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## ACTION PLAN FOR THE HUMAN ENVIRONMENT: PROGRAMME DEVELOPMENT AND PRIORITIES

Report of the Executive Director

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Chapter I

INTRODUCTION

A. Background

1. The United Nations Conference on the Human Environment, held at Stockholm from 5 to 16 June 1972 (hereinafter referred to as "the Stockholm Conference" or "the Conference") was intended by the General Assembly "to serve as a practical means to encourage, and to provide guidelines for, action by Governments and international organizations" (General Assembly resolution 2581 (XXIV) of 15 December 1969, paragraph 2). One hundred and nine recommendations for international action were adopted by the Conference 1/ as part of the Action Plan, and the report of the Conference was subsequently noted with satisfaction by the Assembly and referred to the Governing Council for appropriate action (General Assembly resolution 2994 (XXVII) of 15 December 1972).

2. One of the documents submitted to the Stockholm Conference, "An Action plan for the human environment", stated that the development of recommendations had proceeded by the time of the Conference "only to the point of the identification of major areas of concern and the beginning of the task of defining specific programmes of action to deal with them. The principal need now is for further development of proposed programmes to the stage where priorities can be set for the allocation of resources..."2/

3. The purpose of the present document is to submit to the Governing Council the results of preliminary efforts by the secretariat of the United Nations Environment Programme (UNEP) to formulate, on the basis of the Stockholm recommendations, objectives and programmes so as to enable the Council to provide general policy guidance and establish priorities in the utilization of the resources of the Environment Fund.

4. Recommendations adopted at the Stockholm Conference have already led to completion of action in a number of fields, including the conclusion and signature of the following conventions:

The Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matters, done at London,

The Convention concerning the Protection of the World Cultural and Natural Heritage, adopted by the General Conference of UNESCO at its 17th session, Paris, 16 November 1972;

The Convention on International Trade in Threatened Species of Wildlife, done in Washington, D.C., on 2 March 1973.

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1/ See Part One, Chapter II B, Recommendations for international action of the report of the United Nations Conference on the Human Environment (A/CONF.48/14 and Corr.1).

2/ A/CONF.48/5, para.60.

5. In these cases the preparatory process led to the formulation of recommendations for specific actions which are today largely completed.

6. As regards the proposed International Referral Service for Sources of Environmental Information,<sup>1/</sup> a major element of "Environmental assessment (Earthwatch)",<sup>2/</sup> sufficient work has been carried out since the Stockholm Conference and since the adoption of General Assembly resolution 2997 (XXVII) on 15 December 1972, to make it possible to draw up a preliminary programme. It is recommended to the Council for approval in chapter II of this document.

7. However, the great majority of the recommendations approved at Stockholm still require considerable work before specific programmes can be submitted to the Council. Steps for preparing such programmes are outlined below.

8. In paragraph 39 of the "Action Plan" document referred to above, it was noted that "the priority to be accorded to proposals for international action can be established only through the review by governments and international agencies of a wide variety of environmental concerns shared by a number of nations and through consultation about specific action required to meet these concerns. This cannot be done on a 'one shot' basis. Priority setting must be a continuing process which feeds on new knowledge of needs and opportunities as it becomes available. The preparatory process had identified major areas of concern and has initiated the necessary review of priorities."

#### Major areas of concern

9. On the basis of an analysis of some 12,000 pages of Conference documentation, including national reports and basic papers, and the results of regional seminars and special meetings,<sup>3/</sup> major areas of concern were identified which are directly relevant to the quality of life and to the basic commitment of governments to development. They were summarized under four main headings <sup>4/</sup>:

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<sup>1/</sup> See recommendation 101 of the Stockholm Conference.

<sup>2/</sup> In the report of the Stockholm Conference, Part One, Chapter II C, the Action Plan is divided into three components: global environmental assessment programme (Earthwatch), the environmental management activities, and the supporting measures.

<sup>3/</sup> These include the following meetings organized by the United Nations (see A/CONF.48/5, para.30, footnote 7):

- ECE symposium on problems relating to environment, Prague, 2-15 May 1971
- Panel of experts on development and environment, Founex (Switzerland) 4-12 June 1971
- ECAFE seminar on development and environment, Bangkok, 17-23 August 1971
- ECA seminar on development and environment, Addis Ababa, 23-28 August 1971
- SCOPE/UNCHE working party on environmental problems in developing countries, Canberra, 28 August - 1 September 1971
- ECLA seminar on development and environment, Mexico City, 6-11 September 1971
- UNESOB seminar on development and environment, Beirut, 27 September - 1 October 1971.

<sup>4/</sup> A/CONF.48/5, para.58.

- (i) improvement of human settlements and health:
  - creation of decent habitats for rapidly growing populations
  - protection of human health;
- (ii) development and use of fresh water, land, and energy resources:
  - availability of water for human use
  - maintaining of soil fertility
  - management of forest and mineral resources
  - reconciling energy demands and environmental concerns;
- (iii) harmonizing development goals and social and cultural values with environmental quality objectives:
  - relationship between development goals and environment
  - relationship of social and cultural values and environment;
- (iv) protection of living resources and of the oceans and avoidance of inadvertent climate modification:
  - protection of terrestrial ecosystems, wildlife, genetic resources, and fisheries
  - protection of the oceans
  - man's impact on climate.

10. It was widely agreed at Stockholm that the environment could not be compartmentalized, for it is constituted by a network of inter-acting relationships extending through all sectors of human activities. Nonetheless governments found it convenient to consider recommendations at Stockholm according to the traditional, sectoral approach under such agenda headings as human settlements, natural resources management, pollutants, etc. The "Framework"<sup>1/</sup> was intended to encourage

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<sup>1/</sup> The "Framework for environmental action" as set out in the "Action Plan" document referred to previously (A/CONF.48/5, paras.59 to 62) and as broadly endorsed by the Conference (see its report, Part One, Chapter II A) classified actions into three functional categories:

- (i) Environmental assessment:
  - evaluation and review to provide the basis for identification of what knowledge is needed and to determine that necessary steps are taken;
  - research to create new knowledge of the kinds specifically needed to guide decision-making;
  - monitoring to gather certain data on specific environmental variables and to evaluate such data to determine and predict important environmental conditions and trends;
  - information exchange to disseminate knowledge within the scientific and technological communities and to assure that decision-makers at all levels

governments, having considered sectoral aspects, to look at environmental problems from a functional cross-sectoral point of view. The need for this approach is reflected in General Assembly resolution 2997 (XXVII) in which the Assembly, while "mindful of the sectoral responsibilities of the organizations in the United Nations system", emphasizes "that problems of the environment constitute a new and important area for international co-operation and that the complexity and interdependence of such problems require new approaches". Thus, one of the major results of the Conference was the creation by the General Assembly of new machinery, principally the Governing Council itself, to provide an institutional response to the environmental challenge at the international level.

#### B. Preparation of the programme

11. In order to assist the Governing Council in its task of providing "general policy guidance for the direction and co-ordination of environmental programmes within the United Nations system" (General Assembly resolution 2997 (XXVII), part I, para.2), the secretariat has sought to augment the information which was available at the time of the Conference. For this purpose, consultations were held with a number of organizations and persons both inside and outside the United Nations system, in the course of which many proposals, as well as offers of assistance, were received for programmes which the Council may choose to support. Largely because of the brief interval between the administrative implementation of the mid-December 1972 decision by the Assembly to establish UNEP and the need to complete this document in March for the June 1973 session of the Council, these consultations were of necessity preliminary in nature. For that reason, the present document contains an account of only the initial effort to prepare programmes for the Council's consideration. Consultations within the United Nations system were facilitated by the good working relationships established during the process leading up to the Conference and by the favourable response of all members of the United Nations system to the adoption of Assembly resolution 2997 (XXVII).

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#### Footnote 1/ continued:

have the benefit of the best knowledge which can be made available in the forms and at the times in which it can be useful.

#### (ii) Environmental management:

- planning that is comprehensive and takes into account the side-effects of man's activities;
- conservation and development of environmental resources through management of man's activities that affect the environment as well as the management of certain environmental resources.

#### (iii) Supporting measures required for the actions in the above two categories include:

- education at all stages and training of specialists, multi-disciplinary professionals and technical personnel;
- public information to facilitate the utilization of knowledge in decision-making at every level;
- organization of relevant environmental activities nationally and internationally;
- financing of agreed national and international programmes;
- technical co-operation in those areas where required.

12. Three informal sessions of intensive consultations were held during February and March 1973 to which all members of the United Nations system were invited and in which nearly all participated. In the course of these consultations a large number of well-conceived proposals were elaborated to carry out Stockholm recommendations. While the substance of these proposals has been drawn on in the preparation of this document, it does not attempt to describe them individually or in detail. The Council may be assured, however, that a strong basis now exists for carrying out pre-programming activities in the light of policy objectives to be determined by the Council. Proposals so far submitted will be reflected in supplementary information which will be made available as required when the Council meets. These proposals will serve as the basis for discussion with individual agencies or groups of agencies whenever it appears appropriate, in the light of the Council's policy decisions, with a view to defining the roles of the bodies concerned.

13. Considerable activities relating to the environment are under way in many institutions outside the United Nations system, especially within the scientific community. Proposals and information emanating from these activities will be made available to the Council and will serve as a basis for pre-programming steps in keeping with the policy guidance to be provided by the Council. The compilation of more complete information about current and planned activities both within and outside the United Nations system and the integration of this information into the programme is a continuing process. It is hoped to submit to the Council a summary of available information about relevant activities as a general, but by no means complete, indication of the volume of existing activities on which the United Nations Environment Programme can be built.

14. The new secretariat thus seeks to synthesize new information and new proposals in the light of concerns expressed during the preparations for the Stockholm Conference and at the Conference itself and in a manner responsive to recommendations adopted at the Conference.

#### The nature of the environment programme

15. The overall environment programme about which the Council will wish to be kept informed will cover not only activities encouraged and supported by resources available to UNEP, especially the Fund, but also all work in the United Nations family which bears upon the human environment. Since many activities will be funded from other sources, the overall programme of interest to the Council will be larger than the sum of those activities which rely, in whole or in part, on financial support from the Environment Fund.

16. For example, a large number of activities are already under way within and outside the United Nations system to ensure supplies of fresh water of adequate quality and quantity for human needs, a matter of serious concern reflected in many of the Conference's recommendations. Given the pervasive nature of the water problem, and the large number of related activities, it is proposed that in this respect UNEP should give emphasis to the quality of water. Because, however, it is often difficult to divorce questions of water quality from other aspects of water management, the Governing Council may wish to be kept informed of related activities not supported by the Fund, to ensure that UNEP's activities are harmonized with them.

17. The object of the overall programme is to serve as a means of determining tasks and to contribute to the carrying out of tasks in co-operation with governments as well as with members of the United Nations family and outside institutions, experts and the public. This process is designed to seek out ideas and to submit them to comment and criticism, with a view both to improving the programme and to keeping all involved continually informed. The Fund will be used as a means to encourage and accelerate action and foster co-operative measures. It will not be used to replace existing support by agencies or existing sources of assistance for development programmes but, rather, to help the agencies to develop their activities in combination with those carried out specifically under the Environment Programme and the Environment Fund to improve the human environment for present and future generations.

18. Illustrative material will be prepared to aid the Council in understanding the process by which programmes responsive to the Council's policy are to be developed for approval and subsequent execution.

C. Objectives and tasks

1. Objectives of the programme

19. Faced, on the one hand, with the broad scope of the activities contemplated in the recommendations of the Stockholm Conference and the many proposals for action and, on the other, with limited available resources, the Council may wish to determine general and specific objectives in order to lessen the risk of dispersing both effort and available resources too broadly to be effective.

20. In selecting objectives for consideration by the Council, the secretariat has borne in mind the concerns expressed by governments and in the recommendations and principles adopted at Stockholm, as well as those concerns which require more concerted action in the light of a diversity of actions already being taken by various bodies. The secretariat has also been mindful of the need to establish objectives which, as a whole, respond to the needs of all States whatever the level of their economic or technological development. Special attention has also been given to those concerns which require action cutting across the demarcation lines of traditional sectors. Bearing in mind the spirit in which the General Assembly called for measures "to protect and enhance the present and future quality of the environment for human life and well-being"<sup>1/</sup>, a further consideration in drawing up suggested objectives has been the need to determine long-term environmental imperatives.

21. The order in which the suggested objectives of the programme are set out below is not intended to indicate an order of importance or priority; yet they cannot all be treated with the same degree of immediacy and priority. Accordingly, the guidance of the Governing Council is sought as regards both the adequacy of these objectives, and the priority that should be accorded to them in the preparation of the programme. A distinction is made between particular and general objectives. The latter apply broadly to all endeavours. The objectives are:

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<sup>1/</sup> General Assembly resolution 2850 (XXVI)



(a) General objectives

- (i) To provide, through interdisciplinary study of natural and man-made ecological systems, improved knowledge for an integrated and rational management of the resources of the biosphere;
- (ii) To encourage and support an integrated approach to the planning and management of natural resources so as to take account of environmental consequences to achieve maximum social, economic and environmental benefits.
- (iii) To assist all countries, especially developing countries to deal with their environmental problems and to help mobilize additional financial assistance with a view to promoting the full participation of developing countries in international activities for the preservation and enhancement of the environment.

(b) Particular objectives

- (iv) To anticipate and prevent threats to human health and wellbeing posed by contamination of food, air or water;
- (v) To detect and prevent serious threats to the health of the oceans through controlling both ocean-based and land-based sources of pollution, and to assure the continuing vitality of marine stocks;
- (vi) To improve the quality of water for human use, in order that all persons may have access to water of a quality compatible with requirements of human health;
- (vii) To help governments in improving the quality of life in rural and urban settlements;
- (viii) To prevent the loss of productive soil through erosion, salination or contamination; to arrest the process of desertification and to restore the productivity of desiccated soil;
- (ix) To help governments in managing forest resources so as to meet present and future needs;
- (x) To anticipate natural disasters and to help governments in mitigating their consequences;
- (xi) To assist governments in anticipating and in preventing adverse effects of man-induced modifications of climate and weather;
- (xii) To encourage and support the development of sources and uses of energy which assure future levels of energy adequate to the needs of economic and social development while minimizing deleterious effects on the environment;

- (xiii) To help to ensure that environmental measures taken by industrialized countries do not have adverse effects on international trade, especially the economic trade or other interests of developing countries, and to help developing countries maximize opportunities which may arise for them as a result of changes in comparative advantages induced by environmental concerns;
- (xiv) To preserve threatened species of plant and animal life, particularly those which are important to human life and wellbeing;
- (xv) To help governments identify and preserve natural and cultural areas which are significant to their countries and which form part of the natural and cultural heritage of all mankind;
- (xvi) To help governments take into account in development planning the relationship between population growth, density and distribution and available resources and environmental effects;
- (xvii) To help governments increase public awareness through better education and knowledge of environmental concerns and facilitate wide participation in and support for environmental action.

## 2. Major functional tasks

22. In addition to providing fora and support for the intergovernmental consideration of environmental matters, the principal means through which the above programme objectives can be achieved may be considered as functional tasks. For the most part these tasks consist of the necessary supporting measures for the assessment and management of the environment. Accordingly, these tasks relate to all objectives and all programme areas.

23. A programme for the carrying out of one such functional task was approved by name and in principle at Stockholm, the "Earthwatch" assessment programme, which calls for research and evaluation activities to provide an understanding and assessment of environmental problems, closely associated to a monitoring system, to the proposed Information Referral Service 1/, and to related information-exchange activities.

24. A number of supporting measures are needed to contribute to the execution of various assessment and management actions by States, regardless of their stage of economic or technological development. A study of what is needed, in the light of the Stockholm recommendations, has led to the identification of four major functional tasks, in addition to "Earthwatch":

- (a) The provision of technical assistance to governments in evaluating their environmental needs and in planning and carrying out measures to meet them;

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1/ Under recommendation 101 of the Stockholm Conference.

- (b) The provision of assistance for the training of personnel who will require specialized skills in order to participate in the development and application of measures - including environmentally-sound technologies - for the protection and enhancement of the environment, with particular emphasis on planning and management;
- (c) The provision of financial and other forms of support to strengthen national and regional institutions which can contribute significantly to the international institutional network required for carrying out agreed measures under the programme;
- (d) The provision of information and related material in support of national programmes of public information and education in the environmental field.

25. The next two chapters outline in general terms the approach which the secretariat believes should be followed, on the basis of the Stockholm recommendations, to achieve the objectives and accomplish the tasks described above.

## Chapter II

### GROUPS OF RECOMMENDATIONS

26. The 109 recommendations adopted at the Stockholm Conference have been arranged under fifteen headings, corresponding to groups of subject-matters, largely for purposes of convenience and to facilitate their consideration by the Council. This classification is useful also for internal purposes, to ensure the appropriate flow of information and to make it possible to apportion responsibilities. It should be emphasized that this classification is merely a convenient device and that it can be modified in the light of experience. It does not suggest priorities, or the relative importance of the various subjects or of the actions contemplated.

27. The classification is intended to help the Council by providing headings which constitute a guide to the secretariat's intentions as regards the application of the Stockholm recommendations. Many recommendations contain several elements which could have been distributed among several groups of subjects, but this redistribution was rejected because it might have led to confusion and cumbersome administration. Thus, each numbered recommendation is assigned to only one group. The annex to this document contains a table showing relationships between the Conference's recommendations, these groups of subjects, the major areas of concern identified at the Conference, the suggested objectives of the programme, the functional tasks, and the text of the Principles of the Declaration adopted by the Conference.

28. The fifteen groups of subjects, together with references to relevant recommendations of the Stockholm Conference, are set out below:

1. Pollutants (recommendations 14, 71, 72, 73, 74, 75, 76, 77, 78, 80, 81, 82, 83, 85, 94)
2. Atmosphere (recommendations 70, 79)
3. Oceans (recommendations 33, 46, 47, 48, 49, 50, 55, 86, 87, 88, 89, 90, 91, 92, 93)
4. Energy (recommendations 57, 58, 59)
5. Natural disasters (recommendation 18)
6. Information (recommendations 84, 101)
7. Planning (recommendations 60, 61, 63, 68, 100)
8. Land and water (recommendations 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 51, 52, 53, 54, 56, 65, 66, 67, 69)
9. Settlement systems (recommendations 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 15, 16, 17)

10. Genetics (recommendations 39, 40, 41, 42, 43, 44, 45)
11. Wildlife and parks (recommendations 29, 30, 31, 32, 34, 35, 36, 37, 38, 98, 99)
12. Economics and trade (recommendations 62, 64, 103, 104, 105, 106, 107, 108, 109)
13. Population (recommendations 11, 12, 13)
14. Education and culture (recommendations 95, 96, 97)
15. Institutions (recommendation 102)

29. What follows is a narrative review of each group of recommendations, including a summary of the content of the recommendations, and suggested actions.

A. POLLUTANTS  
(recommendations 14, 71-78, 80-83, 85, 94)

30. Pollutants comprise chemicals (and some biological agents) and physical factors, including heat, radiation, and noise and vibration, whose distribution in the environment and accumulation in living organisms cause deleterious effects on the health and well-being of all living systems, including man.

31. The principal objective suggested for this group is "to anticipate and prevent threats to human health and well-being posed by contamination of food, air or water".

32. In order to achieve this objective, a comprehensive international programme is required to determine existing and potential risks created by pollutants in various concentrations and to devise effective preventive and control measures, including international agreements.

33. An effective assessment of data obtained by monitoring systems would provoke awareness and give advance warning of potential problems. Monitoring must be combined with programmes of research into effects of pollutants, preparation of statistics concerning inputs and flows, and the building up of an international store of data relating to the materials involved, including chemical biological and radio-active compounds. The results of research and data obtained should be evaluated and exchanged among interested parties. Modern techniques, including remote sensing and radioactive tracers, may be appropriately employed.

34. Control measures to be established by governments domestically and by international agreement would require the accumulation of broad knowledge of health effects; as a consequence, primary protection standards would be worked out, internationally-agreed guidelines and standards for dangerous or toxic and persistent pollutants would be defined, and global, regional or national measures would be laid down to limit the release of such pollutants into the environment.

35. Health criteria and primary protection standards should be selected on the basis of the severity of various kinds of adverse effects of pollutants on the population, including irreversible or chronic effects, adverse genetic, teratogenic and carcinogenic consequences, persistence and change in character of the agent as it moves through the environment and its accumulation in man or in the food chain; and the size, type and demographic characteristics of the population exposed to the hazard.

36. Action suggested

(i) A "global environmental monitoring system" within the Earthwatch programme (see also Chapter III of this document) to monitor significant environmental parameters. First priority will be given initially to the monitoring of pollutants of common concern in the air, water, food, soil and biota. This will be closely linked to systems for identifying pollutants of common concern, for assessing their effects, for gathering needed statistics, including international registries of potentially toxic chemicals and of radioactive compounds, and internationally agreed testing procedures. In this connexion early action is needed to:

- (a) ascertain the feasibility of monitoring each such pollutant;
- (b) draw up specific plans for the monitoring of pollutants in cases where monitoring has been proved to be feasible (including intercalibration of equipment, standardization of methodology, technical assistance and training, selection of sites, processing and exchange of data, etc.);
- (c) support existing monitoring programmes or those ready for implementation.

Preparations have already been started, and it is proposed that an Inter-governmental Working Group on Monitoring be convened early in 1974 to act on the basis of material now in preparation.

(ii) Investigations and compilation of information on the sources, pathways and fate of pollutants in the environment and their transformation as they are distributed through the air, water, food and biota.

(iii) Promotion of internationally agreed guidelines and criteria for selected pollutants for the protection of human health and well-being.

(iv) Promotion of the exchange of information about existing control measures, including the best practicable means.

(v) Development of programmes of a background and "stocktaking" nature at the global level in specific industrial branches. (Such programmes should include the study and determination of processing techniques and methods, the type and quantity of discharges and their effects, recently developed environmentally-beneficial technology, including technologies available for the recovery or re-use of waste material, adaptability of different technologies to varying types of local conditions, etc. Similar activities are discussed in Section I, Settlement systems, below).

(vi) Establishment of a "clearing house" for existing technologies and methods which could be used to lessen or avoid the harmful impact of man's activities on the environment.

(vii) Investigations to find alternatives to those processes which produce harmful pollutants, or to find substitute materials used in different amounts, kinds or mixtures, so as to provide a choice between alternatives of different degrees and kinds of usefulness.

(viii) Organizing consultations and meetings for specific industries (such as automobile, petro-chemical, paper and pulp, etc.) to consider environmental aspects of the industries concerned and particularly their polluting effects, and to formulate principles and guidelines which could assist in mitigating harmful effects on the environment.

(ix) Definition of criteria and standards for noise from all sources and the evaluation of the effects of noise on health.

(x) Provision of training and other forms of assistance to ensure the participation of developing countries in national and international monitoring and other activities concerned with pollution.

B. ATMOSPHERE  
(recommendations 70, 79)

37. There is a major gap in man's knowledge of effects of the phenomena - both natural and man-made - that determine climate and its fluctuations. Man's activities which might induce changes in climate include: altering the composition of the atmosphere by adding particles and gases (the most important of which is believed to be carbon dioxide), release of heat into the atmosphere as a result of the production and use of energy, changes of the physical and biological characteristics of the Earth's surface, and large-scale weather modification experiments. The significance of man's activities should be viewed against the background of natural variations in climate, i.e., those changes which would have occurred in the absence of human intervention.

38. The principal objective suggested for this group is "to assist governments in anticipating and in preventing adverse effects of man-induced modifications of climate and weather".

39. Action suggested

(i) Establishing necessary monitoring stations to collect and disseminate data regarding relevant atmospheric elements and quantities and the flow of pollutants through the atmosphere and assessing the data in relation to the global view of pollutants discussed in Section A. above.

- (ii) Stimulating research work, including the development of models to explain the various physical processes that determine weather and climate and their changes including the interaction between the atmosphere and the oceans.
- (iii) Arranging investigations, including the development of models and the collection of data required by the models, for the theoretical understanding of the effects of human activities on climate.
- (iv) Assessing the possible effects on climate of weather modification experiments and considering possible international aspects of such experiments, including the possibility of intergovernmental meetings to establish international agreements dealing with such experiments.

C. OCEANS

(recommendations 33, 46-50, 55, 86-93)

40. The effects produced in the oceans by man's activities - at sea and particularly on land - are a matter of increasing concern. The capacities of the oceans to assimilate extraneous substances and to continue to support biological resources should be carefully assessed and safeguarded. A comprehensive approach to the management of oceans, based on co-ordinated programmes, both at national and international levels, for assessment, control and support activities should be further defined. Since oceans form physically and biologically, an inseparable entity, international co-operation on both regional and global levels is essential.
41. The principal objective suggested for this group is "to detect and prevent serious threats to the health of the oceans through controlling both ocean-based and land-based sources of pollution, and to assure the continuing vitality of marine stocks".
42. Knowledge is required about the physical, chemical and biological state and trends of the oceans, with special reference to changes introduced by man's various activities.
43. In some of the enclosed and semi-enclosed seas and other confined bodies of water, specific programmes (both at national and international levels) are required to evaluate their state critically and, where necessary, to develop effective control measures. A number of steps have been taken and are under way to control marine-based sources of marine pollution (e.g. the IMCO Oil Conventions, the London Ocean Dumping Convention, the Oslo Convention), and to cope with major incidents, but little work has been done to control land-based sources of ocean pollution. Movements of toxic chemicals, such as heavy metals, chlorinated hydrocarbons and radioactive wastes, are giving rise to growing international concern. Emphasis is needed on control over land-based sources affecting coastal areas and fisheries.
44. Aquatic resources, both marine and fresh water, are vulnerable to depletion by over-harvesting, contamination by pollutants, or destruction by disturbance of breeding grounds. Special efforts will be required to develop ecologically-oriented management programmes for aquatic resources and to improve available data.



45. Future exploitation of marine mineral and energy resources may open up additional sources of marine pollution. Policies and methodologies for the proper use of these resources should be developed as a contribution to the preparations for the Conference on the Law of the Sea.

46. Action suggested

(i) Monitoring of sources, pathways and fate of marine pollutants and development of models as an aid to understanding their spread and their chemical and biological changes in the oceans. Special emphasis should be laid on the land-based sources of marine pollution. As part of Earthwatch, and in close association with the Integrated Global Ocean Station System (IGOSS), a marine pollution monitoring programme should be developed which will measure physical and chemical parameters, with initial emphasis on all parameters relevant to pollution by oil and hydrocarbons, but including also other critical chemicals such as heavy metals and pesticides and certain biological parameters. The programme will require research into designs including instruments, techniques and site selection so that the comparability of data may be improved. It should also provide for training and technical and financial co-operation programmes for developing countries.

(ii) On the basis of data generated by the methods described above, development of guidelines for effective national measures to control significant sources of marine pollution, including land-based sources. Government actions will be more effective if they are co-ordinated on regional or, where appropriate, global levels. In this connexion, co-operation and support by UNEP will be needed as regards environmental aspects during preparations for the Conference on the Law of the Sea and the IMO Marine Pollution Conference, as will efforts by scientific groups to develop internationally agreed criteria for control measures. Acceptance and implementation of instruments proposed in a number of international agreements, including the London Ocean Dumping Convention, should be promoted, as should exchange of information about national measures to control marine pollution.

(iii) Scientific programmes for assessing and controlling harmful effects of river-transported pollutants in the oceans. A world registry of important rivers and a registry of clean rivers should be established.

(iv) Programmes to be carried out in co-operation with the United Nations family, regional and intergovernmental organizations for assessing the pollution and state of enclosed or semi-enclosed seas, including the Mediterranean, the Caribbean, the Baltic, the Black Sea, the Adriatic and the Persian/Arabian Gulf, to serve as a basis for decisions and collective action by the States concerned.

(v) Research programmes to examine the flushing properties and pollution characteristics of international straits and similar confined waters, so that appropriate international control measures may be undertaken where required.

(vi) Establishment of comprehensive series of data regarding marine mammal stocks subject to exploitation by man or affected by various human maritime activities, and development of guide-lines for the improvement of these stocks.

(vii) Control and protection of fishery resources by expanding and strengthening existing programmes. More specifically, activities in this respect involve evaluating harmful effects caused by the introduction of exotic species, with a view to establishing guidelines for such introductions; considering measures to control diseases of fish and shellfish, possibly through an international convention; identifying endangered fish species, drawing up guidelines for implementing early precautionary measures and restoring depleted stocks; and assisting in the collection, compilation, processing and publication of data relating to the world's fish resources. 1/

(viii) Compilation of information about processes of extracting minerals from the oceans as a basis for studying the environmental aspects of such processes, and development of criteria for planning and management of mineral production from oceans.

D. ENERGY  
(recommendations 57-59)

47. The increasing demand made on energy resources to support economic and population growth has raised questions concerning the supply of energy and the adverse effects of the demand on the environment. A comprehensive assessment of the energy problem is needed, one which would encompass available and potential sources of energy, consumption trends, and environmental effects of energy use. A number of possibilities exist for improving the supply of energy and mitigating the deleterious effects of the use of energy. These include the exploitation of less polluting sources, more efficient conversion processes, and new technologies for reducing pollution and ensuring a more economical use of energy resources. Information about these other possible choices should be widely disseminated.

48. The principal objective suggested for this group is: "to encourage and support the development of sources and uses of energy which assure future levels of energy adequate to the needs of economic and social development while minimizing deleterious effects on the environment".

49. Mounting concern over energy has given rise to widespread activities of various kinds in which other members of the United Nations family are engaged. The principal interest of UNEP in the energy question is clearly in the environmental implications of the effects of the use of energy. Accordingly, it would be important to ensure that the Council is kept fully informed of related activities, whether or not supported by the Fund, in order to provide a global framework within which particular aspects of the problem may be dealt with.

50. Particular attention should be given to encouraging and supporting the development of alternative energy sources, more efficient methods of conversion, transportation, and uses of energy as well as new methods of its conservation.

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1/ Conservation of fish genetic resources is covered in Section J, Genetic resources, below.

51. Action suggested

(i) Preparation of a report on the state of existing knowledge about potential and available energy resources, consumption trends, technologies and methods for the conservation and development of energy, and the establishment of economic criteria to serve as guidelines for a more efficient use of energy that would safeguard the environment, and for the development of world energy resources.

(ii) Encouraging the formulation of an international energy policy based on a critical evaluation of absolute energy demand, and the planning and management of the production and use of energy which would meet needs without causing significant environmental harm. The policy should cover research into the development of nuclear fuel resources and into other forms of energy production.

(iii) Monitoring the release of chemical and radioactive contaminants within the over-all monitoring system of Earthwatch, for the purpose of promptly reporting possible hazards.

(iv) Research into potential risks of radioactive wastes and into reliable and safe ways of disposing of such wastes; into unconventional new sources of energy which are not or less polluting, e.g., geothermal, solar, wind, tidal, etc.; and into alternative energy systems, especially those which take advantage of special conditions of the environment and of the needs of particular countries, (e.g., in developing countries, where off-grid, low-power systems using local resources, such as solar, wind or waste, may be appropriate).

E. NATURAL DISASTERS  
(recommendation 18)

52. While concerned broadly with natural disasters of all types, recommendation 18 of the Stockholm Conference stresses the importance of the meteorological aspect of the problem of natural disasters and lays more emphasis on the warning and forecasting of storms and floods than on earthquakes, volcanic eruptions and other disasters.

53. The principal objective suggested for this group is:  
"to anticipate natural disasters and to help governments in mitigating their consequences".

54. Action in this area comprises various phases: prevention, mitigation, preparedness for relief, relief, short-term rehabilitation and reconstruction. It is proposed that UNEP should be involved primarily in the first two phases, which would generally cover measures designed to prevent natural phenomena from resulting in major disasters. These measures would include:

General preventive measures

- Statistical studies of phenomena leading to disasters;
- Planning and legislative measures (land use, zoning, building codes, etc.);
- Technical measures (structural design, building materials, etc.);
- Education and training of the population and of building constructors.

Understanding, forecasting, warning  
and control of natural disasters

- Scientific studies of natural phenomena;
- Development and organization of warning systems;
- Education of the population to heed warnings.

55. Action suggested

(i) Support of scientific investigations to improve the understanding of natural phenomena causing disasters and the ability to predict their occurrence. These investigations should include research into ways and means of mitigating the harm done by disasters. They should also lead to transfer of knowledge and experience between industrialized and developing countries.

(ii) Development and extension of warning systems for those types of disasters of which warning can be given, including facilities for the rapid transmission of these warnings to local communities and education programmes to train people to take appropriate action on receiving these warnings.

(iii) Integrating available knowledge about the possibilities of occurrence of natural disasters and appropriate action into the planning of human settlements and land use.

F. INFORMATION

(recommendations 84 and 101, as well as information aspects of recommendations 2, 4, 5, 16, 19, 20, 21, 24, 26, 27, 35, 37, 39, 41, 45, 46, 49, 51, 52, 53, 56, 58, 74, 91, 95, 96, 97, 100, 102)

56. A good deal of practical information is already available about environmental problems and their solution. Access to this information is, however, often difficult because it is scattered and the sources of information and data are poorly organized. A steady flow of information is needed in order that national and international action may become more effective.

57. International programmes should provide for exchanges of information about environmental research; control activities, including legislative and administrative practices; environmental management, including rural planning and the management of forests and water resources; and education and training in environmental questions.

58. Special attention should be paid to collecting, analysing and disseminating information at the regional level, especially in cases where data relate to (a) research, experimentation and the execution of projects covering all aspects of human settlements; (b) the capabilities, degradation, conservation and restoration of the soil; (c) neighbouring or contiguous protected areas; (d) experience, methods and work in progress in connexion with continuous social diagnosis; (e) living aquatic resources and their environment; (f) fisheries.

59. Interested international organizations should promote exchanges of information about forests, forest fire, pests and disease; world genetic resources, marine pollution and baselines. Appropriate machinery is required for exchanges of information about environmental legislation, chemicals of environmental concern, energy, mining and mineral processing, and national park planning.

60. The processing of various types of information and data concerning the environment is a subject for long-term research when set against the total information required for the purpose of promoting and carrying into effect policies for environmental assessment and management, together with appropriate support activities. As a matter of priority, international action can best start by setting up an International Referral Service (IRS) for sources of environmental information. Such a service will improve access to existing sources and will make it possible to derive maximum benefit from exchanges of information about local, national and international research, administrative and legislative experiences in environmental matters.

61. Increased exchange of information is a key element in the "Earthwatch" programme; no objective as such is suggested for the activities under the programme in this field.

62. The proposed International Referral Service should contribute to the successful application of many of the recommendations of the Stockholm Conference.

63. Since the Stockholm Conference, a series of meetings and consultations with experts from a number of States and international organizations has made it possible to develop the concept of the IRS, together with a plan of work for its establishment and functioning. It should be noted that the IRS is not conceived as a full-scale information system, but as a switchboard mechanism between users and suppliers or sources of information, giving users the names, addresses and attributes of those sources most likely to satisfy their needs.

64. Provision will be made for the development of the capability for extending the IRS to the "plug-in" stage so that users may receive direct information or data as answers from co-operating information or data systems through the Referral Service, as well as being referred to other sources of information or data.

65. The proposed development of registries of data and technical information systems required by other programmes and programme areas will be particularly relevant in this context.

66. Action suggested

(i) Analyses and design studies are being out to define, demonstrate and cost possible systems for the referral service, to determine the needs and priorities of users and the role of major existing or planned information services which may wish to use the referral service.

(ii) Because of the great interest of States in the IRS, the plan of work envisages that the operational stage of the service would be preceded by an experimental stage, including a demonstration exercise which will serve to popularize the principles and potentialities of the service as well as to ensure the gradual perfection of a reasonable systems design. This demonstration will take place during the first session of the Governing Council.

(iii) In the light of these early studies, it will be necessary to carry out administrative planning and costing of the IRS. This will involve a study of the organizational, financial and technical implications of the establishment of a rudimentary service, including the recruitment of the staff.

(iv) Technical assistance and training should be extended to facilitate the use of the service by developing countries. There will also be a need for a general training of both users and those responsible for gathering the data, to ensure that information sources are correctly catalogued and users are able to formulate their questions in such a way as to make the most efficient use of the service.

(v) Surveys of existing and planned information services within the United Nations system and of the relationship between the IRS and other similar services are essential. These surveys, together with studies on the resulting implications of referring States or agencies to specific information sources, will have an important influence on the organization of the IRS.

(vi) Among the special and continuing studies needed are those relating to:

- the problem of communication between users, the referral service, sources of information and national input centres;
- the collection, retrieval and storage of up-to-date and reliable information;
- the provision of various outputs from the service, including personalized listings, inventories and magnetic tapes;
- the periodic review of activities of the IRS on the basis of user feedback and consequential modification of the service;
- the analysis of priorities arising from other Stockholm recommendations relating to the exchange of information and the relationships of these activities to the IRS in the light of the Governing Council's guidelines;
- the planning of the expansion of the IRS as envisaged at the Stockholm Conference;
- the study of criteria and methods for evaluating the effectiveness of the IRS.

(vii) Because of limited resources, the successful establishment of the IRS (and the execution of other information and data exchange projects) will depend on the maximum co-operation of those States and agencies which are in a position to provide catalogued and indexed inputs, preferably in computerized form. This will enable the IRS to concentrate input-gathering resources on those developing countries which do not possess advanced information-handling facilities. The Governing Council may wish to encourage those States which have not already done so to identify national central points for the exchange of information about the environment.

G. PLANNING

(recommendations 60, 61, 63, 68, 100)

67. Any plan for any kind of development activity - agriculture, industry, transportation, human settlements - which fails to take into account resulting impacts on the local environment inevitably involves societies in future costs of an economic or social nature. Planning methods should therefore be improved so as to allow for environmental considerations and to give them appropriate weight along with economic, social and other factors. In order to improve the planner's ability to foresee the effects of his plan on the community and its environment, the lessons of past experience should be assembled, pilot studies should be conducted in representative ecosystems and information should be exchanged concerning new forms of environmental planning and management. Wherever possible, means should be found to assist States to incorporate environmental considerations in current planning efforts.
68. Because this group of recommendations applies to all activities, no specific objective has been suggested. Especially applicable here is the general objective: "to encourage and support an integrated approach to the planning and management of natural resources so as to take account of environmental consequences to achieve maximum social, economic and environmental benefits."
69. Various activities related to the UNEP programme as well as other activities inside and outside the United Nations will generate ideas, information and new planning methods which will have important applications in development planning at the national and international levels. Areas of application will include the full range of man's activities to improve his material well-being.
70. New ideas on how to cost environmental aspects will arise especially in connexion with the matters considered in section L, Economics and trade, below, as will new insights into the relationship between environmental effects and population density.
71. These new ideas will have to be seen against the background of local values determined by cultural and social factors, in order that overall development planning can integrate local ecological/environmental conditions (the physical, biological and natural resources component) with man-made agricultural, energy, industrial and settlement systems. The method of planning should facilitate the task of taking all these factors into account in such a way as to produce an economic and social improvement planned, as far as possible, to anticipate and prepare for the growth that is likely to occur.
72. For example, the relative advantages of the use of land for mineral extraction, agriculture, industrial use and settlement must be examined. If migration from the countryside to the towns seems likely, owing to the attraction of jobs in the industrial sector, or to newly-expanding settlements, techniques should be available to ensure that planning takes the inevitable squatter settlements into account. For this purpose, allowance should be made for local conditions and social and cultural attitudes.

73. New development strategies based on integrated planning of ecosystems should be worked out, on the basis of existing studies of selected ecosystems in the developing world, so that economic development will be accompanied by the preservation and enhancement of the environment. A systematic effort should be made to adjust technologies to local ecosystems, especially in the case of tropical resources, rather than applying imported technologies which may have harmful effects. The integrated planning techniques should be based on selected research into particular ecosystems in the developing world, and used as a means of accelerating development.

74. Action suggested.

(i) Environmental criteria should be taken into account in development projects. Efforts are being made by several development assistance agencies to formulate guidelines by which to anticipate and mitigate adverse effects on the environment associated with development projects. Means should be found to ensure that countries receiving development assistance also participate in the process of formulating guidelines.

(ii) Major development projects, particularly those with potential international implications, which are now in the planning phase should be identified, and technical assistance should be provided to enable countries undertaking such projects to assess their effects on the environment.

(iii) Initiate pilot actions and post audit. As check lists of environmental questions are established, selected pilot schemes should be initiated in several regions and training of the planners should be organized, in co-operation with development assistance agencies. Efforts should be made to apply the criteria mentioned above in certain projects. A few selective post audits of projects might also be undertaken. These actions will eventually make it easier to anticipate and ultimately to predict the effects of development projects on the environment and thereby to choose the most satisfactory alternatives.

(iv) Support should be given to new approaches to the management of the environment. A thorough review and assessment of new forms of this management in national pilot schemes should be conducted on a continuing basis, research needs identified, and experimental efforts by developing countries supported.

H. LAND AND WATER

(recommendations 19-28, 51-54, 56, 65-67, 69)

75. In order to make optimum use of land resources, a policy of aménagement du territoire should be pursued. Land inventories should be undertaken to assess the limitations and capabilities of the land and its appropriate uses and to sort out conflicting demands made upon it. The planning of land-use should be comprehensive: it should take account of the needs of industry, agriculture, human settlements, recreation and forests and wildlife. The potential of marginal lands and the degradation of the environment due to mining practices should be studied.



76. Continued productivity of resources should be ensured by encouraging the application of sound ecological principles and by guarding against the degradation of the environment. For example, soil capabilities can be maintained, agricultural wastes controlled and recycled, domesticated livestock improved, and the health of forests strengthened through protection and control measures and through the application of better knowledge.

77. To achieve these purposes, there is need for increased research, monitoring and collection and dissemination of data and technical information and advice.

78. Three objectives are suggested for this group:

"To improve the quality of water for human use, in order that all persons may have access to water of a quality compatible with requirements of human health";

"To prevent the loss of productive soil through erosion, salination or contamination; to arrest the process of desertification and to restore the productivity of desiccated soil";

"To help governments in managing forest resources so as to meet present and future needs".

1. Desertification

79. The deserts of the world are gradually spreading. As marginal lands expand and continually make more and more land unusable for productive purposes, the physical base for habitation and development shrinks. This phenomenon is largely confined to several of the developing or least developed countries. The Action Plan rightly stresses the importance and urgency of integrated and efficient land and water management. A major programme is proposed to halt the spread of the deserts and regain usable land. This will require careful selection of areas for pilot projects, based upon detailed investigations of soil climate, soil degradation, salination, local climate and weather, hydrology, land use, agricultural grazing and rural settlements, wildlife and natural ecology, and economic and cultural patterns. While the question of soil erosion is dealt with separately below, it should be borne in mind that soil fertility and erosion must be treated as aspects of the same set of problems. In the light of these data and of existing or planned activities, including previous cases of attempted de-desertification, further data would be collected where necessary, and then a programme of action would be undertaken in selected areas to change the existing situation.

80. Such a programme would involve the participation of governments and of regional organizations concerned, and essentially all members of the United Nations family, as well as of national organizations and experts. It will involve a mobilization of financial and technical resources and will be closely related to the study being undertaken in this area by the United Nations Department of Economic and Social Affairs.

81. Action suggested (desertification)

(i) Initiation of co-operative arrangements with concerned agencies with a view to mobilizing institutional co-operation and financial resources for particular development projects in this field that are capable of early implementation.

(ii) Methodical incorporation of ecological factors in the geographic, social and economic parameters of the area with a view to stabilizing and developing marginal lands.

(iii) Accelerating research into better techniques for land stabilization and improvement.

82. An appropriate programme would make provision for the judicious use of ground and surface water resources to avoid adverse ecological consequences. It would call for legislation prohibiting the destruction of range land by declaring such land as reserved areas, and through the management of such land ensure a balance between forage resources and animal life. It would also accelerate the carrying out of integrated surveys, including the use of remote sensing techniques, research and monitoring, with the objective of conserving ecosystems. It would take account of economic, social and cultural factors of nomadic populations and settlements in marginal areas with a view to restoring or increasing healthy and productive vegetation. Finally such a programme would make provision for the training of nationals and for the exchange of information, experts and experience.

2. Soils

83. A vigorous programme to improve the quality and productive capacity of the soil is needed, parallel to but separate from a concerted attack on deserts. Particular attention should be paid to the assessment of the hazards of land degradation which may be the consequence of agricultural development and production, and to means of evaluating and forecasting the degree of land degradation, especially man-induced erosion. There is need also for better collection and processing of information concerning soils, including mapping.

84. Action suggested (soils)

(i) Technical meetings to establish methods of improving the quality and productive capacity of the soil by judicious recycling of waste, to extend support to research, conservation and such action programmes as may be developed.

(ii) Strengthening of information, data and mapping capabilities with regard to soil degradation, in connexion with an overall appraisal of land resources.

3. World-wide forest cover

85. The world's forests, particularly tropical forests are, in contrast to deserts, shrinking and will shrink faster if they are exploited without due regard to preservation for the sake of achieving a sustained economic and ecological yield. Shifting cultivation and large-scale felling of trees and, occasionally, colonization and development are the main destructive forces. The world surface area of forest cover, particularly of humid tropical forest, is a factor in the

global humidity balance and hence influences the world climate. Since tropical rain forests seem to be in some danger of extinction, this problem deserves high priority. It is important to assess the trends in world forest cover, both to understand possible effects of changes on climate and to provide information about the existing and potential use of forest resources. A World Forest Appraisal Programme, with particular emphasis on tropical forests should be undertaken.

86. Action suggested (forests)

- (i) Research to gain adequate scientific knowledge of the life histories and growth requirements of tropical trees and forests.
- (ii) Research to improve knowledge of the influence of forests on climate.
- (iii) Assessment of trends in forestation and deforestation.
- (iv) Definition and standardization of criteria and improvement of methods for forest management in the light of economic and environmental considerations.
- (v) Finding new uses for the materials of forests which are in harmony with other uses and the preservation of the forest biome.

4. Fresh water

87. While the problems of water quality are dealt with to a large extent in Section I, Settlement Systems, below, the pervasive problems of the contamination of water from natural sources, particularly in tropical areas, needs special emphasis. Such problems as bilharzia can either be aggravated or mitigated through development projects. Research efforts and new resources, including new technologies, have to be concentrated in the attack on the problems of water-based diseases which afflict large sections of the human population.

88. Action suggested (fresh water)

- (i) Provision of technical and other assistance for major development projects which might significantly affect water quality.
- (ii) The promotion, testing and dissemination of new technologies for the prevention and control of water borne diseases.

5. World materials flow

89. Under current practices mineral resources, which are generally non-renewable, are disposed of as an unused waste product, which in itself can give rise to problems. At the same time, there are many renewable, particularly grown, raw materials like wood, the exploitation of which can place them on a sustainable yield basis and, with the development of suitable technology, replace the use of some of the non-renewable materials. There is thus an interaction between the extraction and use of non renewable natural resources, the recycling or re-use of these materials, and the substitution of natural materials processed in new ways for the non-renewable materials.

90. Action suggested (materials flow)

This complex relationship has important implications for the use of land, forests and water, more generally, for development under ecologically sound conditions. It is proposed to study the subject with a view to establishing a better foundation for national, regional and global policies for the extraction, use and flows of materials. The subject is related to that of ecological economics (discussed in section L, Economics and trade, below) and to that of competition between natural and synthetic materials; also to matters discussed in section A, Pollutants, above.

I. SETTLEMENT SYSTEMS

(recommendations 1, 2-10, 15-17)

91. As populations increase, so does the size of human settlements, often in unregulated and spontaneous ways which cause a decline in the quality of the human environment and of life itself. Problems arise in consequence of interrelated situations - maldistribution of population and of productive forces; haphazard land-uses in urbanized zones; congestion and poverty of urban immigrants; ageing of rural settlements; inadequate housing, transportation, water supply, waste disposal and public health - and under certain conditions become particularly severe, especially for developing countries.

92. To deal with this range of problems, a variety of approaches and actions are required on the part of the international community. A long-term programme for the improvement of human settlements should be undertaken at the rural and urban level, involving pilot projects closely related to preparations for the Conference - Exposition on Human Settlements (see General Assembly resolution 3001(XXVII).<sup>1/</sup> Research efforts should be increased and co-ordinated, and the results of the research disseminated through a broad and efficient exchange of information. Training should be intensified to develop such skills as those of community developers for self-help programmes, specialists in environmental planning and experts in the working environment.

93. The principal objective suggested for this group is: "to help governments in improving the quality of life in rural and urban settlements".

94. Action suggested

(i) Assisting the development of industrial and agricultural complexes by compiling the inputs, including wastes and by-products, of various industrial and agricultural processes and the effects on local environments of different means of production in the same industry. This compilation could be used to provide governments with information about the environmental consequences of various kinds of industrial activities, as an aid to assessing proposals for industrial development. It could also be used in planning complexes of industry and agriculture so designed as to coexist in a symbiotic way with each other and with the local environment.

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<sup>1/</sup> The subject of UNEP participation in the preparation for this Conference is treated separately in document UNEP/GC/6.

To this end, various processes would be designed each of which would use some of the waste and by-products of the others as part of its own raw material, thus minimizing problems of discharge and attracting more industry as a result of lower costs. Energy in this context should be treated as an industry with waste heat as its principal by-product.

(ii) Designing special systems for special situations. Many types of systems of water supply, sewerage, solid waste disposal, and recycling would be useful in rural situations (particularly in developing countries) where local conditions would make them economical and practical. Such systems are unlikely to be developed, however, without special impetus. On the basis of existing information, a programme should be undertaken to develop such systems and to demonstrate pilot schemes in selected cases.

(iii) Establishment of an international fund or financial institution for human settlements. The General Assembly at its 27th session adopted resolution 2999(XXVII), endorsing in principle the establishment of such a fund or institution. In co-operation with the Department of Economic and Social Affairs and the World Bank, UNEP plans to undertake a detailed study of possible alternatives in the provision of such financing needs for human settlements.

#### J. GENETIC RESOURCES

(recommendations 39-45)

95. The diversity of and within various species of life should be maintained to sustain the ecological stability of the biosphere for use as natural resources, as well as for scientific, educational and recreational purposes. This diversity is diminishing, as genetic resources, be they of crops, forests, animals or micro-organisms, are depleted or displaced by man's impact on the biosphere. Many as yet unexplored opportunities exist for the development of genetic resources. Most programmes of conservation and advanced domestication of genetic resources are undertaken in a few industrialized countries, but a large number of genetic varieties originate in the developing countries and are threatened with extinction.

96. An international programme for the conservation of genetic resources is required to collect and preserve gene pools of plants and animals (wild areas, botanical gardens and zoos, seeds, sperms and ova). These collections can then be mobilized for use as alternative species, for replacement or hybridization, and as insurance against the possible drastic reduction of various mono-culture species now in extensive use. Other inter-related activities include surveys, inventories, exploration and collection, evaluation and utilization and documentation and information exchange.

97. The principal objective suggested for this group is: "to preserve threatened species of plant and animal life, particularly those which are important to human life and well-being".

Action suggested

98. The following steps are based on the work of an inter-agency expert Working Group which advised the Executive Director with regard to this group of recommendations:

(i) Crop genetic resources. As a result of modern plant improvement practices, genetic diversity has greatly narrowed. As a consequence major food crops have become more vulnerable to pests and diseases, and genetic resources for resistance, as well as for yield and quality improvement, are disappearing. Additional support should be given to selected national institutions in developing countries engaged in the collection, evaluation and conservation of disappearing species in the light of the Report of the Technical Advisory Committee of the Consultative Group on International Agricultural Research, March 1972 (document PAB:IAR/72/11).

(ii) Forest genetic resources. It is proposed to support initiatives for the conservation of forest plant species, along lines already laid down by the FAO Panel of Experts on Forest Gene Resources.

(iii) Micro-organisms. Activities should be directed towards strengthening some culture collections and the related facilities for basic research into micro-biology, manpower training and support for data collection and information exchange. Micro-organisms as protein sources and those useful for pest control purposes should also receive attention.

(iv) Wildlife genetic resources. It is proposed to identify special measures for management in biological reserves, national parks and contiguous areas in order to guarantee the perpetuation of wild species and varieties, to make an assessment of the population dynamics and habitat requirements of certain wild species, and to organize regional activities for maintenance of genetic diversity.

(v) Domestic animal genetic resources. Measures should be taken to accelerate the establishment of continuing machinery for assessing and maintaining catalogues of the characteristics of domestic animal breeds and to co-ordinate and support institutes engaged in research and conservation of semen and ova.

(vi) Fish genetic resources. It is proposed to prepare a catalogue of threatened fish genetic resources of potential use in aqua-culture, to develop conservation techniques (gene pools and storage of gametes), and to establish conservation programmes.

K. WILDLIFE AND PROTECTED AREAS

(recommendations 29, 30, 31, 32, 34, 35, 36, 37, 38, 98, 99)

Wildlife

99. Wild animal life is of great value to man - it contributes to ecological stability, it is an important economic resource, an attraction for tourism and outdoor recreational activities, and constitutes a source of protein and animal products. A worldwide inventory of wildlife resources is needed as a basis for international action to protect many species which are now threatened with extinction or serious depletion.

Wildlife management -- ensuring that wildlife populations are as large and varied as is compatible with other important land uses -- can counter the threat and should be widely encouraged through specialized training provided at the regional level. The species affected should be identified, and the exploitation and marketing of such wild animals and their products should be brought under strict control. For this purpose international conventions or treaties are needed to protect species inhabiting international waters and those which migrate across national frontiers. Within the context of the environmental monitoring system, attention should be given to the effects of pollutants upon wildlife.

#### Protected areas

100. National parks and similar protected areas should be surveyed, managed and preserved as part of the common heritage of all mankind. With increasing tourist traffic, the planning and management of this heritage became even more important, and special attention should therefore be given to training. The management of protected areas shared by more than one nation should be co-ordinated.

101. Present world holdings of protected areas should be examined and ecosystems of international significance be set aside for protection. The early entry into force of the Convention concerning the Protection of the World Cultural and Natural Heritage, 1972, and of the Convention on Wetlands of International Importance <sup>1/</sup> should be encouraged. A convention for the protection of certain islands for scientific purposes is needed.

102. The principal objective suggested for this group is: "to help governments to identify and preserve natural and cultural areas which are significant to their countries and which form part of the natural and cultural heritage of all mankind."

103. It is gratifying to note the adoption by the UNESCO General Conference on 16 November 1972 of the Convention concerning the Protection of the World Cultural and Natural Heritage, as recommended by the Stockholm Conference. Instruments of ratification, acceptance or accession may be deposited with the Director-General of UNESCO, and the Convention will enter into force three months after the date of deposit of the twentieth such instrument.

104. It is also gratifying to note that the International Convention on Trade in Endangered Wild Species of Fauna and Flora was successfully concluded at a Conference held in Washington from 12 February to 3 March 1973 which was attended by the plenipotentiary representatives of 80 countries and to which the United States Government acted as host. This is in the letter and spirit of recommendations 32 and 99 (3) of the Action Plan for the Human Environment. More than twenty governments have signed the Convention, which will enter into force 90 days after ten countries have deposited formal instruments of ratifications with the Government of Switzerland as depositary.

105. Article XII of this Convention states inter alia.

"Upon entry into force of the present Convention, a Secretariat shall be provided by the Executive Director of the United Nations Environment Programme. To the extent and in the manner he considers appropriate, he may be assisted by suitable intergovernmental or non-governmental,

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<sup>1/</sup> Convention on Wetlands of International Importance especially as Waterfowl Habitat, adopted by the International Conference on the Conservation of Wetlands and Waterfowl at Ramsar, Iran, 2 February 1971.

international or national agencies and bodies technically qualified in protection, conservation and management of wild fauna and flora."

106. The Conference included in its Final Act, signed on 2 March 1973, a resolution which expressed the hope that the "Governing Council will approve the undertaking of Secretariat functions by the United Nations Environment Programme".

107. The responsibilities and functions of the secretariat are outlined in various articles of the Convention.

108. In view of the concern expressed by governments at the Stockholm Conference, the Governing Council may wish to provide guidance regarding the additional responsibilities to be assumed by the UNEP. By the time the Council meets, the secretariat expects to be in a position to submit a more detailed report on this matter, to serve as a basis for consideration.

109. Action suggested

(i) The underestimation of the economic value of wildlife in some developing countries results in inadequate expenditure for the management of this valuable resource, and in the consequential degradation of the habitat and population of the species in question. Systems of world-wide collection, reduction and interpretation of data and documentation and information exchanges are needed on ecological management of resources.

(ii) After existing activities and infrastructures of park management have been evaluated, global management and training programmes with specific regional and subject components should be established in consultation with interested States.

(iii) Appropriate methods should be devised to analyse the relationship between tourism and the environment, particularly for use in the early stages of the development of national parks, game reserves and forest recreational areas. Particular attention should be devoted to the shift of rural populations from mountainous pastoral areas, as a consequence of which traditional pastoral areas are released for use in other ways, including tourism. All aspects of the problems involved in reconciling economic benefits and environmental considerations will be examined in order to establish criteria and methods useful to governments.

(iv) Contiguous protected areas should be identified with respect to which agreements could be fostered relating to e.g. complementary legislation, patrolling systems, information exchange and research projects.

L. ECONOMICS AND TRADE

(recommendations 62, 64, 103-109)

110. It has generally been assumed that the preservation or improvement of the environment will add to the costs of development. It is true that in many cases where industrial plants, human settlements or rural developments were established without regard for environmental factors, funds will have to be disbursed if



measures ~~are~~ taken a posteriori to take account of these factors. However, the establishment of new industrial, urban or rural developments along sound lines in keeping with the safeguarding of the environment, rather than along traditional lines, need not inevitably involve further costs.

111. Even where such additional costs are unavoidable, it is likely that, besides yielding obvious social benefits, they will be considerably lower than the extra costs needed in the longer term to take account of environmental factors not originally considered.

112. Economists have not so far worked out a satisfactory way of dealing with non-owned common property in a manner which would take into account the cost of its destruction or deterioration. This lack is particularly acute in cases where destructive effects are slow and become apparent only in the longer term.

113. Protection of the environment invariably carries economic implications and is frequently accompanied by trade effects. This is not to say, however, that environmental concerns should be considered as an obstacle to economic development or to the liberalization of international trade. Sound environmental management should, on the contrary, encourage economic development and trade. Hence, it will be necessary to prevent the deleterious effects which the developing countries in particular might suffer if considerations related to the environment were used as a pretext for restrictive practices. It will also be necessary to maximize the international division of labour and seize opportunities, in terms of industry location, which seem to be arising as a result of the growing concern about the environment. Work on the economic and international trade aspects of environmental questions suffers at present from an acute lack of specific data regarding the effects of environmental measures on costs of production in major branches of industry.

114. It is essential that economic plans should make allowance for ecological considerations and take account, for this purpose, of elements which are not easily quantifiable. In the absence of such an approach, there is no way of comparing, for example, the true costs of "synthetic" with those of "natural" products. In the case of neither product is there an ecological-economic basis for costing. In the case of "synthetics", traditional costing leaves out of account the cost of the depletion of non-renewable resources (e.g. coal or oil) as well as the cost of measures to prevent or remedy deleterious effects of freely disposed by-products, such as unused effluents, including polluted water and air. In the case of "natural" materials, traditional costing leaves out of account the differential in income resulting from alternative land use, the depletion of non-renewable resources used for the production of fertilizers and pesticides, and the cost of wasted by-products (including the disposal of effluents, such as water and soils degraded by pesticides and fertilizers). Through such an approach the carrying capacity of the environment would be duly taken into account.

115. The principal objective suggested for this group is: "to help to ensure that environmental measures taken by industrialized countries do not have adverse effects on international trade, especially the economic, trade or other interests of developing countries, and to help developing countries maximize opportunities which may arise for them as a result of changes in comparative advantage induced by environmental concern".

116. Action suggested

(i) Research accompanied by case studies. An examination of "total" costs would be particularly useful and instructive in determining the relative merits of the production of synthetic and of natural fibres. Research and studies should also include social considerations and effects. The result should be significant for the International Development Strategy and for working out development and foreign trade policies by individual developing countries. A study of the impact of prospective environmental issues and policies on the International Development Strategy is under way in collaboration with the United Nations Department of Economic and Social Affairs and the OECD.

(ii) Environmental measures will have an important impact on international, commercial and economic relations including the international distribution of new industries. Detailed cost estimates for various industries developed as part of the examination of ecological and economic factors will considerably assist studies in this field.

(iii) Research into the world-wide distribution of industries should consider, on the one hand, advantages that might be derived from the location of industries in developing countries in the light of, for example, the increasing tax costs due to environmental legislation in developed countries. On the other hand, economic and social advantages derived by industry-receiving countries must be estimated with due regard to employment opportunities and to labour-intensive practices, as well as to the over-all integration of new industries in national economic planning. Special emphasis should be given to the location of industries in conformity with environmental considerations, the decentralization of industries, and the possibility of establishing industrial complexes especially adapted to local environments and minimizing pollution effects (in the sense discussed in section I, Settlement systems, above). Present or projected legislation in receiving countries should also be considered.

(iv) There should be continuing concern with controls or international standards in order to avoid their use as a pretext for applying protectionist practices in international trade.

(v) In elaborating environmental standards, the developing countries will benefit from the knowledge and information to be elaborated in the programmes mentioned above and in meetings of industry representatives with representatives of the developing countries concerned convened by UNEP. These meetings will also consider the transfer of technologies for the protection of the environment and ways to make them available to developing countries on terms which encourage their use.

#### M. POPULATION

(recommendations 11-13)

117. The growth and density of population in absolute levels, in relation to the available resource base, are factors which determine fundamentally the quality of life in all societies. Accordingly, population must be seen as a key element in the environmental equation. The principal objective suggested for this group is: "to help governments take into account in development planning the relationship between population growth, density and distribution and available resources and environmental effects".

118. In view of the activities and responsibilities of international organizations, particularly the Population Division of the United Nations Department of Economic and Social Affairs, the United Nations Population Fund and the United Nations Conference on Population to be held in 1974, the initial tasks foreseen for UNEP in this field are limited and relate primarily to support to the preparations for that Conference.

119. Action suggested

The participation of UNEP in the 1974 Population Conference and in preparatory meetings will be designed to ensure that the examination of population problems takes environmental aspects into account. In preparation for this role, the relationship between the environment and population will be studied in the context of various geographic and ecological situations existing in the world. This study will cover:

- (a) The long-term prospects for population trends in the different regions and ecoregions of the globe;
- (b) Various hypotheses of population growth, with reference to available resources and in the context of regional environments;
- (c) Theoretical relationships between a certain level of population, its growth, and the problems of the environment, such as the effects of population density on ecosystems; the generations of pollution by the population and an analysis of various connexions among these factors; the models and analysis systems for predicting situations 20 or 30 years hence; and studies of optimum levels of population.

N. EDUCATION AND CULTURE

(recommendations 96 and 97)

120. The global environment cannot be lastingly improved until all persons become conscious of the environmental impact of their individual actions and demonstrate a willingness to modify them as required. Accordingly, they must acquire a better understanding of the relationship between their actions and their future well-being. In keeping with their own culture and values, they must be helped to learn simple steps they might take to manage and improve their environment.

121. To achieve this objective, an international programme of information and education is proposed. It will involve the use of modern techniques, mass media and specialized personnel; it will have to be broad in scope, diversified and dynamic, and encourage full understanding of the relevance, complexity and urgency of environmental problems, as well as of the long-term nature of these problems and their solution.

122. The continuing process of educating the public is crucial to the success of any national or global programme for the improvement of the environment. An effective network is needed for the acquisition, analysis, storage, retrieval and dissemination of information about the expansion of environmental education, including the design and testing of new methods, materials and programmes suitable

for the training of specialists and technicians, and techniques for educating and involving the "ordinary citizen, ... youth and adult alike" (in the words of recommendation 96). While helping governments with ideas and alternatives regarding the training and retraining of specialized personnel, particular efforts should be made at the regional level to assist in the provision of advisory services to requesting governments.

123. By reason of cultural and political differences, the processes of information and education should be mainly the responsibility of national bodies. Consequently, governments should consider, in the light of their countries' particular circumstances, the establishment of new national bodies or the strengthening of existing ones, designed to inform the public about environmental conditions. The formulation of concrete environmental goals by national authorities can make a significant contribution to the education and mobilization of public opinion.

124. The principal objective suggested for this group is: "to help governments increase public awareness through better education and knowledge of environmental concerns and facilitate wide participation in and support for environmental action". While functional tasks are applicable to all subjects, one is especially pertinent to this: "the provision of information and related material in support of national programmes of public information and education in the environmental field".

125. Action suggested

(i) The varying needs of the national information media should be met through the supply of adequate basic information from which the media may draw substance and inspiration for their work. Existing information about the environment should be gathered and processed so as to ensure its maximum dissemination by traditional and modern mass media throughout all levels of the educational system, to national committees concerned with the environment, to channels of mass communication, to non-governmental organizations and to the information services of governments. An Environmental Programme Information Centre (EPIC) should be created for that purpose.

(ii) An information network service is needed to collect, analyse and disseminate information and to link sources and users of ideas and information about environmental education.

(iii) A concerted programme should be developed to assess environmental educational activities for adults, youth groups, etc., and the needs of governments for support in the form of information, educational materials and expert services.

(iv) Support should be extended to international meetings, symposia, regional seminars and workshops concerned with definition and establishment of methods, and training techniques in environmental education, and with research designed to lead to a better understanding of the processes of environmental education.

O. INSTITUTIONS  
(recommendation 102)

126. The importance of the institutional setting of environmental actions was recognized at the Stockholm Conference where it was noted that nearly all institutions - national and international - were organized by sector or discipline. As was stated in "An action plan for the human environment", "In government, the tasks are divided by sector such as agriculture, health, education, transport, industry and natural resources. Development projects are often evaluated in terms of the costs and benefits within a sector. In the sphere of sectoral decision-making and action, simple tests such as profitability - often short-term - form the basis for embarking upon an activity which may impose severe, long-term costs on the public and may produce adverse effects that are outside the sector originating action. And in schools and universities the subject matter is divided into fields or disciplines such as physics, mathematics, chemistry, engineering, economics, political science and history".<sup>1/</sup>

127. In another Conference document it was noted that the adaptation of institutions to meet the complexity of environmental matters has become an "inescapable necessity"<sup>2/</sup>, and in another the need was stressed for "focal points" in national administrations for the co-ordination of environmental action, both domestic and international.<sup>3/</sup>

128. On the basis of the Stockholm report, the General Assembly singled out "assistance for national, regional and global environmental institutions" as an example of a use for the Environment Fund <sup>4/</sup> and decided that "organizations outside the United Nations system, particularly those in the countries and regions concerned" should be utilized in support of programmes financed by the Fund <sup>5/</sup>.

129. Because of the nature of this recommendation, which applies to all groups discussed above, no objective is suggested in this case. Rather, there is a major functional task which applies particularly here. "The provision of financial and other forms of support to strengthen national and regional institutions which can contribute significantly to the international institutional network required for carrying out agreed measures under the programme".

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<sup>1/</sup> A/CONF.48/5, para. 47

<sup>2/</sup> A/CONF.48/9, para. 105

<sup>3/</sup> A/CONF.48/11, para. 16

<sup>4/</sup> General Assembly resolution 2997 (XXVII), Part III, para. 5

<sup>5/</sup> *ibid*, para. 6

130. Action suggested

(i) Expansion of the collection and dissemination of information about national and regional institutional and administrative arrangements, including relevant legislation, together with experience gained in the use of such arrangements for environmental control and development. A first requirement is to acquire, maintain and disseminate information about institutions dealing with environmental matters at the national and regional levels.

(ii) Provision of financial support to selected institutions to enable them to perform specific projects and tasks undertaken as part of the programme and activities agreed by the Governing Council. Regional as well as national institutions may become useful agents in gathering knowledge of environmental problems particular to certain areas, in drawing up programmes intended to solve these problems, and in carrying out these programmes.

(iii) Case studies on the effects and actual results in practice of the use of various legislative and institutional techniques for environmental management to shed light on the utility of various legal and organizational approaches in this area, including side effects.

### Chapter III

#### ACTION PLAN

131. In the preceding sections an effort was made to relate the suggested objectives and major functional tasks of the programme to the recommendations of the Stockholm Conference. This chapter attempts in brief and general terms to portray future activities in relation to the functional components of the Action Plan: environmental assessment, environmental management, and supporting activities.

132. In sum, a large number of assessment activities must be undertaken with urgency so as to establish a better base than now exists for rational planning and management. In many instances, however, enough is known to be usefully applied in current activities, especially in the development process. For example, as regards both assessment and management there are immediate pressing needs for support, particularly in the forms of training and assistance to national and regional institutions.

#### A. Assessment-Earthwatch

133. Many of the activities proposed for Earthwatch are already being undertaken to some degree by governmental, intergovernmental and non-governmental bodies. The extensive involvement of the United Nations system in these areas was outlined at Stockholm in the consolidated document submitted by the Administrative Committee on Co-ordination on "The United Nations system and the human environment" 1/ and its Annex, which remains a useful reference document. Attention is drawn in particular to the material presented in its Chapter II, dealing with such functional activities as monitoring, research and the definition of scientific criteria and guidelines concerning the quality of the environment. The reports of the Intergovernmental Working Groups which were established to consider monitoring and marine pollution 2/ are also particularly useful. Many of the Stockholm recommendations as well as important definitions, objectives and principles which will continue to guide work in this area, emerged from these reports.

134. A survey of the fifteen groups of recommendations shows the great variety of assessment activities to be undertaken in coming years. These range from the complex process of establishing the facts regarding the rate of expansion of deserts, or loss of forests, to a better understanding of the effects of introducing exotic species of fish in a particular body of water. A specific example concerns the levels of pesticide residues in food entering international trade. The rising levels of harmful chemicals in food are causing such serious preoccupation that the exports of developing countries may be denied admission in order to protect the consumer. Conversely, there is the danger that some developing countries unwittingly admit imported food which is harmful

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1/ A/CONF.48/12.

2/ A/CONF.48/IWGM.I/8, A/CONF.48/IWGMP.I/5 and A/CONF.48/IWGMP.II/5

to their citizens. An important element in any monitoring system should be the repetitive measurement of levels of harmful contaminants in food being traded so that trends may be identified at a sufficiently early stage to allow preventive action.

135. The ultimate objective of the Earthwatch programme is to provide early warning of impending changes or trends, whether man-made or natural, in any part of the environment which threaten directly or indirectly to cause significant harm to man's health or well-being. To be effective, such warning must come early enough to provide governments with a basis for preventive action before the cost of such action becomes prohibitive.

136. At present, however, there is no systematic means by which to identify which pollutants are significant, within the meaning of recommendation 85 of the Stockholm Conference. Even though there may be wide agreement as to the hazards caused by certain broad classes of pollutants, the ability to measure the levels of these pollutants in the media involved is often limited to a few countries; in almost no case has there been sufficient intercalibration to give any assurance that useful comparisons of acquired data can be made.

137. In these circumstances, the secretariat intends to devote special attention to the development by 1974 of an international capability to measure, on a repetitive basis, levels of pollutants of greatest international concern. It is suggested that for this purpose an intergovernmental meeting be convened, not later than February 1974, to reach agreement amongst governments and organizations concerned on specific steps for initiating this part of a global environmental monitoring system in the context of Earthwatch. In the light of the emphasis on this activity in many Stockholm recommendations, preparations for such a meeting have already begun and, with the Council's authority, would be accelerated in order that all necessary information will be in the hands of participants well before the meeting. By the time of the Council's session, it will be possible to report on the state of these preparations within the United Nations system; the specialized agencies most directly involved, on whose support such a system must depend, have already assembled considerable material of direct relevance. It will also be possible at that time to report on co-operation received from bodies outside the United Nations system. Several international organizations, both intergovernmental and non-governmental, have expressed a desire to participate in a comprehensive effort of this nature. One of them, the Scientific Committee on Problems of the Environment (SCOPE) of the International Council of Scientific Unions (ICSU), has recently established a Working Group on Environmental Assessment and Monitoring. (It will be recalled that the SCOPE Commission on Monitoring submitted a report 1/ during the preparatory work for the Stockholm Conference).

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1/ "Global Environmental Monitoring".



138. The initial focus of attention on reliable data concerning levels of pollutants must not delay the development of a monitoring capability to measure other parameters, notably those related to effects, as well as to such resource-related parameters as soil quality.

139. Closely related to monitoring activities will be research and analysis so as to improve the information needed for defining and understanding large-scale processes going on in the biosphere. The results of the research and analysis must be continuously reviewed to provide guidance needed for the sound planning and management of the environment.

140. An integral part of the Earthwatch programme will be the IRS described in Chapter II above, in section F, Information.

141. As awareness of environmental conditions increases, situations of concern become apparent which deserve special attention and assessment. In the nature of things, some of the most widely felt concerns arise in those parts of the world where the resources needed for prompt action are available. The secretariat plans to devote considerable attention, however, to the commissioning of special assessments in areas where the concerns are not accompanied by adequate research and other capabilities. Several situations of a regional nature, such as the pollution of certain bodies of water, will be early candidates for this attention, and efforts will be made to assist governments concerned by mobilizing specialized skills which would not otherwise be available.

142. In view of the clear need to enable developing countries to participate in these activities, support will be needed in the form of training, the provision of equipment and facilities, and the strengthening of national institutions. Particular attention will be paid to strengthening local abilities to deal with widespread local problems.

## B. Management

143. A number of activities falling within the "Management" portion of the framework for environmental action approved at Stockholm have been identified as such in chapter II above. These include the urgent tasks of preventing the loss of fertile soil, of stopping the spread of deserts, of protecting endangered species, particularly plant species where loss of diversity carries ominous implications for the future, and of better management of aquatic and other resources with a view to assuring sustainable yields to meet future needs, etc. In each case programmes are needed to deal with the problem.

144. Long before the adoption of national or agreed international legislative, economic and other measures to preserve the quality of the environment so as to meet future needs, goals must be set and planning undertaken. Thus, in the initial years, management activities will be started only gradually, often held back by generally inadequate information and financial and political constraints. The level of international co-operation with regard to natural resources which are predominantly within national sovereignty will probably be modest for some time to come. Nonetheless, the need for such co-operation in a number of areas is so obvious that progress can be expected.

145. Here again, support is manifestly needed, particularly in assisting governments to build institutions able to satisfy newly perceived needs. It is imperative to improve planning techniques which, by taking account of environmental considerations, will help guard against adverse effects on the environment while obtaining maximum social, economic and environmental benefits for all. In the absence of better planning methods, decisions of a kind which will unavoidably lead to a more serious deterioration of the environment are likely to be taken at the national and international level.

C. Supporting activities

146. As has been evident throughout this document, there is an immediate need for supporting measures that pervades each of the fifteen groups of recommendations. The framework for environmental action approved at Stockholm specified that international measures are needed to support the national and international actions of assessment and management. This work should be begun without delay, irrespective of established operational objectives.

147. In recognition of this need, a general objective has been suggested - "to assist all countries, especially developing countries, to deal with their environmental problems and to help mobilize additional financial assistance with a view to promoting the full participation of developing countries in international activities for the preservation and enhancement of the environment". Closely associated are the major functional tasks calling for (a) the provision of technical assistance, (b) the provision of specialized training, (c) the strengthening of national and regional institutions, and (d) the development of increased public awareness through education and public information.

148. A special study is at present being carried out to determine what are the training and technical assistance needs and capabilities in relation to the Stockholm recommendations and to the suggested objectives of the programme. Illustrative material will be available at the time of the Council's first session, in the expectation that the Council will wish this study to be vigorously pursued.

Chapter IV

RECOMMENDATIONS

149. It is recommended that the Council:

- (a) Consider and approve the objectives suggested in Chapter I above, and specify objectives which it considers deserve special attention or priority;
- (b) Authorize the Executive Director to draw upon resources available to him for the purpose of taking action consistent with approved objectives and tasks, in order that he may be able to initiate preliminary steps and submit comprehensive programmes for achieving these objectives to the Council at its next and succeeding sessions;
- (c) State its views on the functions it wishes the Executive Director to perform under the Endangered Species Convention 1/, and, if possible, provide guidance regarding the secretariat's responsibilities under similar conventions concluded in pursuance of recommendations of the Stockholm Conference;
- (d) Provide guidance as to the manner of bringing the International Referral Service into operation at an early date;
- (e) Encourage governments, the United Nations system and the international scientific community to contribute to the preparation for early initiation of the monitoring portion of "Earthwatch", including the convening of a meeting in early 1974 at the intergovernmental level.

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1/ The Convention on International Trade in Threatened Species of Wildlife, Washington, D.C., 2 March 1973.

## CLASSIFICATION OF CONFERENCE RECOMMENDATIONS

showing the relationship between those recommendations, the major areas of concern identified at the Conference, the particular objectives suggested in the foregoing report (chapter II), the functional tasks indicated (ibid) and the principles contained in the Declaration adopted by the Conference

Stockholm Recommendation	Heading in the foregoing report chapter II	Area of concern identified at the Conference <sup>a/</sup>	Suggested particular objective <sup>b/</sup>	Related Principle(s) in the Stockholm Declaration
14,71,72,73,74 75,76,77,78,80 81,82,83,85,94	Pollutants	Improvement of ... and health protection of human health	To anticipate and prevent threats to human health and well-being posed by contamination of food, air or water	6,21,22,26

<sup>a/</sup> As described in "An action plan for the human environment" (A/CONF.48/5), paragraph 58.

<sup>b/</sup> In addition to the particular objectives cited in this column, three general objectives are suggested in the foregoing report (paragraph 21) which apply broadly to all endeavours in the field of the environment, viz:

- "(i) To provide, through interdisciplinary study of natural and man-made ecological systems improved knowledge for an integrated and rational management of the resources of the biosphere" } Related principle: 20
- "(ii) To encourage and support an integrated approach to the planning and management of natural resources so as to take account of environmental consequences to achieve maximum social, economic and environmental benefits" } Related principles: 13,14,15,17
- "(iii) To assist all countries, especially developing countries, to deal with their environmental problems and to help mobilize additional financial assistance with a view to promoting the full participation of developing countries in international activities for the preservation and enhancement of the environment". } Related principle: 12

Stockholm Recommendation	Heading in the foregoing report chapter II	Area of concern identified at the Conference <sup>a/</sup>	Suggested particular objective <sup>b/</sup>	Related Principle(s) in the Stockholm Declaration
70,79	Atmosphere	... and avoidance of inadvertent climate modification	.To assist governments in anticipating and in preventing adverse effects of man-induced modifications of climate and weather	2,6,21,24
33,46,47,48,49 50,55,86,87,88 89,90,91,92,93	Oceans	protection of living resources and of the oceans	.To detect and prevent serious threats to the health of the oceans through controlling both ocean-based and land-based sources of pollution, and to assure the continuing vitality of marine stocks	6,7,21,22
57,58,59	Energy	reconciling energy demands and environmental concerns	.To encourage and support the development of sources and uses of energy which assure future levels of energy adequate to needs of economic and social development while minimizing deleterious effects on the environment	5,6
18	Natural disasters	improvement of human settlements and health	.To anticipate natural disasters and help governments in mitigating their consequences.	9

Stockholm Recommendation	Heading in the foregoing report chapter II	Area of concern identified at the Conference	Suggested particular objective <sup>b/</sup>	Related Principle(s) in the Stockholm Declaration
84,101	Information	relationship of social and cultural values and environment	"Earthwatch" <sup>c/</sup>	20
60,61,63,68,100	Planning	harmonizing development goals and social and cultural values with environmental quality objectives	(planning) (see general objective (ii))	13,14,15,17

c/ In addition to Earthwatch, the four functional tasks specified in paragraph 24 of the foregoing report are common to all activities designed to achieve the objectives indicated. The four tasks are:

- "(a) The provision of technical assistance to governments in evaluating their environmental needs and in planning and carrying out measures to meet them;
- "(b) The provision of assistance for the training of personnel who will require specialized skills in order to participate in the development and application of measures - including sound technologies - for the protection and enhancement of the environment, with particular emphasis on planning and management;
- "(c) The provision of financial and other forms of support to strengthen national and regional institutions which can contribute significantly to the international institutional network required for carrying out agreed measures under the programme;
- "(d) The provision of information and related material in support of national programmes of public information and education in the environmental field."

Stockholm Recommendation	Heading in the foregoing report chapter II	Area of concern identified at <sup>a/</sup> the Conference	Suggested particular objective <sup>b/</sup>	Related Principle(s) in the Stockholm Declaration
19, 20, 22, 23, 24, 25, 26, 27, 28, 51, 52, 53, 54, 56, 65, 66, 67, 69	Land and water	<ul style="list-style-type: none"> <li>. development and use of fresh water, land, and ...:</li> <li>. availability of water for human use</li> <li>. maintaining of soil fertility</li> <li>. management of forests</li> </ul>	<ul style="list-style-type: none"> <li>. To improve the quality of water for human use in order that all persons may have access to water of a quality compatible with requirements of human health</li> <li>. To prevent the loss of productive soil through erosion, salination or contamination; to arrest the process of desertification and to restore the productivity of desiccated soil</li> <li>. To help governments in managing forest resources so as to meet present and future needs</li> </ul>	2, 3, 6
1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 15, 16, 17	Settlement systems	<ul style="list-style-type: none"> <li>. improvement of human settlements and health</li> <li>. creation of decent habitats for rapidly growing populations</li> </ul>	<ul style="list-style-type: none"> <li>. To help governments in improving the quality of life in rural and urban settlements</li> </ul>	1, 8, 15, 16
39, 40, 41, 42, 43, 44, 45	Genetic resources	<ul style="list-style-type: none"> <li>protection of ...</li> <li>genetic resources</li> </ul>	<ul style="list-style-type: none"> <li>. To preserve threatened species of plant and animal life, particularly those which are important to human life and well-being</li> </ul>	2, 3, 4
29, 30, 31, 32, 34, 35, 36, 37, 38, 98, 99	Wildlife and parks	<ul style="list-style-type: none"> <li>relationship of social and cultural values and environment ...</li> </ul>	<ul style="list-style-type: none"> <li>. To help governments identify and preserve natural and cultural areas which are significant to their countries and which form part of the natural and cultural heritage of all mankind</li> </ul>	2, 3, 4, 5

Stockholm Recommendation	Heading in the foregoing report chapter II	Area of concern identified at the Conference <sup>a/</sup>	Suggested particular objective <sup>b/</sup>	Related Principle(s) in the Stockholm Declaration
62,64,103,104 105,106,107, 108,109	Economics and trade	relationship between development goals and environment	To help to ensure that the effects of environmental measures taken by industrialized countries do not have adverse effects on international trade, especially the economic, trade or other interests of developing countries, and to help developing countries maximize opportunities which may arise for them as a result of changes in comparative advantages induced by environmental concern	10,11,18,23
11,12,13	Population	improvement of human settlements and health creation of decent habitats for rapidly growing populations	To help governments take into account in development planning the relationship between population growth, density and distribution and available resources and environmental effects	16
95,96,97	Education and culture	harmonizing development goals and social and cultural values with environmental quality objectives	To help governments increase public awareness through better education and knowledge of environmental concerns and facilitate wide participation in and support for environmental action (Public information)(see functional task (d) )	19
102	Institutions	relationship between development goals and environment	(Institutions)(see functional task (c) )	9,17