a small team consisting of a geographer, an economist, a statistician, and a political scientist and/or an international lawyer.

The duration of the project is expected to be six months. The project would be carried out at the IOI in Malta, in cooperation with the University of Malta and UNEP, and it would have the following components:

1. Identification and cost/benefit analysis of existing or past international taxation schemes: e.g., airport taxes, road taxes, the tax on shipping to clean up the Suez Canal, etc.
 - (a) methods and costs of collection;
 - (b) impact on tax payer;
 - (c) impact on purpose to be achieved.
11. Identification and critical analysis of proposed schemes for international taxation (e.g., anti-desertification tax proposed by UNEP; taxes to be levied by the International Seabed Authority under the 1982 United Nations Convention on the Law of the Sea; various proposals for the establishment of a tax on international arms sales; Ocean Development Tax as proposed by the International Ocean Institute in 1969; creation of a "Common Heritage Fund" as proposed by the

Delegation of Nepal to UNCLOS III, etc. (A study on the potential of the Law of the Sea Convention for the generation of international revenue was undertaken by the IOI for the World Bank in 1982. It is attached as Annex 1. A study on applying an ocean development tax to commercial fisheries was also undertaken by the IOI in 1971, through a team of economists at Cambridge University. This is attached as Annex 2.)

III. Cost/benefit analysis of various methods of collecting, monitoring and transferring payment of tourist tax in the Mediterranean.

- . collection on air, train, bus tickets;
- . Road tax
- . tax on hotel bills and vacation home rentals
- . etc.

Identification of taxes already paid by tourists in the Mediterranean ("tassa di soggiorno," etc.) and use made of this revenue.

IV. Questionnaire to be submitted to 5,000 tourists and analysis of results.

V. Conclusions and recommendations.

VI. Applicability of system to other regions and to other areas of activities (anti-desertification; coping with climate change; peace-keeping).

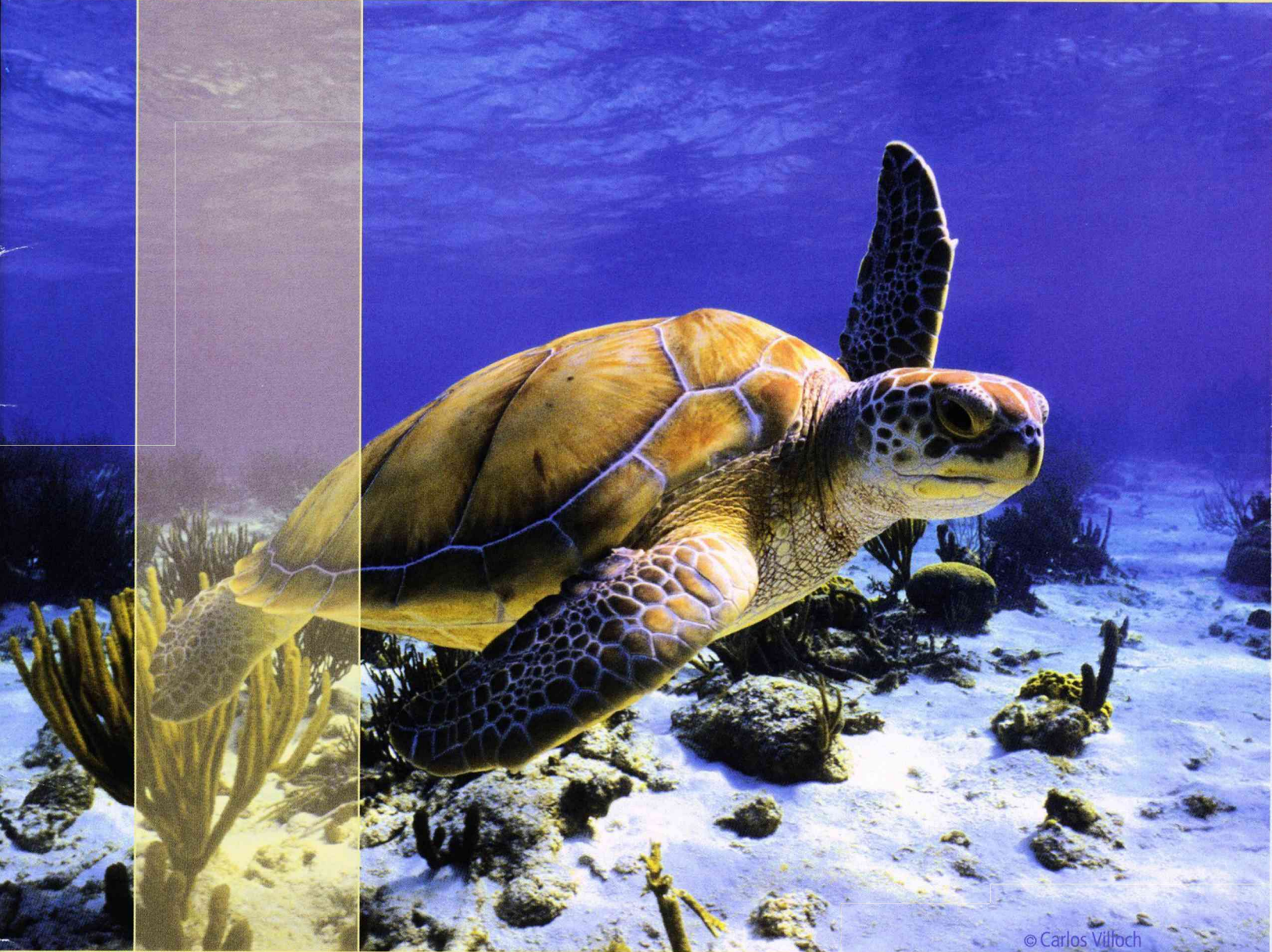
BUDGET

I. Fees for primary investigator and four additional researchers	- US\$13,000.00
II. Questionnaire (compiling, mailing, analysing, computerizing)	8,000.00
III. Communications	3,000.00
IV. Printing & distribution of final report	5,000.00
V. Miscellaneous	1,000.00
GRAND TOTAL	US\$30,000.00

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The Caribbean Environment Programme



© Carlos Vilfoch

*Promoting regional co-operation
to protect the marine environment*

The Caribbean Environment Programme

MISSION

Promoting regional co-operation for the protection and development of the marine environment of the Wider Caribbean Region.

On March 24, 1983, the nations of the Wider Caribbean Region met in Cartagena de Indias, Colombia, to adopt the "Convention for the Protection and Development of the Marine Environment of the Wider Caribbean Region." Its preamble, in part, reads:

The Contracting Parties,

CONSCIOUS of their responsibility to protect the marine environment of the Wider Caribbean Region for the benefit and enjoyment of present and future generations,

RECOGNIZING the special hydrographic and ecological characteristics of the region and its vulnerability to pollution,

RECOGNIZING FURTHER the threat to the marine environment, its ecological equilibrium, resources and legitimate uses posed by pollution and by the absence of sufficient integration of an environmental dimension into the development process,

CONSIDERING the protection of the ecosystems of the marine environment of the Wider Caribbean Region to be one of their principal objectives,

REALIZING fully the need for co-operation amongst themselves and with competent international organisations in order to ensure co-ordinated and comprehensive development without environmental damage.

Have agreed as follows...



UNEP



Protecting the Caribbean Sea

KNOWN WORLDWIDE for its tropical breezes, abundant waters, and interesting culture, the Caribbean region depends upon a healthy environment to sustain its people and their livelihoods. The Caribbean Environment Programme (CEP) helps nations protect the marine environment and promotes sustainable development in the Wider Caribbean Region. Although a part of the United Nations Environment Programme (UNEP), the CEP is managed by and for the diverse Caribbean nations and territories under a legal and programmatic framework they created in 1981.

The Wider Caribbean Region is one of the most culturally and economically diverse areas in the world. Its traditions and customs are a mix of Latino, African, European, South Asian, Indian, and Native American cultures. It is a region of great natural beauty and abundance, and also of great economic disparity. CEP works as a facilitator, educator, and catalyst to co-ordinate activities and build the capacity of all member governments in the region to manage their coastal environments and build sustainable coastal economies.

As one of UNEP's regional seas programmes, the CEP helps link Caribbean states to each other and to other institutions working in the region. The CEP also is part of UNEP's Division of Environmental Conventions and works closely with UNEP's Regional Office for Latin America and the Caribbean (ROLAC).

The 28 UN member states that created CEP encircle the Caribbean Sea and Gulf of Mexico: from as far north as Florida in the United States to as far south and east as French Guiana on the North Coast of South America. The region also includes Mexico, Central America, and the many small island nations and territories of the insular Caribbean.



■ CEP is managed by and for the diverse Caribbean nations and territories under a legal and programmatic framework they created in 1981.



Governments in the region have identified a number of pressing issues, including:

■ **LAND-BASED SOURCES OF POLLUTION.** Municipal, industrial and agricultural wastes and run-off account for as much as 90 percent of all marine pollution. Sewage and wastewater, pesticides, heavy metals, oils, nutrients, and sediments can harm both human health and coastal ecosystems.

■ **OVER-EXPLOITATION OF RESOURCES.** Fish, mollusks, and crustaceans provide recreational and industrial fish stocks as well as food for subsistence communities. But over-harvesting and pollution have depleted fish populations faster than they can recover through natural population growth. According to a 1994 assessment, some 35 percent of fish stocks in the Wider Caribbean Region were considered overexploited. Other species such as sea turtles, manatees, and other marine mammals are disappearing at an alarming rate.

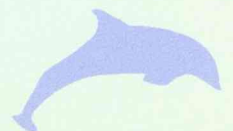
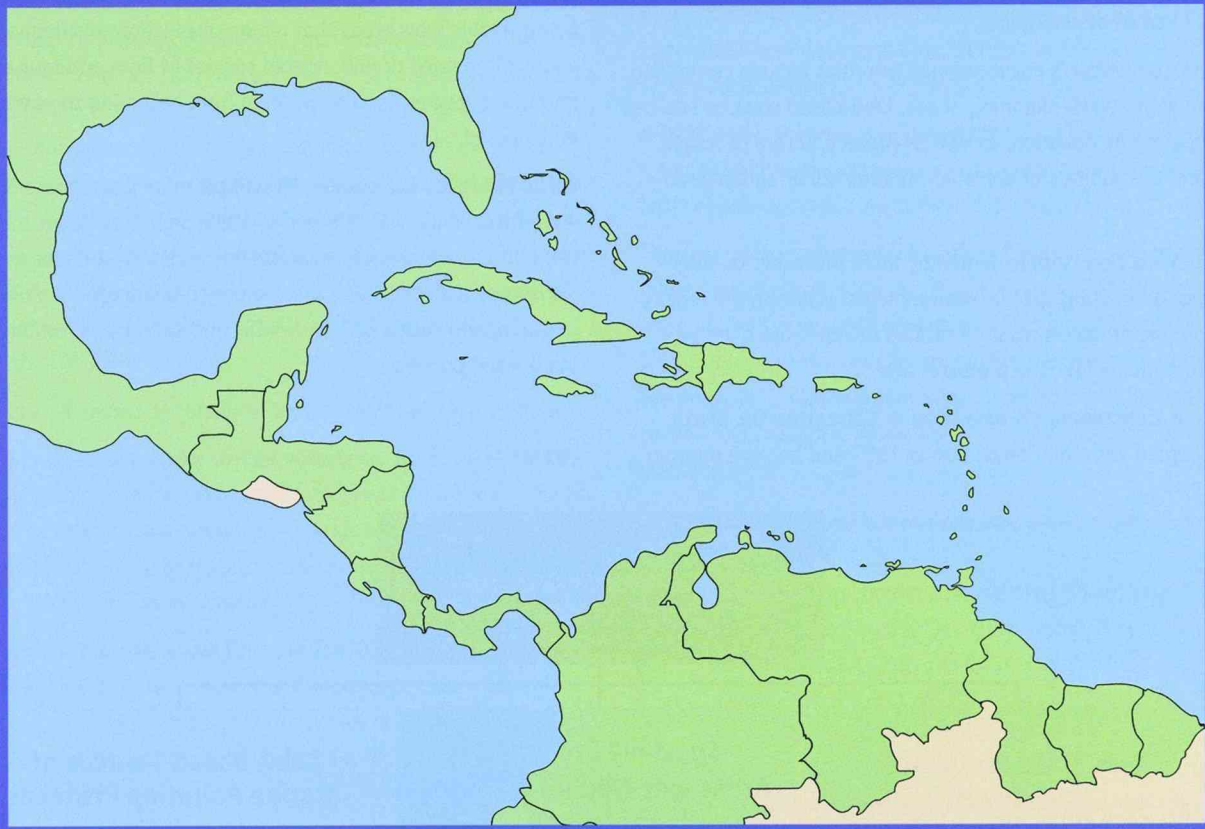
■ **INCREASING URBANISATION AND COASTAL DEVELOPMENT.** Population growth and tourism are prompting the conversion of the natural Caribbean coastlines into ports, tourist beaches, and new communities. Clearing of mangrove forests and other natural areas reduces habitat for endangered wildlife, as well as nurseries for important fisheries.

■ **UNSUSTAINABLE AGRICULTURAL AND FORESTRY PRACTICES.** Deforestation and agricultural activities have increased sediment loads into Caribbean coastal areas. The World Wildlife Fund estimates that the forests of Central America are being cleared faster than anywhere else in the world. Excess nutrients and pesticides can cause fish kills and make nearshore environments unsuitable for popular tourist activities such as swimming, snorkeling, and scuba diving.

■ **A NEED TO STRENGTHEN GOVERNMENT AND INSTITUTIONAL CAPACITY.** Governments in the Wider Caribbean Region can benefit greatly from training, information-sharing, and technical assistance geared toward national institutions responsible for addressing environmental problems. Environmental pressures take a particular toll on small island states, whose size and isolation make them vulnerable to extinctions, habitat loss, and rising sea levels.

The Wider Caribbean Region

Antigua and Barbuda	Grenada	Saint Kitts and Nevis
Bahamas	Guatemala	Saint Lucia
Barbados	Guyana	Saint Vincent and the Grenadines
Belize	Haiti	Suriname
Colombia	Honduras	Trinidad and Tobago
Costa Rica	Jamaica	United Kingdom of Great Britain and Northern Ireland
Cuba	Mexico	United States of America
Dominica	Kingdom of the Netherlands	Venezuela
Dominican Republic	Nicaragua	
France	Panama	



Legal and Programmatic Framework

IN THE 1970s, Wider Caribbean governments grew concerned about the future of social and economic development and resources management in the Caribbean. The governments also realised that addressing these issues could only be accomplished through an integrated, co-operative, regional approach. In 1981, the Caribbean nations adopted CEP's Action Plan in order to strengthen environmental practices in the region. The Action Plan committed the governments of the Wider Caribbean Region to work toward common objectives.

The Action Plan led to the 1983 adoption of the "Convention for the Protection and Development of the Marine Environment of the Wider Caribbean Region" in Cartagena de Indias, Colombia. Known as the "Cartagena Convention," it became legally binding on October 11, 1986. By signing and ratifying the Convention, states agree to:

- take all appropriate measures to prevent, reduce and control pollution and to ensure sound environmental management,
- conduct environmental impact assessments for major development projects,
- co-operate in scientific research, monitoring and the exchange of data and other information, and
- co-operate in cases of emergency.

The Cartagena Convention's environmental priorities include controlling pollution from ships, waste-dumping at sea, land-based sources, sea-bed activities, and airborne pollution, as well as protecting rare or fragile ecosystems and the habitats of depleted, threatened, or endangered species.

The Convention has been supplemented by three protocols, or sub-agreements, for addressing specific environmental issues in the region. After adoption, the protocols must be ratified by nine states before becoming international law. The protocols are:

- **THE PROTOCOL CONCERNING CO-OPERATION IN COMBATING OIL SPILLS**, which was adopted with the Convention in 1983 and became interna-



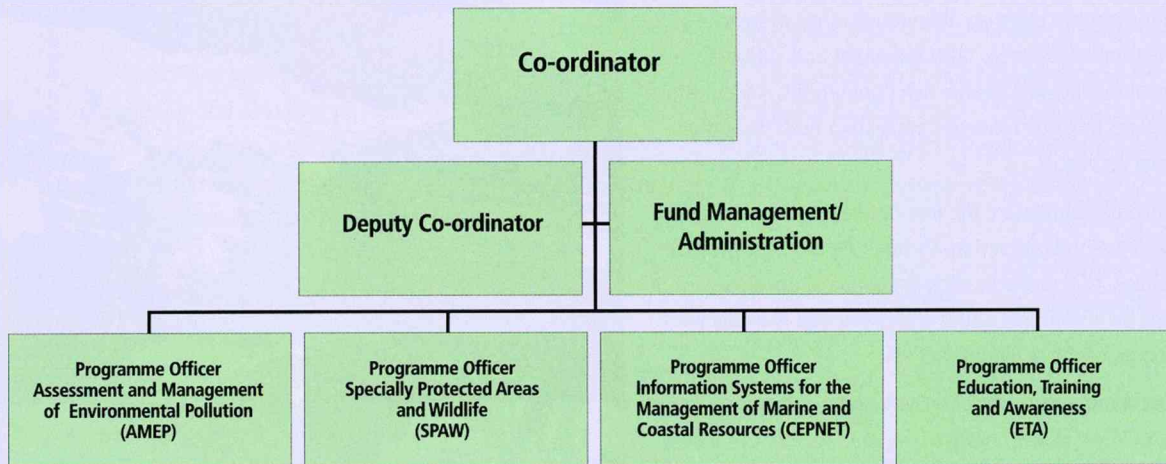
tional law in 1986. Signatory nations agree to help prevent and remediate oil spills in the marine environment, including developing capabilities to respond to spill emergencies.

- **THE PROTOCOL CONCERNING SPECIALLY PROTECTED AREAS AND WILDLIFE (SPAW PROTOCOL)**, which was adopted in 1990 and became international law in 2000. Signatory nations agree to protect, preserve and manage in a sustainable way: areas that require protection to safeguard their special value; threatened or endangered species of flora and fauna; and other important species, to prevent them from becoming threatened or endangered.

- **THE PROTOCOL CONCERNING POLLUTION FROM LAND-BASED SOURCES AND ACTIVITIES**, which was adopted in 1999. Signatory nations agree to establish effluent and emissions limitations and/or best management practices for priority pollutants and to promote co-operation in monitoring, research, and exchange of scientific and technical information on land-based pollution.



UNEP-Caribbean Regional Co-ordinating Unit (CAR/RCU)



To help facilitate the implementation of the Convention and its protocols, the governments created a Regional Co-ordinating Unit (CAR/RCU) for CEP with a Co-ordinator and staff stationed in Kingston, Jamaica.

Created in 1986 and administered by UNEP, CAR/RCU serves as a secretariat to CEP, the Cartagena Convention, and its Protocols. CAR/RCU staff help co-ordinate numerous scientific and technical projects conducted by national and technical agencies, bodies of experts, scientific and academic institutions, non-governmental organisations, and others. CAR/RCU does not conduct research and implement projects itself, but coordinates projects and helps to collect, review, and disseminate studies, publications, and the results of work performed under the aegis of CEP. In addition, CEP has established a Regional Activity Centre in Guadeloupe to support the implementation of the SPAW Protocol and another in Curaçao for the Oil Spill Protocol.

The Caribbean Environment Programme has four main sub-programmes:

■ **ASSESSMENT AND MANAGEMENT OF ENVIRONMENTAL POLLUTION (AMEP)**, which facilitates implementation of the protocols on land-based sources and oil spills, as well as such global agreements as the Basel Convention and the Global Programme of Action for the Protection of the Marine Environment from Land-based Activities.

■ **SPECIALLY PROTECTED AREAS AND WILDLIFE (SPAW)**, which facilitates implementation of the SPAW Protocol and coordinates with numerous related global initiatives, such as the Convention on Biological Diversity, the Ramsar Convention on wetlands protection, the Convention on

International Trade in Endangered Species (CITES), the International Coral Reef Initiative, and the Global Coral Reef Monitoring Network.

■ **INFORMATION SYSTEMS FOR THE MANAGEMENT OF MARINE AND COASTAL RESOURCES (CEPNET)**, which supports all CEP activities by promoting information and data exchange, through both electronic information systems and networks of experts and agencies.

■ **EDUCATION, TRAINING AND AWARENESS (ETA)**, which develops the research, technical, and managerial capability of Caribbean states and territories to address environmental issues.

Through Intergovernmental Meetings held every two years, participating governments and Contracting Parties review CEP's progress in implementing the Cartagena Convention, chart future activities, and oversee financial and institutional arrangements. Between Intergovernmental Meetings, a 13-nation Monitoring Committee and Bureau of Contracting Parties supervises the programme's development and provides policy direction.

■ **Through Intergovernmental Meetings held every two years, participating governments and Contracting Parties review CEP's progress, chart future activities, and oversee financial and institutional arrangements.**



Promoting Sustainable Coastal Economies

PROMOTING BALANCED AND SUSTAINABLE ECONOMIC DEVELOPMENT in the Caribbean region is an integral part of CEP's mission. In the Wider Caribbean Region, economic prosperity depends upon a healthy environment. Tourism relies upon an abundance of clean beaches, healthy coral reefs, and safe water. Both industrial and subsistence fishing require healthy and sustainable fish populations. Agricultural and forestry practices must be managed to sustain both local populations and coastal resources.

All three CEP protocols emphasize the link between economic development and environmental protection. Through its projects, publications, and workshops, CEP seeks to sustain economic development in Caribbean nations by promoting sound environmental management in all coastal economies. Its activities include:

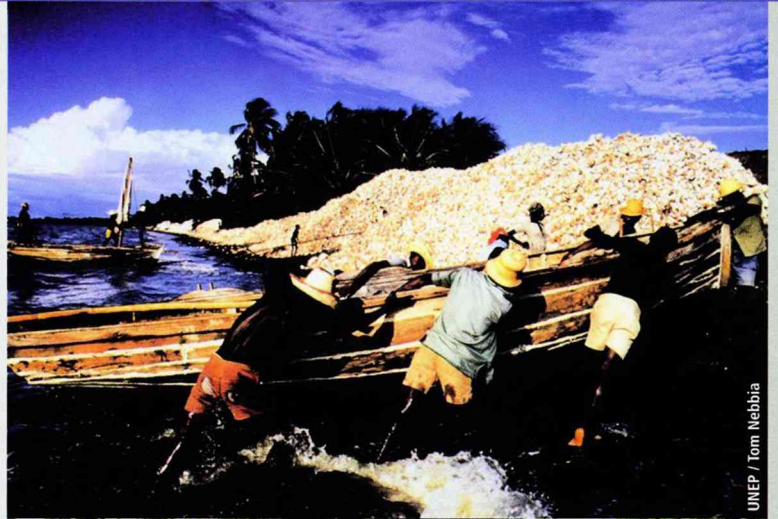
■ **IMPROVING AGRICULTURAL PRACTICES.** Through technical reports, workshops, and networking, CEP encourages best management practices for erosion and sediment control, water and land use management, and pesticide and nutrient control.

■ **PROMOTING SUSTAINABLE TOURISM.** CEP promotes successful practices for beach management; sewage and solid waste disposal; environmentally sound hotel management; ecotourism; and the design and construction of hotels and marinas.

■ **PREVENTING AND PREPARING FOR OIL SPILLS.** CEP has offered training in oil spill response in co-operation with the Regional Marine Pollution Emergency, Information and Training Center-Carib and the Clean Caribbean Co-operative. Oil spill response teams are trained using classroom instruction, simulated exercises, and role-playing.

■ **ENCOURAGING BETTER FISHERIES MANAGEMENT AND PROTECTION OF CRITICAL HABITATS.** CEP helps nations establish and manage marine reserves and protected areas, and helps disseminate information on the health of Caribbean fisheries and the need for more sustainable practices.

■ **ESTABLISHING REGIONAL EFFLUENT LIMITS AND MANAGEMENT PRACTICES.** The Protocol Concerning Pollution from Land-Based Sources and Activities calls for the establishment of region-wide effluent limits and management practices for the following priority sources: domestic sewage, agricultural non-point sources, chemical industries, extractive industries and mining, food-processing operations, manufacture of liquor and soft drinks, oil refineries, pulp and paper factories, sugar factories and distilleries, and intensive animal-rearing operations.



UNEP / Tom Nebbia



UNEP / Juan Pablo Ojeda

■ CEP seeks to sustain economic development in Caribbean nations by promoting sound environmental management in all coastal economies

Working to Reduce Pesticide Run-off

Agriculture has long been a mainstay of many Caribbean economies. The region produces approximately 60 percent of the world's coffee, 40 percent of its bananas, 25 percent of its beans, 20 percent of its cocoa, and significant quantities of sugar, corn, vanilla, and other crops. Many of these crops are grown in large monocrop plantations, increasing the need for pesticides and fertilizers – and causing damage to the coastal environment.

CEP is working with the Global Environment Facility to reduce run-off of pesticides in the Caribbean under a project with the countries of Nicaragua, Costa Rica, Panama, and Colombia. Prevailing currents flow in a circular pattern along the Caribbean coast shared by these countries. Trans-boundary pollution can result when contaminants released into coastal waters of one nation impact the other three. Therefore, regional co-operation is necessary.

The CEP project analyzed current pesticide use and environmental impacts in each country, and identified barriers to more sustainable pesticide management practices. Working with affected stakeholders, each country will develop a national policy framework and regulatory system for the use and control of pesticides. Based on national and regional investigations, CEP helped identify common problems and priorities for action at the regional level.

The project is strengthening each country's ability to regulate pesticide use while encouraging regional co-operation on problems they share. It also encourages the agricultural sector to implement better management practices to reduce the need for pesticides and ensure a more sustainable future.



Protecting Coral Reefs

SOMETIMES CALLED THE "RAINFORESTS OF THE SEA," coral reefs support an abundance of marine life. As one of the most productive and diverse of all natural ecosystems, coral reefs provide food and shelter for fish, shrimp, crabs, oysters, clams, turtles, and many other marine creatures. Coral reefs also provide coastal protection during storms and hurricanes.

The beauty of Caribbean reefs draws millions of international tourists who support many local economies. Unfortunately, by the year 2000 scientists estimated that 27 percent of the world's coral reefs had been lost, and 40 percent could be lost by 2010 unless urgent action is taken. In the Caribbean alone, 22 percent of coral reefs are already lost and many more seriously threatened. The major threats are linked to human activities: sewage, industrial and agricultural pollution, erosion, and over-exploitation of fisheries.

Under the Protocol Concerning Specially Protected Areas and Wildlife (SPAW Protocol), CEP unites governments and other institutions to protect coral reefs in the Caribbean. Activities include:

- **CO-ORDINATING INTERNATIONAL ACTIVITIES.** CEP co-ordinates Caribbean activities with the International Coral Reef Initiative (ICRI), creating an environmental partnership that allows developing countries with coral reefs to work on conservation strategies with donor countries, development banks, and international agencies, among others.
- **ENCOURAGING BETTER MANAGEMENT.** CEP promotes best management practices for coral reefs, including sustainable fisheries and tourism practices.
- **MONITORING AND DISSEMINATING INFORMATION.** CEP identifies gaps in monitoring and information, and offers financial and technical support to help Caribbean nations monitor and assess the health of their coral reefs. National institutions and non-governmental organisations prepare national and sub-regional reports on the status of the reefs for governments, the public, the news media, and international donor organisations.
- **PARTNERING.** Working with non-government organisations and local communities, CEP helps raise public awareness, promotes best management practices and alternative livelihoods, and assists with enforcement of regulations protecting coral reef resources.
- **PROMOTING REMEDIATION.** CEP encourages remedial actions, where necessary, such as restoration and rehabilitation of degraded ecosystems.

Coral reefs are vitally important to the marine environment and human development in the Caribbean. Governments, academia and other institutions in the region must continue working together to protect this important but sensitive resource.



Fabio Ehrenguber



Fabio Ehrenguber

■ **CEP unites governments, non-governmental organisations, and other institutions to protect coral reefs in the Caribbean.**



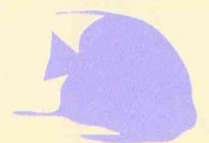
Promoting Sustainable Tourism

The Caribbean's coral reefs, sandy beaches, tropical climate, and warm and friendly people draw millions of tourists from around the world every year. The Caribbean Alliance for Sustainable Tourism estimates that one in every four jobs in the Caribbean is part of the tourism industry. Coral reefs in the Caribbean are the destination of approximately 60 percent of scuba diving tours worldwide.

Tourism activities are usually concentrated in coastal areas, and thus place extra stress on these sensitive environments. A 1997 CEP technical report documented the negative impacts of tourism on the Caribbean environment, including a number of factors that harm coral reefs: smothering sediment loads, improper sewage disposal, overfishing, coral harvesting, and boat anchor damage.

CEP's Caribbean Environmental Network Project, a joint venture with the United States Agency for International Development, worked to improve environmental quality and natural resource protection by promoting environmentally sound tourism industry practices. The project involved working in close collaboration with the Caribbean Tourism Organisation (CTO) and Caribbean Hotel Association (CHA). Results of the three-year project included training of stakeholders and publication of several studies, training materials, and reports. In addition, the Caribbean Hotel Association formed the Caribbean Alliance for Sustainable Tourism (CAST), a non-profit organisation that provides environmental expertise and assistance to hotel and tourism operators in the Caribbean region.

CAST also has developed an "Environmental Management Tool Kit for Caribbean Hotels" and conducts seminars for its 1,900 members in sustainable management practices. Best practices cover such issues as waste management, water and energy usage, tourist recreation, and interaction with the local community.



Protecting Sensitive Habitats

CORAL REEFS, SEAGRASS BEDS, AND MANGROVES are among the most important but least well known marine and coastal ecosystems in the region. These habitats are being altered and destroyed by construction, dredging, mining, and anchoring, threatening the biodiversity that contributes to the health, beauty, and economy of the Caribbean region.

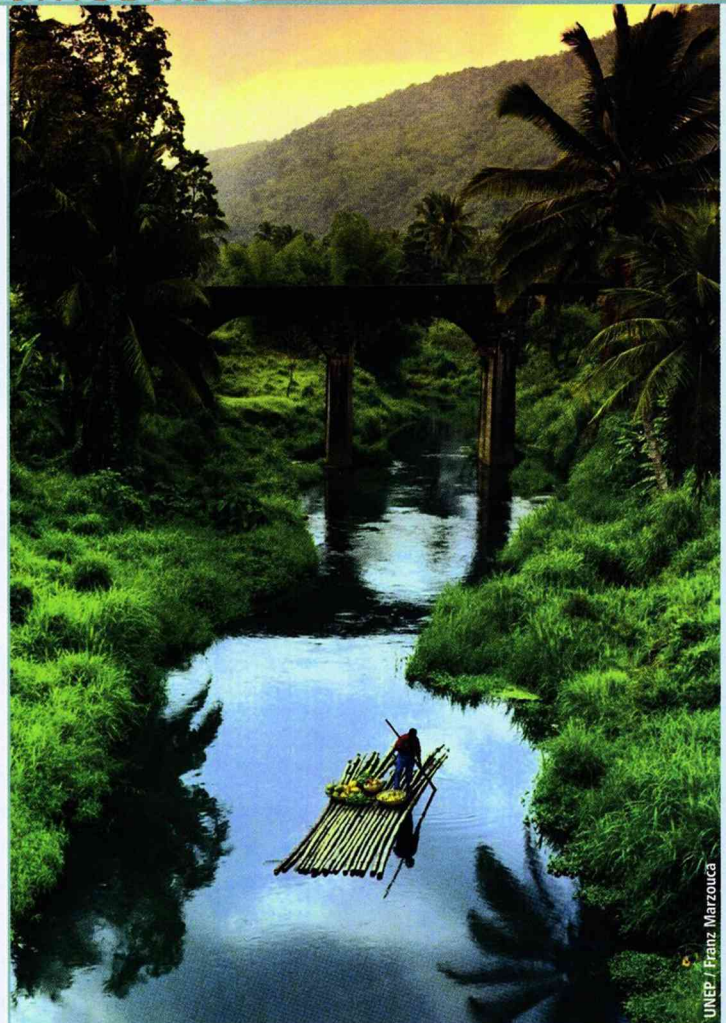
For example, when mangroves are cut down for housing, roads, or industry, the coast becomes more vulnerable to erosion and flooding. Increasing sedimentation can stress or even smother coral reefs. Mangroves also provide nurseries for many commercially important fisheries species, such as lobster and conch.

Scientific evidence demonstrates that marine reserves conserve both biodiversity and fisheries, and could help to replenish the seas by protecting young marine life. The Specially Protected Areas and Wildlife (SPA) Protocol of the Cartagena Convention creates a network of protected areas to conserve regional ecosystems, including coral reefs, mangroves, and seagrass beds.

Almost every Caribbean nation has designated one or more marine protected areas (MPAs). However, the effectiveness of these protected areas varies greatly from one country to another. Many protected areas have been established by law, but are not being managed and protected in reality, due in part to lack of institutional capacity and information. CEP builds the capacity of governments to protect these areas from undesirable development, pollution, and exploitation.

CEP activities include:

- **NETWORKING.** CEP has established a network of marine protected area managers (CaMPAM) to share information, experiences, and ideas for solving common problems.
- **TRAINING.** CEP offers a train-the-trainer programme for MPA managers, covering such topics as management plans, operational plans, public awareness, monitoring, and planning/zoning.
- **PROVIDING FINANCIAL ASSISTANCE.** CEP offers small grants to strengthen MPA capacity to prepare management plans, begin public awareness programmes, or support infrastructure development.



UNEP / Franz Marzouca

- **CEP builds the capacity of governments to protect sensitive habitats from undesirable development, pollution, and exploitation.**

Bonaire Marine Park

Obtaining adequate funding is the most common difficulty facing marine protected areas in the Caribbean. By instituting user fees and reaching out to stakeholders, Bonaire Marine Park has become one of the few self-funded, actively managed, protected marine areas in the world.

Bonaire is a small island in the Netherlands Antilles in the southern Caribbean, approximately 60 km north of Venezuela. The Marine Park extends all around the island, from the high-water mark to a water depth of 60 meters. Ranked as one of the top ten diving destinations worldwide, Bonaire relies on dive tourism to support its economy. In 1999, approximately 70,000 tourists visited Bonaire, including 29,500 divers.

In 1992, the island government instituted a US\$10.00 annual admission fee, payable by anyone scuba diving in the Marine Park. Within a year, the park was entirely self-sustaining – without relying on government funds to support its programmes. Through the user fees, the park maintains moorings and shoreline marker stones, and operates educational programmes aimed at both islanders and tourists. Park rangers patrol daily, by both land and sea. Grants are sought from donor agencies to support some capital expenses and research projects.

Through both education and enforcement, Bonaire has virtually eliminated such destructive practices as anchoring, coral collecting, and spearfishing. The marine park is an excellent example of how the tourism industry and conservationists can work together to protect coral reefs in the Caribbean.

CEP congratulates the Bonaire Marine Park on its success. CEP is working to promote the park as an excellent example of how the tourism industry and conservationists can work together to protect coral reefs in the Wider Caribbean Region.



Protecting Endangered Species

THE WIDER CARIBBEAN REGION contains a great abundance of plant and animal species, representing the greatest concentration of biodiversity in the Atlantic Ocean Basin. However, human activities have destroyed a number of unique ecosystems and habitats, and species have been lost. In the last 150 years, eight species of vertebrates have become extinct in Jamaica alone.

The primary threats to endangered species in the Wider Caribbean Region include pollution; sedimentation; overexploitation of resources, including fisheries; and habitat destruction due to coastal development, population growth, and increased tourism. In the Caribbean, 76 percent of all endangered species are threatened by habitat loss or habitat modification.

Species that mature slowly and produce few young are particularly vulnerable. In the Caribbean, this category includes sea turtles, sharks, whales, manatees, and sea birds. Sea turtles, for example, may take up to 50 years to reach sexual maturity and only one in a hundred make it to adulthood. Hundreds of thousands of dolphins and whales die worldwide each year in fishing nets. The slow-moving and gentle West Indian manatee, also known as the sea cow, faces threats from boaters as well as from coastal development, poachers, and herbicides that destroy its habitat.

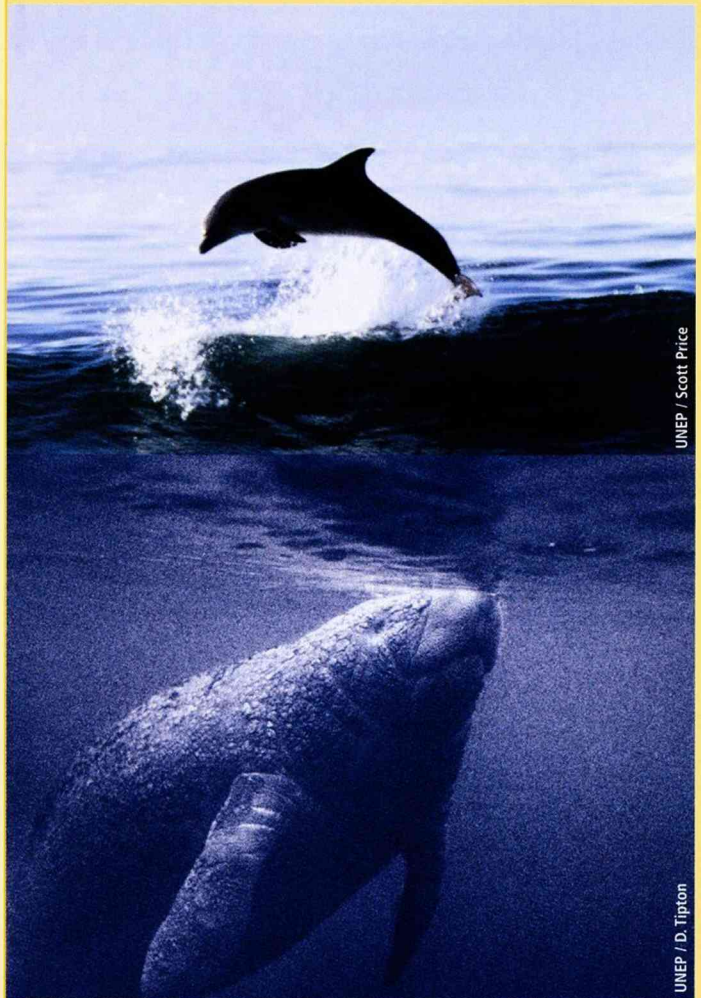
The responsibility for managing endangered or threatened species in the Caribbean Sea is shared by 28 UN member states. In many cases, regional co-operation is necessary to protect species and address environmental issues that cross national boundaries, in particular for highly migratory species such as sea turtles, whales, dolphins, and many birds.

The SPAW Protocol of the Cartagena Convention lists several endangered or threatened species as priorities for the Caribbean region. These include all marine mammals and sea turtles, as well as species of economic importance in the region: the conch, the spiny lobster, and coral reefs. CEP activities include:

■ **PROVIDING TECHNICAL ASSISTANCE.** CEP prepares management plans at the regional level and helps governments prepare recovery plans at the national level to restore endangered populations and/or their habitats. CEP works in partnership with other organisations, experts and regional networks, such as WIDECASST for sea turtles.

■ **NETWORKING.** CEP encourages regional networking and information sharing on the status of endangered species and national protected areas.

■ **INCREASING PUBLIC AWARENESS.** CEP helps to raise public awareness of endangered species by working in partnership with conservation organisations such as the International Fund for Animal Welfare (IFAW), the Eastern Caribbean Cetacean Network (ECCN), the MER Centre, and the Center for Marine Conservation (CMC).



UNEP / Scott Price

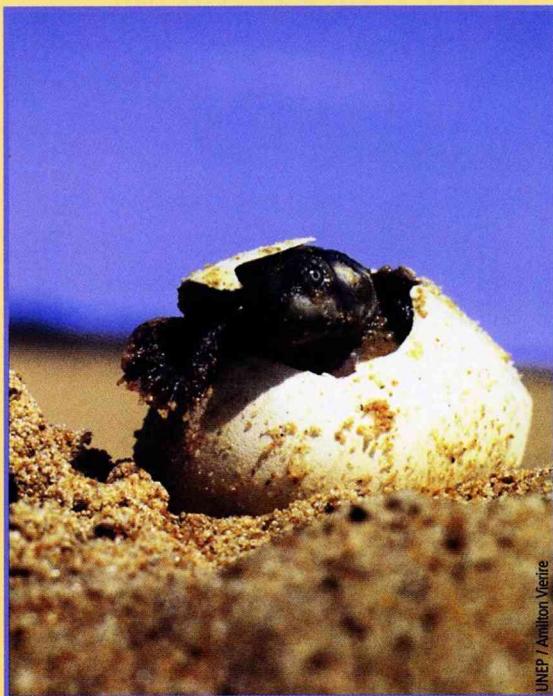
UNEP / D. Tipton

“The Cartagena Convention and its Protocols constitute a shared vision of the future... The CEP Regional Co-ordinating Unit is entrusted with shepherding that vision, supporting nations on their political and socio-cultural journeys to a sustainable future, and ensuring the ecological integrity and economic vitality of the Caribbean Sea. For the last two decades the RCU has discharged its unique responsibilities with professionalism and creativity – I don't know where the region would be without them!”

- Karen L. Eckert, Ph.D., Executive Director, Wider Caribbean Sea Turtle Conservation Network (WIDECASST)



UNEP / D. Bartell



UNEP / Anillon, Vierre



UNEP / Ann Hamman

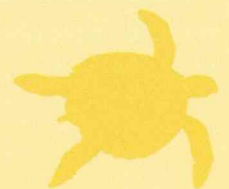
Saving Sea Turtles

During the last two centuries, sea turtles have declined dramatically throughout the Wider Caribbean Region. High human-induced mortality rates have placed all six Caribbean-occurring species at risk. Over-exploitation, especially of adult females on nesting beaches and the widespread collection of eggs, are largely to blame. In addition, thousands of sea turtles are accidentally captured and killed each year in active or abandoned fishing nets.

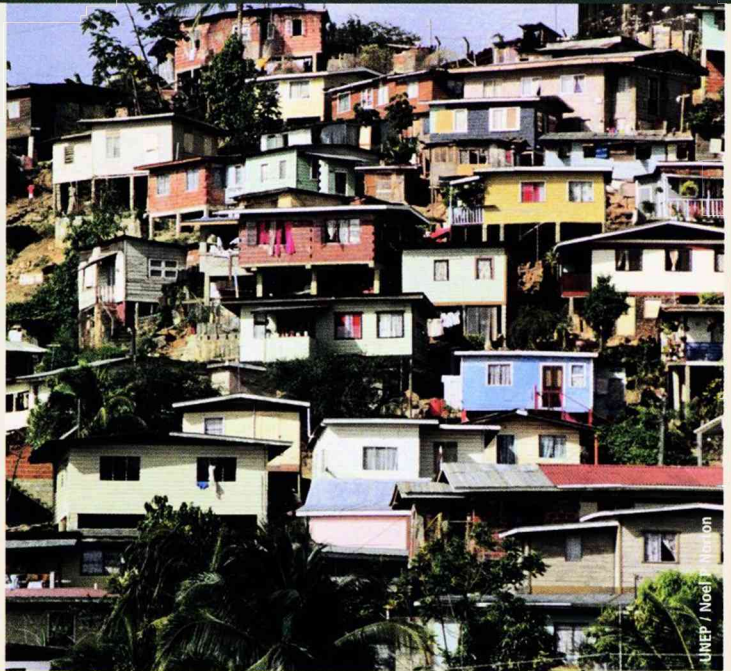
Sea turtles are highly migratory, passing through the territorial waters and coastal areas of many countries over the course of their long lives. As adults, leatherback turtles return to foraging grounds in the North Atlantic and West Africa after nesting in the Caribbean, and green turtles forage in more than a dozen Caribbean nations after nesting in Tortuguero, Costa Rica. While local conservation is crucial, action also is needed at the regional level.

WIDECAST, the Wider Caribbean Sea Turtle Conservation Network, brings together international experts with local country coordinators and interested citizens to promote locally based sea turtle management and conservation. WIDECAST was formed in 1981 to assist Caribbean governments in fulfilling their obligations under the Cartagena Convention and, later, the SPAW Protocol. This includes assistance in preparing Sea Turtle Recovery Action Plans, as well as educational materials for the public, and technical workshops on sea turtle biology and conservation.

WIDECAST is a vital partner in CEP's efforts to promote best management practices for turtle survival, such as community-based eco-tourism, alternatives to beachfront lighting, protecting coral reefs and other feeding habitats, and improving law enforcement and the regulatory framework.



Controlling Marine Pollution



POLLUTION IS A THREAT to environmental and human health throughout the Caribbean region. Some 80 to 90 percent of marine pollution is caused by land-based activities. These activities include inappropriate sewage treatment, agricultural non-point sources, inappropriate coastal development, and domestic and industrial activities associated with large urban areas.

Most industries in the Caribbean discharge wastewater directly into the sea, without prior treatment. More than 70 percent of the 80 million people in the Caribbean live in coastal cities, and most of these cities have no functioning or poorly functioning sewage treatment systems. Rivers are contaminated by unsustainable agricultural practices, and bays are further contaminated by ports lacking systems for handling solid and liquid shipping wastes.

The Protocol Concerning Pollution from Land-Based Sources and Activities (LBS Protocol) requires countries to prevent, reduce, and control such pollution in the Wider Caribbean Region. CEP promotes monitoring, integrated planning, and institutional development to help nations control pollution and restore contaminated areas. CEP works to leverage resources from many partners in the region to conduct activities to promote the LBS Protocol:

■ **IMPROVING COASTAL MANAGEMENT.** Through workshops and direct assistance, CEP helps Caribbean nations implement integrated coastal area management as a primary tool for controlling pollution. Integrated planning and management allows for balanced economic and social development, without compromising the protection of natural resources.

■ **IMPROVING ENVIRONMENTAL MONITORING.** CEP builds capacity within Caribbean nations to conduct environmental assessments and monitor their own environmental conditions.

■ **PROMOTING SUSTAINABLE AGRICULTURE.** Through workshops and demonstration projects, CEP encourages the use of best management practices for agricultural non-point sources of pollution, such as erosion and sediment control, pesticide/nutrient control, water management, and solid waste controls.

■ **IMPROVING SEWAGE TREATMENT.** Through case studies, workshops, and technical reports, CEP helps countries select appropriate and affordable sewage collection and treatment technologies.

■ **RESTORING CONTAMINATED BAYS.** CEP assesses environmental conditions and management practices in heavily contaminated bays, and demonstrates innovative approaches to rehabilitate bays throughout the region.

■ **CEP promotes monitoring, integrated planning, and institutional development to help nations control pollution and restore contaminated areas.**

Improving Sewage Treatment

Domestic and industrial sewage causes some of the most significant coastal pollution in the Caribbean, particularly in developing countries. Many countries have an inadequate number of sewage collection and treatment facilities, while the facilities that do exist are often poorly maintained or inoperable.

Industrial facilities often store waste on factory sites or vacant lots, dispose of it in municipal dumps, or discharge it into rivers with little or no treatment. Only 39 percent of 140 small industries surveyed in 1995 by the Caribbean Community (CARICOM) undertook some form of wastewater treatment.

Untreated sewage can threaten human health, reduce fisheries, and cause harmful algal blooms that damage coral reefs. Under the LBS Protocol, CEP is helping countries select appropriate technologies to collect and treat sewage.

For example, CEP is developing sewage treatment needs assessments in several countries to help them implement the LBS Protocol's requirements to prevent, reduce, and control sewage-related pollution.

A CEP technical report, *Appropriate Technology for Sewage Pollution Control in the Wider Caribbean Region*, assists nations in making decisions on sewage collection systems and sewage treatment to meet the regional effluent standards. CEP workshops also bring together wastewater treatment professionals from throughout the region to discuss such issues as practical treatment standards, effluent reuse, and discharges to sensitive receiving waters.



Javier Tapia Munoz



Creating an Environmental Network



WHEN THE CARIBBEAN NATIONS drafted the Cartagena Convention, they acknowledged a need for greater co-ordination of resources and activities in the region. The Convention requires countries to co-operate in scientific research, monitoring, and the exchange of data and other scientific information. Therefore, one of CEP's central roles has been to assist and promote greater co-ordination of environmental activities and to disseminate information throughout the Wider Caribbean Region.

The CEP Regional Co-ordinating Unit has created an environmental network that gathers and disseminates information to researchers, facilitates co-operation and co-ordination in the region, and builds the capacity of nations to use information technology to manage the marine and coastal environment.

Activities include:

- **DEVELOPING INTERNET-BASED TOOLS** for information dissemination, including an on-line clearinghouse of Caribbean environmental data and day-to-day information exchange through e-groups and web pages.
- **IMPROVING ENVIRONMENTAL PLANNING** and decision-making by developing capacity in the region to obtain and use information technology. CEP has provided training to help countries employ powerful information tools, such as geographic information systems, web pages, and the use of satellite imagery.
- **DEVELOPING A MORE INTERACTIVE WEBSITE** and an improved CEP News bulletin to facilitate information sharing in the region.
- **TAKING ADVANTAGE OF THE DEVELOPING INTERNET ENVIRONMENT** to expand CEP's environmental network to more users and more providers of data and information.

CEP's website at <http://www.cep.unep.org> is a valuable resource for researchers and governments working in the Caribbean – and many outside the region. Dr. Robert Ryerson, a researcher working in Ottawa, Canada, wrote:

"(The site) is the single most comprehensive source on coastal areas: issues, needs, management, and the legal constructs that impact the coastal zone. After seeing a number of sites with data that are much older, poorly written and far less comprehensive, it was nice to see one with such a thorough treatment of the topic with such solid links and good references. Thank you!"

Using Technology to Improve Environmental Management

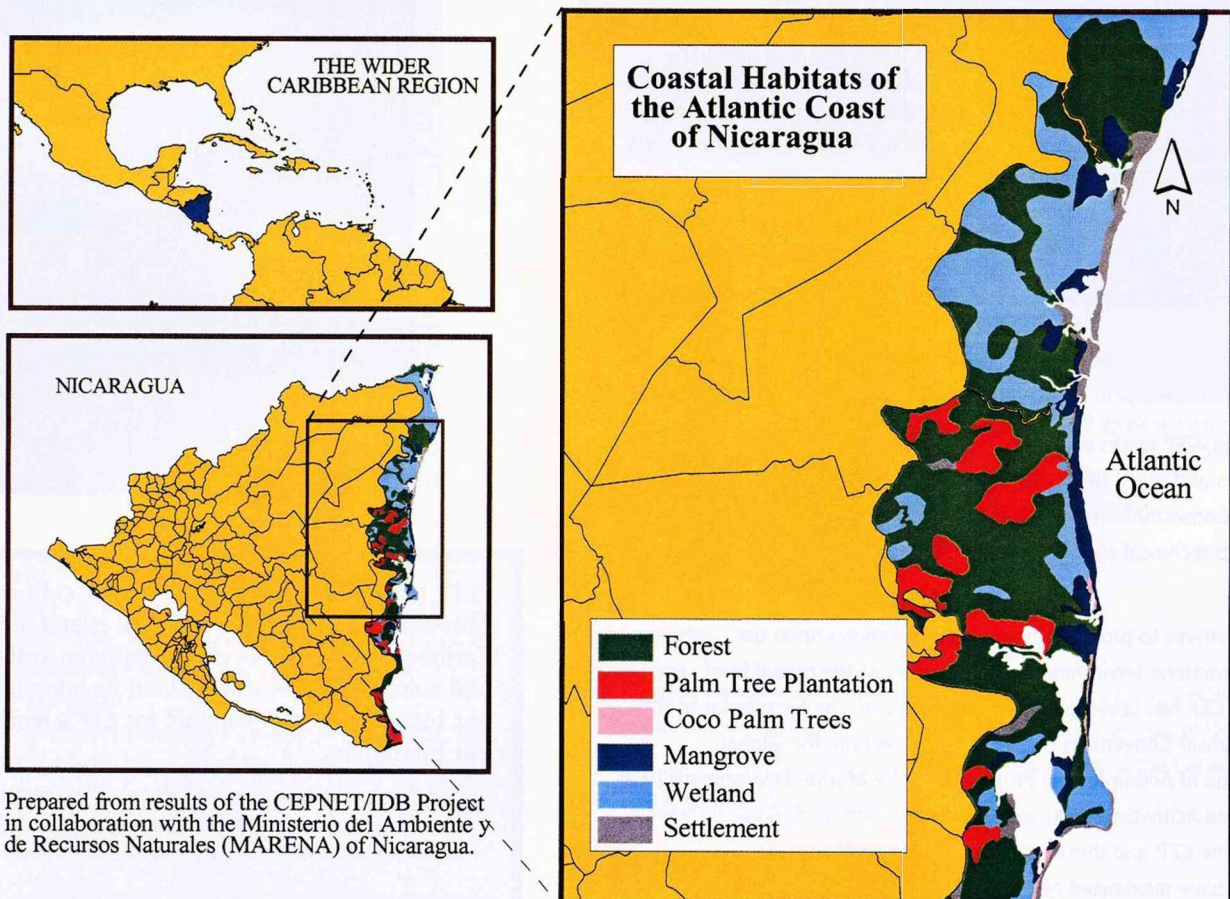
In recent years, new and emerging technologies have made the Internet an indispensable tool for information dissemination and management. To take advantage of this tool for managing the Caribbean environment, CEP is helping nations develop interactive, Internet-based, geographic information systems that provide decision-makers with updated, high quality information. CEP will build regional capacity to employ these technologies through on-line training programmes, improved access to clearinghouses, and monitored e-group discussions.

This approach was first envisioned when CEP joined with the Inter-American Development Bank (IDB) to create the CEPNET/IDB project. CEPNET strengthened capacities of governments and CEP to document and disseminate data they already held, thus promoting information-sharing and enhancing expertise in coastal and marine resource management. The project was initially developed in six IDB member countries: Barbados, Dominican Republic, Jamaica, Nicaragua, Trinidad and Tobago, and Venezuela.

The project was designed to enhance communications via the Internet and to disseminate metadata, or data about data. The participating agencies created Web sites with environmental information, as well as metadata for key marine and coastal datasets. The metadata form the backbone of a searchable Internet clearinghouse on coastal and marine data in the Wider Caribbean Region.

Project participants also published "State of the Coasts" reports for their countries, using Web-based geographic information system (GIS) tools to demonstrate coastal zone management case studies. For example, the map below highlights the sensitive coastal habitats along part of Nicaragua's Atlantic coast. This graphic display of environmental information can help decision-makers and stakeholders better manage coastal and marine resources.

CEPNET will continue to promote access to powerful and adapted tools for managing environmental information in the Wider Caribbean Region. CEPNET will serve as a portal to global and regional information and new data sources, such as satellite images, digital maps, and others.



Building Partnerships

THE WORK OF PROTECTING THE CARIBBEAN SEA and its coastal areas is beyond the ability of any one organisation or group of people. For this reason, the Caribbean Environment Programme relies on and collaborates with an extensive network of experts and professionals in government, academia, and non-governmental organisations.

For example, CEP teamed with The Nature Conservancy in developing a funding guide and training programme for managers of marine protected areas. This partnership tapped into The Nature Conservancy's extensive expertise and local contacts to improve management of protected areas, including lessons on how to generate revenue to self-finance programmes and activities.

Academic institutions working in the Caribbean are vitally important CEP partners. The CEP Secretariat works with the EARTH College (Escuela Agricultura de la Region Tropical Humeda/ Agricultural School for the Humid Tropical Region) to implement a pesticide management project in four Central and South American countries. This partnership combines

"The Caribbean Environment Programme is the cornerstone of the region's institutional framework for sustainable development. Across linguistic and political divides, it links all key governmental and civil society actors in the formulation and adoption of regional policies and agreements, and in the implementation of priority programmes."

– Yves Renard, Director,
Caribbean Natural Resources Institute (CANARI) in St. Lucia

CEP's expertise on coastal and marine area protection with the EARTH College's knowledge of local agricultural areas and practices.

In addition, CEP works with the University of the West Indies to monitor coral reefs and teach the principles of coastal zone management, and with the Consortium of Caribbean Universities to provide practical training to technical staff in government ministries of environment and tourism.

CEP also strives to promote greater co-ordination within the Caribbean of other multilateral environmental agreements at the global level. For example, CEP has developed joint activities with the Secretariat to the global Ramsar Convention on wetlands protection, the Global Programme of Action for the Protection of the Marine Environment from Land-based Activities (GPA), and the Convention on Biological Diversity. Because the CEP and these agreements have similar objectives, the joint activities have maximized resources while increasing co-ordination and communication among government officials responsible for their implementation.

"The Institute of Marine Affairs appreciates the hard work and dedication shown by CEP in facilitating the development of the Cartagena Convention and its Protocols, which will ultimately lead to the sustainable development of the Wider Caribbean Region."

– Hazel McShine, Director, Institute of Marine Affairs,
Trinidad and Tobago



"CEP understands the unique social, cultural and economic conditions facing small island nations in the Caribbean. CEP's particular sensitivity to the concerns and vulnerability of small island developing states has fostered greater support for CEP's work throughout the region."

– Christopher Corbin,
Sustainable Development and Environment Officer
Ministry of Planning, Development, Environment and Housing,
St. Lucia

"Co-operation within the Wider Caribbean Region has slowed the rate of environmental degradation and sustained the hope for a better future."

– David Read Barker, President, Monitor International



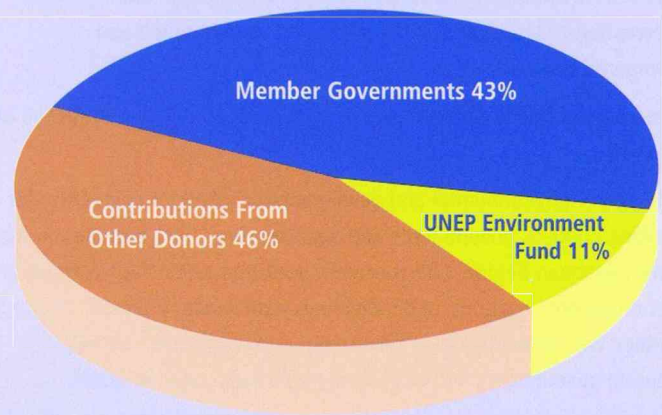
Fabio Ehrengrubner

Financial Mechanisms

CEP operates from the Caribbean Trust Fund administered by UNEP Headquarters in Nairobi, Kenya. CEP was initially funded under UNEP's Environment Fund, but the programme was designed to sustain long-term support from its member governments in the Wider Caribbean Region and through other partner governments and organisations. Today, the governments of the Wider Caribbean meet the basic financial operating costs of the Regional Co-ordinating Unit through voluntary contributions. Contribution levels are established during the biennial Intergovernmental Meetings of CEP, with payments made directly to the Caribbean Trust Fund.

Also during the biennial Intergovernmental Meetings, the CEP governments approve a two-year workplan and budget, which authorises CAR/RCU to seek additional funding for specific projects and activities. Project funding comes from development agencies, non-governmental organisations, the private sector, and extraordinary contributions from member and non-member governments. Through partnerships with other UN agencies or non-governmental organisations, CEP also leverages co-financing of many projects in the Caribbean. CEP is always willing to forge new partnerships with other technical and financial institutions in the region.

The Caribbean Environment Programme Funding Sources 1990–2000



Through new and existing partnerships, CEP unites many people and organisations working toward a common goal: protection of the marine environment and sustainable development of the Caribbean Sea and its coastal resources.

"The Caribbean Environment Programme has played a catalytic role in bringing together the resources of the diverse institutions of the region toward the common goal of sustainable development of our marine and coastal environments. Examples of this are clearly seen through the projects involving the environmental management of heavily contaminated coastal ecosystems and pilot projects involving waste management".

– Dr. Manuel Alepuz
Executive Director, CIMAB, Cuba



Preserving Our Future

Through the Caribbean Environment Programme, governments are co-operating to create a more sustainable future for marine and coastal resources in the Wider Caribbean Region. While many challenges face the region, CEP's long-term goal remains unchanged:

To achieve sustainable development of marine and coastal resources in the Wider Caribbean Region through effective, integrated management that allows for increased economic growth.

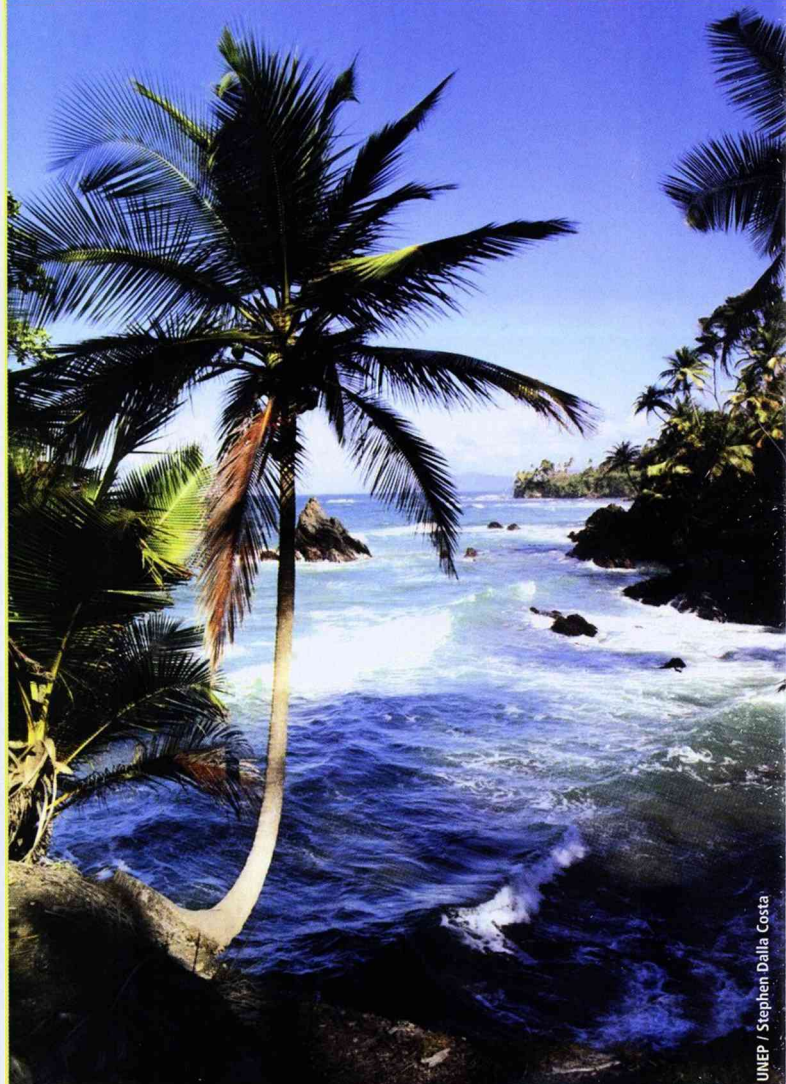
To achieve this goal, CEP is pursuing the following objectives:

- **MAINTAINING A SOUND INSTITUTIONAL AND FINANCIAL BASE** to carry out the mandates of the Cartagena Convention and its Protocols.
- **STRENGTHENING THE REGION'S LEGAL AND LEGISLATIVE CAPABILITIES** to protect marine resources, and, where appropriate, facilitating the signature, accession, or ratification of the Cartagena Convention and its supporting Protocols.
- **INFORMING GOVERNMENTS** about multilateral environmental agreements applicable to the region, and promoting co-ordination in their implementation.
- **DEVELOPING A TECHNOLOGICALLY ADVANCED AND INTEGRATED REGIONAL NETWORK** for information management for the coastal and marine environment.
- **ENHANCING THE REGION'S CAPABILITIES TO USE SCIENCE AND TECHNOLOGY** to address problems of marine pollution, protected area management, conservation of bio-diversity, and protection of threatened and endangered species.
- **BROADENING CEP'S CONSTITUENCY** by incorporating public outreach in all activities.

With greater environmental and development challenges competing for shrinking budgets, governments and agencies must work together in the Wider Caribbean Region. CEP is actively seeking partnerships with other institutions, organisations, and individuals with similar interests. Working together, we can demonstrate how regional co-operation can help disparate governments and cultures achieve their common goals.

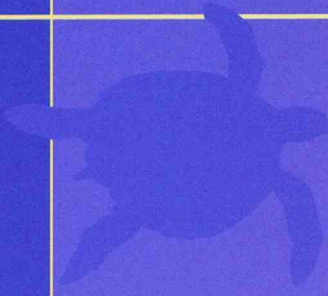
FOR MORE INFORMATION, visit CEP's website at <http://www.cep.unep.org> or contact us at:

Regional Co-ordinating Unit
Caribbean Environment Programme
United Nations Environment Programme
14-20 Port Royal Street
Kingston, Jamaica
Telephone: (1-876) 922-9267 to 9
Telefax: (1-876) 922-9292
Electronic mail: uneprcuja@cwjamaica.com



UNEP / Stephen Dalla Costa

- Through the Caribbean Environment Programme, governments are co-operating to create a more sustainable future for marine and coastal resources in the Wider Caribbean Region.



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What does the CEP do?

The CEP helps to protect the marine and coastal environments of the Wider Caribbean Region through its catalytic and facilitating role. This is accomplished through programmes that strengthen national and subregional institutions, stimulate technical co-operation among countries and by the creation of networks of information and people. The various programmes and activities of the UNEP CAR/RCU assist the nations of the Wider Caribbean Region to chart a course for sustainable development and environmentally sound practices. The CEP assists in the co-ordination of international initiatives in the region, such as the International Coral Reef Initiative and the International Year of the Ocean and has established co-operation with global agreements such as the Convention on Biological Diversity.

The Programme co-ordinates the collection, production, review and dissemination of studies, publications and the results of work performed under its aegis. From technical reports, to newsletters, to educational and awareness-raising materials, to technical protocols and agreements, the CEP distributes materials in print and via the Internet. As befits its regional role, the CEP organizes and hosts many seminars and workshops. These events bring together non-governmental organisations, environmental specialists, scientists, policy makers and others, including representatives of the member governments of the CEP.

How can I find out more about the CEP?

More accessible and comprehensive information is available on our Web page, <http://www.cep.unep.org/>. This site provides further detailed information about our activities, office and staff. More importantly, the site also makes available to the world our library of technical reports, our quarterly newsletter, project update pages, environmental databases and directories, and links to other Internet resources. If you do not have Internet access, or require any additional information, please contact us by fax, email or phone.



United Nations Environment Programme

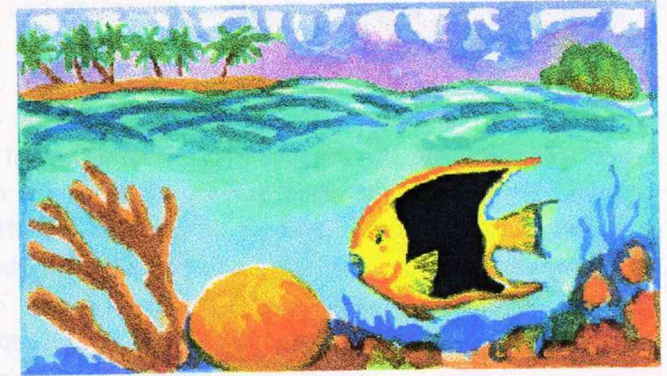
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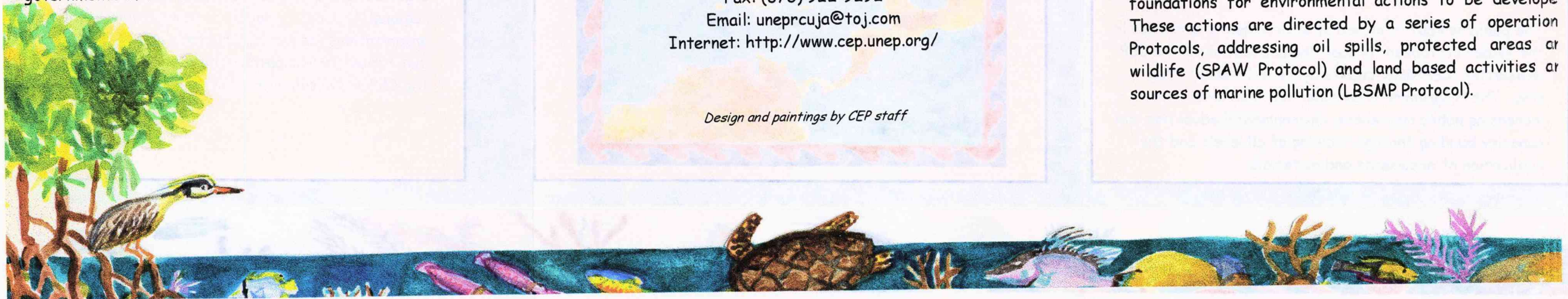
Design and paintings by CEP staff

The Caribbean Environment Programme



Established by the nations and territories of the Wider Caribbean Region in 1981, the Caribbean Environment Programme (CEP) promotes regional cooperation in the protection of the marine and coastal environment. The CEP is an integral part of the Regional Seas Programme of the United Nations Environment Programme (UNEP), and is administered by its Regional Co-ordinating Unit (CAR/RCU) in Kingston, Jamaica.

The legal framework for the CEP is provided by the Cartagena Convention that was adopted in 1983. The Convention, the only region-wide environmental treaty, is a framework agreement setting out the political and legal foundations for environmental actions to be developed. These actions are directed by a series of operation Protocols, addressing oil spills, protected areas and wildlife (SPAW Protocol) and land based activities and sources of marine pollution (LBSMP Protocol).

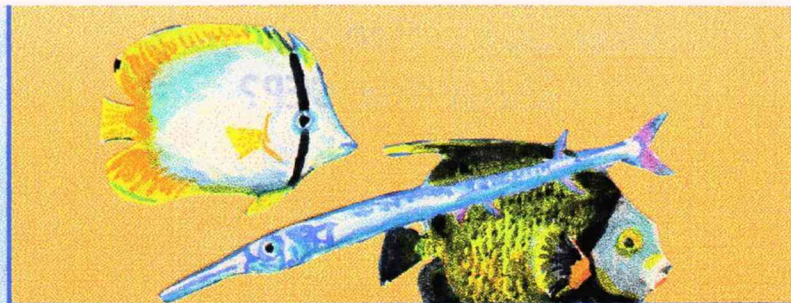


What are some of the major CEP activities?

The activities of the CEP have been developed to support the implementation of the Cartagena Convention and its Protocols. In this capacity, the CEP has been coordinating activities regarding the conservation and management of endangered species and habitats of regional concern, the establishment and management of protected areas, and the assessment, management and monitoring of land-based sources of marine pollution. The Programme has developed guidelines for best available technologies and practices for sewage and agricultural waste management, as well as oil spills contingency plans. Systematic assistance is also provided on integrated coastal area management through the promotion and application of regional guidelines. Other major activities are the promotion of best environmental management practices in the vital tourism industry of the Wider Caribbean and the creation of a network of marine protected areas.

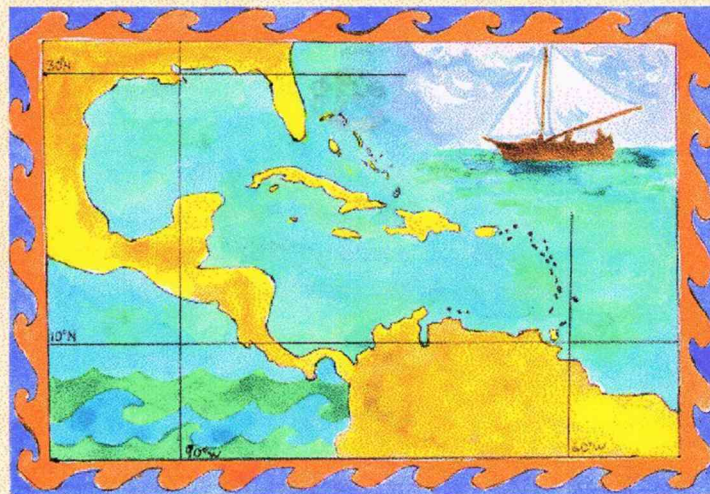
The CEP is also assisting with the development of a regional network of marine and coastal information and data through the Internet. Databases on government and regional contacts, experts, and projects are maintained. Additionally, the Programme develops geographic databases on relevant subjects, such as marine protected areas and endangered species.

The public is kept informed of environmental activities in the Wider Caribbean through the publication of the CEP newsletter, *CEPNews*, and its dynamic Internet Web site. The Programme is an important instrument for increasing public awareness, environmental education and capacity building through training of all levels and the publication of documents and materials.



Who are the members of the CEP?

The members of the CEP are the countries and territories bordering the Caribbean Sea, the Gulf of Mexico and adjacent portions of the Atlantic Ocean, south of 30° North latitude and within 200 nautical miles of the Atlantic Coast. This area, known as the Wider Caribbean Region, includes all the islands of the Caribbean, the North and Central American countries bordering the Gulf of Mexico and the Caribbean Sea, and the northern South American countries as far east as French Guiana. This region is a complex mix of peoples, languages and societies in one of the most culturally and ecologically diverse areas of the world.



Our partners

The CEP works closely with numerous organizations in protecting the Wider Caribbean marine and coastal environments. The Programme is primarily funded by the Governments of the region through the Caribbean Trust Fund. Additional funds are provided by other governments, donor agencies and the UNEP.

As an office of the UNEP, the CAR/RCU cooperates with the Regional Seas Programme and many other UNEP initiatives, as well as many organizations of the UN system. International, regional and local non-governmental organizations, as well as academic and research institutions, participate in the many projects of the CEP and assist with their implementation.

