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International
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in ecological approaches
to resources development
land management
and impact assessment
in developing countries

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**INTERNATIONAL POSTGRADUATE COURSE IN ECOLOGICAL APPROACHES TO
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IN DEVELOPING COUNTRIES (EMA)**

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Subject I: International strategies for the solution of basic natural resource problems of developing countries

STUDY MATERIAL

elaborated by a team of authors under E. Seidel

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Round-table discussion

Volume Two

2. UNEP's role and priorities for the rational use and protection of natural resources

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I. 2. UNEP's role and priorities for the rational use and protection of natural resources¹

Environmental awareness is as old as man. Man could not have survived if he had not sought to understand his environment and adapt himself to it. Indeed, one view of human history is that it records a sequence of social and technological adaptations that have enabled us to use our environment with increasing effectiveness while minimizing the limitations imposed by it.

The environment satisfies human needs in a multitude of ways. Among other things it supplies air, food, water, energy, clothing and shelter. As the sum of our surroundings, it conditions our cultures, life styles, educational processes, employment patterns and, to a considerable extent, determines the level of satisfaction we derive from life.

But while the environment provides for man's needs it also imposes certain limitations on his activities. Land areas that are infertile or have extremes of temperature or precipitation normally remain sparsely populated unless they contain resources, such as minerals, that can be exploited with available technology. The strictness of environmental limitations can, to some extent, be eased by technological developments, but the concept of environmental limits is an important one to bear in mind.

There are also limits to the amount of environmental manipulation that can be safely tolerated by human beings - pollution and contamination of water, land and air, for example, or weather modification and the reduction of the ozone layer. Man has striven for millennia to get increasing benefits from the environment and to minimize the limits the environment imposes upon his activities. The environmental problems as we now perceive it is a consequence of profound changes in the human condition which began several centuries ago and continue apace. The onset and spread of indus-

¹ Based on: UNEP: The United Nations Environment Programme, Nairobi, 1979

trialization, both within and beyond the countries where it first developed, created a complex of environmental problems of entirely new dimensions. These have been aggravated by relatively great increases in human numbers at different times in different parts of the world, though such increases cannot compare with the exponential increases of the present day.

The nature and significance of some of these problems - for example the mismanagement of living resources, soil degradation and air pollution - have been well described in many papers and publications and need not be restated here.

What is worth repeating is that the continuing increase in the amount and availability of knowledge has recently given rise to the realization that everything is related to everything else - that the global environment makes all nations and peoples interdependent.

Environmental studies have highlighted such obvious interrelationships as those between fisheries and coastal area development, health and the treatment of domestic wastes and land use and the distribution of wild animal and plant populations. They have also revealed the less immediately obvious links between irrigation schemes and the occurrence of schistosomiasis, for example, and the quality and extent of forage crops and control of livestock pests.

Increasingly sophisticated weapons development and the continuing wars of this century are forcing many people to recognize that, ultimately, world problems cannot be solved without world cooperation. What is needed are increasing efforts at all levels of society - from local communities to the community of nations - to understand and take into account interrelated social, economic and environmental factors.

Such a comprehensive view of the environment has taken a long time to develop. It was foreshadowed in the works of the early Greek scientific philosophers some 24 centuries ago, who saw all created things as the products of various combinations of such basic ele-

mente as earth, air, fire and water. (Interestingly, if we take "fire" to signify energy, we have here four elemental components that enter into today's environmental concerns.) Twenty-two centuries ago the Indian emperor Asoka who reigned from 265-238 B.C. defined a king's duty as not merely to protect citizens and punish wrongdoers, but also to preserve animal life and forest trees. He also forbade the killing of a large number of species of animals for sport or food. Similarly many Indian societies in North America have always believed in and lived out the environmental ethic.

In more modern times a comprehensive view of the environment has been taken by certain geographers such as the Scot, Patrick Geddes in the late 19th century. It was the Austrian geographer Eduard Suess who, in 1875, introduced the term "biosphere", and the concept was systematically developed by the Soviet biogeochemist, V. I. Vernadsky in the early part of this century. Conservation movements have contributed to awareness of the environment as a combination of dynamic forces in stable equilibrium. Some 150 years ago Simon Bolivar issued a decree on conservation, and thus became the first conservationist in South America. Alexander Graham Bell foresaw today's fossil fuel depletion problems as early as the first quarter of this century.

However, the first steps towards an institutional approach to environmental problems were not taken until the years following World War II. Many separate areas of environmental concern were built into the mandates of various United Nations agencies, and their work was explicitly recognized by the General Assembly in its December 3, 1968 resolution 2398 (XXIII) when it specified that full account must be taken, in the preparations for Stockholm, of the work that had already been long under way in these UN bodies. Similarly Governments of many countries built environmental policies into the mandates of their Departments and Ministries, dealing with such concerns as water, forests, wildlife, lands and fisheries.

In the late sixties and early seventies there was a growing awareness among many countries that international cooperation was essen-

tial to deal with a number of environmental problems that could not be resolved at national levels. Dramatic oil spills called for international cooperation and problem solving. Preserving the quality of rivers flowing through two or more countries also dearly required international cooperation, as did the problem of acid rain, originating outside the borders of the countries affected. Some nations had begun to prohibit the importation of certain materials on the grounds that they presented an environmental danger, thus providing a further impetus toward international environmental cooperation.

Obviously, environmental concerns could no longer be treated in a sectoral manner, and by 1968, a comprehensive approach to inter-related environmental problems was seen as a necessity.

The General Assembly's action in calling a World Conference on the Human Environment was a recognition of the need for specific knowledge on what was actually happening to the various elements of the environment. Emotional hand-wringing over obvious problems like pollution was not enough, though it had sometimes served a good purpose in prompting action. But sound knowledge was necessary in order to face up to environmental realities, and Stockholm was to be a response to that need.

A great deal of information was amassed in the preparations for Stockholm between 1968 and 1972, in the course of which the understanding of global environmental problems increased tremendously. Much of this knowledge was reflected in the Report of the Conference, and underlay the 26 Principles for guiding national and international action. The 109 Recommendations of the Conference dealt with the broad scope of environmental concerns in greater detail.

The United Nations Environment Programme, like the environment itself, is evolving and will continue to evolve. Since Stockholm, public understanding of the interconnectedness of all human activities that impinge upon the environment has continued to broaden. This has been mainly due to a series of world conferences; on

food, population, human settlements, the status of women, water, desertification, environmental education and training, and on technical cooperation among developing countries. This broadening awareness has had its effect upon UNEP's own programmes and priorities.

Additional information will continue to influence policies, priorities and programmes. The basic objective of UNEP, however, as stated at its inception in the General Assembly's Resolution No. 2997, stands unchanged as the guiding principle of the Programme: "to safeguard and enhance the environment for the benefit of present and future generations of man".

The Stockholm Conference was the culmination of an intensive process. National reports were prepared and regional seminars and special meetings convened. Massive and detailed background documentation resulted, and intensive discussions on environmental matters took place in many countries. On the basis of all this, delegates to the Conference agreed upon the action required in the major areas of concern.

The Conference identified a number of broad objectives which indicated the necessary scope of an international environmental programme. The outcome of the Conference was thus a Declaration and an Action Plan for the Human Environment, together with a resolution on institutional and financial arrangements.

In the autumn of 1972, the 27th Session of the General Assembly received the report of the Stockholm Conference. Resolution 2997 (XXVII) prescribed the institutional arrangements needed to give effect to the Stockholm recommendations.

In these institutional arrangements a 58-member Governing Council was established and required to report annually to the General Assembly through the Economic and Social Council. This emphasized the primacy of States in providing general policy guidance for the direction and coordination of environmental programmes within the United Nations.

Furthermore, the General Assembly defined the function of the Environment Secretariat as that of a focal point for environmental action and coordination within and even beyond the United Nations system. It also established an Environment Coordination Board (ECB) as an interagency body to ensure cooperation and coordination among all UN bodies concerned with the implementation of environmental programmes. These functions, as noted in the Foreword, have now been assumed by the Administrative Committee on Coordination (ACC). Thus the General Assembly, while clearly recognizing the operational responsibilities of existing elements of the United Nations system, and stating that these should be maintained, also established institutions for effective coordination in dealing with a complex of interdependent problems.

Finally, by establishing the Environment Fund, the General Assembly acknowledged the need for additional funds to finance wholly or partly the costs of new environmental initiatives, including cooperative projects undertaken within the United Nations system. The Fund can also be used to stimulate action outside the UN system through supporting organizations, or in directly implementing important resultant activities. It should be noted that the UNEP Fund depends upon voluntary contributions.

The Governing Council of the United Nations Environment Programme held its first session in Geneva in June 1973, and has since met annually in Nairobi. The Environment Coordination Board was first convened in April of the same year. Mr Maurice F. Strong, as Secretary General of the United Nations Conference on the Human Environment, was beyond doubt the man most responsible for the success of the Conference. In December 1972 he was nominated by the UN Secretary General and elected by the UN General Assembly to be the first Executive Director of UNEP. Dr Mostafa K. Tolba was chairman of the Egyptian delegation at Stockholm and also served as Vice-President of the Conference. He was the first Deputy Executive Director and was elected to succeed Mr Strong in December 1975. He was re-elected for a full four-year term as Executive Director, effective 1 January 1977.

The first appointments to the Environment Secretariat were made early in 1973. The Secretariat staff is small and is composed of many nationalities. It consists of professional officers who do the substantive work on the Programme, backed up by administrators, finance officers and other staff.

The UNEP secretariat supports the Governing Council and serves the United Nations system in the discharge of its responsibility by collecting and interpreting information, coordinating elements of the environment programme, and administering the Environment Fund. The Administrative Committee on Coordination facilitates coordination and cooperation by providing high level executive linkages between the UNEP Secretariat and cooperating organizations of the UN system.

When Nairobi was chosen for its headquarters, UNEP became the first UN global body to be headquartered in a developing country. In order to carry out efficiently its global and catalytic role, UNEP has regional and/or liaison offices in different regions of the world (Geneva, New York, Beirut, Bangkok, Mexico City, Nairobi), and focal points in agencies of the United Nations system and in governments. Furthermore, certain operational units, such as the Regional Seas Programme Activities Centre in Geneva and the Industry and Environment office in Paris, are decentralized, for specific purposes.

During its early sessions the Governing Council started with the broad definition of the scope of the environment programme developed at Stockholm and gave it an increasingly precise character. Priorities were decided upon, objectives and strategies established, and areas of concentration as proposed by the Executive Director approved.

The subject matter of the programme is now fairly clear, though by its very nature it cannot be static. It is touched upon briefly here, and described in more detail in the next chapter.

Because the number of problems discussed at Stockholm and in-

corporated into the 109 Recommendations was so vast, Stockholm grouped them under five divisions, which ultimately became six "subject areas". These are:

- human settlements and human health;
- terrestrial ecosystems;
- environment and development;
- oceans;
- energy;
- natural disasters.

It was recognized at Stockholm that to reduce the areas of environmental concern to a small number of sectoral divisions could obscure the vitally important inter-relationships among them and, in fact, could undermine the needed comprehensive approach to the understanding and solution of environmental problems. The Stockholm Conference, therefore, went on to define a general integrating framework for action to help identify and solve environmental problems. The idea was to provide a process for implementing environmental programmes, consisting of an interacting system of functional tasks, namely:

- Environmental Assessment;
- Environmental Management;
- Supporting Measures.

These tasks would apply equally to all subject areas at all levels. The Stockholm framework for action has since been slightly modified by UNEP and will be described in detail in chapter IV.

The programmatic process

The approach that UNEP takes in dealing with the various elements of the environment programme is called the programmatic process. It should be emphasized that this is simply a systematized approach taken by UNEP to the environmental concerns voiced at Stockholm, which have been grouped under the six subject areas. Basically, UNEP examines each of these matters to see what are the problems; it makes recommendations on what is to be done about them and by

whom; and it decides when the money to support such actions must come from the Environment Fund. Thus the programmatic process is a way of defining problems and working out means of solving them. It is a commonsense, sequential procedure.

UNEP's programmatic approach involves three levels:

Level 1 aims at providing information on environmental problems and the efforts being made to respond to them, in order to identify gaps. Each year, the Governing Council chooses specific topics for which a "State of the Environment" report is to be prepared and presented at the Council's next session.

Level 2 sets out objectives and strategies for the environment programme and formulates specific actions. It presents an environment programme to the whole world for specific action; to Governments, international and non-governmental organizations, inter-governmental bodies, various supporting organizations and all other groups concerned.

Level 3 identifies those areas of the programme presented at Level 2 which are selected for support from the Environment Fund, that is, UNEP-supported projects. In selecting activities for Fund support the possible catalytic and coordinating effects of such actions are kept uppermost in mind.

The three-level programmatic process is something that is internal to UNEP, and is designed to prepare the way for further action by UNEP and/or by others. Projects can be undertaken in one of three ways: by cooperating agencies, that is, bodies within the United Nations family; by other supporting organizations; or by direct implementation. Major activities involving direct implementation have been the development of the Global Environmental Monitoring System (GEMS), the International Referral System, now known as INFOTERRA and the International Register of Potentially Toxic Chemicals, (IRPTC). For these activities UNEP has established Programme Activity Centres. These Centres have also been established for the Industry, and for the Regional Seas Programmes. It should

be borne in mind in all that follows, however, that the role of UNEP, even in the case of internal projects, is primarily catalytic, that is, to stimulate actions by others.

To sum up, in contrast with most of the other members of the United Nations family, UNEP is not an operational agency. The Governing Council considers environmental issues, and reviews and develops the environment programme, but the implementation of the programme is the responsibility of the United Nations system as a whole. The activities of every agency in the UN family impinge upon the environment in one way or another, and for that reason environmental action within each respective sector is considered to be the agency's responsibility. UNEP does not compete or overlap, but complements, supplements, fills gaps and accelerates action as necessary.

I, 2.1. UNEP's role in the United Nations system¹

It is clear from the foregoing that from their inception the Governing Council, the Secretariat, the Environment Fund and the Environment Coordination Board faced an unprecedented task, and a role and operational style had to be worked out for UNEP that was unique in the United Nations system.

As already pointed out, UNEP was the first United Nations body to be headquartered in a developing country and its relative geographical isolation from the other major parts of the UN system posed special problems, for example, in travel, communication and administration. Its location, on the other hand, offered the advantage of close proximity to the environmental problems of a number of developing countries.

Other more significant factors contribute to the uniqueness of UNEP. Most of all, UNEP is unique in the way it relates to the United Nations system and in its inter-agency coordination arrangements. UNEP attaches importance to joint programming of activities. It engages in discussions with individual agencies and coordinates

¹ Based on: UNEP: The United Nations Environment Programme, Nairobi, 1979

dialogue among a number of agencies sharing an interest in a particular sector of the programme. The emphasis on these joint programming exercises ensures that the catalytic role of the programme is effectively performed, and the resources of the United Nations system put to good use.

The Environment Coordination Board, whose functions are now assumed by the Administrative Committee on Coordination (ACC), was established to ensure such cooperation and coordination among all organizations in the United Nations system. In each agency, a designated official for environmental matters serves as the main channel of communication with UNEP. The environment cannot be dealt with sectorally, but requires an inter-disciplinary approach covering the whole range of human activities. Duplication of effort has to be avoided to make the best use of available resources and manpower. The cooperative approach among UN agencies, including the United Nations Regional Commissions, promotes system-wide cooperation in drawing up and reviewing the environment programme.

UNEP is also unique in the contrast between the breadth of its mandate and the complexity of its functions on the one hand, and its small size and relatively modest Environment Fund on the other. The target for the first five years was \$100 million, raised by voluntary contributions, and the target for the following four years, set at \$150 million, was essentially maintained at this level, if considered in real dollar value terms. Since 1973 the Fund has been used to assist UNEP in fulfilling its policy-guiding role for the coordination of environmental activities in the UN system. Fund resources are also directed to multi-agency projects and other joint activities with cooperating agencies, which often result from joint programming exercises.

UNEP's role as a catalyst is thus exercised partly by selective use of the Environment Fund and partly through the power of persuasion based on information about environmental hazards, and on the sounding of alerts on major dangers like risks to the stratospheric ozone layer. UNEP also keeps under review documents and papers from a multitude of sources of environmental information. Without

adequate information drawn from a sufficiently broad base, effective coordination of the activities that make up the United Nations Environment Programme would be impossible, as would be the accurate identification of the most important additional activities that should be undertaken. Moreover, to do its job, UNEP must not only possess and understand the facts, but must also perceive the linkages among them.

One effective device employed by UNEP for promoting environmental action is to stimulate and support the development of international agreements on environmental matters. These can be on a regional or global scale. UNEP has been active in promoting and supporting regional agreements for the protection of the marine environment in various parts of the world, as already noted. The example of the Mediterranean region may be cited in more detail to illustrate UNEP's operational style.

The Mediterranean region had, from the earliest days of UNEP, been selected as a concentration area where UNEP would act in a catalytic manner to assist coastal states to protect and develop the area in environmentally-sound ways.

Following a preliminary three-level identification of objectives and strategies, UNEP convened an Intergovernmental Meeting on the Protection of the Mediterranean in early 1975 at Barcelona. This was preceded by intensive preparatory activities involving a number of United Nations bodies, as well as experts from the region. Representatives of 16 states bordering the Mediterranean attended the meeting, and approved an action plan.

Under Assessment, monitoring and research activities were initiated in seven pilot projects involving 82 laboratories from 16 Mediterranean States in collaboration with UNEP and a number of organizations of the United Nations system. At a review meeting of coastal states in January 1978 it was recommended that the pilot phase of assessment be ultimately transformed into a permanent monitoring system.

Under Environmental Management, several activities in the Mediterranean region have been initiated or supported by UNEP since 1975. These were aimed at integrated socio-economic development planning and rational management of natural resources. Cooperation between Governments and United Nations agencies, approved at a meeting in Split, Yugoslavia in early 1977, called for coordination of studies, now known as the Blue Plan, on the long-term socio-economic development of the Mediterranean region.

At the same meeting, Governments recommended a Priority Actions Programme to apply sound environmental management practices in selected fields such as soil protection, fresh water resources management, marine living resources and aquaculture, human settlements, tourism, and soft technologies for energy. The Priority Actions Programme demonstrates in concrete terms the theories developed in the Blue Plan.

The Barcelona Conference also agreed to set up a Regional Oil Combating Centre in Malta, which has already established links with national focal points in 16 Mediterranean countries.

In addition, steps have been taken, in cooperation with IUCN, to identify Mediterranean marine parks and wetland areas in need of greater care and protection.

Under Environmental Legislation, texts for three legal instruments were approved at the Second Barcelona Conference in early 1976, namely: a Convention for the Protection of the Mediterranean Sea Against Pollution; a Protocol for the Prevention of Pollution of the Mediterranean Sea by Dumping from Ships and Aircraft; and a Protocol concerning Cooperation in Combating Pollution of the Mediterranean Sea by Oil and other Harmful Substances in Cases of Emergency. In February 1978 these treaties entered into effect and at present eleven parties have ratified them.

As a result of work under way in 1977, in cooperation with WHO, Intergovernmental Consultations on a draft Protocol for the Protection of the Mediterranean Sea against Pollution from Land-Based

Sources are well advanced. Additional protocols to control pollution in the Mediterranean are also foreseen.

In addition to the many supporting measures required under these Assessment and Management activities, it was found necessary for UNEP to coordinate joint activities with special institutional and regional organizations for Mediterranean Governments and their national institutions, especially those of developing countries. Financial support from UNEP is provided on the assumption that the Governments will gradually take over the operating costs as UNEP's initial catalytic role is fulfilled. At its sixth session, in May 1978, the Governing Council called upon the States involved in the Mediterranean Action Plan to take increasing responsibility for Secretariat costs with the object of assuming full financial responsibility by the end of 1983. It recognized, however, that the experience gained during the preparation and implementation of the Mediterranean Action Plan should be useful in other regional seas programmes.

Undoubtedly the momentum of the Mediterranean experience was carried over into the conference convened by UNEP and hosted by the Government of Kuwait in April 1978. At this conference, as already mentioned, top scientists and Government officials from eight countries of the region agreed upon an Action Plan for the protection of their common marine environment and for developing it in an environmentally-sound manner. In doing so they put the emphasis on applying the knowledge and skills already available.

Another outstanding example of UNEP's operational style could be taken from the United Nations Conference on Desertification held at Nairobi in August/September 1977. The Executive Director of UNEP was Secretary-General of the Conference and the UNEP Governing Council was the Inter-governmental Preparatory Body for the Conference.

It was the great drought that affected the countries of the Sahel for some six years prior to 1973 that aroused world concern about desertification. The first priority was to help relieve the mass

human suffering it caused, and second, to try to understand what may lie behind such drastic occurrences. In December of 1974, the Assembly decided to initiate concerted international action to combat desertification, and to convene the United Nations Conference on Desertification.

The Conference Secretariat sought advice from hundreds of internationally recognized experts in a large number of disciplines. These men and women reached a number of important understandings on the problem and provided a sound foundation for action. Four regional intergovernmental preparatory meetings were held, in which the catalytic and coordinating role of UNEP was very obvious. The quality of the documents presented at the Conference has been universally acclaimed.

Among the cooperating agencies were the United Nations Development Programme (UNDP), UNESCO, FAO, WHO and WMO. Support and assistance were offered by UNDP and the United Nations Fund for Population Activities (UNFPA). The Under Secretary-General for Economic and Social Affairs attended the opening of the Conference and read a message from the Secretary-General of the United Nations. The Secretary-General of the World Population Conference and the United Nations Water Conference also attended.

The immediate goal of the Plan of Action to Combat Desertification, adopted by the Conference, is to prevent and arrest the advance of desertification and, where possible, to reclaim desertified land for productive use. The ultimate objective is to sustain and promote, within ecological limits, the productivity of arid, semi-arid, sub-humid and other areas vulnerable to desertification in order to improve the quality of life of their inhabitants. Desertification was seen as a human problem in both its origins and effects, and the main concerns of the Conference lay in human actions as well as in human well-being. The problem is global. Its solution will have direct impact on those who suffer from it, and will affect, directly and indirectly, the rest of the world. This serious threat to the welfare of mankind can be arrested only when men's actions take a direction more in harmony with the environment.

The United Nations General Assembly has endorsed the Plan of Action to Combat Desertification and entrusted UNEP with the responsibility to follow-up and coordinate the implementation of the Plan at the global level. A desertification unit has been established within the secretariat of UNEP in order to organize proper coordination. The Consultative Group for Desertification Control, co-sponsored by UNEP, UNDP, UNESCO, UNFPA, WFC, WMO, UNIDD and FAO, was convened with a view to mobilizing necessary resources for implementing the projects within the framework of the Plan of Action. UNEP and the Governments concerned are working in preparing several large transnational projects to combat desertification in the most seriously affected regions of the world. These include two projects on monitoring desertification processes in South America and South-west Asia, two projects on creating the so-called Green Belts north and south of the Sahara, a project on livestock and rangelands management in the Sudano-Sahelian region, and a project on rational management of the regional aquifer in North East Africa. Many other relevant activities are being planned, including those initiated or continued by the specialized agencies of the United Nations.

UNEP also supports international action for the conservation of natural resources. It has been closely involved in the Convention on International Trade in Endangered Species of Wild Fauna and Flora, along with the International Union for the Conservation of Nature and Natural Resources (IUCN) which provides the Secretariat for the Convention.

Pursuant to the General Assembly resolution 3129 (XXVIII) of 13 December 1973 on cooperation in the field of the environment concerning natural resources shared by two or more States, the Governing Council in 1975 requested the Executive Director to establish an Intergovernmental Working Group of Experts on the conservation and harmonious exploitation of such resources. In February, 1978, Government experts from 26 countries met in Nairobi and adopted 15 draft principles of conduct for guiding states when using and conserving natural resources shared with their neighbours. At its sixth session, the Governing Council welcomed the draft principles and approved their transmission to the General Assembly with an

invitation to adopt them. In its resolution 33/87, the General Assembly invited the Secretary-General to transmit the report to Governments "for their study and comments regarding the principles and to report thereon, taking into account also other significant information, with a view to enabling the General Assembly to take a decision at its thirty-fourth session".

UNEP has also been active in a number of major international conferences, as already noted. In particular, it supported Habitat, the United Nations Conference on Human Settlements, in 1976; participated in the United Nations Water Conference in March, 1977; and cooperated with UNESCO in organizing the Intergovernmental Conference on Environmental Education in October 1977. Other important meetings and conferences include the General Assembly Special Sessions on Disarmament in 1978 and 1982; the United Nations Conference on Technical Cooperation Among Developing Countries, in 1978; the United Nations Conference on Science and Technology for Development in 1979; the Conference on Agrarian Reform and Rural Development, organized by FAO in 1979; and the United Nations Conference on New and Renewable Sources of Energy in 1981.

I. 2.2. Structure and mode of work¹

Stockholm aroused hopes and expectations among many concerned people in many countries. At last, ten years after Rachel Carson's best-seller "Silent Spring" had triggered wide-spread anxiety about the unpleasant environmental prospects that lay ahead if we failed to change our ways, action was going to be taken at the international level to set things right. What was not entirely grasped at first by many segments of the public was that such action had to be taken by everyone everywhere. This meant local communities, through wider and wider jurisdictions, to national, regional and ultimately global levels. International environmental action could be spurred and guided from the top (that is from an international body like UNEP set up for that purpose), but it could not be imposed from the top. It certainly could not be centrally financed or managed, except for the relatively small working budget and a small Fund to be used to get action under way in a

few selected areas. Those who initially expected UNEP to clean up the world environment, or to provide the funds so that others could do it, were bound to be disappointed. UNEP's Fund was intended to be a small but potent catalyst only.

It should be emphasized that there were good reasons for UNEP's deliberate smallness. The problems were so vast and so complex that it was not possible to conceive of a Secretariat or a Fund that could cope alone. Hence the idea of a complementary and coordinating role within the UN system, and the emphasis on the catalyzing function.

One of the first tasks of UNEP was to attain a working grasp of the whole scope of the environment programme, summarized in the Stockholm report and organized by UNEP under the six subject areas. The 109 Stockholm Recommendations, though themselves a summary, still represented a long and exhaustive list of areas of concern and suggested actions, and prior attention had to be given to certain elements from the beginning.

It may also be useful at this point to draw attention to certain interrelationships and contrasts among the UNEP subject matter divisions.

The two subject areas Terrestrial Ecosystems and Oceans together cover all global ecosystems, human communities excluded. Environment and Development, on the other hand, is concerned with socio-economic and political systems so far as they focus on the satisfaction of human needs and demands. A major concern here is the effect of human activities on the quality of the environment and on the continuing availability of resources. Human Settlements and Human Health together deal with the environmental and health aspects of human communities. It is in human settlements that both the need for development and the threats to the human environment tend to be most apparent, and it is in the planning of human settlements, above all, that apparent conflicts between the objectives of environment and development must be resolved. Energy is logically a sub-division of environment and development, but it is also linked with natural resources and the whole question of

conservation. Natural Disasters is unique in that the concern is primarily with the impact of the natural environment on man rather than the other way around. The impact of some of man's activities on the environment, however, may affect occurrence of natural calamities such as floods, landslides, and loss of arable land through desertification.

Summaries of each of these subject areas follow. Such summaries cannot give a complete picture, and for a more detailed review the reader should refer to the UNEP Programme documents presented annually to the Governing Council. The functional structure of the UNEP Bureau of the Programme is geared to these subject areas and their interrelationships.

Human settlements and human health

Following Stockholm's lead, the Governing Council has been unequivocal in its affirmation of the close and vital relationship between the natural and the man-made environments. The Human Settlements and Human Health programme has been developed with that relationship in mind.

At Stockholm there was much pre-occupation with pollution and its effects upon human communities. But there was also a move towards a more complete view of human settlements as complex organisms within the natural environment. One UNEP approach has been to focus on aspects of the relationship between human settlements and ecosystems.

Through this approach, full advantage may be taken of the materials, resources and amenities the environment can supply. But the concept demands the development of appropriate technologies to minimize disruption of the natural environment, and thereby conserve soil, vegetation and water resources. It also calls for the adoption of appropriate waste management practices to reduce pollution, recycle wastes, and dispose safely of ultimate residues. At the same time, appropriate technologies in both urban and rural areas must take into consideration not only environmental factors, but also social

and economic ones. There are many areas where environmental problems are intimately related to socio-economic phenomena. These cannot be dealt with solely by technological approaches.

The concerns expressed at Stockholm eventually led to Habitat - the United Nations Conference on Human Settlements, held at Vancouver in 1976, and the establishment of the United Nations Habitat and Human Settlements Foundation (UNHHSF) with the purpose of providing seed capital for housing and settlement infrastructure.

The Vancouver Conference produced a series of recommendations. It provided a conceptual framework within which comprehensive integrated international planning could take place. Such planning would take into account many interrelated factors, including technological, social, economic, and ecological ones. This led to the creation by the General Assembly, in 1977, of Habitat, the United Nations Centre for Human Settlements, which is also located in Nairobi. The two major United Nations components which came together to form this new Centre were the Centre for Housing, Building and Planning and the United Nations Habitat and Human Settlements Foundation. The Foundation will retain its original terms of reference within the framework of the new Centre.

In cooperating with the Habitat Centre, UNEP will continue to promote the inclusion of environmental considerations in human settlements planning. UNEP would like to see a global network of institutions established to test, apply and publish advice on appropriate and environmentally-sound technology - including human settlements technology. UNEP is also involved in regional and global cooperative activities such as exchange programmes, study tours, seminars and workshops, and training in various aspects of human settlements with special emphasis on environmental considerations. Among other specific activities, UNEP has developed, with the cooperation of the United Nations Educational, Scientific and Cultural Organization (UNESCO), a human settlements managers' training programme. UNEP is also developing an integrated approach to improving slums and marginal settlements in different regions. In this effort, it is cooperating with other United Nations bodies and Governments.

The environmental aspects of human health were discussed at the first session of the Governing Council. It was recognized that the question of human health was inescapably linked to the health of the living environment itself. The objectives are to promote human and environmental health without creating new hazards.

Health hazards are often aggravated by rapid urbanization, particularly in developing countries, and physical and chemical hazards to which some people whose resistance has already been lowered by other infections are exposed. The problems addressed are basic: mal-nutrition, infectious diseases associated with lack of sanitation and contaminated water supplies, micro-organisms responsible for endemic diseases, and radio-active substances. It is a stark fact that cancer, linked, among other things, with aflatoxins, air pollution, and cigarette smoke, is now a universal threat for developed and developing countries alike. One must also consider the effects upon the environment and human health of the indiscriminate use of chemical fertilizers and herbicides. UNEP cooperates with the World Health Organization (WHO) on many health matters, including health criteria for chemicals, noise and other potentially harmful agents.

Terrestrial ecosystems

This is a very broad subject area encompassing ecosystems and resources over all the land areas of the earth. It is sub-divided into three groups: ecosystem types, which includes arid and semi-arid lands, tropical woodlands and forests, mountains, islands and coastal areas; resources, such as soils and water; and conservation of genetic resources, wildlife and protected areas.

The focus of work in the case of arid and semi-arid lands is on wise management to ensure sustained productivity. Arid and semi-arid lands are ecosystems which are vulnerable to the processes of desertification through human mismanagement, particularly over-grazing, over-cultivation, improper irrigation, and over-use of plant material for fuel. Desertification, as the word implies, is a process in which the productivity of arid and semi-arid areas is

reduced to a level characteristic of deserts. Control is essential to maintain or improve the productivity of these areas and to keep them suitable for habitation by man.

Tropical forests and woodlands are an invaluable resource, but are increasingly subjected to modification by man as he strives to meet his needs. There is mounting concern about the disappearance of tropical forests. Although much more needs to be done to provide a complete picture of the present status of forests and woodlands, it is already evident that in some regions the need to adopt ecologically sound techniques of land management is urgent.

Mountains, islands, coastal and other ecosystems are also characterized by specific environmental problems that require assessment and development of action plans for their management. Mountain regions are sources of water for adjacent lowlands. Many islands are sites of unique fauna and flora. Coastal zones are significant for transport and settlement, and as habitats for marine life. In due course the environment programme may give some attention to the sound environmental management of other ecosystems such as ice caps, cold steppes, tundra regions, sub-arctic forests, temperate forests and grasslands.

Soil is the basis for food production, and it conditions the productivity of all the ecosystems of which it forms a part. Activities here should be aimed at preventing further degradation of soil, and restoring or improving soils which have already been degraded through misuse. Increasing attention must also be paid to restoring or enhancing fertility by methods that do not pollute and do not have a high energy demand.

Man's need for water is fundamental, but supplies are limited in quantity and distribution, and quality is often poor. Lack of control of industrial, agricultural and municipal wastes can reduce the productivity of ecosystems and increase water-borne diseases. It can also result in pollution of water sources, and have other undesirable effects on human health and the environment. Measures to increase the availability of potable water must be planned and

executed with these considerations in mind. Activity is at present concentrated on water resources management programmes, and on improving the quantity and quality of rural water supplies, especially in developing countries.

Genetic resources are of great significance because they have reached their present forms through millennia of evolution; once lost they are irreplaceable. Genetic diversity of species is the basis for evolution of economically-useful plants and animals. The strategy here is first to appraise the status of genetic resources, with special attention to species of known or potential value to agriculture, fisheries, food production or forestry. The next step is to develop and implement means of maintaining maximum genetic diversity. Microbial resources receive particular emphasis because of their application in environmental management, and because of their high biological activity which can be used in food, feed and chemical production, and in the degradation of pollutants.

Activities related to conservation of wild animals and plants, national parks and other protected areas are also essential components of environmental management and economic development.

Wild animals are a resource which may be used for the benefit of human society. But such resources must be used without lowering the chances of long-term survival of wildlife. Major activities in this area include the appraisal of the status and distribution of wild plants and animals and their habitats, development of plans of action for conservation and rational use of wildlife and their natural homes, and establishment of a network of national parks and other protected areas and reserves. Although these activities are necessarily long-term, there is an urgency about getting them underway as quickly as possible. International conventions and agreements can be effective instruments in this connection. Training and public awareness in national park and wildlife management also provide a good basis for effective and practical conservation activities.

Environment and development

Some years ago concern for the environment was regarded as being in conflict with the requirements of development, because such concern was seen as diverting resources, especially financial ones, from other more pressing needs. This was of particular interest to countries with dire development needs, though it also sparked many debates within developed countries.

Since Stockholm, the link between environment and development has become better understood and environmental quality and human well-being are now widely seen as going hand in hand. No longer is environmental protection looked upon only as a "cost". Its benefits become abundantly obvious when long-term needs are included in economic calculations, and when the environment is accepted as a vital component of the quality of life.

There is now a growing acceptance of UNEP's assertion that the ultimate aim of everything done under the United Nations Environment Programme is development that is environmentally sound. Management of all human activities that impinge upon the environment is essential if the biosphere is to be able to respond on a continuing basis to human needs and aspirations.

The necessity of the integrative approach that characterizes the United Nations Environment Programme is nowhere more evident than in the subject area Environment and Development. The relevant activities are wide-ranging and must be undertaken at many levels, global, regional and local. They include:

- the promotion of alternative development patterns and life-styles in all countries that are less destructive to the environment and less wasteful of energy;
- support to design of technologies with less destructive effects upon the environment, and which require fewer resources than technologies now in common use;

- the development and application of environmental criteria for industrial siting;
- the development and application of criteria for the rational use of natural resources;
- the improvement of methods to ensure that the environmental dimension is fully incorporated in development plans at the national, regional, and global levels, as well as in the planning and execution of major development projects;
- the explicit consideration of environmental concerns in the restructuring of international economic relations.

UNEP activities related to industry and the environment have been many. They have included detailed studies, workshops, seminars and booklets on the environmental aspects of the pulp and paper, aluminium, motor vehicle, petroleum, iron and steel, sugar, cement, and chemical industries. UNEP has also been involved in discussions and studies on the utilization of residues and the problem of post-harvest food losses, in on-going activities related to low and non-waste technologies, industrial cost/benefit analysis, pollution prevention, resource-conserving technologies, industrial environmental impact assessments, and industrial siting. UNEP has also set up an industrial information storage and retrieval system.

Environmental problems of developing countries may be caused by underdevelopment, as well as by development processes which do not take account of environmental factors. Environmental problems arise from poor living conditions, inadequate levels of nutrition - often made worse by environmentally-caused diseases, such as schistosomiasis, river blindness and malaria - loss of forest resources and arable soil, inadequate water supplies, etc. Industrialized countries are faced with such problems as pollution, wasteful use of natural resources, and the environmental hazards associated with life in the big cities.

The policies and activities of industrialized countries can have

environmental impacts on developing countries - the export of inappropriate technologies, for example, or resource demands which promote development geared too exclusively to short-term gain. In any country, long-term economic benefits could accrue from a greater investment in environmental protection and enhancement. Such an approach would be sound economically as well as environmentally.

The impact of development activities depends a great deal on the type of technology used, and much attention is being given to the development of alternative technologies that are environmentally sound and appropriate. This means that they should conserve resources and be non-polluting and energy-saving. Where appropriate, recycling and local and renewable resources should be used.

The close links between the environment and the New International Economic Order (NIEO) were recognized at the 32nd Session of the United Nations General Assembly when it stressed "the need for ensuring that environmental considerations are taken into account in development programmes in differing socio-economic settings, in the implementation of the Programme of Action on the Establishment of a New International Economic Order and in the formulation of the new international development strategy".

Environment/development issues are complex, yet they are among the most important issues with which the United Nations Environment Programme is concerned. A better understanding of them can lead directly to effective action to improve the quality and long-term productivity of the environment.

Oceans

This subject area covers activities aimed at protecting the oceans from pollution and enhancing the quality of the marine environment. UNEP also attaches importance to marine conservation programmes. Marine living resources are not only of great interest to science, but have enormous value as food and for other human uses. The activities in this subject area are diverse: halting the pace of destruction of living marine resources and their habitats, and pre-

venting the decline or the exhaustion of major traditional world fishery resources; preventing pollution of the seas, especially in biologically-productive inshore waters; promoting the establishment of additional protected areas and particularly those habitats on which marine life depends for reproduction; developing a coordinated network of protected areas representative of the earth's diversified ecosystems and using them for sustained productivity of renewable natural resources for the benefit of man; effectively implementing international conventions and agreements; and promoting public awareness.

International conventions are particularly useful in achieving objectives in this area. Priority is given to the regional approach. Since marine pollution is no respecter of territorial waters, nations bordering on a particular body of water have a common interest and a common responsibility to mitigate and avert common dangers. Two areas in which promising action is already under way are the Mediterranean, and the marine environment and coastal areas of Bahrain, Iran, Iraq, Kuwait, Oman, Qatar, Saudi Arabia and the United Arab Emirates. Regional conferences of states are also being planned in relation to the Gulf of Guinea, the Caribbean, the East Asian seas, the Red Sea, the South-west Pacific and the South-east Pacific.

UNEP assists Governments in implementing international and regional conventions to control marine pollution and protect and manage marine and coastal resources. Three examples of such existing conventions may be cited: the Convention for the Prevention of Marine Pollution by Dumping from Ships and Aircraft, Oslo, 1972; the Convention for the Prevention of Marine Pollution from Land-Based Sources, Paris, 1974; and the Convention on the Protection of the Marine Environment of the Baltic Sea Area, Helsinki, 1974.

Energy

The programme in this area is concerned with gaining improved knowledge of the environmental implications of production, transport and use of all energy resources to serve as a basis for guidance to

Governments. The programme is also concerned with the establishment of units for production of energy from renewable sources in rural areas, particularly in developing countries.

Energy is essential to economic development and the satisfaction of human needs. The continual increase in the global demand for energy has been met in recent years mainly by fossil fuels, particularly oil. These resources are finite. The possibility of using renewable sources of energy is becoming increasingly attractive, both to developed countries which are trying to reduce their dependence on oil, and to developing countries which see the importance of renewable energy sources in meeting rural energy needs. The environmental effects of many forms of renewable energy are small in comparison with those associated with the use of fossil fuels.

UNEP is convening a series of international panels of experts to study the environmental impacts of all forms of energy. The relationship between energy conservation and the environment is being studied so that draft guidelines may be issued for the rational use of energy.

UNEP is establishing an experimental Rural Energy Centre in Sri Lanka for harnessing solar and wind energy and biogas. UNEP and the Centre for Natural Resources, Energy and Transport (CNRET) are cooperating in the establishment of similar centres in Senegal and Mexico. The aim is to demonstrate the use of appropriate technologies in developing clean sources of energy. Feasibility studies on harnessing renewable energy sources in the Philippines are also being supported by UNEP. A survey of the feasibility of exploiting renewable energy sources in the Arab region is being carried out in cooperation with the Arab League of Economic, Cultural and Scientific Organizations (ALECSO).

A meeting of Government experts was held at Malta in October 1978 to define a cooperative programme on the practical applications of renewable sources of energy.

Natural Disasters

Extreme natural phenomena of sudden onset, such as tropical cyclones, floods and earthquakes, can cause widespread physical, ecological and socio-economic damage to large areas. These cannot be coped with by the affected community alone. In this subject area, only natural disasters of sudden onset are dealt with. Those of slow onset or those directly affecting health, fall under other subject areas.

At the international level, both the natural phenomena and their sometimes disastrous consequences are responded to by various United Nations bodies. Programmes designed to prevent or mitigate natural disasters are being undertaken and include such activities as early warning systems, relief, rehabilitation and reconstruction, information, education and training, and technical assistance. UNEP's programme in this area is focussed primarily on world-wide early warning systems for natural disasters, in cooperation with UNDRO, UNESCO and WMO.

A better understanding of what UNEP does may be gained by examining how the three functional tasks, Environmental Assessment, Environmental Management, and Supporting Measures, relate to one another. Sound Environmental Management is the culmination of these three. Reference may be made to the following chart, showing the functional structure of UNEP's Bureau of the Programme.

ENVIRONMENTAL ASSESSMENT

Monitoring
Research
Information Exchange
Evaluation
Review

ENVIRONMENTAL MANAGEMENT

Includes
Environmental Law

SUPPORTING MEASURES

Environmental Education
Environmental Training

Information
Technical Assistance

Environmental Assessment

Environmental Assessment is essential to the other two functional tasks and is usually the first step undertaken, although management activities may reveal the need for further assessments. Environmental assessment is the collection, collation, and interpretation of data that describe and evaluate the conditions and trends of the environment, and the effects of man's activities on it. Environmental assessment may relate to the entire globe; to a particular country or region; or to a particular locality, project or product.

Earthwatch was the term Stockholm used for global assessment. It includes monitoring, research, information exchange, evaluation and review.

Monitoring and research refer to the process of obtaining the necessary data and information. Information Exchange and Evaluation ensure that the information obtained is widely available and interpreted for the guidance of policy makers and planners. Review refers to an analysis of the system to ensure it is meeting the needs of environmental management.

The Global Environmental Monitoring System Programme Activity Centre (GEMS PAC) of UNEP was established in response to the need for sound information about the environment on a world-wide basis and is expected to coordinate all international environmental monitoring. At present the main activities coordinated by GEMS concern health-related monitoring, climate-related monitoring, ocean monitoring and the monitoring of renewable natural resources.

Health-related monitoring is carried out mainly in cooperation with the World Health Organization (WHO), and is carried out in 180 stations in 60 cities. In 14 of these stations there was no previous local experience in monitoring. Fifteen stations are concerned with food contamination. Water quality monitoring has become operational this year and will eventually be carried out in 300 to 400 stations. These activities are primarily concerned with levels of pollution outside the human body. Pilot activities are now being

initiated which aim at direct measurement of contaminants in human body fluids and tissue.

UNEP has been given organizational responsibilities in connection with the United Nations Scientific Committee on the Effects of Atomic Radiation (UNSCEAR). This Committee produces at intervals major reports on the levels and effects of ionizing radiation from all sources and on the attendant risks for the human population. The Committee reports directly each year to the General Assembly.

The World Meteorological Organization (WMO) is the main cooperating agency responsible for climate-related monitoring. This has so far been confined to the monitoring of background pollution (particularly CO₂ and turbidity) at stations far removed from sources of pollution. New activities such as the systematic determination of the earth's reflectivity, and the extent and variability of global snow cover and sea ice are being planned for the near future.

Most of the GEMS activities related to oceans are carried on as part of the Regional Seas Programme. However, a project on the monitoring of petroleum hydro-carbons is being carried out globally on a pilot basis, in cooperation with the Intergovernmental Oceanographic Commission (IOC) of UNESCO and WMO. Plans are also being developed for background pollution monitoring in open oceans.

The monitoring of renewable natural resources is at present carried out mainly in cooperation with the Food and Agriculture Organization (FAO). Monitoring of wild living resources is done in cooperation with the International Union for the Conservation of Nature and Natural Resources (IUCN).

Rising world concern with desertification made it apparent that there was an urgent need for simple, reliable techniques to measure and monitor the extent and rate of various types of soil degradation. Such techniques have been developed and are being field-tested before being introduced into a global monitoring network.

The depletion and degradation of tropical forests and rangelands

are two other areas of primary concern to GEMS. A pilot project on tropical forest cover monitoring is already under way in West Africa, and this will serve as a basis for the development of a pan-tropical network for forest monitoring. A pilot project for monitoring tropical rangelands will also shortly be undertaken in West Africa. Similar methods will be used in two regional habitat monitoring programmes, primarily concerned with anti-desertification measures, to be established in South America and South-west Asia. These three projects are precursors of a world tropical rangeland monitoring network. The information provided will make possible more rational management of these important global resources.

Information exchange is of prime importance to decision-makers if they are to devise environmentally-sound development strategies. The International Referral System (INFOTERRA) was designed by UNEP to improve the access of decision-makers everywhere to environmental information. UNEP houses the small staff and central unit of the INFOTERRA PAC. INFOTERRA is based on the concept of referral - it refers users to appropriate sources of information.

In keeping with the broader role of UNEP as a catalytic organization, INFOTERRA was designed to be a highly decentralized network, with flexible and simple procedures for its use. Above all, it has been designed to make maximum use of existing or planned information systems throughout the world. One of its fundamental aims is to encourage the establishment and development of national systems for environmental information, and to link them in interlocking national and international networks of users and sources of information. The INFOTERRA PAC provides full technical and other support services to the international network. To promote development of the network, technical training courses have been held in every region, and all countries have been given an opportunity to have their personnel trained. Study tours, fellowships and on-the-job training have also been provided to help national focal points of the network to discharge their functions.

By March, 1979, sources registered throughout INFOTERRA numbered

7,100 in 63 countries. The number of national focal points in the system at that time stood at 96. The target set for source registration by 1982 is 20,000. By that time it is estimated that requests for information should reach 800 a month, and by then INFOTERRA should include 100 active partner countries, each providing sources to the system and responding to queries.

INFOTERRA is concerned with providing users with access to sources of environmental information. Another PAC, the International Register of Potentially Toxic Chemicals (IRPTC) is itself an international source of information on one aspect of environmental knowledge that is becoming increasingly important on a global scale.

The ultimate purpose of the IRPTC is to help reduce the hazards associated with chemicals in the environment by supplying relevant information to those responsible for human health and environmental protection. It also provides base data for evaluating (and eventually predicting) the hazards associated with particular chemicals. To achieve these objectives, the IRPTC relies on centrally stored data; and data available elsewhere through a network of cooperating data bases and institutions.

The IRPTC consists of four components: a Central Unit, which is the operating centre of IRPTC and is located in Geneva; network partners, who undertake to receive and respond to queries received through the network; contributing sources which make their data available to IRPTC; and national, regional or sectoral correspondents who act as coordinating centres for interaction with IRPTC and actively participate in information exchange. By March, 1979, 60 countries had appointed their national correspondents. Plans are afoot to hold regional workshops to familiarize the correspondents with the operation of IRPTC and train them to carry out their task.

Technical publications will be issued in the near future. A regular Bulletin carries information on chemicals causing concern, and news on controls or bans.

An Environmental Data Unit deals with environmental statistics and

indicators. It also collects information on the environmental activities of Governments and non-governmental and international organizations. The Unit compiles facts and figures on environmental events by means of a Data Base which covers not only long-term trends, but also short-lived events like accidental emissions of chemicals into the atmosphere and accidental oil spills.

UNEP task forces deal with Earthwatch-related research, evaluation and review. They also deal with the assessment of basic human needs, and of outer limits.

The satisfaction of basic human needs, especially food, health, shelter, clothing, and employment, is closely related to the alleviation of acute poverty. The problem is circular: acute poverty causes serious problems of resource depletion and environmental degradation and these conditions make the alleviation of poverty all the more difficult to achieve.

Thus, public policies and programmes have to be formulated carefully so as to minimize and alleviate environmental problems such as deforestation, desertification, soil erosion and unhygienic conditions in and surrounding human settlements. Similarly, environmental improvement measures have to be carefully designed so that they make a maximum contribution to the lives of the people in the region.

The ultimate objective of UNEP's programme in this Basic Human Needs area is the promotion of environmentally-sound patterns of development. UNEP-supported assessment work in this field is aimed at investigating the relationship between the satisfaction of basic human needs and the protection and improvement of the environment.

The concept of environmental limits is an important one to bear in mind. How far can the adaptive capacity of the environment be stretched? What are the outer limits of the biosphere? Only by seeking to improve our understanding of the biosphere and to respect its constraints can we manage our affairs in the best interests of human life and well-being.

In the assessment of outer limits five subjects have been chosen for study by the Governing Council:

- the characteristics and causes of climatic change;
- the nature and impact on the environment of deliberate weather modification;
- the dimensions and significance of risks to the stratospheric ozone layer;
- the limits to the capacity of societies to modify their behaviour in the interests of sound environmental management;
- bioproductivity.

The aim in bioproductivity is to determine if the efficiency of photosynthetic productivity can be improved. The question is whether people would benefit if the rate at which plants synthesize carbohydrates could be pushed beyond the limits observed in nature.

It is clear that these are far from being the only subjects worthy of attention in relation to environmental limits. Other questions may be examined in due course. What, for example, is the minimum of forest cover needed for the oxygen cycle, or what are the limits to available supplies of essential minerals?

Turning now to environmental assessment at the regional level, good examples are provided by the regional seas activities of the Environment Programme. Activities have been undertaken in the Mediterranean and the marine environment and coastal areas of Bahrain, Iran, Iraq, Kuwait, Oman, Qatar, Saudi Arabia and the United Arab Emirates. Similar activities will soon be undertaken in the Gulf of Guinea, the Caribbean area, the Red Sea and South-east Asia. Other excellent examples of regional assessment are the regional studies of desertification processes made in preparation for the United Nations Conference on Desertification which took place in Nairobi in August-September 1977. More will be said about UNEP's

involvement in regional seas and desertification activities in the next chapter.

The processes of such assessments may vary. When they are large-scale they usually involve collation and review of existing information on the state of the environment by groups of experts associated with Governments. Such reviews lead to identification of the most severe pollution or degradation problems, and of the specific monitoring activities needed to provide detailed information on such things as pollutant sources, pathways and sinks, and rates of loss of vegetation cover.

The needs for research may also be identified at this stage. At the same time, the institutional capabilities of the region must be studied to define the training and technical assistance that may be needed for initial assessments - and for those done later to determine if management measures are having the desired effect.

An example of assessment on the local level is an environmental impact assessment of a river development project affecting an area within a country. It must be aimed at gathering information about the ecological characteristics of the land to be flooded, the likely ecological characteristics of the reservoir to be created, the effect on the ground-water regime, the effect of changes in water flow on downstream areas, the silt load of the stream, effects on surrounding micro-climates, and socio-economic effects.

Assessments may also be made of products or processes. These may vary in scope depending upon their proposed uses or applications. In assessing a pesticide, for example, one would want to know, among other things, its toxicity to non-target species, its persistence in various media, and its mobility, particularly in food chains.

More will be said later about the importance of disseminating environmental information. But here it should be noted that one of the chief ways in which UNEP provides information on critical subject areas is through its annual State of the Environment reports.

Among other things the General Assembly in its resolution 2997 (XXVII) of December 1972, gave to the UNEP Governing Council responsibility "to keep under review the world environmental situation in order to ensure that emerging environmental problems of wide international significance receive appropriate and adequate consideration by Governments".

The first three SOE reports dealt with the following issues: lands and water, climatic changes, energy, toxic substances, human stress and social tension (1974); population, food, oceans, energy, raw materials and outer limits (1975); and the interaction between man and environment with particular reference to hunger, pollution, world climate, and ways to improve management of the environment (1976).

At its fourth session, in 1976, the Governing Council decided that future reports would be selective in treatment and that an analytical, comprehensive report should be issued every fifth year, beginning in 1982. Topics focussed on during 1977 were: The Ozone Layer, Environmental Carcinogens, Soil Loss, and Firewood. In 1978 they were Chemicals and the Environment, Malaria, Use of Agro-Industrial Residues for Increasing the Base of Food Production, and Conservation of Energy. In 1979 they will be Environmental Disease, particularly Schistosomiasis, Noise, Tourism and the Environment, and Resistance to Pesticides. Brief mention will also be made of Genetic Engineering, and Peaceful Uses of Outer Space.

The first comprehensive five-year State of the Environment report in 1982 marked the tenth anniversary of the Stockholm Conference. Entitled "The State of the Environment: Ten years After Stockholm", this publication sought to identify, analyse and interpret changes in the environment and environmental situations, according to the available information. By displaying interrelationships, the report identified trends and possible future changes in ecosystems.

Environmental management

Environmental Management does not refer so much to the management

of the environment as to the management of all of man's activities which depend upon the resources of the environment, and which have an effect - beneficial or detrimental - upon the environment. The problems which environmental management attempts to solve arise, as indicated in the preceding chapter, from consequences of activities undertaken to meet human needs and to satisfy human wants. Environmental management seeks to take into consideration the resources required for meeting such needs and wants, the essential characteristics of the environment, the possible gaps between human demands and resource availability, and the best means of bridging such gaps. Broadly speaking, it is an attempt to define environmentally sound and sustainable means by which social and economic development can be pursued.

All countries, whatever their stage of development, need to make environmental management an integral part of their developmental decision-making processes. Governments have an obligation to present and future generations of the citizens, as well as to neighbouring countries and the world at large, to ensure that their development policies are environmentally sound and sustainable. Moreover, the international community has a responsibility, in the interests of all nations, to do what it can to help Governments to fulfil this obligation.

In this UNEP can play a key role. Everything done by UNEP is aimed at promoting sound environmental management everywhere. By its industry and environmental activities mentioned in chapter III; by developing the concepts and tools of environmental management; by stimulating awareness of the need for it; and by increasing understanding of the approaches available, UNEP can help to find solutions to specific developmental problems of Governments. It can also help to integrate and harmonize international approaches to regional and global problems.

An integral part of environmental management is Environmental Law which includes regulatory measures for prevention of pollution and other environmental malpractices. It also seeks to control the inevitable intrusions of human activities upon the natural environ-

ment, in order to keep them within ecologically and humanly acceptable limits. Environmental Law thus serves as an indispensable tool for sound environmental management.

Environmental Law is concerned with a wide range of activities. These include: land use practices, major construction projects, the conservation of fauna and flora, the preservation of amenities such as green space in settlements, the control of nuisances like excessive noise, and emissions of effluents damaging to human health or the environment as a whole. Certain emissions may impair the fertility of the soil or poison it beyond recovery. Some may destroy valuable natural ecosystems. Others represent a waste of scarce natural resources.

Most environmental regulations have so far been developed at local or national levels. This is the case with practically all enactments relating to land use practices, and most that relate to pollution and the use of renewable resources. However, many systems of management and law are now being developed, and these may be expected to become more and more coordinated, particularly as the economic and social factors that sometimes constrain such coordination are overcome. It is a primary task of UNEP to provide information and assistance that can help countries and regions to formulate and implement systems of environmental management and law suited to their needs.

Agreements on and implementation of regulatory measures related to the conservation and management of renewable living and non-living resources are becoming an increasing preoccupation of regional groups of countries. On living resources, some agreements of long standing aim at the protection of stocks of migratory animals, marine mammals, and fish in ocean areas beyond national jurisdiction. Many such agreements are now being revised to conform to the trends that have emerged at the UN Law of the Sea Conferences. Interest in concluding new agreements is being shown in areas where no agreements have so far existed. The role of UNEP in this area is essentially one of coordination. It seeks to ensure that environmental considerations are adequately taken into account in

formulating and implementing agreements relating to the conservation and management of renewable resources.

On non-living resources, more and more countries are becoming interested in the conclusion of international river basin agreements. There have been agreements for some time on the control of pollution in a few bodies of fresh water shared by two or more countries, a notable example is the Canada/United States agreement on water quality in the Great Lakes system, signed in 1975. The measures in some such agreements are being improved to make them more effective.

But it is the semi-enclosed seas, such as the Mediterranean, that have recently attracted most attention. In this connection a particularly effective role in catalyzing regional environmental management has fallen to UNEP.

The number of agreements calling for the control of pollutants is increasing. They cover maximum permissible pollutant levels in emissions or effluents, or maximum permissible concentrations of pollutants in the environment. A number of global and regional agreements on marine environmental protection have been concluded such as: the Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter; the Convention on the Prevention of Pollution from Ships; the Convention on the Protection of the Marine Environment of the Baltic Sea Area; the Convention for the Protection of the Mediterranean Sea Against Pollution, with its Protocols relating to dumping and marine pollution emergencies; and the Kuwait Regional Convention for Cooperation on the Protection of the Marine Environment from Pollution by Oil and Other Harmful Substances, and its related Protocol concerning Regional Cooperation in Combating Pollution by Oil and Other Harmful Substances in Cases of Emergency.

With regard to air, the Economic Commission for Europe (ECE) has prepared a draft convention on Long-range Transboundary Air Pollution which was adopted at the High-level Meeting within the framework of the ECE on the Protection of the Environment in September 1979.

Concerning soil, international agreements are still virtually non-existent and actions are being taken mostly at the national level. Use of the land for agricultural or forest crops, or as sites for settlements, industries and transport routes, may be controlled according to predetermined environmental standards by laws and regulations. Financial instruments such as taxes and grants may also be used to promote desirable land use practices.

The harvesting of renewable resources may be made to conform to standards that will ensure their continuing availability. Limits may be placed on the amounts of the resource that may be taken within a given period of time. Limits may even be set on the use of environmentally-harmful large-scale exploitation techniques, such as those which result in the decimation of non-target species, like porpoises caught in tuna nets.

Zoning regulations, and the establishment of parks and reserves, are techniques of environmental management used to maintain certain standards in the extent and distribution of natural ecosystems. Major construction projects are often made to conform to generally defined standards by an ad hoc negotiation of design and construction characteristics.

A global approach to environmental management has yet to be worked out, although a number of international environmental agreements have been concluded and are open to accession by all countries of the world. Two examples of agreements which are now in force relate to the preservation of the world's cultural and natural heritage and the regulation of trade in endangered species of fauna and flora. As environmental problems throughout the world more and more affect environmental conditions across national boundaries, it may be expected that the number of global environmental agreements will grow. UNEP's job is to support and promote this trend.

Supporting measures

Neither Environmental Management nor Environmental Assessment can be carried on effectively unless an informed and understanding

public lends its support, and unless skilled people are available to undertake the necessary tasks. Thus, Supporting Measures are an essential part of the operational process. This area includes environmental education, environmental training, information, and technical assistance. UNEP's strategy emphasizes the inclusion, where appropriate, of training, information and technical assistance in all its Fund Programme activities. In addition, UNEP is seeking to establish a clearing house to match requests for technical assistance from developing countries in environment-related matters with appropriate offers of help from developed countries.

Four Regional Advisory Teams have been recruited by UNEP to serve Africa, Latin America, Asia and the Pacific, and West Asia. The services of these advisers are made available on request to the Regional Director concerned, who keeps the major needs of the region under constant review. The advisers assist Governments in dealing with their environmental problems, and give advice to regional organizations so that they can effectively participate in UNEP programmes.

The promotion of environmental education, which requires effective contact with educational systems all over the world, presents a considerable challenge. In the long run human needs and aspirations cannot be satisfied unless the public becomes aware of the essential links between human needs and environmental quality. Indeed, they cannot be satisfied unless such awareness leads to appropriate action at all levels of society from local communities to the community of nations.

UNEP is concerned with environmental education and training in all countries, and collaborates closely with the United Nations Educational, Scientific and Cultural Organization (UNESCO) in this field. To cite one example, UNEP worked with UNESCO in the international Environmental Programme initiated in 1975, which led up to the Intergovernmental Conference on Environmental Education at Tbilisi, USSR, in October, 1977.

UNEP has supported more than 40 training activities including the following:

- ENDA, an Environment and Training project located in Dakar and mounted jointly by UNEP, the African Institute for Development and Planning, and the Swedish International Development Authority;
- the International Centre for Training and Education in the Environmental Sciences for Spanish-speaking countries (CIFCA), located in Madrid and organized by UNEP and the Spanish Government;
- a Regional Programme Activity Centre for Environmental Education and Training (PACEET), established in Africa on an experimental basis, to promote the development of environmental education and training. The Governing Council of UNEP has also endorsed the establishment of similar centres in other regions.

In many of these training activities UNEP has had a number of partners: UNESCO, the Intergovernmental Maritime Consultative Organization (IMCO), the United Nations Industrial Development Organization (UNIDO), the International Labour Organization (ILO) and a number of other bodies concerned in various ways with education and training.

There are close links between environmental information, education and training. Technical information is required for the specialized tasks associated with environmental assessment and management, and for keeping decision-makers and others aware of new knowledge and skills.

General environmental education needs to be provided for all citizens in both the formal and non-formal systems of education. An environmentally literate citizenry must have basic knowledge about environmental matters. It must be aware of the implications of environmental mismanagement, and must have the skills necessary to cope with and initiate elementary solutions. And, of course, effective environmental management presupposes public motivation and commitment to support the necessary measures.

In the environmental education and training of specific profes-

sional or social groups, education and training overlap. Planners, engineers, architects, lawyers, professional communicators, and decision-makers need to understand environmental problems, and to develop competence in those areas of their technical and professional practices that affect the environment directly or indirectly. Environmental training proper is appropriate to specialists and technicians who have to undertake environmental assessment and management tasks.

Dissemination of information

An essential part of the process of creating widespread public awareness is the dissemination of information on environmental issues. Information is conveyed through many channels, including the mass media, and influences public behaviour patterns and values. It is also conveyed through the non-governmental organizations which form another important part of UNEP's constituency. UNEP carries the major responsibility for environmental information, and coordinates the activities of other United Nations organizations with interests in this area through the Joint United Nations Information Committee (JUNIC).

In order that maximum effect may be obtained from environmental information, messages must be tailored to audiences. Each target audience requires in most cases, a specific approach, as it is rarely possible for one uniform message to be equally effective with Governments, non-governmental organizations, the UNEP Governing Council, the agencies of the United Nations system, and the public in general.

Information is conveyed to Governments through close relationships with Member States, and national focal points at Nairobi; through informal consultations, and through the Executive Director who undertakes a series of visits to various countries every year. "Report to Governments" is the official channel by which the Executive Director communicates with Member States, keeps them informed on UNEP's current activities, and gives information on newly-approved, current and completed projects. It is issued every

two months in English, French and Spanish. The project section is produced in all five official languages of the United Nations.

Through its public information activities, UNEP seeks to reach a wide segment of the general public through the mass media and other information multipliers. In effect, UNEP relies on the active cooperation of the world's media to get its messages closer to the grass roots level all over the world, as well as to action groups, organizations and Governments. One outstanding example of information support by the world media was the coverage given to the United Nations Conference on Desertification in 1977.

A special build-up effort is made for World Environment Day on June 5. Each year this day becomes the focus for public support of UNEP's objectives - which corresponds to major environmental issues - on a global scale. To reach more people, production of UNEP sponsored information material for the general public is being progressively decentralized so that messages are adapted to suit more closely the different needs and concerns of the various regions of the world. While the annual State of the Environment report forms the basis of the World Environment Day message, regions or countries are encouraged to feature other - perhaps more pressing and local - issues to create motivation for the world public on that day.

UNEP is paying increasing attention to audio-visual materials as media for public information. Some of these materials are produced for and focus on World Environment Day activities, for example films on specific topics for world-wide TV distribution, radio interviews, poster competitions and so on. Other year-round activities involve sponsoring co-productions with TV and film companies on such subjects as Desertification, the Mediterranean, Tropical Forests, and the Biosphere.

A series of slide/tape shows on different environmental subjects has been produced and made available to a wide public through UNEP's Regional Offices. Radio is perhaps the most important single means of communication in the developing world, and UNEP

produces radio programmes consisting of interviews, in different languages on UNEP's priority areas. These are sent directly to radio stations or distributed via information multipliers, such as UN radio. UNEP also encourages and motivates national radio stations to produce their own "environment" programmes relevant to their audiences' needs. UNEP organizes or participates in regional meetings of broadcasting organizations, for example the Union of National Radio and Television Organizations of Africa (URTNA), to brief them on environmental problems and possible solutions.

A briefing centre has been established at UNEP headquarters in Nairobi, equipped with film and slide projectors; and many visitors have received information on the work of UNEP. A reference library of environmental photographs has also been set up.

In the dissemination of environmental information, publications are indispensable. They serve many purposes: they broadcast the message of environmental concern widely among peoples and nations; they indicate possible solutions to environmental problems and clarify UNEP's role in world environmental activities; they are effective in providing a means of communication among specialists in scientific fields; and they make essential information available to decision-makers, both in public administration and private enterprise, particularly through studies emanating from UNEP projects, and through reference books.

The catalytic nature of UNEP's activities is particularly evident in the field of publications. Much of the effort has been in encouraging authors and publishers to take the initiative in publishing texts related to environmental matters. So the publishing that UNEP has undertaken under its own imprint is proportionally small compared to the overall publishing it has fostered in accordance with its catalytic mandate. Nevertheless, its direct production will no doubt increase because certain messages, both to the public and to specialists, are best conveyed directly by UNEP. This is most evident in relation to information produced for developing countries in their own languages.

UNEP has published, or arranged for the publication of, some 300 titles over the last five years, and is issuing a Bibliography of these publications. It has also sponsored, financed, and substantively contributed to some key works of a thought-provoking nature in the field of general environmental information.

A quarterly journal, *Mazingira*, is being produced in three languages by Pergamon Press. Eric Eckholm of the Worldwatch Institute has prepared, at UNEP's request, two best-sellers: *Losing Ground* and *The Picture of Health*. Both of these have aroused much interest.

The functional tasks

Material of a more scientific nature, communicating environmental data, information and research to the scientific community at large, decision-makers and public administrators is equally a concern of UNEP; it has arranged accordingly for publication of texts such as the SCOPE reports, IIASA reports, etc.

Closer to home, UNEP has arranged for the direct publication of a certain number of key texts, some of which have already been mentioned, including the State of the Environment reports, the Annual Review and Report to Governments, *Uniterra*, a newsletter dealing with a wide range of problems faced and activities undertaken by UNEP, is published ten times a year. Many technical reports are published in cooperation with other bodies in the UN system, particularly those involved in joint programming exercises.

Looking developments in the field of publications, UNEP is undertaking activities to publish reference manuals and "transfer of technology" reports. Such works are of importance to the Environment Programme, and it makes sense that UNEP should directly organize their preparation and dissemination. Examples are: *Handbook of National Environmental Mechanisms*; *Directory of Sources: Institutions and Individuals Active in Environmentally-Sound and Appropriate Technologies*; and a *Register of International Conventions for Environmental Protection*. A UNEP technical reports series was prepared.

UNEP looks for a widening readership of environmental publications, and particular efforts are made to reach out to developing countries in their own languages. Distribution networks for UNEP publications are encouraged to develop appropriate channels to readers at prices they can afford.

It was pointed out earlier that the United Nations Environment Programme was not conceived as a separate UN Organization, but as a programme of the United Nations system as a whole. Its problems, successes and failures are the problems, successes and failures of the international community. By the same token, any forward step taken in any country to face up to environmental problems is a matter in which UNEP takes satisfaction, though it may be only very indirectly related to any specific UNEP activity.

One world-wide development in which UNEP takes great satisfaction is the growth in numbers and effectiveness of non-governmental organizations (NGOs) concerned with the preservation and enhancement of environment. It must not be forgotten that NGOs played an extremely significant role in stimulating Governments to convene the United Nations Conference on the Human Environment at Stockholm. In addition the General Assembly gave UNEP a specific mandate to work with non-governmental organizations. This was in recognition of the fact that the Stockholm goals demanded the acceptance of responsibility by citizens, communities, enterprises and institutions at every level. The 1972 General Assembly resolution which established UNEP specifically invited NGOs with an interest in the field of the environment to lend their full support and collaboration to the United Nations with a view to achieving as large as possible a degree of cooperation and coordination. Thus NGOs are able to play a significant role in relation to many UNEP objectives.

UNEP has established close links with the world scientific community. Since 1975, for example, UNEP has cooperated with the Scientific Committee on Problems of the Environment of the International Council of Scientific Unions (ICSU/SCOPE), together with the United Kingdom Department of the Environment, Chelsea College,

and the Rockefeller Foundation, in operating and staffing the Monitoring and Assessing Research Centre in London which provides UNEP and the scientific community in general with valuable advice on various problems related to Earthwatch.

UNEP has also contributed financial support to the preparation of the 1977 recommendations of the International Commission on Radiological Protection (ICRP) which form the basis of virtually all national and international regulations in the field of protection against ionizing radiation.

The nature of environmental concerns will require that these links with the scientific community be increasingly strengthened in the future. This is essential if environmental concerns are to be translated into practical action based on a sound understanding of natural processes.

The number, magnitude, and inter-connectedness of global environmental problems became better understood in UNEP's first five years, and thus the Governing Council at its fifth session in 1977 agreed that it would be useful to set forth specific goals for UNEP to achieve by the end of its first decade. Twenty-one goals were specified. They were not intended to cover everything in the environment programme. They were set up in such a manner that performance could be more clearly evaluated and work plans drawn up to show specifically how goals would be implemented.

As to the future, it seems clear that environmental programmes will continue to be essential elements of human activities at local, national, regional and global levels. It is recognized at UNEP that a great deal of harm has already been done to the environment, and the trend must be reversed. UNEP believes it can and will be reversed.

In the years ahead, it is likely that the developed countries will place more and more emphasis on the need for alternative life styles, and both developed and developing countries will pay more and more attention to the relationship between the environment and

development. It is also likely that the environment programme will operate in a broadening framework as Governments face up to the linkages between environmental matters and economic, social and political problems.

Joint efforts by the nations of the world can lead to a more equitable global society and an improved environment in which all can live. This is not to say there are no problems ahead. There are many. But optimism with regard to the future is by no means unreasonable, as long as we are active optimists; for optimism, like pessimism, tends to be self-fulfilling.

On the occasion of UNEP's tenth anniversary in 1982, a Session of a Special Character of the Governing Council assessed the progress made in the first decade and defined the future tasks in its Resolution "The environment in 1982: retrospect and prospect."

I. 2.3. Retrospect and prospect

Resolutions of the Governing Council adopted at its Session of a Special Character in 1982

Resolution

The environment in 1982: retrospect and prospect

The Governing Council.

Having met in Nairobi from 10 to 18 May 1982 in a session of a special character to commemorate the tenth anniversary of the United Nations Conference on the Human Environment, held at Stockholm from 5 to 16 June 1972,

Having taken into account the report of the Executive Director entitled "The environment in 1982: retrospect and prospect",¹

¹ UNEP/GO(SSO)/2 and Corr. I (Russian only) and Corr. 2

Reaffirming its commitment to the implementation of the Action Plan for the Human Environment adopted by the Stockholm Conference.

Convinced that the principles of the Declaration of the United Nations Conference on the Human Environment are as valid today as they were in 1972, and, together with the principles adopted in Nairobi at the session of a special character, provide basic guidance for effective and sustained environment progress.

The major achievements in the implementation of the Action Plan for the Human Environment

1. Concludes that the past decade has seen:

(a) Increased awareness among Governments and the public of the implications of environmental change, and acceptance that environmental protection consists not only of pollution abatement, but also of the national use of natural resources for sustainable development;

(b) Provision for the environment in many national constitutions and administrative structures, creation of new environmental programmes at regional and international levels, and the extension and intensification of existing ones;

(c) Increased cooperation and collaboration among and between Governments and international organizations on environmental assessment and management;

(d) Efforts to protect the environment slowed down somewhat towards the end of the decade because of financial difficulties experienced by some countries;

(e) A worsening of environmental problems in developing countries arising from the present international economic order which has slowed down their development and the protection of their environment;

2. Considers that the sector-by-sector review of the implementation of the Action Plan suggests a mixed record of achievement. An overall assessment is that fair-to-good progress has been made in implementing some of the elements of the Action Plan, while in respect of other elements the record has been very modest;

3. Further considers that major achievements and failures in the implementation of the Action Plan appear to be:

(a) In the area of environmental assessment:

- (i) The Global Environmental Monitoring System is operating and expanding, although important gaps in the development, coordination, user applications and integration of the system components persists;
- (ii) The Global Atmospheric Research Programme has continued and international studies of climatic change and variability and of the applications of climate knowledge to human activity have been incorporated in the World Climate Programme;
- (iii) The International Referral System for sources of environmental information is functioning but has not adequately realized its objectives, in particular because the growth of user demand has been slow;
- (iv) The International Register of Potentially Toxic Chemicals has started to prove itself as an important centre for information on toxic chemicals;
- (v) The International Programme on Chemical Safety is providing toxicological assessments for an increasing number of substances, together with accelerated manpower development, guidelines for emergency response to chemical accidents and technical cooperation relating to control of toxic chemicals;

(vi) Assessments of the environmental impacts of various sources of energy have been published;

(vii) A major report entitled "The World Environment 1972-1982" has been published in conjunction with the session of a special character;

(b) In the area of environmental management:

(i) There has been progress in the formulation of regional environmental programmes, and Governments have concluded a number of important global and regional agreements as well as drawn up principles and guidelines, although in some cases there have been delays in their implementation or observance;

(ii) Worldwide efforts have expanded to combat desertification, to improve water supply and management, and to improve human settlements although progress to implement the comprehensive United Nations action plans developed in each of these areas has remained slow;

(iii) Progress has been made in the implementation of international scientific programmes relating to the human environment, particularly the Programme on Man and the Biosphere and the International Hydrological Programme;

(iv) The World Conservation Strategy, which focuses on and provides guidance for sustainable development through conservation of living resources, is being used by an increasing number of Governments as a basis for national conservation programmes;

(v) There has been progress in conceptualizing the objectives of environmental management and in developing some of its tools, such as environmental impact assessment, cost-benefit analysis and cost-effectiveness analysis;

(vi) The need to take environmental considerations into account in the evaluation of development projects has been widely recognized;

(vii) Although progress has been made through the international Whaling Commission in reducing whale catch quotas, the call for a 10-year moratorium on commercial whaling has not been given effect;

(viii) The Regional Seas Programme, which covers environmental assessment, environmental management, environmental law and supporting measures, including aspects of technical assistance and training, has been implemented with a satisfactory measure of success. Sufficient resources, continued planning and sustained commitment by Governments and international organizations are, however, necessary to maintain and extend the Programme;

(ix) Industry has had a number of achievements in reducing its adverse effects on the environment, but still needs to strive and be encouraged to assume fully a role commensurate with its capabilities. Environmental controls in industrial development, including measures for the improvement of the working environment, are still very weak in a large number of countries;

(x) The industry and environment programme of the United Nations system has identified the environmental impacts of a number of specific industries, and guidelines formulated to deal with them are being tested and applied: training programmes have been provided, and a supportive information service established and put into operation;

(xi) The draft principles of conduct in the field of the environment for the guidance of States in the conservation and harmonious utilization of natural resources shared by two or more States were the subject of United Nations General Assembly resolution 34/186 of 18 December 1979 and have not been widely used by Governments;

(xi) Inadequacies persist in redressing environmental problems of poverty and underdevelopment;

(c) In the area of supporting measures:

(i) Progress has been made by Governments and international organizations in encouraging environmental education, particularly following the Intergovernmental Conference on Environmental Education (Tbilisi, 1977). In the field of training, however, significant deficiencies persist. Moreover, there has been insufficient attention to environmental education, particularly at university and intermediate levels, as well as to training of workers, technicians and managers and to public education;

(ii) Programmes of technical cooperation at the international level have increasingly included environmental components;

(iii) World Environment Day (5 June) is now observed by almost all countries. The various member organizations of the United Nations system participate actively in a wide information programme catalysed by the Joint United Nations Information Committee. Despite the progress, however, the information programme is still inadequate and does not take sufficient account of regional needs;

(iv) The United Nations Environment Programme and other organizations in the United Nations system have published many technical and general reports relevant to the environment. Coverage of environmental issues by the world media has expanded, particularly at the national level. Non-governmental organizations have made major contributions to increasing public awareness and knowledge of environmental issues. Continuation of these efforts remains important;

(v) Despite extensive aid through bilateral and multilateral channels to assist with development programmes, it is

recognized that the priorities of developing countries for dealing with their serious environmental problems still do not receive adequate attention;

- (d) In the area of institutional and financial arrangements for international environmental cooperation:

The Governing Council of the United Nations Environment Programme, the environment secretariat and the Environment Fund were established, and procedures for efficient coordination of environmental programmes in the United Nations system came into effect;

II

New perceptions of environmental issues

1. Considers that the following new perceptions which evolved during the past decade are generally accepted and, together with the Nairobi Declaration, complement the principles contained in the Declaration of the United Nations Conference on the Human Environment:

(a) Issues of disarmament and security in so far as they relate to the environment, because the role of the United Nations Environment Programme is to promote environmentally sound development in harmony with peace and security, need to receive appropriate attention;

(b) Wise use of resources and enlightened conservation strategies are consistent with the economic growth imperative and should be considered prerequisites for sustainable growth;

(c) Imaginative research into alternative consumption patterns, technological styles and land-use strategies, and the institutional, economic, juridical and educational framework to sustain them, are called for;

(d) The important interconnections between the components and

processes which support the life of the planet should be taken seriously into account in development plans. Actions which benefit one area may cause unforeseen damage in others, and the possibility of such consequences should be considered at the planning stage;

(e) Because of the great space and time variability in environmental processes and the fallibility of models of technological and social change, environmental development and management should be planned in a flexible fashion. Unexpected changes should be detected at an early stage through continuous monitoring;

(f) Development plans should take account of the "outer limits" to the stability of environmental systems;

(g) Developments in the transfer of certain inappropriate technologies, export of toxic substances and hazardous materials and certain marketing arrangements, such as the patenting of seeds, can pose serious risks to the environment which need to be arrested;

(h) The United Nations system, involving especially the catalytic role of the United Nations Environment Programme, must address environmental problems of poverty and underdevelopment, particularly in the framework of the efforts being undertaken to establish the new international economic order;

III

Major environmental trends, potential problems and priorities for action for the United Nations system, coordinated by the United Nations Environment Programme, during the period 1982-1992

1. Considers that the United Nations system must be alert to and retain the necessary programme flexibility for addressing major environmental trends and problems which may emerge or become more pronounced during the coming decade;

2. The trends, problems and priorities for action which should receive attention by the United Nations system, and specifically through the system-wide programme activities coordinated by the

United Nations Environment Programme, are listed below:

(a) Atmosphere

Trends and problems: Continued deterioration in urban air quality in developing countries and, in the case of some pollutants, in developed countries, long-range transport of air pollution, including SO₂ and NO_x emissions that give rise to acid rains, continued increase of CO₂, other trace gases and particulates in the atmosphere, possible depletion of stratospheric ozone, possible effects of human activities on weather and climate, extreme meteorological events such as tropical cyclones, floods and droughts;

Priority for action: Integrated monitoring of atmospheric pollutants and their effects, development and promotion of appropriate global, regional and national programmes; guidelines or conventions to respond to these problems; improvement of early-warning indicators for extreme meteorological events; understanding of factors affecting climate, including ocean-atmosphere interactions;

(b) Oceans

Trends and problems: Increasing pollution of the seas with oil and other substances from land-based sources and from ships; pollution of estuaries and coastal waters; overfishing; environmentally inappropriate exploitation of marine and coastal resources, despite expansion of mariculture and protected areas;

Priority for action: Development and application of methods for monitoring, assessing, reducing and preventing: (i) pollution of the seas, including oil pollution; (ii) degradation of natural resources including mangrove and coral areas; development of new and strengthening of existing programmes and conventions for the environmental protection of regional seas; further development of plans and procedures for the management of marine resources; further development of mariculture and the establishment of marine protected areas; and support for disaster mitigation;

(c) Water

Trends and problems: Depletion and deterioration of surface water and ground water with increasing demand for drinking, agriculture and industry; and rising pollution in most countries; continued acidification and eutrophication of fresh waters; environmental problems created by water development projects; inadequate water basin management; transboundary water pollution, and continued technical difficulties in management of surface waters and ground waters shared by two or more States;

Priority for action: Assistance in the implementation of the objectives of the International Drinking Water Supply and Sanitation Decade, and in the promotion of guidelines for environmentally sound water management, including transboundary water management and pollution and related environmental aspects; management of inland fisheries and aquaculture; promotion of techniques for rational water management including river basin management, pollution control, recycling of domestic and industrial waste water and flood control, prevention of water waste; promotion of assessment of environmental impact of water resources development projects;

(d) Lithosphere

Trends and problems: Environmental impacts resulting from increased mineral extraction, especially by surface mining and quarrying, and from mining of coal, tar sands and oil shales, and disposal of waste; environmental hazards caused by earthquakes, volcanic eruptions, tidal waves and landslides;

Priority for action: Encouragement of technology for economic use of minerals, including recycling; further development of methods of environmental impact assessment of mineral resource extraction; further development and promotion of improved methods for rehabilitation of land following mineral extraction, and satisfactory disposal or reutilization of wastes generated by human activities; further development of early-warning systems for volcanic eruptions, earthquakes and tidal waves;

(e) Terrestrial biota and bioproductive systems

Trends and problems: Mounting world food demand only partially satisfied because of inadequacies of production and distribution; continued severe soil degradation and desertification as a result of inappropriate agricultural practices, erosion, and deforestation; loss of agricultural land as a result of urbanization, adverse impacts on land and water resources from increasing land-use conflicts between agricultural production, fuelwood and other energy crops, protected areas and human settlements; adverse effects of slash-and-burn agriculture or other inappropriate agricultural practices; loss of potentially valuable genetic resources, including wild flora and fauna, as a result of deforestation and use and commercialization of endangered species; adverse impacts of improper or increased use of fertilizers and pesticides; depletion of wetlands;

Priority for action: Monitoring and assessment of land conditions and capability in developing countries; monitoring and assessment of tropical ecosystems including changes in forest cover; formulation and promotion of programme activities for sustainable management of soils, tropical forests, genetic resources and for combating desertification; development of environmentally sound farming and forestry practices, including agroforestry, integrated pest management and proper use of fertilizers; prevention of post-harvest food losses; reutilization of agricultural and agro-industrial residues; development of appropriate international procedures and instruments for handling and use of and international trade in pesticides; promotion of implementation of national and regional plans of action following the World Conservation Strategy; protection of wetlands and the designation of biosphere reserves; promotion of planning of urban development taking into account the needs of agricultural development and conservation of natural resources;

(f) Population and human settlements

Trends and problems: Continued growth of human population despite some decline in the rate of world population increase; high rate of

urbanization that outstrips the capacity of Governments to provide essential services in urban centres; growth of slums; disruption of rural communities and major inadequacies in rural services; environmental degradation due to the distortion of traditional patterns of pastoral nomadism;

Priority for action: Research into the interrelationship between population growth and the environment; development and promotion of application of guidelines for environmentally sound planning of rural and urban settlements, including provision of services and infrastructure; improvement of methods for safe disposal and re-use of urban wastes; social and environmental support for the nomads;

(g) Health

Trends and problems: Continued massive prevalence of infectious and parasitic diseases, malnutrition, inadequate safe water supplies, and lack of sanitation and food safety in developing countries; increased resistance of pathogens or their intermediary agents to chemical control; increase in disease incidence associated with development schemes; increasing number and prevalence of potentially toxic chemicals and residual micro-pollutants in the living and working environments; illnesses related to life-styles and the working environment; continued danger from trade in hazardous substances and inadequacies in their safe disposal;

Priority for action: Development of environmental health measures, including methods for the environmental control of disease vectors and parasites, and for improvement of sanitation in settlements, and improvement of hygiene, especially in developing countries; continued monitoring, notably in the Global Environmental Monitoring System, and preparation of procedures, principles and guidelines within the International Programme on Chemical Safety; development and promotion of the application of procedures, principles or guidelines for safe trade, handling and transport of hazardous substances and disposal of hazardous wastes; follow-up to the list of dangerous substances and processes prepared by the United Nations Environment Programme;

(h) Energy

Trends and problems: Environmental impacts of continued increase in demand for fuelwood, expanding nuclear energy programmes and wastes generated in the production of energy; increasing use of coal; positive and negative aspects of intensified development and use of new and renewable sources of energy, and increase in energy plantations; some success in the development of energy conservation programmes;

Priority for action: Support for reforestation policies in developing countries, including encouragement of the use of fast-growing species; promotion of improved energy efficiency and conservation methods; development and promotion of guidelines for environmentally sound development of new and renewable sources of energy, and of nuclear energy; promotion of global strategies for energy conservation and diversification;

(i) Industry and other economic development

Trends and problems: Continuing risks of serious pollution and natural resource degradation from inappropriate industrial development and existing industries, despite some progress in the development of low and non-waste technology and of improved systems of pollution control; inefficiency in the use of natural resources and energy in industry and other programmes of economic development; inadequate environmental consideration in the siting and technologies of industrial and other economic activities, and in international trade and investments;

Priority for action: Development and promotion of guidelines for assessment of environmental impacts of industrial and other economic development (planning, siting, construction and operational control), for the improvement of the human environment, and for the rational use of natural resources with special emphasis on the development of non-waste and low-waste technologies; preparation of principles or guidelines for environmental management of industry for the transport, handling (including storage) and disposal of

toxic and dangerous wastes, and for minimization of water pollution resulting from industry; promotion of integration of environmental considerations in the development process; evolution of principles, guidelines or codes of conduct for promotion of environmentally sound practices in international trade and investments; improvement in the access to technical achievements which are of practical promise for the management of the environment;

(j) Peace, security and the environment

Trends and problems: The continuing increase in the production, stock-piling and risk of use of weapons of mass destruction and the development of new types of chemical and bacteriological weapons not only pose a major threat to the environment and even to life on earth, but also compete for limited resources that could be better used for constructive purposes;

Priority for action: In support of the continuing efforts in the United Nations General Assembly, and especially in its special session on disarmament and the Disarmament Committee, to ensure that the environmental implications of existing and new types of armaments and warfare are taken into account;

IV

Basic orientations of the United Nations Environment Programme for 1982-1992

1. Considers that, on the basis of the new perceptions described in section II, the United Nations Environment Programme which is the global environmental organization at Government level, in keeping with its mandate and with the support of organizations of the United Nations system, should focus its attention on three major areas and should:

(a) Stimulate, coordinate and catalyse monitoring and assessment of environmental problems of world-wide concern and initiate and coordinate international cooperation in dealing with such problems;

(b) Promote and coordinate appropriate policies and programmes for rational resource and environmental management as an integral part of economic and social development with particular attention to the needs of developing countries;

(c) Promote, coordinate and direct activities in the fields of information, education, training and national institution-building especially for developing countries, as well as the further development of environmental law and guidelines and methodologies of environmental management, and, where supplementary funds are available, assist in the implementation of these activities;

2. Further considers that with these three over-all basic orientations in mind, the objectives of the Programme should be:

(a) In the area of environmental assessment;

(i) To improve early warning indicators of significant environmental changes;

(ii) To improve the planning and coordination of monitoring at the global and regional levels;

(iii) To produce concrete assessment statements for important environmental problems and their human health, social and economic implications;

(iv) To establish better links between the Global Environmental Monitoring System, the International Referral System for sources of environmental information, the International Register of Potentially Toxic Chemicals and national and international data centres;

(v) To promote the establishment of reliable global, regional and national environmental statistics and state of the environment reporting as a basis for evaluating major trends and deciding on any necessary action;

(b) In the area of environmental management;

- (i) To promote environmentally sound patterns of development and to participate in the implementation of the International Development Strategy for the Third United Nations Development Decade;
- (ii) To strive for the improvement of cost/benefit and cost/effectiveness evaluation of environmental measures, environmental assessment of development activities and integrated physical planning for rational use of natural resources;
- (iii) To promote the adoption and implementation by States of legal and other appropriate instruments for assessing the effects on the environment of potentially harmful activities under their jurisdiction and control, as well as the dissemination of information and the public use thereof;
- (iv) To promote the development of more cost-effective solutions to environmental management problems, in particular such solutions adapted to the needs of developing countries;
- (v) To develop guidelines for environmentally sound development planning;
- (vi) To promote and continue to contribute to the activities of the United Nations system in the area of the interrelationships among population, resources, environment and development;

(c) In the area of supporting measures;

- (i) To strengthen the existing arrangements within the United Nations Environment Programme and between it and the United Nations Development Programme and other organiza-

tions of the United Nations system with a view to enhancing the capacity of developing countries to deal with their environmental problems and concerns, including methodologies of sound environmental management, as part of their sustainable economic and social development;

- (ii) To promote and facilitate the strengthening, within countries, of institutional arrangements for effective assessment of environmental impact of development and environmental management;
- (iii) To promote, coordinate and catalyse, in cooperation with relevant institutions at the United Nations system, activities in the area of environmental education and training and public awareness with particular emphasis on:
 - a Application of new education methods and better teacher training programmes through research and institution-building and the integration of an environmental component into school curricula, and seeking to improve the quality of education and training through making adaptations to existing facilities;
 - b Increased training of specialists in various fields of environmental activities;
 - c Better dissemination of information to the media, the general public and scientific audiences;
 - d Integration of an environmental component in the training of enterprise managers, technicians, skilled workers and decision-makers concerned with environmental and resource management;
- (iv) To encourage national and regional arrangements for the

provision of information on crucial and emerging environmental issues, for example on the use of technology and products condemned in the country of origin;

- (v) To support Governments and non-governmental and youth organizations in their efforts to increase environmental awareness and to encourage Governments to provide for strong public participation in the planning and implementation of environmental activities;
- (vi) To encourage and facilitate the development of legal instruments relating to the environment at the national and international levels and to monitor their implementation; and, within its mandate, to promote the development of further guidelines, principles or agreements and to facilitate their application in areas of global and regional environmental concern in cooperation with the responsible international organizations;
- (vii) To encourage the further examination of economic measures, such as pricing policies, incentives and pollutant and effluent charges which may be applied to complement environmental regulations;

3. Considers also that in pursuing the above-mentioned objectives the United Nations Environment Programme should be guided by the major environmental trends, potential problems and priorities for action identified in section III, and should concentrate in particular on: promotion of land and water management, including control of desertification and deforestation; protection of natural resources; promotion of the International Drinking Water Supply and Sanitation Decade; promotion of the new and renewable sources of energy; promotion of regional seas programmes; prevention of environmental disturbances from air pollution; promotion of chemical safety and control of hazardous substances;

Planning and implementation of environmental activities

1. Solemnly urges Governments:

(a) To establish or strengthen national mechanisms for proper and timely identification and assessment of changes in the environment, including the national components of Earthwatch, especially their monitoring stations and their focal points for the International Referral System;

(b) To establish or strengthen national mechanisms for the integration of environmental considerations into development planning;

(c) To fit management techniques to environmental circumstances in dealing with sectoral problems;

2. Invites all Governments, intergovernmental organizations and non-governmental organizations to ensure that the priorities for action mentioned in section III above are accorded high priority within their respective programmes;

3. Requests the Executive Director, by means of close cooperation within the outside the United Nations system to ensure, in the planning and implementation of environmental activities, that:

(a) The basic orientations identified in section IV above, and in particular, the objectives contained in paragraph 8, with special emphasis on the needs of the developing countries, serve as primary guides and are accorded high priority;

(b) Such planning and implementation are responsive to regional and subregional needs and national conditions and capabilities;

(c) These activities are concrete, have fixed priorities, are realistic and within a realistic time-frame, where possible undertaken collaboratively, implemented within an administratively simple framework and with adequate technical and financial support;

4. Also invites the governing bodies of the relevant organizations of the United Nations system to integrate the major environmental trends over the next ten years effectively in their action plans, and, on the basis of those trends, in close cooperation with the United Nations Environment Programme, to draw up appropriate measures for environmental protection with due regard to available resources;

5. Requests the administrative heads of the relevant organizations of the United Nations system to intensify their cooperation with the Executive Director in the effective implementation of approved programmes in the field of the environment for the next ten years;

6. Requests the Executive Director to intensify cooperation with intergovernmental organizations outside the United Nations system and non-governmental organizations and, as appropriate, support their work, and to invite such organizations to intensify their efforts in the field of the environment;

7. Urges all donors to respond positively and increase their assistance, in accordance with established procedures and with the priorities of developing countries, to help meet their technical and financial requirements, particularly in their efforts aimed at evolving national programmes of research and development, technology, institutional approaches and machineries for dealing with environmental problems;

VI

Institutional arrangements for the United Nations Environment Programme

1. Considers that the institutional arrangements for international cooperation in the field of the environment - the Governing Council, the secretariat, the coordination process within the United Nations system through the Administrative Committee on Coordination and the Environment Fund - are, generally speaking, adequate and appropriate;

2. Encourages Governments to keep under close and continuing review the functioning of these institutional arrangements and the implementation of the environmental activities of the organizations of the United Nations system with a view to improved coordination, programme strengthening and greater over-all effectiveness and efficiency in their application of financial and manpower resources;

3. Considers that the catalytic, coordinating and stimulating role of the United Nations Environment Programme remains appropriate and will require the continuing attention of the Governing Council in the light of section IV, paragraph 7 (c), bearing in mind the responsibilities of other bodies of the United Nations system;

4. Invites the Governing Council, at its regular sessions, to:

(a) Give over-all policy guidance on global, contemporary and emerging issues;

(b) Set priorities for the implementation of the programmes approved by it and assure that funds and/or other resources are made available in accordance with these priorities;

(c) Address itself more to governing bodies of other organizations of the United Nations system dealing with various environmental issues;

5. Requests the Executive Director, in preparing the system-wide medium-term environment programme in harmony with the procedures agreed to by the Committee for Programme and Coordination, to emphasize the process of thematic joint programming, to intensify his consultations with various organizations of the United Nations system in the further development of the programme, and to ensure that the relationships between the secretariat of the United Nations Environment Programme and its cooperating agencies and supporting organizations continue to be positive and constructive;

6. Stresses the important present and future role of the Environment Fund;

7. Stresses further that, in view of the basic orientations described in section IV above, renewed efforts are necessary, and therefore:

(a) Strongly appeals to Governments to ensure that their contributions are in line with those objectives and basic orientations;

(b) Requests the Executive Director to continue his campaign to broaden participation in and secure a higher level of contribution to the Fund, and seek other modalities of funding, and to continue his consultations with the Secretary-General to ensure application of the rationale for the distribution of the costs of the programme between the regular budget of the United Nations and the Environment Fund;

(c) Further requests the Executive Director to develop and put into effect mechanisms to ensure that budgetary measures are more responsive to regional, subregional and national needs.