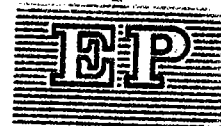




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THE ENVIRONMENT PROGRAMME

Approval of activities within the Environment Programme, in the
light inter alia of their implications for the Fund Programme

Report by the Executive Director

GE.73-12442

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ABBREVIATIONS

used in this document

| | |
|-------------------|---|
| ACC | Administrative Committee on Co-ordination (United Nations) |
| ACMRR | Advisory Committee on Marine Resources Research |
| ACOMR | Advisory Committee on Oceanic Meteorological Research |
| ALECSO | Arab League Economic, Cultural and Scientific Organization |
| CIAP | Inter American Committee of the Alliance for Progress |
| ECA | Economic Commission for Africa (United Nations) |
| ECAFE | Economic Commission for Asia and the Far East (United Nations) |
| ECE | Economic Commission for Europe (United Nations) |
| ECLA | Economic Commission for Latin America (United Nations) |
| ENEA | European Nuclear Energy Agency |
| ESA | Department of Economic and Social Affairs (United Nations) |
| FAO | Food and Agriculture Organization of the United Nations |
| GARP | Global Atmospheric Research Programme |
| GATT | General Agreement on Tariffs and Trade |
| GESAMP | Joint Group of Experts on the Scientific Aspects of Marine Pollution (IMCO/FAO/UNESCO/WMO/WHO/IAEA/UN) |
| GIPME | Global Investigation of Pollution in the Marine Environment |
| IAEA | International Atomic Energy Agency |
| IAMAP | International Association of Meteorology and Atmospheric Physics |
| IARC | International Agency for Research on Cancer |
| IASH | International Association of Scientific Hydrology |
| IATA | International Air Transport Association |
| IBP | International Biological Programme |
| IBRD | International Bank for Reconstruction and Development |
| ICAO | International Civil Aviation Organization |
| ICC | International Computing Centre (United Nations) |
| ICE | International Centre for the Environment |

| | |
|--------|---|
| ICES | International Council for the Exploration of the Sea |
| ICRP | International Commission on Radiological Protection |
| ICSPRO | Inter-Secretariat Committee on Scientific Problems Relating to Oceanography |
| ICSU | International Council of Scientific Unions |
| IGOSS | Integrated Global Ocean Station System |
| IGU | International Geographical Union |
| IHD | International Hydrological Decade |
| ILO | International Labour Office |
| IMCO | Intergovernmental Maritime Consultative Organization |
| IOC | Intergovernmental Oceanographic Commission |
| ISSS | International Society of Soil Science |
| ITU | International Telecommunication Union |
| IUCN | International Union for Conservation of Nature and Natural Resources |
| IUFRO | International Union of Forestry Research Organizations |
| IVIC | Institute of Scientific Research, Caracas |
| IWP | Indicative World Plan |
| LEPOR | Long-term and Expanded Programme of Oceanic Exploration and Research |
| MAB | Man and the Biosphere Programme (UNESCO) |
| OECD | Organization for Economic Co-operation and Development |
| SCOPE | Scientific Committee on Problems of the Environment of ICSU (g.v.) |
| SCOR | Scientific Committee on Ocean Research |
| UNCTAD | United Nations Conference on Trade and Development |
| UNDP | United Nations Development Programme |
| UNESCO | United Nations Educational, Scientific and Cultural Organization |
| UNESOB | United Nations Economic and Social Office in Beirut |
| UNFPA | United Nations Fund for Population Activities |
| UNICEF | United Nations Children's Fund |
| UNIDO | United Nations Industrial Development Organization |

UNISIST World Science Information System
UNITAR United Nations Institute for Training and Research
UNRWA United Nations Relief and Works Agency for Palestine Refugees
UNSCEAR United Nations Scientific Committee on the Effects of Atomic Radiation
WEI World Environment Institute
WFP World Food Programme
WHO World Health Organization
WMO World Meteorological Organization
WWW World Weather Watch

Chapter I

INTRODUCTION

1. At its first session, the Governing Council adopted decision 1 (I)^{1/} "Action Plan for the Human Environment: programme development and priorities", which spelt out general policy objectives, particular policy objectives and programme priorities for action by UNEP. The decision was endorsed by the General Assembly in its resolution 3131 (XXVIII) of 13 December 1973.
2. In addition to specifying the objectives and the specific tasks of the programme, the Council's decision noted that "the quality of human life must constitute the central concern of this Programme and that therefore the enhancement of the total human habitat and the study of environmental problems having an immediate impact on man should be given the highest priority in the over-all programme"^{2/}. The Council arranged the subject areas of the programme in the order in which it found that "they relate directly to the immediate physical condition of the human being and to problems of the environment"^{3/} but noted that the lists of tasks within each subject area "are neither exhaustive nor in strict priority order and that action in one subject area does not preclude the initiation of action in the subject areas below it or the development of programmes adjusted to the needs of particular regions"^{4/}.
3. The purpose of the present document is to submit to the Governing Council information and proposals in response to its decisions concerning the objectives, priorities and tasks of the programme and its future development.
4. The arrangement of this document follows broadly the order of the priority subject areas of the programme established by the Council^{5/} and that of the functional tasks set out in the Governing Council's decision^{6/}. In keeping with the request^{7/} addressed to the Executive Director to integrate the area of "Education, training, assistance and information" with other subject areas of the programme, and in order to avoid unnecessary duplication, the order established by the Council has been modified in certain respects, as is explained below.

^{1/} See the Council's report on its first session, Official Records of the General Assembly, Twenty-eighth session, Supplement No. 25 (A/9025), annex I.

^{2/} Decision 1(I), para 3.

^{3/} Ibid, para 7.

^{4/} Ibid, para 8.

^{5/} Ibid, paras 7 and 12.

^{6/} Ibid, para 4.

^{7/} Ibid, para 11.

5. The following priority subject areas identified by the Council are treated as such in chapter II below:

HUMAN SETTLEMENTS, HUMAN HEALTH, HABITAT AND WELL-BEING
LAND, WATER AND DESERTIFICATION
TRADE, ECONOMICS, TECHNOLOGY AND TRANSFER OF TECHNOLOGY
OCEANS
CONSERVATION OF NATURE, WILDLIFE AND GENETIC RESOURCES
ENERGY

6. Chapter III deals with the functional tasks with the addition of sections relating to "Information and education, training and technical assistance". These are arranged according to the functions mentioned in the Council's decision^{1/}.

ENVIRONMENTAL ASSESSMENT - "EARTHWATCH"
ENVIRONMENTAL MANAGEMENT
SUPPORTING MEASURES: INFORMATION, EDUCATION AND TRAINING, AND
TECHNICAL ASSISTANCE

Chapter IV deals with future programme areas^{2/}.

7. Under the main headings set forth above, more detailed sub-headings have been inserted to reflect the tasks and objectives specified by the Council viz

CHAPTER II - PRIORITY SUBJECT AREAS OF THE PROGRAMME
HUMAN SETTLEMENTS, HUMAN HEALTH, HABITAT AND WELL-BEING

Human settlements and habitat
Human health and well-being

LAND, WATER AND DESERTIFICATION

Ecosystems
Soils
Water

TRADE, ECONOMICS, TECHNOLOGY AND TRANSFER OF TECHNOLOGY

Trade and economics
Technology and its international transfer

OCEANS

Marine pollution
Conservation and protection of living aquatic resources

^{1/} See decision 1(I), para 4.

^{2/} Ibid, para 15.

CONSERVATION OF NATURE, WILDLIFE AND GENETIC RESOURCES

Plants, animals and endangered species
Ecosystem sites and samples (parks and resources)
Genetic resources.

ENERGY

Energy studies

CHAPTER III - FUNCTIONAL TASKS

ENVIRONMENTAL ASSESSMENT - "EARTHWATCH"

Monitoring
International Referral System (IRS)

ENVIRONMENTAL MANAGEMENT

Integrated planning and management methods

SUPPORTING MEASURES: INFORMATION, EDUCATION AND TRAINING, AND
TECHNICAL ASSISTANCE

Information
Education and training
Technical assistance

8. These sub-headings were included in order to indicate the close relationship between the objectives of the programme and the tasks selected by the Council. In preparing this material, the Executive Director has been mindful of the specific guidance given by the Council in its decisions regarding:

- (a) the general and particular policy objectives^{1/};
- (b) the major functional tasks^{2/};
- (c) the administrative criteria which should govern the choice of priority areas for action^{3/}.

9. Each section dealing with a priority subject area contains a statement of the objectives relevant to the area, a description of the context for action within the area and an overall estimate of the support from the Fund of the United Nations Environment Programme (the "Fund")^{4/}. For each priority subject area one or more sub-areas are identified along with relevant tasks laid down by the Council (primarily in paragraph 12 of its decision). In every section relating to a sub-area, a further

^{1/} Decision 1(I), paras 1 and 2

^{2/} Ibid, para 4

^{3/} Ibid, para 5

^{4/} The Fund was established under General Assembly resolution 2997 (XXVII) of 15 December 1972. The "general procedures" governing its operations were adopted by the Governing Council in its decision 2(I).

estimate of the support from the Fund is presented. The sections concerning sub-areas are followed by sections describing programme activities which contain more specific information about initiated actions and planned actions.

10. Some relevant background information is presented in the sections relating to subject areas. However, as noted in the Introductory Report of the Executive Director^{1/}, given the range of activities relevant to each area, and the limited time and staff available for assembling and analysing pertinent information, no claim can be made for completeness of the material presented. Rather, it is intended to indicate the great variety of work under way or planned both inside and outside the United Nations system. This subject, the presentation of relevant information, is discussed in a separate document entitled "Review of the environmental situation and of activities relating to the Environment Programme" (hereinafter referred to as "the Review")^{2/}.

11. In due course, the Executive Director will make suggestions concerning the decisions which the Governing Council might consider taking in respect of the Environment Programme.

^{1/} UNEP/GC/14

^{2/} UNEP/GC/14/Add.1

Chapter II

PRIORITY SUBJECT AREAS

OF THE PROGRAMME

1. Human settlements, human health, habitat and well-being

The Governing Council noted that "the quality of human life must constitute the central concern of the [United Nations Environment] Programme and that therefore, the enhancement of the total human habitat and the study of environmental problems with an immediate impact on man should be given the highest priority in the overall programme"^{1/}. Accordingly, the Governing Council decided to accord top priority to problems of human settlements, human health, habitat and well-being in the activities which it requested the Executive Director to undertake.

As guidelines for UNEP, the Governing Council noted five objectives which are specially relevant to this priority subject area:

- "to anticipate and prevent threats to human health and well-being posed by contamination of food, air and water;
- "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 help governments in improving the quality of life in rural and urban settlements;
- "to assist governments in anticipating and preventing adverse effects of man-induced modifications of climate and weather;
- "to help governments take into account in development planning, the relationship between population growth, density and distribution and available resources and environmental effects"^{2/}.

There is a clear inter-relationship between the tasks in this priority area, and action taken in this area will therefore need to be integrated with other actions. However, for the sake of facilitating the consideration by the Governing Council of the framework of action and initiated and planned activities in this area, it will be covered under two sub-headings:

- 1.1 Human settlements and habitat
- 1.2 Human health and well-being

Estimated support from the Fund: The estimated support from the Fund for planned activities within this priority area is set out below:

| 1974 | 1975 | 1976 |
|------|-----------------------------|------|
| | (in millions of US dollars) | |
| 3.8 | 4.5 | 4.7 |

^{1/} Decision 1(I), para 3.

^{2/} Ibid, para 2 (a, c, d, h, m).

1.1 Human settlements and habitat

1. To achieve the above objectives, the Governing Council requested the Executive Director: 1/

"To prepare by the second session of the Governing Council the report on the establishment of an international fund or financial institution for human settlements which is required by General Assembly resolution 2999 (XXVII) of 15 December 1972;

"To take note of General Assembly resolution 2998 (XXVII) of 15 December 1972 and to express interest in the findings arising therefrom and to report to the Governing Council accordingly;

"To promote, encourage and support the development of new low-cost technologies with potential for widespread application in waste disposal and water treatment, particularly in tropical areas;

"To assist developing countries, in co-operation with appropriate agencies, in developing and applying low-cost methods for meeting the environmental aspects of their housing needs. Emphasis should be laid on labour-intensive measures and methods utilizing local materials;

"To promote studies related to the special problems of transitional settlements, including the socio-economic factors of rural-urban migration;

"To help in providing adequate potable water supply in urban and rural settlements;

"To ensure that due attention is given to the environmental aspects of population densities."

Context for action

2. In order to meet the requirements of the Governing Council's decisions, an integrated programme covering research, training, pilot and demonstration projects, and dissemination of information should be elaborated.

3. In formulating such a programme, the following points should be taken into consideration:

- The need for international co-ordination of research and the development of effective methods of exchange of information and experience;
- The unprecedented scale and seriousness of urban problems. These are further aggravated by a lack of scientific forecasting and of adequate methods for dealing with the social, economic and environmental problems brought about by urbanization.

1/ Decision 1(I), para. 12(a).

4. The programme relating to human settlements will attempt to:

- (a) provide policy guidelines for the development of human settlements with particular attention to the distribution, composition and densities of the population and thereby assist governments in the formulation and implementation of standards for habitats and their densities;
- (b) supply information and support demonstration projects, training and research intended to assist governments in improving the environmental quality of transitional settlements;
- (c) develop means to assist governments in improving infrastructure facilities and in enlisting the active participation of the inhabitants in the planning and management of settlements of higher quality;
- (d) provide information concerning locally available building materials and technologies and support efforts to employ lower-cost, labour-intensive technologies where these will contribute to intensified building activity;
- (e) develop and operate a systematic service to provide comprehensive information, specifically responsive to the needs of developing countries, about the results of research, technical knowledge and experience.

5. While preparing such an integrated human settlements and habitat programme, the Executive Director proposes, at this stage, to concentrate on those tasks which the Governing Council has identified.

6. The reports on:

- (a) arrangements made for holding the Conference-Exposition on Human Settlements,
- (b) the international fund or financial institution for human settlements; and
- (c) the action taken in pursuance of General Assembly resolution 2998 (XXVII),

are submitted to the Governing Council in separate documents. 1/

7. The other tasks mentioned by the Governing Council will be dealt with under the following headings:

- 1.11 Development of human settlements
- 1.12 Environmental aspects of population densities
- 1.13 Transitional settlements
- 1.14 Human settlements technology

1/ UNEP/GC/18, 19 and 20.

- Building technology;
- Water supply and treatment systems;
- Waste disposal technology;
- Energy requirements.

8. It should be noted that initiated action under these headings would form a contribution to the Conference-Exposition scheduled for 1976.

Estimated support from the Fund: The estimated support from the Fund for planned activities in this sub-area is set out below:

| 1974 | 1975 | 1976 |
|------|-----------------------------|------|
| | (in millions of US dollars) | |
| 2 | 2.5 | 2.5 |

Some relevant background information

9. The exchange of information and experience concerning human settlements has been accorded high priority by the United Nations ever since 1946, when the General Assembly in resolution 53 (1) dealt with the subject of the organization and unification of the international exchange of information.

10. Currently, considerable information exchange is taking place in this field, in the United Nations, for example through the human settlements programmes of the Department of Economic and Social Affairs (ESA) of the United Nations, and the regional economic commissions, particularly the Economic Commission for Africa and the Economic Commission for Asia and the Far East. The two regional housing centres of the Asia and Far East region, in Bandung and in New Delhi, carry out other activities involving the exchange of information and experience, as does the Inter-American Information Service for Urban Development (SINDU) of the Organization of American States (OAS) at Bogotá, Colombia. The Centre for Housing, Building and Planning of ESA issues a quarterly publication on human settlements, and has recently completed the first draft of a world housing survey, with extensive information about and analysis of the world urbanization situation and problems. A Yearbook of housing statistics is shortly to be issued by the ESA Statistical Office. An impressive number of publications has been issued by the United Nations based on specialized studies, expert group meetings, and regional and inter-regional seminars. These deal with many areas of human settlements programming, such as the improvement of slums and uncontrolled settlements, rural housing and community facilities, the impact of urbanization on man's environment, urban land policy in the different regions; new towns and metropolitan development, social aspects, social programming and social indicators of housing and urban development; financing of housing and urban development; administrative aspects of community development; popular participation; climate and house design; building technology; co-operative and non-profit housing; local government; etc.

11. Similarly, a substantial storehouse of information is available, awaiting further analysis and evaluation, through the demonstration projects and projects of technical co-operation carried out under the auspices of the United Nations, the United Nations Development Programme (UNDP) and various of the specialized agencies.

12. Nevertheless, much remains to be done to systematize and to make more readily available the existing information and experience, so that it can be applied, particularly in the developing regions. Recently, however, in at least two of the regions, considerable progress has been made with respect to the development of documentation and information programmes in this field. As noted above, in Latin America, under the auspices of the Organization of American States and in co-operation with the Government of Colombia, there has recently been established the Inter-American Information Service on Urban Development (SINDU) which is undertaking a systematic programme to provide documentation and information, and advice on suitable classification and referral systems, in the broad area of human settlements. The ECE has also undertaken a systematic review or appraisal of exchange mechanisms, but this has been limited to industrialized countries.

13. WHO has recognized the importance of the relationship between health and sanitation, on the one hand, and human habitat, settlements and regional planning on the other. In 1974 it plans to establish a WHO International Reference Centre for the environmental health aspects of urban planning and housing. WHO is also giving attention to subsidiary aspects of environmental health problems, such as over-crowding and its effects on malnutrition, poor hygiene and mental health. The organization is aware that disease is an extremely complex phenomenon, particularly influenced by environmental conditions.

14. Assistance is being provided by WHO to governments in planning, implementing and evaluating programmes for community water supplies and waste disposal facilities. Two International Reference Centres to deal with these matters have been set up by WHO.

15. In general, insufficient attention has been given to defining and implementing methods for disseminating information about the social, economic and physical conditions existing in e.g. squatter settlements and slums. Fellowships are being granted and training programmes and direct assistance are provided for government agencies and individuals.

16. Under the auspices of ECE and with the support of the United Nations Department of Economic and Social Affairs (ESA), the ILO, the Commission of the European Communities, and the International Confederation of Free Trade Unions, studies are being conducted in France, the Federal Republic of Germany, Sweden and Switzerland on transitional housing for migrant labour, including analysis of the socio-demographic characteristics and employment conditions of such labour.

17. The extraction and processing of building materials have a profound impact on the environment. In the field of housing technology, interest lies in finding architectural conceptions, building materials and construction techniques that will utilize local materials and, perhaps, waste materials in harmony with local environmental and social conditions.

18. Under General Assembly resolution 2816 (XXVI) of 14 December 1971, the Office of the Disaster Relief Co-ordinator is called upon to "promote the study, prevention, control and prediction of natural disasters, including the collection and dissemination of information concerning technological developments" and to "assist in providing advice to governments on pre-disaster planning."
19. UNESCO through its Man and the Biosphere (MAB) programme and its Department of Social Science, is engaged in the pre-programming stage of a long-term study on the interactions between rural and urban ecosystems.
20. WMO is studying various aspects of building climatology and co-operates with the International Council for Building Research, Studies and Documentation and the Centre for Housing, Building and Planning of ESA on the application of meteorological information to building design and construction.
21. In 1971 the UNICEF Executive Board adopted an explicit policy of assisting in the creation of services for the improvement of the conditions of children and mothers in urban slums and shanty towns. The Centre for Housing, Building and Planning of ESA is supporting UNICEF in this endeavour. Pilot projects have been initiated in several countries and more are planned. UNICEF aid takes the form of support for project development and, in the implementation phase, for training, the provision of equipment, supplies and transport.
22. The World Food Programme provides food for workers engaged in improving slums. In cases of a sudden influx of migrants (e.g., refugees from rural areas in Africa) into an area, WFP assists the host community in helping the newcomers to become self-supporting and integrated into other farming communities.
23. The UNIDO Construction and Building Materials Programme supports projects to stimulate production of local building materials and low-cost housing.
24. The ECE Committee on Housing, Building and Planning covers a wide range of similar programme activities. The ECE Working Party on the Building Industry has undertaken a series of specialized studies and seminars on subjects such as: building costs, industrialized construction, prefabrication and mechanization, maintenance and modernization of buildings, standardization, harmonization of building regulations and construction in disaster areas. Studies on the development of building materials and construction industries have been jointly carried out with UNIDO. A seminar to attempt to reconcile environmental factors with the application of building technology is in preparation.
25. The ECE Committee's Working Party on Urban Renewal and Planning has considered certain aspects of the quality of life in human settlements and is continuing studies on the environmental aspects of the planning and development of human settlements. In 1974/75, a comprehensive study is to be undertaken on "Urban and regional research policy, research results and institutional organization of research". In 1973/77, national digests and lists of research projects with an environmental focus are to be prepared for the Group of Experts on Urban and Rural Research. A seminar on the role of transportation in urban planning, development and environment was held in Munich in May 1973; another is scheduled to take place in about two years' time. A seminar

on the planning and development of rural areas, taking environmental factors fully into account, is to be held in Plovdiv, Bulgaria, in 1974. A seminar on National and Regional Planning Frameworks for Local Planning is to take place in Helsinki in 1975. A standing group of experts has made studies on methods of estimating housing requirements, the programming of housing activities, the development of a dynamic model for a region, methods for analysing regional housing needs and methods of evaluating improvements and replacement needs. A seminar on the financing of housing took place in August 1973.

26. The ECE is planning to organize a seminar in Yugoslavia in 1975 on the planning and development of the tourist industry with special reference to the environmental aspects.

27. ECLA, in conjunction with the Centro Brasileiro de Analise e Planejamento, Sao Paulo, Brazil, is planning a number of studies on the natural and the man-made environment which are expected to be of much more than regional interest.

28. The Economic and Social Development Division of ECLA has carried out studies on metropolization, marginalism, urban and regional development which have treated problems of the human settlements in the region.

29. ECAFE has two Regional Housing Centres, in Bandung and New Delhi, and one United Nations Centre on Regional Development in Nagoya, Japan.

30. The Inter-agency Committee on Housing and Urban Development for Latin America, in co-operation with six governments, has launched a multinational demonstration project for the improvement of squatter settlements, whose results, expected by October 1975, will provide useful information for the Conference-Exposition on Human Settlements. The Inter-agency Committee had previously organized demonstration housing projects in the five countries of Central America, and a rural community multinational demonstration project in South America.

31. In the region of Asia and the Far East, with the support of a research foundation, a special survey and evaluation project of housing and environmental policies in six countries of South-East Asia is currently under way and should provide a considerable body of new information and projected areas requiring support and future programming. Similarly, in the Latin American region, a project is under way covering the developments, in nine countries. In Africa, a number of demonstration projects have been initiated in the field of human settlements, including housing and building research, building materials production, and establishment of pilot and demonstration projects in several countries. A Building Construction Centre has been established in Togo, which now carries on multi-national programmes.

32. The United Nations Economic and Social Office in Beirut (UNESOB) has an extensive programme relating to human settlements. A series of studies has been carried out on the ecological, social and physical problems of urban settlements in the countries with which it is concerned. The programme of policy-oriented studies, advisory services to governments and seminars will be intensified in the next few years with a view to protecting and improving the urban environment.

33. Studies conducted by UNESOB have dealt with a number of topics: population distribution and urban growth; settlement patterns and policies; the building materials industry; social aspects of industrial development; regional planning experiences and prospects; social surveys of urban areas; progress and trends in building, housing and planning; urban land policies and problems; slums and uncontrolled settlements; guidelines for housing policy formulation; trends in building costs; the development and growth of urban nuclei; environmental implications of urban settlements and issues of urban ecology in the region; the application of science and technology to housing, building and planning; the current state and problems of the housing construction industry; case studies of uncontrolled urban settlements; integrated community services for low-income families in uncontrolled settlements; the review and appraisal of progress in housing, building and planning in the Second United Nations Development Decade; problem and policy implications of urbanization; and the problem of providing housing through co-operatives.

34. UNESOB has been assisting the Arab Organization for Cities in conducting a conference on environmental health in urban settlements.

35. In view of the importance of finding and using cheap locally-produced building materials to provide low-cost housing on the scale necessary in urban and rural settlements, UNESOB will convene a meeting to consider the co-ordination of building research.

36. Through governmental assistance, the Arab Organization for Cities will establish a regional research and training centre to deal with problems of urban settlements in Saudi Arabia to which UNESOB will contribute.

37. UNESOB provides substantive support to a number of United Nations experts and projects in the area of human settlements. Among these projects are a Building Research Centre in Iraq, a Housing Corporation in Jordan and a Housing and Construction Centre in Syria.

38. UNESOB gives particular attention to low-cost housing, building research, infrastructural needs for urban settlements, marginal and transitional settlements and to surveys of slums and uncontrolled settlements. UNESOB has carried out studies of the problems of rural settlements and particularly the relationship between rural and urban settlements and the distribution of settlements in relation to the whole economy and society.

39. The Council of Europe is sponsoring six programmes in pursuance of its objective "Development of urban and rural communities and adaptation of regional and local structures in the framework of European co-operation".

40. A number of groups affiliated to the International Council of Scientific Unions (ICSU) are equipped to make contributions in this and related areas.

41. International concern with the problem of human settlements is so great that the relationship between population and settlements was thoroughly considered by the United Nations Symposium held at Stockholm in September 1973 in preparation for the World Population Conference scheduled in 1974. That Conference will deal with this problem under a specific agenda item concerning the relationship between population and the environment.

PROGRAMME ACTIVITIES

1.11 Development of human settlements

A. Initiated actions

(a) Conference-Exposition on Human Settlements

1. Priority for UNEP work in this field has been given to the Conference-Exposition on Human Settlements (HABITAT'76) to be held at Vancouver from 31 May to 11 June 1976. As indicated above, the resources applied by UNEP to this project are directly related to the objectives specified by the Governing Council, as well as to the specific tasks requested of the Executive Director.
2. UNEP has supported, as a project of the Fund, the work of the Preliminary Planning Group, which has prepared the budget and organizational format for the Conference-Exposition in advance of the establishment of the Conference Secretariat and the appointment of the Secretary-General. The work accomplished was designed from the beginning to form part of the programme of action specified by the Governing Council.

(b) Fund or financial institution for human settlements

3. In the report of the Secretary-General pursuant to General Assembly resolution 2999 (XXVII), it is proposed that there be established a trust fund for a new facility to be called "Technical and financial assistance services for human settlements" (TAFS-HS) to be governed by chapter II of resolution 2(I) of the Governing Council concerning "General procedures governing the operation of the Fund of UNEP". The report contemplates that organizing the new facility would be undertaken as part of the international community's efforts in the field of the environment, possibly as a programme activity centre with the UNEP. The report considers that specific and detailed organizational proposals should more appropriately flow from the consideration of this report by the Governing Council at its second session in March 1974 and its recommendations thereon to the 29th session of the General Assembly.

4. It is clear that further preparatory work will have to be undertaken in connexion with General Assembly resolution 2999 (XXVII), as determined by the consideration of the report and action thereon at the second session of the Governing Council. Thus, the Executive Director envisages further follow-up activity prior to the consideration of the matter by the 29th General Assembly. He will also hold himself ready to undertake whatever tasks he would be called upon to assume on this question in the light of decisions to be taken by the General Assembly at its 29th session.

(c) Other initiated actions

5. Assistance is being provided by UNEP to the Office of the Disaster Relief Co-ordinator in the preparation of a comprehensive set of guidelines for town planners, builders and urban managers to be set out in a series of manuals which will describe the best existing methods of minimizing the consequences of natural disasters for human settlements. These manuals will particularly take into account the specific situation and needs of disaster-prone developing countries.

6. ECLA has requested UNEP to support a study of the conurbations of Sao Paulo, Santos and Guanabara, as samples of a major urbanization situation in a developing country illustrating the problems being faced in such situations. The study will, on the basis of available information, examine critical environmental problems in these fast-growing urban areas. The study should eventually lead to the formulation of a framework for the analysis and interpretation of the ecosystems and the quality of life in a large metropolis and its regional surroundings. Methods of applying the conclusions to other similar urban areas will be described in the study.

7. WHO is receiving support from UNEP in preparing background documentation on basic sanitary services in human settlements in developing countries. Subsequently, an assessment will be made of draft minimum requirements for basic sanitary services, and guidelines will be published for the benefit of planners in this field.

B. Planned actions

8. The Executive Director proposes to work out an integrated study, in co-operation with ESA and appropriate United Nations and other institutions, for the purpose of identifying constraints, choices and opportunities involved in the formulation and implementation of human settlements policies, and he will draw up programmes which take into account environmental as well as demographic, economic and housing considerations.

9. The results of this study would form the basis for formulating concrete advice on how human settlements policies and programmes could be designed and implemented, so as to result in an effective improvement of the housing environment and of the environment of human settlements as a whole.

1.12 Environmental aspects of population densities

1. The Governing Council has requested the Executive Director to ensure that due attention is given to the environmental aspects of population densities ^{1/} when formulating proposals for action in the area of human settlements and habitat. As regards the possible actions that could be undertaken in this area it was considered difficult to formulate a well integrated programme activity which would deal with the environmental aspects of population densities without due regard to population growth and distribution. The Governing Council itself recognized the difficulty when spelling out the general and detailed objectives for UNEP's activities.

2. The Executive Director is dealing with this aspect of the problem in an integrated programme being formulated in co-operation with ESA and other interested United Nations and other bodies. The objective should be to provide policy guidelines for the development of human settlements with particular regard for the distribution, composition and densities of the population, and to reconcile such diverse goals as efficiency, growth, amenities and welfare. More specifically, the objectives should be:

- to determine the extent to which growth and social equity interact with the urbanization process, the patterns of population distribution and the spatial organization within a settlement, and how these in turn affect the environment;
- to provide guidelines and technical assistance regarding the statistics required for dealing with questions of the environment of settlements in relation to population distribution and density;
- to identify a set of indicators and performance standards that human settlements must satisfy in order to reconcile environmental requirements, social and economic well-being and functional efficiency;
- to identify improvements that are required in the decision-making and administrative mechanism in order to make policy formulation and administration more comprehensive.

A. Initiated actions

3. To make a beginning in this activity, one aspect amenable to immediate work has been identified and the Executive Director, in collaboration with WHO, will examine the effects of population density through the development of guidelines for the protection of man by means of environmental control against health hazards resulting from overcrowding. The pre-programming steps consist in the collection of existing data from different studies on the negative factors of crowding. This activity will lead to recommendations on epidemiological problems and on basic sanitary requirements which will be published as WHO/UNEP guidelines for settlements management under conditions of overcrowding.

^{1/} Decision 1(i), para 12(a) (ix).

B. Planned actions

4. Since population and environment relationships will be considered as a special item by the forthcoming (1974) World Population Conference to which the Executive Director has contributed a paper dealing with population and the environment, he proposes to delay final formulation of the integrated programme for this area of human settlements until after that Conference. By that time, the Executive Director hopes to be in a position to proceed with the formulation of a programme that would be easily integrated with UNEP's other activities on the one hand, and would conform to the views and ideas expressed by the Conference on the other.

1.13 Transitional settlements

Some relevant background information

1. Slums, squatter settlements and other forms of spontaneous settlements are the most conspicuous symptoms of the social and economic changes taking place in most of the rapidly urbanizing countries in the developing world. It is here that a substantial portion of the urban population lives under the worst environmental conditions. The efforts of the United Nations and other international organizations to render assistance in this area to some African, Asian and Latin American countries have remained inadequate in the face of the problem.
 2. These relatively unsatisfactory results are almost certainly due less to methodological deficiencies than to the inherent weaknesses of the organizations undertaking the structural changes which are dictated by the urgency of the situation.
 3. However, when situations have reached the point where organizational changes can no longer wait for self-generated evolution, means have to be found of by-passing institutional bottlenecks and bringing face-to-face those who formulate strategies with those who are supposed to take advantage of them. The failure to establish such a dialogue is ascribed by various specialists partly to present communication systems which rely on information and research originated "outside" with no participation by the policy makers concerned and with little effect on the people who are the subject of this research. Thus, the policies are filtered through successive and separate channels, allowing for little or no feedback.
 4. The experience of some countries, particularly in Latin America, shows interesting and successful examples of new approaches born of the spontaneous activities of the populations themselves. It is evident that as a result there have been gradual changes in the previous attitudes in these countries.
- A. Initiated actions
5. WHO is receiving support from UNEP in the collection of data concerning basic sanitary measures taken in different transitional settlements, including data concerning the results of the application of such measures. Such data will form the basis of guidelines relating to transitional settlements.
 6. ECE is receiving support for a study on transitional housing for immigrant labour in selected European countries. While related to a somewhat special transitional settlement problem, this study is of interest to both developed and developing countries and can provide useful information of general applicability to the problems of housing affecting migration generally. The conclusions and recommendations are intended for governments. The first phase of this investigation, now initiated, may lead to the extension of the study to all of Europe and possibly also to some of the developing countries which provide the labour pool.

B. Planned actions

7. The Executive Director plans to formulate and implement a programme for this activity, in co-operation with ESA and interested United Nations and other bodies and with the aid of consultants. Such a programme would include the following points:

- (a) The establishment of suitable systems of communication for the dissemination of information about experiences in the improvement of slum and squatter settlements;
- (b) Assistance and demonstration projects in developing countries;
- (c) Assistance to developing countries for the training of personnel;
- (d) Studies on the problems of settlements for immigrant foreign labour in Western Europe. Although these problems arise in Europe, they cannot be considered as confined to that continent, for much of the immigrant labour comes from other continents.

8. It is proposed to participate in the work of the Inter-Agency Committee for Housing and Urban Development in Latin America concerning the development and execution of a multinational demonstration project for the improvement of squatter settlements which involves six governments and nine different projects. The projects would provide useful inputs for the Vancouver Conference-Exposition on Human Settlements (HABITAT'76).

9. It is planned to consider the establishment of a building materials and tool pool. Such a pool could provide a most effective form of international action to improve squatter settlements, enabling interested countries to contribute in services and kind to specific demonstration projects. It would draw upon the experience of the World Food Programme, the Sahelian Operation and the Office of the Disaster Relief Co-ordinator, as well as of non-governmental organizations such as CARE and OXFAM. It is considered that a building materials and tool pool could be most effective in stimulating pilot and demonstration projects in developing countries, especially those which could be carried forward for presentation to the Vancouver Conference-Exposition on Human Settlements.

1.14 Human settlements technology

1. In line with the introductory statement concerning the context for action in the area of human settlements and habitat, the Executive Director proposes to establish institutional machinery to accomplish tasks relating to the following programme activities:

- (a) Building technology (including environmentally appropriate design techniques);
- (b) Water supply and treatment systems;
- (c) Waste disposal technology;
- (d) Energy requirements (The emphasis here would be on small, local energy systems for human settlements away from primary energy grids, and possibly special technology applicable to small local energy grids).

2. The emphasis throughout should be on low-cost labour-intensive techniques, using local materials and, if possible, techniques for simple construction and maintenance systems. In each case, it will be important to consider the cultural compatibility of the system chosen. While simplicity of construction and maintenance is the ultimate objective, the best way to achieve this is sometimes to use principles which derive from sophisticated scientific and engineering concepts that may, in the course of adaptation, prove simple to put into practice.

3. In order to achieve these objectives, the Executive Director plans:

- (a) To collect and disseminate information about various technologies applicable to situations in developing countries;
- (b) To foster or sponsor the research and development of technology which is found to be lacking. Special emphasis would be placed on the conduct of this work in developing countries;
- (c) To arrange for the transfer of technology, the adaptation of technology to local conditions, and the use of technology and technological principles in developing new means for solving local problems using, where possible, local materials and techniques in cases where more than adaptation will be involved;
- (d) To provide services for the planning of systems, the adaptation of technology and the design of systems that fit with local cultural practices in so far as possible, or, where necessary, to give assistance in educating local people in new practices required by new technology, i.e. assistance in bridging cultural differences (provision for this capability will require both the development of planning methodology and strong social science capabilities);
- (e) To arrange demonstration projects and assistance for local self-help projects in adapting technology and constructing systems;
- (f) To provide for the necessary professional education and training to diffuse knowledge of the new approaches and technologies as widely as possible;

- (g) To provide "on-the-job" technical training in demonstration projects and system construction, thus creating local expertise;
- (h) To provide extension services to spread the capability more broadly in a given country or region (imported talent may be used to begin with, but if the training and education programmes are properly operated such services should eventually be provided by local effort);
- (i) To provide for re-visit services to assess the results of the programme and to provide for necessary re-training and assistance services to keep maintenance and skills at the necessary level until the activity is entirely self-sustaining.

A. Initiated actions

(1) Building

4. Support is being given to ECE in its work of preparing guidelines and policy advice with respect to the choice of appropriate building materials and methods for the construction of low-cost housing and related infrastructure facilities in developing countries. ECE was considered appropriate for this task because of the large amount of work that has been done in the European region on building and infrastructure technology. The object of the work is to select technology appropriate for transfer and use in developing countries. A later stage of the work will have to involve close discussions with appropriate developing countries to arrange for the transfer and use of selected technologies. The initial phase will build a base of information for this contact.

5. A survey of environmentally sound architecture for arid and semi-arid regions is being carried out in co-operation with the Arab League Educational, Cultural and Scientific Organization. The object is to produce a reference publication applicable to all arid and semi-arid regions, containing a survey of examples of environmentally sound older architecture, alternative plans for urban and rural settlements, a survey of locally available building materials, environmental considerations affecting the design of buildings in arid climates, and particulars of technologies for sewage and garbage disposal.

(2) Water supply and treatment systems

6. UNEP is working with WHO in preparing recommendations for the control of endemic disease caused by a deficient environment, particularly lack of water of adequate quality and lack of waste disposal facilities. A programme for transfer of knowledge and methods is being carried out with the assistance of WHO's international network of reference centres and collaborating institutions concerned with community water and waste disposal.

7. UNEP's assistance to WHO should make it possible to accelerate the current programme of preparing guidelines, codes of practice, training manuals, and organizing training courses dealing with various aspects of community water supply and water quality and waste disposal, including the training and exchange of research workers. It will also help WHO conduct a developmental investigation in simplified technology for community water supply and waste disposal systems with particular attention to resources existing in developing countries.

(3) Waste disposal technology

8. No action has yet been initiated.

(4) Energy requirements

9. The Advisory Committee on the Application of Science and Technology to Development (ACAST) is being supported in the preparation of a survey reviewing "the state of the art" and existing research into non-conventional sources of energy (solar, biological, wind, geothermal), to assess if they are technologically exploitable, their economic competitiveness with conventional sources, the environmental impact of their use and the consumption of natural resources through the use of non-conventional sources. In each case, the study would estimate when these technologies would become operational and the order of magnitude of the development investments and further research required for this purpose. The object of the study is to give information to decision-makers in developing countries about alternative sources of energy which could be practical for human settlements in remote areas, isolated farms and small communities.

B. Planned actions

10. The formidable list of tasks mentioned can probably be carried out by a suitably organized network based upon existing institutions with new arrangements for co-operation and co-ordination, although it is possible that some new organizations might have to be created. There are already institutions, both within the United Nations system and in the scientific, engineering, university and business communities, working on various aspects of appropriate technology that might be applied. In addition, the field capabilities of the United Nations agencies, of regional and national institutions and the organizational and administrative capabilities of these various institutions can presumably be used in a co-operative manner.

11. The intention is to provide for a small central staff with the responsibility for tying the programme together globally and ensuring that technology, information and techniques developed in one part of the world may be available for use elsewhere. This staff would also be responsible for co-operation with the central headquarters of major agencies, donors, etc. Responding to this central staff, a network would have to be established to link those regional organizations which have roughly the same responsibilities on a more detailed regional, rather than global, basis. It is proposed that initially UNEP might use existing capabilities for this type of work in the regional economic commissions, though at a later stage it might be necessary to decentralize the effort.

12. Finally, there will be an associated network of local institutions, principally existing institutions (some equipped with new capabilities), to carry out the actual work in particular cases. It should be noted, however, that some institutions which are local (particularly institutions that might be regarded as making a major technological contribution) might be directly associated with the central staff, rather than with the regional body, if this appeared particularly appropriate.

13. Several projects already initiated with ESA, WHO, ECE, ALECSO and the Office of the Disaster Relief Co-ordinator (as detailed above) can be considered as partial contributions to the realization of this part of the programme.

1.2. Human health and well-being

1. Man's health is being impaired by activities which contaminate the air, water, food, soil and biota. These activities include harmful discharges resulting from uncontrolled industrial development, the indiscriminate use of pesticides and fertilisers and the poor or non-existent planning of water supply and waste disposal in human settlements, resulting in certain endemic diseases.

2. The Governing Council has asked the Executive Director to undertake the following tasks which relate to this sub-area:

"To encourage and support programmes aiming at raising the level of health and eliminating endemic diseases which are due to environmental conditions, especially those relating to under-development;

"To anticipate and prevent threats to human health and well-being posed by contamination of food, air and water and to co-operate with the organizations concerned in establishing criteria for the relevant pollutants;1/

"To support and encourage national and international efforts for assessing environmental effects of agricultural chemicals on man and ecological systems and for avoiding their undesirable effects."2/

Context for action

3. In pursuance of these directives, the Executive Director intends to initiate action in co-operation with organizations, both within and outside the United Nations system, to achieve the following objectives:

- (a) To develop a programme aimed at eliminating endemic diseases attributable to environmental conditions; this programme, which will be closely tied to work in the settlements area, will emphasize the ecological and habitat control of such diseases;
- (b) To develop a system for monitoring and assessing the significance of levels of identified pollutants which are of international significance to all media; and for this purpose

- to establish a registry of data concerning potentially toxic chemicals which should include statistical data, data of tests of toxicity, production rates, etc. The registry will be an integral part of the assessment programme for pollutants and will include data concerning all important characteristics of substances that are likely to be toxic;

- to support studies of the fate and the pathways of pollutants from their sources until the point where they harm human health or well-being;

1/ decision 1(I), para 12(a)(iii) and (iv)
2/ Ibid, para 12(b)(viii)

- to develop environmental health criteria and international guidelines which would serve as a basis for establishing standards and control measures at the national level;
- to stimulate the development of programmes which will lead to an integrated system of pest control and the use of fertilizers;
- to support programmes for the protection of human health against radioactive material, including studies of the feasibility of establishing a register of significant radioactive materials released into the biosphere, the management of radioactive wastes and the development of radiological safety standards.

4. In this connexion, the Executive Director plans to make adequate use of the arrangements being devised for the establishment of close consultations and co-operation with industries to consider the development of appropriate environmental principles and guidelines for individual industries.^{1/}

Estimated support from the Fund: The estimated support from the Fund for planned activities in this sub-area is set out below:

| 1974 | 1975 | 1976 |
|------|-----------------------------|------|
| | (in millions of US dollars) | |
| 1.8 | 2 | 2.2 |

This sub-area comprises the following programme activities:

- 1.21 Endemic diseases
- 1.22 Environmental health criteria standards and control
- 1.23 Monitoring of pollutants and study of their effects in the air, water, food, soil and biota
- 1.24 Registry of potentially toxic chemicals
- 1.25 Environmental effects of agricultural chemicals
- 1.26 Radiological protection
- 1.27 Environmental statistics

^{1/} See chapter IV below

PROGRAMME ACTIVITIES

1.21 Endemic diseases

1. The endemic diseases to be studied in this context are those which are largely accounted for by the quality of the environment and its man-made components. Outstanding examples of such diseases are schistosomiasis, onchocerciasis and malaria.
2. Infant gastrointestinal diseases, which are among the most serious endemic diseases in the world, are mainly caused by deficient water supply and waste treatment and will therefore be dealt with through programmes discussed above under "Human settlements technology".
3. While some action has been taken to deal with the first group of diseases (schistosomiasis, etc.) on the basis of the ecological peculiarities of the disease cycle, it is believed that a great deal more could be done to make provision in national plans and in schemes of environmental management for a combined attack using medical, habitat and antivector measures. African trypanosomiasis is closely related to malnutrition. Whenever it occurs, cattle can be severely affected, and in some areas of East Africa where the tse-tse fly occurs, cattle farming cannot even be carried on. Other examples could also be cited which indicate that in each case the measures taken have generally emphasized one particular aspect of the disease cycle at a given time, but few attempts have been made to take co-ordinated action for dealing with the disease in the light of all the ecological factors.
4. Discussions have been initiated between experts from both developed and developing countries under the auspices of UNEP in an attempt to consider the "formulation" of a trans-national programme for the ecological and habitat control of schistosomiasis and malaria, taking into account existing activities. The Executive Director proposes to expand such consultations to cover all interested countries. He hopes that Governments and institutions will show interest in dealing with other endemic diseases resulting from environmental conditions, particularly in developing countries.
5. Further studies and consultations need to be initiated by the Executive Director before he will be in a position to submit an integrated programme in this area to the Governing Council.

1.22 Environmental health criteria, standards and control

Some relevant background information

1. The primary agency responsible for defining environmental health criteria is the WHO. Its programme for the establishment of criteria for environmental pollutants in the air, water, food and work places has been accelerated and expanded in collaboration with national institutions. In addition to making provision for the evaluation and assessment of the existing scientific information about the effects of environmental agents (including physical factors, such as noise and radiation) on health, the programme is concerned with the identification of new environmental hazards to public health and with the co-ordination and promotion of national and regional research into these influences.
 2. FAO and WHO work jointly through the "Codex Alimentarius Commission" which has the task of laying down international standards for pollutants in food, through the WHO/FAO Food Standard Programme and through many other joint activities.
 3. Studies under the auspices of the ECE Inland Transport Committee relating to the prevention of pollution of the air by automobiles and of water by boats, as well as those relating to the carriage of dangerous goods and perishable commodities, have led to the elaboration of standards which are now being applied.
 4. The Pan American Health Organization has developed plans to establish a centre for human ecology and health sciences which would support the organization's programmes of assistance to Governments of member States and collaborate closely with its existing network of national centres. The education and research function could be an integral part of the Pan American Health University. The centre would also play a major role in the programme for the development of environmental health criteria.
- A. Initiated actions
5. Action has been initiated, in co-operation with the WHO, to stimulate its programme for the establishment of criteria of environmental health. The data which are being or will be obtained on pollutant levels through monitoring activities will be used in this connexion. The WHO scientific group on environmental health criteria has produced a report on the scientific aspects of these criteria. This will be followed by the preparation of criteria documents and preliminary reviews. This work is expected to take about three years. Current support has, however, been limited to the initial phases of this programme which consist of reviewing and strengthening national data, the preparation of draft documents by consultants and task groups, and their evaluation.
 6. Activities with a view to establishing standards for tolerable levels of pollution in food are closely related with the monitoring of contaminants in food. Activities initiated or planned, in respect of both matters, will be co-ordinated to ensure compatibility and to avoid duplication. Support was extended to the FAO/WHO Codex Alimentarius Commission which prepares international standards for pollutants in food, and to strengthen FAO/WHO capabilities to assist developing countries in applying food control. The support extended was limited to providing consultants to assess the tasks, prepare technical working papers for expert meetings on "Food microbiology" and "Methods of analysis of sampling of contaminants in food" and to prepare a "Manual on organization of food control".

7. Arrangements were made, together with WHO, to organize visits by experts in environmental health to individual countries in Latin America; the experts surveyed environmental pollution problems and available scientific capabilities to monitor each situation. As a result, expert groups will be established to select certain situations for further investigation.

B. Planned actions

8. It is intended to continue, jointly with WHO, the progressive implementation of the environmental health criteria programme so as to cover pollutants which have already been identified as internationally significant and which many governments consider to deserve priority attention.

9. Along the lines mentioned above, an integrated and co-ordinated programme for the establishment of food standards will be developed.

10. Further action designed to deal with environmental health problems will be planned in the light of the results of the initiated activities; it is proposed to deal with these problems on a regional and sub-regional basis, bearing in mind always the global targets of the programme for this area. The Executive Director is considering the start of such regional activities in Latin America.

1.23 Monitoring of pollutants and study of their effects in the air, water, food, soil and biota

1. This subject is dealt with in detail in Chapter III (section relating to Earthwatch/Monitoring).
2. In connexion with this activity, due attention will be given to studying the fate and pathways of pollutants from their sources to the point where they adversely affect human health and well-being. Some relevant background information and information about initiated and planned actions in this area are given below.

Some relevant background information

3. The WMO is dealing with this problem through its Advisory Committee on Oceanic Meteorological Research (ACOMR) which participates together with SCOR and the International Association for Meteorology and Physics of the Air, in a Working Group on Tropospheric Transport of Pollutants. It seems, however, that little has been done in this area.

A. Initiated action

4. Arrangements were made to support a meeting of the aforementioned Working Group to evaluate the problems involved in studying the transport of organic and inorganic particles and gases through the troposphere and their transfer to the oceans, including the development of suitable sampling and analytical methods.

B. Planned actions

5. Further work in this area will be undertaken in the light of the outcome of the initiated action.

1.24 Registry of potentially toxic chemicals

Some relevant background information

1. Data concerning potentially toxic chemicals are at present being assembled only in certain countries and under the auspices of certain intergovernmental organizations, e.g. OECD and EURATOM.

A. Initiated actions

2. Action has been initiated to study the problems and feasibility of the comprehensive collection, assessment, processing and reporting of data on all important forms of potentially toxic substances. The data would cover the production, use, transport pathways, molecular structure, transformation, effects of such substances on man and other components of the biosphere, as well as their accumulation therein. The existence of such a registry is closely linked with pollutant monitoring and environmental criteria and control. It should function as an early warning system, indicating which substances should be monitored and the release of which should perhaps be controlled. It would also prevent duplication of unnecessary effort in testing the toxicity of substances since the transfer of information would enable all parties to be aware of work already done.

3. A beginning has been made with a survey of the activities of existing data centres undertaking such functions in individual countries, and of intergovernmental organizations. The purpose of the survey is to collect information about the activities of the centres, to find out to what extent they are willing to co-operate in the establishment of an international registry and lay a basis on which to discuss modalities of this co-operation.

B. Planned actions

4. Future action for the development of the international registry will depend on the results of the survey and its recommendations. These recommendations will be considered by a group of experts in 1974 who will be requested to put forward long-term plans for the development of the registry. Conceivably, in very general terms subject to the view of the group of experts, the international registry might take the form of a network of national and regional registries conforming to agreed practices and procedures established by international machinery in which national and regional registries as well as other agencies concerned would be represented. The machinery will probably have to be administered by UNEP, under the supervision of a standing group of scientists, chemists, biologists, and systems analysts.

1.25 Environmental effects of agricultural chemicals

Some relevant background information

1. FAO is active in the field of agrochemicals, its activities covering both the efficient use of agrochemicals and pesticides and their long-term effects. There is also a joint FAO/IAEA programme involving co-ordinated studies with the aid of isotope tracers and the collection and dissemination of comparative data regarding the fate and biological significance of foreign chemical and radioactive substances in food and in the agricultural environment.

2. FAO and WHO both have expert committees on pesticides and food additives and have undertaken studies in these areas. A paper on "Identification, effects and control of contamination through man's food chain" was prepared jointly by these two organizations for the Stockholm Conference. FAO, WHO and several other organizations have enlisted the assistance of the Scientific Committee on Problems of the Environment (SCOPE) of the ICSU, for several of their programmes relating to agrochemicals.

A. Initiated actions

3. Action was initiated to develop, jointly with FAO, a global research and training programme regarding integrated pest control, with special emphasis on wiser use of chemicals and on biological control as a means of maintaining agricultural production while preserving the quality of the environment. The initial stages of this programme, which call for the participation of institutions of developing countries, consists of reviewing the progress towards integrated pest control as regards cotton, rice and maize, the identification of the important problems arising in this respect in developing countries and the formulation of co-operative programmes for applied research and training.

4. In the meantime, a trans-national group of experts, both from developed and from developing countries, has begun consultations on methods of co-operation in this field.

5. Steps were taken to prepare, jointly with FAO and WHO, a programme for assisting developing countries in detecting and minimizing or avoiding damage to the environment caused by uses of agricultural pesticides, particularly for detecting and measuring residues of pesticides in the food, soil, water and air, in wild and domestic animals, in high exposure areas. This programme will be co-ordinated with the programme on monitoring of pollutant levels which will be defined by the Intergovernmental Meeting on Monitoring.

6. The Central American Research Institute of Industry is being assisted in a study of a "systems management programme", to reduce the harmful environmental effects of pesticides. The investigation will concentrate on the environmental effects of the use of pesticides in cotton production, including the public health and economic aspects. The results of this study will serve as a contribution to the overall research and training programme in integrated pest control.

B. Planned actions

7. Other research activities, similar to that initiated in Central America, which might be undertaken by groups of countries will be supported. Such research activities would eventually form part of a global programme.

8. It is also intended to formulate and support, in co-operation with FAO, authorities and governments which have the required capability and are willing to do so (e.g. the Federal Republic of Germany), a curriculum of training in integrated pest control. It will be applied on a pilot basis in suitable test areas.

1.26 Radiological protection

Some relevant background information

1. The IAEA has established guidelines and recommended standards of safety for the protection of health, covering every type of activity in which nuclear energy is used for peaceful purposes. They cover, for example, the safe handling of radio-isotopes, the safe transport of radioactive materials, radioactive waste disposal underground and its discharge into freshwater and the sea, the monitoring of marine radioactivity and the safe operation of nuclear plants. The IAEA also promotes and co-ordinates research related to the protection of man and his environment from radiation.
 2. The IAEA, in co-operation with a number of other organizations, in particular WHO, promotes research into the behaviour of radionuclides in the environment.
 3. The United Nations Scientific Committee on the Effects of Atomic Radiation (UNSCEAR) is also reviewing and assessing levels, effects and risks of radiation from all sources.
 4. The International Commission on Radiological Protection (ICRP) is a non-governmental body of scientists whose responsibilities cover a wide range of activities. The most important of its functions is to make recommendations on radiological protection, which it did most recently in 1966, but progress in science and technology makes it necessary to up-date such recommendations.
- A. Initiated actions
5. Action was initiated with IAEA, to organize a seminar on the evaluation of the effect of radiation doses on the population and the application of radiological standards to man and his environment.
 6. It was agreed to initiate, jointly with IAEA, a long-term programme for the management of radioactive waste. It will be limited to the preparation of geological criteria governing the selection of long-term storage sites for radioactive wastes and to a study of the possibility of establishing a register of significant quantities of wastes in storage or disposed of in the territories of member States.
 7. Agreement was reached to initiate, jointly with IAEA, a study on the feasibility of establishing a register or releases of significant quantities of radioactive materials (and gases) into the biosphere.

B. Planned actions

8. A programme is to be developed for evaluating radiation doses to which the population is exposed and applying standards for the tolerable limits of radiation affecting man and his environment. It is intended to co-operate with the IAEA in establishing and carrying out this programme which will be formulated in the course of a joint seminar.

9. So far as the management of radioactive waste is concerned, support will be considered for areas other than those already supported, namely, "transportation of wastes", and "management of high-level alpha-bearing radioactive wastes".

10. Support will be given to the ICRP in bringing its recommendations on radiological protection up to date.

11. If the study on the possibility of establishing a register of releases of significant quantities of radioactive materials (and gases) into the biosphere leads to affirmative results, possible procedures and guidelines will be prepared for submission to, and consideration by, member States and international organizations.

1.27 Environmental statistics

Some relevant background information

1. The Conference of European Statisticians, an ECE body and a subsidiary organ of the United Nations Statistical Commission, has since 1970 been conducting studies and discussions on environmental statistics. A seminar on environmental statistics was held in Warsaw in October 1973, under the joint auspices of the Conference of European Statisticians and of the Senior Advisers to ECE Governments on Environmental Problems. The seminar, which was attended by representatives of both the national statistical offices and departments and ministries responsible for dealing with environmental problems in ECE countries approved a proposed system of environment statistics and statistical requirements for evaluating programmes dealing with problems of air, water and soil pollution. Further meetings and studies are planned to apply and extend this work.

A. Initiated actions

2. A report on the current status and future needs of environmental statistics is being prepared. It will contain proposals for the development of the statistical programme to serve the joint interests of UNEP and the United Nations Statistical Office of ESA, as well as proposals concerning the technical and organizational requirements of the implementation of the programme.

B. Planned actions

3. The Executive Director proposes that a number of tasks should be undertaken in co-operation with the United Nations Statistical Office of ESA and with the ECE, to lay a basis for extending current studies. These tasks would include a review of the existing industrial classification and the development of a "standard" classification of major industrial processes and environmental reservoirs (i.e. sectors) and materials. There would also be an examination of the needs for aggregation or disaggregation of certain activities or services to improve the modelling of environmental situations by means of statistics. Surveys are to be undertaken of likely governmental and non-governmental users of environment statistics, the kinds of analytic models available or under development by governmental statistical offices and internationally available sources of environmental statistics. These surveys would be followed by the identification of statistical gaps, where existing data sources are inadequate and where requirements cannot be filled by a further combining and/or processing of existing data, together with proposals concerning the acquisition of additional data to fill these gaps.

4. These tasks are to be jointly discussed with the Statistical Office and the ECE, with a view to preparing a plan of work which would make use of existing national capabilities.

2. Land, water and desertification

1. The Governing Council while reiterating that, in accordance with General Assembly resolution 2997 (XXVII) and the Action Plan of the United Nations Conference on the Human Environment (the Stockholm Conference), 1/ a general policy objective of the UNEP shall be:

"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, and for safeguarding human well-being as well as ecosystems", 2/

noted the following detailed objectives as guidelines for action which are applicable to this priority area:

"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." 3/

Context for action

2. Considerable work has been undertaken at the national and international levels during the last 25 years and there is a wealth of information, which has, however, fallen short of the needs owing to the sectoral and non-integrated approach followed. In many instances, social, economic and political aspects have not been taken into account.

3. In the area of land, water and desertification, the world faces a host of serious problems, which include the expansion of deserts as dramatically illustrated by the present Sahelian and Sudano-Sahelian drought. The problem is much more deep-rooted than the Sahel example indicates. It is apparent, therefore, that one of the main objectives of UNEP should be to prepare a global and ecologically balanced programme in this priority area which integrates knowledge in the natural, social and economic sciences.

4. While formulating such a global programme, UNEP should:

(i) Establish methodologies for applying integrated knowledge;

(ii) Take full advantage of existing national, regional and international machinery and facilities in carrying out this global programme;

(iii) Ensure that there is a global network of information exchange;

1/ For the report of the Conference, see United Nations publication, Sales No. E.73.II.A.14 (A/CONF.48/14/Rev.1).

2/ Decision 1(I), para. 1(a).

3/ Ibid., para. 2(e) and (f).

- (iv) Ensure that for each specific programme there is sufficient local staff and, to this effect, integrate in each area an education and information content suited to the global objectives of the programme, including population, natural resources, inventories, planning, management, evaluation, etc.

5. In carrying out these activities UNEP should aim at:

- (a) Integrating knowledge and bridging gaps in knowledge in the natural and social sciences;
- (b) Integrating current programmes and projects;
- (c) The experimental application of research;
- (d) The initiation of pilot integrated projects or pilot projects, able to serve a broad area or to be included later in an integrated long-term programme;
- (e) Building up and reinforcing national and regional infrastructures;
- (f) Facilitating interchange of views between the policy-maker, the decision-maker and the scientist.

6. Taking into account the applicable tasks specified by the Council, the Executive Director proposes in the initial phase to concentrate on the following sub-areas:

Ecosystems

- (a) Arid lands, including desertification
- (b) Tropical woodlands and forests

Soils

- (a) Degradation: assessment, salination

7. In the near future, it is planned to extend the programme progressively within each sub-area by order of priority to:

Ecosystems

- (i) savannahs and grasslands
- (ii) temperate forests
- (iii) freshwater, wetlands and coastal areas
- (iv) islands
- (v) polar and sub-polar regions
- (vi) high mountains

Soils

- (i) Degradation: erosion
- (ii) Degradation: pollution
- (iii) Other aspects of soil degradation such as laterization, ~~mining operations~~, etc.

Water

- (i) water resources
- (ii) water quality

8. It should be mentioned in this respect that a number of countries have drawn special attention to the problem of eutrophication. This specific aspect of water quality is dealt with in chapter IV of this document.

9. The following tasks, defined by the Governing Council under the title "Land, water and desertification" are dealt with elsewhere in this document: 1/

"To help countries prevent or remedy the pollution of water and to develop safe methods of waste recycling;

"To support and encourage national and international efforts for assessing environmental effects of agricultural chemicals on man and ecological systems and for avoiding their undesirable effects." 2/

10. As regards this area, the Governing Council requested the Executive Director to undertake a specific task, viz:

"To support, encourage and initiate national and international efforts for efficient drought forecasting and help countries in mitigating the consequences of drought," 3/

The activities initiated or to be undertaken in fulfilment of this task are described under the heading "arid lands" (2.11. below).

11. This priority area is divided into the following sub-areas:

- 2.1 Ecosystems
- 2.2 Soils
- 2.3 Water

Estimated support from the Fund: The estimated support from the Fund for planned activities within this priority area is set out below:

| 1974 | 1975 | 1976 |
|-----------------------------|------|------|
| (in millions of US dollars) | | |
| 3.25 | 4.25 | 4.75 |

1/ In the section "human settlements technology", sub-sections concerning water supply and treatment and waste disposal technology, and in section 1.25 concerning environmental effects of agricultural chemicals, respectively.

2/ Decision 1(I), para. 12(b)(vi) and (viii).

3/ Ibid., para. 12(b)(v).

2.1 Ecosystems

1. The aim of programme activities in this area is to establish guidelines for the integrated management of ecosystems in order to minimize the adverse long-term effects of man's impact and to obtain regular and sustained production within each ecosystem. The Governing Council set a number of tasks that apply to this area:

"To support ecological investigations on ecosystems process in relation to the impact on human activities; 1/

"To support and encourage concerted research programmes to develop, manage and conserve ecological systems, particularly arid lands and tropical forests, special account being taken of support for initiatives by governments in their national and regional programmes; 2/

"To initiate assessment of trends of forestation and deforestation. 3/

Context for action

2. In the past, most projects were either sectoral and not fully integrated, or related only to a small geographical area, or were implemented for too short a time to produce durable results. This is particularly true in the arid zones, yet a vast amount of knowledge has been accumulated, even in many of the developing countries. Unfortunately, the links between scientific information and the rational use of ecosystems resources are insufficient especially in developing countries, and little use has been made by field specialists of this knowledge. Meanwhile, the accumulated knowledge permits action to start immediately. In planning such action, care should be taken to minimize duplication of efforts of various donors of assistance, to reduce the number of projects which may work at cross purposes and to maximize the impact of assistance. Not only should there be a greater concentration of resources, but there should be better integration and co-ordination during the conception, implementation and evaluation phases of programmes and projects.

3. During the preliminary phase of an intended programme on ecosystems, studies should be undertaken to determine the present state of knowledge and to accelerate a comprehensive programme of international research.

4. While a research programme is being established, guidelines will be adopted for immediate action. Whereas it is advisable to base long-term integrated development programmes on sound scientific data which permit an ecologically balanced management of the resources, it is, at the same time, necessary to initiate without delay medium-term actions which can eventually be integrated into long-term programmes.

1/ Decision 1(I), para 12(f)(ii)

2/ Ibid, para 12(b)(iv)

3/ Ibid, para 12(b)(ix)

5. To allow for inherent sub-regional or regional variations and differences in research and training, activities should be encouraged and supported on a sub-regional or regional basis.
6. Although tropical ecosystems represent an area of the world in which international ecological knowledge is deficient, valuable data are held in numerous national institutions, but it is difficult to acquire and interpret the data. The compilation and critical evaluation of existing information is an essential step towards identifying the main gaps in present knowledge and crucial topics for research. All panels of experts, organized in 1972 and 1973 within the framework of the "Man and the Biosphere" (MAB) programme and convened by UNESCO in close co-operation with FAO, WHO and WMO, and non-governmental organizations such as ICSU and the International Union for the Conservation of Nature and Natural Resources (IUCN), recommended that any international research programme should be preceded by a preliminary study phase to determine the extent of available information.
7. Forest ecosystems require particularly careful management. Tropical deforestation due to man and erosion are two major problems in Asian, Far Eastern and Latin American countries. Forests which have a significant productive value are subject to increasing pressure from land and forest use. Shifting cultivation and large-scale felling of forests and sometimes settlement and development are the main destructive forces. Little attention is paid to adverse changes in local climate, to changes in the micro-climate of soils and water cycles, to accelerated soil erosion by wind and run-off and subsequent silting of water bodies, or to the destruction of the natural habitat and wildlife. The quality and the productive capacity of other natural resources are also reduced.
8. Development activities in tropical forest areas have already resulted in major environmental disturbances in all ecosystems, and many projects have been unsuccessful because they did not give sufficient attention to ecological imperatives. If similar situations are to be avoided and the destruction of important resources is to be prevented, it is clear that the formulation of guidelines for development, planning and management is of primary importance, even if it is limited to selected do's and don'ts.
9. The following are but a few examples of the points which require clarification before a long-term development programme for any type of ecosystem can be established. These points illustrate the complexity of the problem and the inter-relationship between the various sectors, and emphasize the need for integrated action:
 - Population: number, composition, dynamics, distribution and occupation;
 - Social groups: their capacity to absorb new techniques and new policies for development;
 - Urbanism: laws to prevent uncontrolled urbanization and to favour middle-sized instead of large centres;

- Natural resources: laws to protect them;
- Soils: sufficient knowledge of their capacity so as to clarify views on their possible utilization;
- Land use: how is the land used ... or over-used? Type of utilization, land ownership and rights;
- Meteorology, climatology, agroclimatology: is there sufficient knowledge about the possible limitations to various crops and types of utilization?
- Water: quantity and quality, both surface and underground;
- Flora and vegetation: what is known about the limits of natural vegetation groups, which are so important for evaluating possibilities of utilization? Are the dynamics of vegetation and the trends of the limits well known?
- Livestock: what are the species, their number and productivity as measured by individual, national and global yields?

10. In this setting, the Executive Director proposes to formulate programmes for dealing with two major programme activities: first, arid lands (including desertification) and secondly, tropical woodlands and forests.

Estimated support from the Fund: The estimated support from the Fund for planned activities within this sub-area is set out below:

| 1974 | 1975 | 1976 |
|-----------------------------|------|------|
| (in millions of US dollars) | | |
| 2 | 2 | 2 |

PROGRAMME ACTIVITIES

2.11 Arid lands

1. In this document the expression "arid lands" is used to cover deserts, arid lands and semi-arid lands, in the sense given to them by ecologists. The area includes deserts (rainless deserts, arid deserts, man-made deserts, etc.), arid and semi-arid areas stricken by desertification (steppes, pseudo-steppes, low and tall savannah and adjacent marginal lands where they are menaced by desertification).
2. The term "desertification" is used in a broad sense to describe the process by which productive land is laid waste through expanding aridity. Aridity is characterized by a deficient balance between the availability of water and the water required for plant growth. The expansion of aridity can be induced by changes in climate, reduction of the water content of the soil, reduction or loss of the protective vegetation cover. A special aspect of desertification is the over-riding of usable land and its burial by mechanically driven desert sands.
3. The arid land ecosystem is found in the following geographical regions:
 - (i) Australia
 - (ii) Central Asia
 - (iii) Indian sub-continent
 - (iv) Western Asia
 - (v) North Africa
 - (vi) Sahelian and Sudano-Sahelian
 - (vii) Southern Africa
 - (viii) North America
 - (ix) Central America
 - (x) South America
4. However, for global programmes, the Executive Director proposes to regroup them into the following five regions:
 - (i) Australia, Indian sub-continent, Central Asia
 - (ii) Western Asia, North Africa
 - (iii) Sahelian and Sudano-Sahelian
 - (iv) Southern Africa
 - (v) North, Central and South America

5. For each region, the Executive Director will formulate a regional programme concerning the four major factors affecting an ecosystem, namely climate, vegetation, soil and water.

(a) Meteorology, climatology, agro-climatology

6. It is necessary to complete the meteorological (and the hydrological) network and to help the countries to employ enough qualified staff to record the data. Data should preferably be processed, on a regional or sub-regional basis, by qualified climatologists established in a well equipped centre.

(b) Vegetation

7. Vegetation is a component of the environment which reflects the combined effects of climate, soil and man. Knowledge is an invaluable tool for the planner. Knowledge of the vegetation presupposes a knowledge of the flora.

(c) Soil

8. Soil problems specific to arid lands are those of soil conservation and sand dune fixation.

(d) Water

9. Equally specific to arid lands is the problem of utilization of salty water. Of special importance in studies pertaining to this ecosystem are: assessment of underground water resources and determination of the age of water reserves.

Some relevant background information

10. More detailed information on the state of affairs in ecosystems in the world as well as on the current and planned activities of FAO, UNESCO and WHO is given in document UNEP/GC/14/Add.1 (the Review). Examples of such activities, relevant to the proposed UNEP programme in this area, are cited below:

11. For a long time, FAO and UNESCO (arid zone major project, humid forests projects, etc.) have been drawing attention to the necessity to study ecosystems and to conceive integrated programmes adapted to each ecosystem.

12. The extent of environmental deterioration and its effect upon the biosphere is now the subject of a long-term interdisciplinary programme, under the auspices of UNESCO (Man and the Biosphere - MAB). The MAB programme, while concentrating on the interaction between man and his environment, will remain flexible both in content and in approach. It is extending assistance for the development of research and methodological guidelines relating to different ecological processes. Within the framework of UNESCO's activities, the International Hydrological Decade (IHD) is concerned with the effects of man's intervention on hydrological systems.

13. WMO is studying the effects of man's intervention on weather and climate in natural ecological systems, for example: the unintentional intervention which results from urban settlements (urban climates), bad land management, over-grazing and the faulty regulation of rivers and lakes. A small group of experts is considering forms of intentional intervention affecting the weather and climate,

such as precipitation stimulation, fog depression, hail suppression and the modification of hurricanes. WMO is also closely following the development of environment modification techniques and issues regular information on this subject.

14. ICSU, especially the International Biological Programme (IBP) and SCOPE, and IUCN have attached high priority to tropical ecosystems.

A. Initiated actions

15. UNEP is co-operating fully with the Special Sahelian Office established by the Secretary-General of the United Nations to co-ordinate the medium-term and long-term assistance activities of the organizations of the United Nations system aimed at the recovery and economic expansion of the drought stricken countries of the region. UNEP was represented at the meetings held by the Special Sahelian Office to this effect in Geneva in June 1973. A top level consultant was seconded by UNEP to the Special Sahelian Office.

16. UNESCO/MAB is co-operating with UNEP to complete "state of knowledge" reports on the major biomes. The reports will constitute a preliminary synthesis; they will review, evaluate and abstract knowledge concerning biome-oriented projects in a functional framework. This will be of use to national planners and administrators. These reports will give a first indication of the main gaps in knowledge of the crucial topics for further research and of ways and means of establishing alternative patterns of management and useful guidelines for land use. In addition, these reports will indicate the best methodological approaches in each one of the biomes, and the best strategy for collecting new research data for their further interpretation, codification and transmission to decision-makers. The guidelines will be of use to various national, bilateral and multilateral agencies and educational and research institutions.

17. Support is being given by UNEP to a series of meetings which will consider an integrated approach to the development of arid lands on the southern border of the Sahara. The first will be a UNESCO/MAB meeting on ecological research to be held at Niamey in March 1974. At the same time a Seminar organized by the African Institute for Economic Development and Planning for decision-makers of the same belt is being held with the support of UNEP: the object of this seminar is to alert decision-makers to the necessity of an integrated approach to development.

18. With a view to formulating an international programme for the ecological management of arid lands in North Africa and Western Asia, the Government of Iran, with the co-operation of UNEP, will convene a meeting of Directors of Arid Zone Research Institutes, specialized agencies and other organizations in April 1974. Another meeting of this kind will be supported in the region, comprising Australia, the Indian sub-continent and Central Asia, to be convened in 1975.

19. The Executive Director proposes to examine with FAO the holding of a technical meeting on the formulation of an international programme for the ecological management of arid and semi-arid lands in Africa and the Near East, which will take into account the results of the meetings to be held at Niamey and Teheran (Iran) as mentioned above.

20. Arrangements are being made to support the First International Congress of Ecology, to be held in the Hague in the autumn of 1974 by the Institut Voor Oecologisch Onderzoek, Netherlands, which will bring together distinguished scientists of several disciplines to discuss the unifying concepts of ecology within the framework of the theme of the conference, namely, "Structure, Functioning and Management of Ecosystems". UNEP assistance will be given to the "Participation Fellowship Fund" of the Congress, which provides financial assistance to enable scientists from developing countries to participate in the conference.

B. Planned actions

21. The Executive Director proposes to convene a multi-disciplinary meeting for each region. Participants will include natural and social scientists from the countries concerned, representatives of United Nations bodies, non-governmental organizations, interested aid-giving organizations and high level experts. In spite of similar ecological patterns in the structure and function of biomes, obvious regional differences exist. Some of these lie in the varying bio-geographical origins of the components of ecosystems, others in the cultural characteristics of the population and in local political and economic structures. For this reason, the Executive Director expects that it may prove necessary to convene several meetings for each programme.

22. In the light of the recommendations and priorities established by such meetings, a small multi-disciplinary task force will elaborate an integrated programme for each region using common methodology to ensure compatibility of data.

23. The Executive Director will then ensure the co-ordinated implementation of the integrated programme through the establishment of appropriate machinery and will, together with the organizations concerned, carry out a continuous evaluation of the programme.

24. When appropriate, the most modern methods, such as computerized information, the use of analogic models and satellites, remote sensing for permanent or periodical surveys, etc. will be used.

25. In response to General Assembly resolution 3054 (XXVIII) which, inter alia

"Requests the Governing Council of the United Nations Environment Programme to give priority to the search for a medium-term and long-term solution to the problems of desert encroachment in the countries bordering on the Sahara and other areas with similar geographical conditions and to take all necessary measures to help the countries concerned to implement their action programme",

the Executive Director proposes to begin the series of meetings mentioned above by preparing, in co-operation with the Special Sahelian Office, for the convening in 1974 of a multi-disciplinary meeting along the lines described above, to establish the priorities for action in this area taking full account of the proposals submitted to the Inter-State Committee in Ouagadougou, Upper Volta, in September 1973.

2.12 Tropical woodlands and forests

1. The objectives of this programme activity are (a) to produce guidelines for and improvements of management techniques to ensure, among other things, the integral utilization of heterogeneous forests, species and planting techniques for man-made forests under a wide variety of ecological conditions, and the adaptation of technologies to accelerate the domestic processing and use of forest products; (b) to evaluate the role of afforestation in rehabilitating marginal lands and in halting desertification, the global and local environmental influences of the forests; and (c) to evaluate the contribution of wildlife management to the development of tropical woodlands and forests.

Some relevant background information

2. Detailed background information about the state of the ecosystems as well as the current and planned activities of FAO, UNESCO and WHO are given in document UNEP/GC/14/Add.1 (the Review). Examples of such activities, relevant to the proposed programme in this area, are cited below.

3. Since 1948 FAO has been conducting forest resources surveys and every five years has published and updated its World Forest Inventory. The Seventh World Forestry Congress (1972) discussed forests and socio-economic development. Planned activities through 1975 include a seminar on environmental forestry and investigations of forests influences and environmental monitoring, and the preparation of a world consultation on the development of humid tropical forests to be organized in 1975. The 1974/1975 Regular Programme makes provision for measures against harmful plants and animals and the Second FAO/IUFRO ^{1/} World Symposium will cover dangerous forest diseases and pests. Planned activities also include the preparation for a World Symposium (UN/FAO) on forestry institutions for socio-economic development to be held in 1977 and a seminar of experts on the role of forest services in the multi-functional programmes for environmental quality.

4. FAO has proposed a five-day symposium of high level experts in the environmental and urban planning field from selected developed and developing countries where wildlands and urban area interactions are most critical.

5. Projects relating to tropical forests, undertaken by UNESCO include previous and current activities in tropical biomes. For example, there is a series of publications on humid tropics research; the continuing support to the Flora Neotropica; the preparation and publication of vegetation maps of South-East Asia and Africa, and the organization of an international course in tropical ecology in Caracas in 1973. The report of UNESCO/MAB Project No. 1 on the ecological effects of tropical and sub-tropical forest ecosystems gives a sound basis for practical action.

6. The UNDP has supported in the past and presently assists a large number of forestry projects.

^{1/} IUFRO: International Union of Forestry Research Organizations

7. The International Biosphere Programme conducts studies of forest biomes. The International Association of Ecology of the International Union of Biological Sciences has a commission on tropical forests, and the International Geographical Union has a commission on humid tropics.

A. Initiated actions

8. Arrangements are being made to support a project to be executed by UNESCO concerning "Integrated ecological research and training activities in Latin America". The object of this project, among others, will be to identify gaps in knowledge and possibilities for integrated research in the region, with special reference to tropical forests ecosystems, examine methodological approaches and establish a programme of research. The project will be closely co-ordinated with the IUCN project relating to Latin American humid tropical forests. A meeting to be organized by UNESCO and to deal with forests in the South-East Asian region is also being supported.

9. While the substantive part of the World Forest Appraisal Programme of FAO will form part of the second phase of the Global Environment Monitoring Systems (GEMS) envisaged under programme activity "Earthwatch", FAO has been requested to formulate a large-scale project for monitoring forest cover in the tropical and sub-tropical areas and to outline methods of measuring parameters relevant to forests, which will be incorporated in GEMS. This project will be supported.

10. Support has been given to IUCN in connexion with a working conference in Venezuela to consider the ecological principles of development in the American humid tropics which will bring together administrative personnel from various disciplines. This project also has the sponsorship or support of UNESCO, FAO, UNDP, ECLA and the Swedish International Development Agency. A similar regional conference under the auspices of the Indonesian Government organized by IUCN for the South-East Asian region is to be supported. The Government of Indonesia will hold a meeting of its local authorities as an immediate follow-up.

B. Planned actions

11. The formulation of integrated plans relating to tropical woodlands and forests ecosystems will follow the pattern of the plan for arid land ecosystems. The regional meetings to be convened will be expected to suggest ways of filling the gaps in knowledge about vegetation cover and other factors of ecological relationships with a view to encouraging better management practices for woody vegetation, including a regeneration of vegetation, or the orderly arrangement of vegetation and to establish criteria and methodologies for the management of the multiple use of the vegetation cover.

12. Programmes for controlling forest fires will be established with special emphasis on warning systems based on the existing extensive knowledge, and for the purpose of disseminating information about the positive and negative effects of forest fires according to the environment in question. This is a long-term programme, and a modest beginning will be made with efforts to improve fire detection systems.

2.21 Soils

Context for action

1. The accelerated shrinkage of the amount of land available to feed each person when half the earth's population is already hungry, requires UNEP to assist concerted programmes for reducing the loss of soil and reclaiming soil. Since desertification is dealt with under "arid lands", the Executive Director proposes to concentrate in this area on an assessment of land degradation and on soil loss caused by wind erosion, salination and mining operations.

Some relevant background information

2. Detailed background information on the situation with regard to soils and some information about the current and planned activities of FAO, UNESCO and WHO are given in document UNEP/GC/14/Add.1 (the Review).

A. Initiated actions

3. As a pre-programming step, FAO will organize an expert consultation for the formulation of a global programme concerning soil degradation and control. The consultation will review the knowledge about soil degradation, establish a methodology for appraising soil degradation (especially by wind erosion, salination and mining and monitoring wind erosion, salination and mining degradation); its object will be to promote and support programmes of ecological management of soil resources; with priority for the arid lands ecosystems, the tropical woodlands and forests ecosystems, the control of wind erosion, the control of salinity and reclamation of salinated land and the rehabilitation of mining areas.

B. Planned actions

4. The Executive Director proposes to support activities by the specialized agencies, or by groups of countries on a regional or trans-national basis, or even by specific countries, if the problems they propose to consider have a distinct bearing on the global problem of soils, by means of;

- establishing a methodology of assessing soil degradation;
- accelerating applied research into the improved utilization of land by conservative and protective techniques (wind break, terracing, contour lining, etc);
- promoting the more judicious use of the soil and water complex (irrigation, drainage) to avoid adverse ecological consequences such as erosion or salination;
- ensuring the protection of land by appropriate legislation; reclaiming land deteriorated by mining exploitation.

2.3 Water

As stated earlier, the Executive Director is concentrating on working out methodologies for formulating integrated programmes relating to;

- (a) arid lands and tropical woodlands and forest ecosystems; and
- (b) soil degradation through erosion and salination.

However, in view of the great importance attached to actions concerning the problems of water resources and water quality, and of the fact that considerable information is available about the activities concerned with water, both in the United Nations system and in other organizations, the Executive Director has taken action with a view to collating and synthesizing this information.

Two reports are being prepared by a group of leading specialists on:

- (a) water resources; and
- (b) water quality.

Each of these reports will review the state of affairs in the field concerned as part of the "Review" of environmental activities within and outside the United Nations system. They will, no doubt, constitute a solid basis for identifying the gaps in the knowledge and make it possible to formulate a coherent programme in response to the Governing Council's definition of the tasks in this sub-area, namely:

"To help countries prevent or remedy the pollution of water, and to develop safe methods of waste recycling;

"To help the development of water resources to meet the present and future requirements of water of high quality;

"To support and encourage national and international efforts for assessing environmental effects of agricultural chemicals on man and ecological systems and for avoiding their undesirable effects." 1/

Estimated support from the Fund: The estimated support from the Fund for planned activities within this sub-area is set out below:

| 1974 | 1975 | 1976 |
|-----------------------------|------|------|
| (in millions of US dollars) | | |
| 0.25 | 1 | 1.25 |

1/ decision 1(I), para 12(b) (vi, vii and viii)

2.31 Water

1. Since, for the time being, action in this sub-area is treated as constituting a single programme activity, that activity has the same title as the sub-area, viz. "water".
2. The Executive Director hopes to submit a programme to the Council at its third session on the basis of the reports being prepared.
3. In the meantime, he has initiated various activities relating to water quality in different sub-areas dealt with in the present chapter, e.g. human settlements and habitat (section 1.11) and marine pollution (section 4.1).
4. Furthermore, IAEA will, in co-operation with UNEP conduct isotope studies of ground water and surface water.
5. It is envisaged to use isotope techniques for the study of some selected projects concerning systems containing young waters, such as Karstic systems or aquifers in fractured and fissured rocks. Shallow ground waters will also be studied with tritium and stable isotopes to find out their rate of recharge and their possible relationship with surface water bodies. Mixing with salt water in coastal areas is another topic to be studied. The investigation of the water balance of lakes by means of heavy stable isotope tracing will be an important part of the studies. IAEA will be requested to give priority in its investigations to the dating of the aquifers of the arid lands, especially south of the Sahara.

3. Trade, economics, technology and transfer of technology

1. The Governing Council of UNEP noted the following detailed objective which is applicable to this priority subject area:

"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 environment concerns," ^{1/}

Context for action

2. Many of the activities planned to resolve problems which form the subject of other areas have implications for the area of trade, economics, technology and transfer of technology. The evaluation of these implications is particularly difficult in the absence of specific criteria or methodologies for this purpose.

3. Existing techniques of cost-benefit or similar methods of analysis tend to be arbitrary in the manner in which they are applied through the choice and definition of benefits to be considered and in the manner in which they attach simplistic valuations to many environmental considerations and the quality of life. The application of techniques of economic analysis has tended to be too narrow in this area.

4. In many situations, environmental problems are the consequence of a lack of economic development, of choices made in the process of economic development, or sometimes of both, depending on the characteristics of the development process. Development and the environment are thus frequently closely linked. This link would be better understood with the aid of criteria and methodologies of the kind mentioned above. The nature of the development process is of great concern to all countries, regardless of the present degree of their economic development; this concern thus extends to the issues involved in the area of "trade, economics, technology and transfer of technology". The establishment of the criteria or methodologies is essential for the purposes (among others) of:

- evaluating the impact of environmental policies on economic development;
- considering to what extent and by what methods environmental considerations can be incorporated into national development plans;
- appraising the total impact of proposals for applying new techniques and environmental technologies;
- appraising the effectiveness of environmental measures and policies, their feasibility and their possible effects;

^{1/} Decision 1(I), para 2(j)

- evaluating specific proposals relating to other areas in view of their possible effects on development, trade and economics;
- forecasting possible trends in technological development in terms of the impact of environmental considerations.

5. The determination of the cost of environmental measures and policies, which is a matter of considerable importance both for developing and for developed countries, would be facilitated if there were appropriate cost-measurement criteria. It is necessary, however, to determine what environmental considerations can indeed be defined in direct cost terms or whether the methodology to be developed should provide for the costing of certain factors while treating other factors in a non-cost manner.

6. The long-term objective of the proposals relating to this area is, therefore, to work out methods of taking account of economic, social and other considerations in the evaluation of various environmental measures and policies with a view to understanding the impact of such measures and policies on the achievement of development objectives and to devising ways of adopting appropriate measures and policies that will not hinder development. At the same time, means will have to be devised for evaluating the effect of various developmental measures on the environment. The central object of such evaluations should be an attempt to define the major criteria by which the economic and social situation should be measured.

7. Many aspects (technological, social, economic and trade, etc) are involved in this work. Each of them, as a rule, is dealt with by a separate organization (both inside and outside the United Nations system), which generally is highly qualified to study the particular issue. In addition, the interactions and cross-sectoral connexions among the different issues have to be defined and studied. Attention must be focussed on this process of evaluation of environmental measures and policies. It is these specific areas of evaluation and costing which will be at the centre of UNEP's co-ordinating activities in this area. Another major task for UNEP would be to work out the methodologies for the integration of all the issues, including particularly those mentioned above. This integrative approach is discussed elsewhere in this document, in connexion with the specific matters of "integrated planning and management methods" and of "Eco-development".

8. Another issue which should receive due attention by UNEP is the conduct of research and studies leading to possible alternative patterns of growth (taking into account various environmental considerations), in the light of which decision-makers, particularly in developing countries, could choose whatever methods accord best with the prevailing socio-cultural-economic structures of their countries.

Estimated support from the Fund: The estimated support from the Fund for planned activities within this priority area is set out below:

| 1974 | 1975 | 1976 |
|-----------------------------|------|------|
| (in millions of US dollars) | | |
| 2 | 2.75 | 3 |

This priority area comprises the following sub-areas:

3.1 Trade and economics

3.2 Environmentally sound technologies and their international transfer

3.1 Trade and economics

1. The Governing Council, in a further elaboration of this priority subject area, specifically requested the Executive Director:

"To help ensure that environmental measures adopted by governments do not needlessly create non-tariff barriers to trade, especially to the disadvantage of developing countries, to help the developing countries maximize opportunities and assess risks which may arise for them as a result of changes in comparative advantage induced by environmental concerns, and to examine ways of offsetting possible negative trends in trade consequent upon environmental measures taken by developed countries;

"To assess the feasibility of, and if appropriate, to create a global "early warning" system to provide notice to countries whose trade may be affected by environmental measures being planned by others or the health of whose populations may be affected by the export of environmentally harmful substances;

"To take steps, in collaboration with other appropriate agencies, to encourage, developed countries to make increased capital assistance available to developing countries so that extra costs of introducing environmentally-sound technologies by them are covered;

"To encourage training of personnel in the techniques of incorporating environmental considerations into development planning, and of identifying analysing the economic and social cost-benefit relationships of alternative approaches". 1/

Context for action

2. As has been mentioned above, the present state of methodologies and studies in this field is inadequate at this stage and hence it is not possible to deal directly with much of the work in this area. It is necessary to undertake several specific programmes which will serve as preparatory work for fulfilling the major tasks set forth for this area and which will, at the same time, have an important significance of their own. Though broad in scope, many of the specific actions should be in the form of case studies dealing with such specific topics as: problems which might arise in international trade from legislation and regulations of importing countries concerning the environmental standards of imported goods; ways and means of ensuring that such measures produce as few negative trade effects as possible; changes in competitive advantages; identification of non-tariff trade barriers, evaluation of the effects of such barriers on international trade; the remedial actions for countries affected in their trade position by such environmental measures; shifts in production processes, and others.

1/ Decision 1(I), para 12(d).

3. At the same time, it is necessary to continue to carry out those activities of an integrative character which may help to elucidate the connexions between the environment and development. Inter-disciplinary discussions of an international character should be conducted with the object of contributing to further clarification and to generating new ideas that could be used in the future.

4. Adequate remedies against adverse trade effects of environmental measures require sufficient information obtained early enough to permit timely counter-action to mitigate these effects. Accordingly, the Executive Director plans to examine the feasibility of an "early warning" system, whereby producers and exporters, especially those in the developing countries, could be informed in advance of any new environmental standards in the countries to which they export (or intend to export) so that they may have an opportunity to adapt their products to the new standards.

5. The question of the cost of preventing harmful environmental effects is complicated and difficult, as will be indicated later in this document. It is clear that a rather complex task of data collection and analysis needs to be undertaken, since it appears that much of the basic material does not exist. The first step in this direction would be the collection and analysis of the available information, in co-operation with an appropriate organization.

6. The concern of UNEP in this field has to be clearly co-ordinated, not only with the United Nations family, in particular UNDP, UNCTAD, GATT, UNIDO, ILO, FAO and WHO, and other specialized agencies concerned with development assistance, but also with organizations such as OECD and others having a concern with the trade position of the developing countries.

Estimated support from the Fund: The estimated support from the Fund for planned activities within this sub-area is set out below:

| 1974 | 1975 | 1976 |
|-----------------------------|------|------|
| (in millions of US dollars) | | |
| 0.75 | 1 | 1 |

Some relevant background information

7. UNCTAD is concerned with the expansion and diversification of the export trade of developing countries in manufactures and semi-manufactures and the elaboration and application of general and consistent policies designed to achieve this purpose. In this context, it is analysing the effects of non-tariff barriers on the exports of manufactures and semi-manufactures from developing countries with a view to suggesting measures for the reduction, relaxation or elimination of those barriers which adversely affect the exports of developing countries. The non-tariff barriers being studied by UNCTAD include import quotas, import licensing, "voluntary" export restraints, import prohibitions, embargoes, State trading, government procurement, variable levies, standards as technical barriers to trade, packaging, labelling and marking requirements, health and sanitary regulations, customs procedures and customs valuation.

8. The Senior Economic Advisers to ECE Governments are conducting a study on complex trade and environmental implications of long-term plans for the production and use of basic communities and energy.

9. Biennial ECE meetings of Government officials responsible for standardization policies are to draft recommendations on such subjects as the treatment of imported goods, testing and certification procedures, means of harmonizing national standards, and the organization of multilateral channels of information, between countries about national regulations and standards.
10. The Economic and Social Council and the ECE, in their respective fields of competence, are doing work relating to the transport of dangerous goods.
11. The ECE Committee on the Development of Trade conducts annual analysis and reviews of recent trade trends, policies and problems (including the emergence in both intra-European and inter-regional trade of tariff and non-tariff barriers as a result of environmental policies).
12. A long-term study on timber trends and prospects in Europe, to be conducted by ECE and FAO in 1974/75, will pay particular attention to the possible impact of environmental measures on the future wood supply potential of European forests. The study will lead to the consideration of future locations of forest industries and patterns of international trade.
13. ECLA will continue its work on trade trends and policies. The relevant studies which cover questions arising for the Latin American countries in their trade relations with other regions and among themselves, particularly on account of the integration process, will also consider the consequences for these countries of environmental policies adopted by developed countries.
14. GATT has catalogued and studied 27 categories of non-tariff barriers to international trade, which cover 800 different varieties. GATT is also involved in the elaboration of principles and procedures specifically applicable to standards, and has established a group dealing with environmental and trade measures to which specific complaints may be submitted.
15. The procedure for notifications and consultations by States concerning measures for the control of substances affecting man or his environment was elaborated by the Organization for Economic Co-operation and Development in 1971.

The sub-area of trade and economics comprises the following programme activities:

- 3.11 Rational use of earth resources
- 3.12 Non-tariff barriers
- 3.13 Early warning systems
- 3.14 Cost of environmental measures

PROGRAMME ACTIVITIES

3.11 Rational use of earth resources

A. Initiated actions

1. As a follow-up to the Founex meeting, which was one of the expert group symposia held in preparation for the Stockholm Conference, the Executive Director, in co-operation with UNCTAD, is preparing for a meeting to be held in Nairobi late in 1974 to consider the various aspects of the rational use of earth resources. Particularly emphasis will be laid on the concept of eco-development and on alternative patterns for growth. The Steering Committee for this meeting consists of leading experts in appropriate disciplines from both developing and developed countries. The interdisciplinary approach will be ensured in that about one-third of the participants will be chosen from among leading biological and physical scientists, the rest being social scientists (including sociologists, economists, and anthropologists), politicians, and decision-makers concerned with development planning.

2. As a follow-up of the Canberra meeting - also one of the expert group symposia held in preparation for the Stockholm Conference - the Executive Director, in co-operation with ICSU/SCOPE is convening a symposium in Nairobi in February 1974 to discuss the subject of "Environmental sciences in developing countries". The objectives of the symposium are: (a) the building up of national resources, (b) the development of national research programmes associated with the rational utilization of natural resources, and (c) the furthering of national contributions to regional, international and global programmes of environmental studies.

3. As in the case of the symposium on the rational use of earth resources mentioned above, the inter-disciplinary approach to the problems discussed will be ensured by the fact that about one-third of the participants will be chosen from among social scientists.

4. The two meetings mentioned above will consider, separately, two papers prepared for the Executive Director of UNEP on:

- (a) Alternative patterns for growth;
- (b) Eco-development.

B. Planned actions

5. In the light of the recommendations of the two symposia, it is expected that the Steering Committees of the two symposia acting jointly will be able to define the major eco-regions of the world. Meetings (with balanced representation of social, natural and physical scientists together with planners) will then be convened for each eco-region, to formulate guidelines for planning the economic and technological development of these regions which would take into account the various environmental considerations.

3.12 Non-tariff barriers

A. Initiated actions

1. UNCTAD, in co-operation with the Executive Director, is carrying out a study on trade barriers and restrictions resulting from environmental policies. The major components of this study which are of relevance to this programme activity area are: (a) the preparation of an inventory of import barriers at frontiers and restrictions on the processing of products for environmental reasons which affect the trade in products of export interest to the developing countries, (b) the carrying out of a study on the trade implications of barriers and other measures affecting a selected product or product group, and (c) the carrying out of a country study to analyse the barriers and restrictions imposed as a result of environmental policies, as well as assessing their consequences for trade.

B. Planned actions

2. On the basis of the results of the study now being carried out in co-operation with UNCTAD, the Executive Director plans to arrange assistance to various countries, especially to developing countries, which will enable them to carry out the necessary studies required to seize and fully exploit in their own interests, opportunities which may arise as a result of changes in comparative advantage arising from environmental concerns, or to minimize the risks inherent in such changes.

3.13 Early warning system

A. Initiated actions

1. A part of the study mentioned under 3.12 above which is being carried out in co-operation with UNCTAD on trade barriers and restrictions resulting from environmental policies is investigating the possibility of establishing a global "early warning" system by means of which countries concerned, particularly developing countries would receive notice of the environmental measures which may affect their trade.

B. Planned actions

2. The Executive Director plans to base his proposals for such a global early warning system upon the results of the study mentioned above.

3.14 Cost of environmental measures

A. Initiated actions

None undertaken as yet.

B. Planned actions

1. The Executive Director proposes to undertake the following activities:

- (a) to collect and analyse existing information relating to costs of environmental measures;
- (b) to carry out case studies of the costs of certain environmental measures which give special emphasis to the control of industrial pollution;
- (c) to establish criteria for determining the costs of environmental measures at various levels of environmental conditions as part of development projects. Such criteria should, as stated earlier, be designed to take account of both economic and social considerations in the evaluation of different environmental measures;
- (d) to investigate ways and means of establishing appropriate mechanisms for encouraging developed countries to make increased capital assistance available to developing countries so that the extra costs of introducing environmentally-sound technologies into the latter are covered.

3.2 Environmentally sound technologies and their international transfer

1. The Governing Council requested the Executive Director:

"To examine the degree to which the location of new industry is being or may be influenced by environmental factors and the risks and opportunities this may create especially for developing countries;

"To examine the optimum uses which may be developed for such natural products as fibres, rubber and forest products and to recommend measures for national and international action, in co-operation with other international bodies as appropriate, and to examine the extent to which problems of pollution could be ameliorated by a reduction in the current levels of production and in the future rate of growth of the production of synthetic products and substitutes which in their natural form could be produced by developing countries;

"To encourage the exchange of information and co-operation in the field of low-waste and non-waste technology;

"To encourage comprehensive studies designed to safeguard against possible negative effects of the international transfer of technology particularly from the developed to the developing countries; and to evaluate the effectiveness of such safeguards as may be devised." 1/

Context for action

2. The use of technology, though indispensable to modern economic development, can be a source of environmental problems and at the same time can offer solutions to these problems. Any action intended to protect the human environment involves a careful analysis of existing technology and the development of new technologies better able to protect the environment while performing their essential functions.

3. The analysis of existing technologies and of their effect on the human environment may indicate that certain technologies, and the industries employing them in a given ecological context, are harmful, while in different ecological circumstances their environmental effects may be negligible. Such conclusions might lead to pressure for the transfer of industries from locations where they harm the environment to more appropriate locations, since the differential cost of mitigating harmful effects might change the economic factors involved.

4. Parallel to the interest in the location of industries is the concern with certain products, the manufacture, use, consumption or disposal of which may damage the environment. Many believe that the environment is harmed more by synthetic than by natural products. For this reason it is believed that environmental problems may lead to an increased demand for natural products, many of which originate in developing countries.

1/ Decision 1(I), para. 12(d) (iii, iv, vi, vii, ix).

5. Arrangements are being made for the establishment of close consultations and co-operation with industry designed to facilitate the development and implementation of programme activities in this area, particularly in respect of the transfer of technology and location of industry. Industry has been encouraged to establish international mechanisms through which such consultations and co-operation may be facilitated. The decision to establish in Nairobi a "Centre for industry and environment" represents a welcome and constructive response by industry to this need (see chapter IV).
6. These various possibilities suggest that the preoccupation with the human environment may have favourable effects on the economic development of the developing countries.
7. The Executive Director is concerned with yet another aspect of international efforts for economic development: projects undertaken to promote this development should take into consideration environmental requirements and should be conceived in such a manner as to avoid as far as possible negative effects on a country's environment flowing from its development activities.
8. The Executive Director proposes, as a first step, to gather the basic information needed to build up a coherent programme aimed at defining research and pilot actions. Most of the pilot actions should be case studies dealing with specific problems, such as the comparative advantages and disadvantages of different locations of industry by reason of the environmental effects, optimum uses of natural products and the comparative environmental impacts of their production in contrast to the impact of synthetic products, and the possible environmental effects of new trends in technological development. Of prime importance in this respect is the establishment of guidelines for the evaluation of environmental projects.
9. The Executive Director proposes that, within this area, certain other related subjects should also be explored:
 - (a) The use of simple indigenous technologies, their advantages and how they could be applied, also in regions other than that in which they are at present used;
 - (b) New uses of natural materials, in particular the successful experiences of some countries should be considered in such studies.
10. The integrative approach is of prime importance in dealing with problems in this area. Such an approach emphasises the need for inter-disciplinary meetings which will enable experts in the social, natural and exact sciences to exchange views on basic problems, such as the development of national research into the utilization of natural resources, the environmental aspects of development, and others.
11. The protection of the human environment involves the use of new technology. UNEP should continue wherever possible to promote the development of such new technologies. Emphasis will be laid on the promotion of low-waste and non-waste technology.

12. It is within this context that the Executive Director plans to carry out the tasks entrusted to him by the Governing Council.

Estimated support from the Fund: The estimated support from the Fund for planned activities within this sub-area is set out below:

| 1974 | 1975 | 1976 |
|------|-----------------------------|------|
| | (in millions of US dollars) | |
| 1.25 | 1.75 | 2 |

This sub-area of "Technology and its international transfer" comprises the following programme activities:

- 3.21 Environmental considerations of certain technologies
- 3.22 Industrial location
- 3.23 New uses for natural products
- 3.24 Natural versus synthetic products
- 3.25 Low-waste and non-waste technology
- 3.26 Transfer of technology

PROGRAMME ACTIVITIES

3.21 Environmental considerations of certain technologies

A. Initiated actions

1. An environmental component was included, through support extended by UNEP, in the UNIDO sponsored Third Inter-regional Iron and Steel Symposium, Brasilia, October 1973.

2. Environmental considerations in the leather producing industry

UNIDO is co-operating with UNEP in undertaking a study of the leather industry in order to assess the impact of various environmental considerations upon its operation and development. The study will consider whether the approach used in this project for dealing with environmental aspects can also be used in other industries.

3. Case studies: Four industrial development projects in the developing countries

UNEP is supporting UNIDO in carrying out four case studies of industrial development projects in developing countries in various regions of the world. The object is to evaluate the effect of insufficient attention to environmental aspects in the establishment and operation of the projects on the physical and economic sectors in surrounding areas.

4. The development of integrated industrial complexes with minimized pollution

UNIDO has been studying the materials flow (inputs and outputs, including present waste products) in several industrial processes in order to identify and determine the totality of materials required as inputs and all those that must be disposed of outside the process. In the light of the results of the study, it is planned to develop a methodology for determining whether it is possible to establish viable "integrated industrial complexes" that would conserve raw materials and minimize waste and the costs of waste treatment by the juxtaposition of industrial processes that could to a maximum extent "eat each other's waste". Such an approach to industrial development would, if successful, minimize waste disposal problems and provide more economical solutions to industrial development problems.

B. Planned actions

On the basis of the results of initiated actions, the Executive Director proposes to undertake the following activities:

- (a) to elaborate guidelines for the integration of the environmental factor into future development projects;
- (b) to elaborate guidelines for the post-audit of industrial projects with a view to determining their environmental impacts;
- (c) to work out a long-term programme for in-plant training;
- (d) to estimate the usefulness of the "industrial complex" approach to industrial development, and possibly sponsor appropriate pilot projects, particularly in developing countries.

3.22 Industrial location

A. Initiated actions

None undertaken as yet.

B. Planned actions

The Executive Director proposes to undertake the following activities:

- (a) to compile and analyse existing environmental standards with a view to establishing criteria for such standards;
- (b) to identify industries or industrial processes in which developing countries may have comparative advantages because of environmental considerations, with due regard to meteorological factors;
- (c) to evaluate the costs of relocating certain industries as compared to the costs of adapting their production processes to more stringent environmental requirements in the countries in which they are at present located;
- (d) to assist developing countries in studies showing how to take advantage, and minimize risks, of industrial location.

3.23 New uses of natural products

A. Initiated actions

None undertaken as yet.

B. Planned actions

The Executive Director proposes to undertake the following activities:

- (a) to identify existing uses of some of the most important of widely distributed natural products;
- (b) to formulate integrated research programmes aimed at finding new uses for such natural products which would be economically as well as environmentally sound.

3.24 Natural versus synthetic products

A. Initiated actions

1. UNCTAD is being given assistance in initiating research studies relating to the pollution caused by certain synthetic products for which there are natural alternatives.
2. UNIDO, with UNEP assistance, is studying the technical and industrial aspects of the ecological-economic evaluation of the competition between synthetic and natural rubber. It will examine the relationship between the two categories of rubber with a view to achieving a comparative environmental rating of both the products themselves, in their entire life cycle, and the processed inputs utilized in their manufacture. This study will contribute to the formulation of a suitable methodology for similar evaluations of other products or product groups in the future and will be complemented by the formulation of an action plan for the reduction of pollution caused by the rubber industry at national, regional and international levels.

B. Planned actions

3. The Executive Director proposes to undertake the following activities:
 - (a) to work out a more detailed programme for dealing with the technical and industrial aspects of the ecological-economic evaluation of the competition between synthetic and natural products. This programme would:
 - (i) identify the principal types of competing products that would need to be studied;
 - (ii) examine the order of priorities in which the studies should be carried out;
 - (iii) identify the alternative approaches or methodologies for undertaking such studies and make recommendations as to the most desirable approach;
 - (iv) suggest economic and social indicators as well as environmental components that should be considered, including a methodology for determining trade-offs.
 - (b) to continue the UNCTAD study and to concentrate on determining the pollution generated by the production of specific natural materials and their synthetic substitutes and the costs of eliminating the pollution or mitigating its effects.

3.25 Low-waste and non-waste technology

A. Initiated actions

None undertaken as yet.

B. Planned actions

The Executive Director proposes to undertake activities which would include:

- (a) making a survey of experts, institutions and international organizations concerned with low and non-waste technology and technology assessment;
- (b) prepare an international register of low and non-waste technology. The register would facilitate the identification of research and development priorities for the creation of new technologies;
- (c) carrying out case studies on factors influencing waste generation in specific enterprises, industries or regions; on the basis of these studies particular problems could be pinpointed, recommendations would be made for future action and possible solutions could be suggested;
- (d) arranging a seminar on the principles, concepts and practices of non-waste systems: such a seminar would endeavour to define the principles, concepts and practices of non-waste systems and to assess their implications for the existing programmes, policies and plans for dealing with environmental problems;
- (e) carrying out a study of legislative and fiscal measures to encourage the development and application of low-waste and non-waste technologies: on the basis of national reports on existing legislation and fiscal measures, a consolidated report identifying the measures at present being applied and proposing priority problems for further study could be prepared;
- (f) preparing societal flow charts for specific materials: the relevant study would involve the publication of flow charts for materials causing environmental problems to be used as a guide by decision-makers. The charts could be used for further studies and for planning strategies to deal with specific pollutants;
- (g) establishing registers of residuals for particular products, processes or industries: these registers would record the kind, quantities, concentrations, known environmental effects, etc. of residuals for particular products, processes and industries. The registers could be used as a basis for studies on the abatement or prevention of pollution, recovery of waste materials and their possible re-use. Such registers will have a close relationship to the registry of potentially toxic chemicals discussed above in the section on human health and well-being.

3.26 Transfer of technology

A. Initiated actions

Consultations have been held with several governments with a view to the possible establishment of one or more centres at which information could be found about relevant technologies of potential interest to developing countries. The Federal Republic of Germany, for one, is examining the feasibility of organizing such a centre, which might later be integrated into a comprehensive UNEP activity. Such centres may become focal points for information about advanced environmental technologies in specific fields of major importance and may also lend assistance, particularly to developing countries, in the application and further development of such technologies.

B. Planned actions

The Executive Director proposes to undertake the following activities:

- (a) to carry out a comprehensive investigation of methods of identifying the problems and possibilities of the transfer of low and non-waste technologies, particularly to developing countries;
- (b) to carry out case studies of national laws relating to non-waste technologies, with the object of evaluating their environmental soundness and the possibilities of their application in places other than those of their origin.

4. Oceans

1. Man's intensified use of the oceans - for navigation, waste disposal and mineral resources extraction - has significantly changed their physical, chemical and biological characteristics. The discharge into the sea of harmful substances in amounts and at rates which overtax its capacity to absorb or purify them aggravates the problem of marine pollution. In order that early and adequate control measures may be taken, a systematic assessment of the state of the marine environment and its living resources is necessary. This assessment rests on surveillance and monitoring activities, the research and evaluation of results, and the timely exchange and dissemination of relevant data and information.
2. By resolution 3133 (XXVIII) adopted on 13 December 1973, the General Assembly specifically requested the Governing Council "to consider and decide upon making a detailed survey of living marine resources of the world's seas and oceans threatened with depletion, to be carried out by the United Nations Environment Programme in co-operation with the Food and Agriculture Organization and to be submitted to the third session of the Governing Council of the United Nations Environment Programme", and "to continue to direct special attention to the question of environmental protection of the seas and oceans, and in particular its living marine resources, and report thereon to the General Assembly at its twenty-ninth session as well as on the implementation of this resolution." By this resolution, the Assembly underlined the fact that a number of the world's important living ocean resources are at present threatened by depletion for a variety of reasons including overfishing in certain areas, and emphasized the need for concerted action, both national and international, to preserve and enhance the quality of ocean life and protect the living resources of the marine environment. The Assembly also emphasized by this resolution the importance of the task of the Conference on the Law of the Sea in relation to the preservation of the marine environment taking into account recommendation 92 of the Action Plan as approved by the Stockholm Conference. The Conference on the Law of the Sea has commenced its work, and the Executive Director will make suitable arrangements to assure closest co-operation between UNEP and those responsible for this Conference, in pursuance of the above-mentioned General Assembly resolution and of the relevant decision taken by the Governing Council at its first session.
3. The Governing Council noted the following detailed objective for this priority area:

"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." 1/

Estimated support from the Fund: The estimated support from the Fund for planned activities within this priority area is set out below:

| 1974 | 1975 | 1976 |
|------|-----------------------------|------|
| | (in millions of US dollars) | |
| 2 | 3 | 3.5 |

The programme for this priority area is planned to be developed within the following sub-areas:

- 4.1 Marine pollution
- 4.2 Conservation and management of living aquatic resources

1/ Decision 1(I), para.2(b).

4.1 Marine pollution

1. The Governing Council has requested the Executive Director to undertake the following tasks in this sub-area:

"To carry out objective assessments of problems affecting the marine environment and its living resources in specific bodies of water;

"To assist nations in identifying and controlling land-based sources of pollution, particularly those which reach the oceans through rivers;

"To stimulate international and regional agreements for the control of all forms of pollution of the marine environment, and especially agreements relating to particular bodies of water;

"To urge the Intergovernmental Maritime Consultative Organization to set a time-limit for the complete prohibition of international oil discharges in the seas, as well as to seek measures to minimize the probability of accidental discharges;

"To develop a programme for the monitoring of marine pollution and its effects on marine ecosystems, paying particular attention to the special problems of specific bodies of water including some semi-enclosed seas, if the nations concerned so agree; 1/

"To promote the development, on an entirely voluntary basis, of a register of clean rivers." 2/

Context for action

2. The tasks defined by the Governing Council indicate the need for specific action which should be taken in co-operation with both United Nations and other bodies. Such action will concentrate on:

- (a) The development of a system for monitoring significant marine pollutants;
- (b) The encouragement and support of existing programmes for research into and evaluation of marine pollution and in particular the major programme for the Global Investigation of Pollution in the Marine Environment (GIPME);
- (c) The development of inter-disciplinary referral system covering marine pollution data and scientific information, in conjunction with the International Referral System;

1/ Decision 1(I), para.12(e) (i,iii,iv,v,vi).

2/ Ibid., para.12(f)(vi).

- (d) The formulation of a programme of training courses relating to marine conservation and pollution problems;
- (e) The encouragement of the conclusion of international and regional agreements for the control of marine pollution from all ocean sources as well as of pollution in specific bodies of water.

3. Arrangements will be made for making a contribution to the "comprehensive interdisciplinary study to identify and review the problems of coastal area development" which is called for by Economic and Social Council resolution 1802 (LV) of 9 August 1973.

Estimated support from the Fund: The estimated support from the Fund for planned activities within this sub-area is set out below:

| 1974 | 1975 | 1976 |
|-----------------------------|------|------|
| (in millions of US dollars) | | |
| 1.5 | 2 | 2.25 |

This sub-area comprises the following programme activities:

4.11 Assessment

4.12 Control

4.11 Assessment

1. A comprehensive plan for the Global Investigation of Pollution in the Marine Environment (GIPME) is being prepared under the auspices of the Intergovernmental Oceanographic Commission (IOC), as co-ordinating body with assistance from members of the United Nations system. The scientific advisory bodies of the IOC (SCOR, ACMRR, ACOMR, ECOR) ^{1/} and national experts will provide inputs for this plan. It will include proposals for internationally co-ordinated research projects. These are required as the basis of a better understanding and evaluation of the effects of marine pollution on living resources and man's environment, and for improved monitoring of marine pollution.

2. A scientific contribution to the GIPME and other programmes concerned with marine pollution is made by the Joint Group of Experts on the Scientific Aspects of Marine Pollution (GESAMP). It produces studies and advises the agencies concerned on the interdisciplinary scientific aspects of standards (e.g. water quality) as well as on principles and guidelines (e.g. waste disposal). GESAMP also undertakes a critical review of methods used in its field and maintains an up-to-date list of harmful substances. Advice on sea pollution from the atmosphere and a contribution towards the specification of parameters to be monitored in developing systems for monitoring marine pollution also come within the scope of GESAMP.

3. The WMO is co-ordinating studies on the movement of surface drifting pollutants and on standardizing methods of observation and analysis for the purposes of monitoring marine pollution. The IAEA is co-ordinating a series of studies on the effects of radioactive waste on the marine environment. The United Nations, through the Office of Ocean Economics and Technologies of ESA, is pursuing its activities relating to the mineral resources of the sea and the technological development associated with their exploitation, including the possible environmental impact of such activities.

4. In addition to the training and education programmes organized by United Nations agencies in their respective fields of competence, the IOC has set up a working group on Training, Education and Mutual Assistance (TEMA) whose purpose it is to identify training needs in the marine fields and to facilitate the co-ordination of training within agency programmes.

5. Outside the United Nations system, marine and marine related research and evaluation work is being carried out by many national institutions, under the auspices of regional and international scientific bodies. The International Council for the Exploration of the Sea (ICES), for example, is undertaking intensive studies of the pollution of the Baltic and the North Sea.

^{1/} SCOR: Scientific Committee on Oceanic Research
ACMRR: Advisory Committee of Experts on Marine Resources Research
ACOMR: Advisory Committee on Oceanic Meteorological Research
ECOR: Engineering Committee on Ocean Resources.

A. Initiated actions

6. Action has been undertaken to start preparing a comprehensive plan for the GIPME, as well as a report on the health of the oceans. In particular, a meeting of the joint SCOR, ACMMR, ACOMR, ICES, GESAMP working group on marine pollution research was supported to review that plan.

7. The inter-sessional working groups of GESAMP are studying specific forms of marine pollution, including the effects of oil on marine ecosystems, the selection of sites for the disposal of wastes into the sea, the environmental criteria for coastal water quality (review of harmful substances and specification of physical, chemical and biological parameters for the monitoring of marine pollution). At the time when this document was being written, consultations were taking place with the IOC on the pre-programming steps that could be initiated to support these activities.

8. Many countries use rivers and the sea as acceptors for the controlled release of radioactivity from nuclear facilities. The development of nuclear power programmes and also of nuclear propulsion from ships will increase the incidence of both planned and unplanned releases of radioactivity into the aquatic environment. In order to assess the state of the problem, UNEP is organizing, jointly with IAEA, a symposium on the evaluation of the radiological impacts of the release of radioactive effluents from nuclear facilities into the aquatic environment.

9. For the Mediterranean area, UNEP is organizing, jointly with IOC, a workshop to review pollution research programmes and make proposals for filling in gaps and avoiding duplication. The workshop will also provide guidance for regional pilot projects and inter-calibration as a scientific basis for the monitoring programmes.

10. For the Caribbean area, an IOC/FAO Steering Committee will, with support from UNEP, prepare for a workshop in 1975 which will evaluate the state of pollution in the Caribbean area and its effect on fishery resources and develop a technical basis for a pilot project for marine pollution monitoring in the area.

B. Planned actions

11. The Executive Director will consider supporting relevant research activities which could contribute to the GIPME plan upon its formulation on the basis of the outcome of the meeting of the Joint Working Group of Pollution Research and in co-operation with other agencies concerned, including the scientific advisory bodies of the IOC (SCOR, ACMMR, ECOR, ACOMR).

12. In co-operation with the agencies and institutes concerned, it is planned to prepare training courses directly relating to marine conservation and pollution problems.

13. Support will be given, in connexion with the International Referral System (IRS), to the development of interdisciplinary referral systems covering marine pollution data and scientific information.

14. In the light of the outcome of the activities initiated with respect to the Mediterranean and Caribbean areas, consideration will be given to follow-up programmes.

15. It is also intended to develop a programme for evaluating the state of pollution in the Indo-Pacific region and the effects of pollution on fishery resources. A technical basis is to be established for a pilot project for marine pollution monitoring in the area. Special attention will be given to areas seriously affected by oil pollution from industrial and domestic waste, e.g. the Malacca Straits.

4.12 Control

(1) International agreements

Some relevant background information

1. It is increasingly realized that international and regional agreements are needed for the control of marine pollution. Two such international agreements have recently been negotiated (see the next two paragraphs), and in addition preparations are being made for the forthcoming Conference on the Law of the Sea.

2. The London Convention on the Prevention of Marine Pollution by Dumping of Wastes and other Matters, 1972, is open for accession. This Convention classifies harmful substances into three categories, prohibits completely the dumping of the most dangerous of them and requires special permits for the dumping of specified substances in the second category and general permits for the dumping of substances in the third category. Under this Convention, the IAEA is responsible for defining high-level radioactive wastes which are unsuitable for dumping, and for formulating recommendations concerning the issue of special permits for other radioactive wastes. Draft recommendations by IAEA are now being studied by member States.

3. The IMCO Conference on Marine Pollution (London, 8 October - 2 November 1972) adopted an International Convention for the Prevention of Pollution from Ships, 1973, and a Protocol Relating to Intervention on the High Seas in Cases of Marine Pollution by Substances other than Oil. It also adopted a number of resolutions inviting IMCO and governments to pursue studies on scientific and technical problems with a view to the effective implementation and further improvement of the Convention, and concerning other matters related to the prevention and control of marine pollution. Resolution 3 of the Conference was particularly intended to respond to recommendation 86(e) of the Stockholm Conference and the recommendation of the Governing Council of the United Nations Environment Programme referred to earlier in this document.

4. Much attention has also been given to international environmental law in the United Nations Committee on the Peaceful Use of the Sea-bed and the Ocean-floor beyond the Limits of National Jurisdiction, in the course of its preparation for the Third United Nations Conference on the Law of the Sea. The Conference is expected to prepare a comprehensive treaty, establishing a new legal regime for the oceans.

A. Initiated actions

5. UNEP participated actively in the preparation of the London Convention on the Prevention of Marine Pollution by Dumping of Wastes and in the 1973 IMCO Conference on Marine Pollution. Through its support for the interagency expert group (GESAMP) UNEP is contributing to the early establishment of a scientific basis for judging the consequences of the disposal of wastes into the sea, as well as to the updating of the review of harmful substances.

6. The Executive Director, in his statement at the opening of the IMCO Conference, made a number of suggestions concerning the lines on which the proposed Convention should be drafted in order that it should achieve the environmental objectives approved by the Stockholm Conference and by the Governing Council.

B. Planned actions

7. In accordance with guidance given by the Governing Council during its first session, support will be given to the effective implementation of the London Ocean Dumping Convention, by ensuring the availability of scientific expertise for the review and updating of the technical annexes and the provision of other forms of assistance, as necessary.

8. While the IMCO Conference has substantially achieved its objective by concluding the International Convention for the Prevention of Pollution from Ships, 1973, it adopted numerous resolutions which called for further scientific and technical studies and improved measures. These include:

- (a) development of new techniques and methods for cleaning, recycling and disposing of hazardous substances carried by ships;
- (b) development of devices and chemicals used in removing oil and other harmful substances discharged into the sea;
- (c) review of the problems associated with the discharge of light refined oils;
- (d) development of a practicable method of identifying promptly the discharged oil as the oil loaded on board a certain ship;
- (e) development of more sensitive, accurate and reliable instruments for measuring oil content;
- (f) examination of the method and procedure necessary to establish water quality criteria;
- (g) development of internationally applicable procedures and arrangements for the discharge of noxious liquid substances into the seas;
- (h) evaluation of the hazards due to new noxious liquid substances;
- (i) development of standard and test methods concerning the discharge of sewage from ships.

UNEP will co-operate with IMCO in developing programmes for scientific and technical studies and measures in order to facilitate the effective implementation and improvement of the Convention. The establishment by the IMCO Assembly of the new Marine Environment Protection Committee, widens the scope of IMCO's capabilities and interest in a way that will facilitate further co-operation between UNEP and IMCO in the protection of the marine environment from pollution arising from ships.

9. The IMCO Conference further adopted an article in the Convention and an associated resolution urging Governments to promote, in consultation with IMCO and other international bodies, and with assistance and co-ordination by the Executive Director of UNEP, support for those States which request technical assistance for:
(a) the training of scientific and technical personnel; (b) the supply of necessary equipment and facilities for monitoring; (c) the facilitation of other measures and

arrangements to prevent or mitigate pollution of the marine environment by ships; and (d) the encouragement of research. Appropriate programmes will be developed, in co-operation with IMCO and taking account of the need expressed by States, for the provision of the abovementioned technical assistance.

10. It is intended to contribute to the preparation of the forthcoming Conference on the Law of the Sea by facilitating a study on the environmental impacts of the exploration and exploitation of sea bed resources and on measures for preventing and controlling marine pollution resulting from such activities. It is also planned to co-operate with the Conference in co-ordinating work on the environmental aspects of the law of the sea and in promoting scientific, technical and financial co-operation with a view to providing a basis for the further development of international legal measures for the prevention and control of marine pollution and for the protection of living resources of the seas.

11. Much depends on the outcome of the Conference on the Law of the Sea, for it will affect UNEP's role with respect to international agreements for the control of marine pollution.

(2) Regional agreements

Some relevant background information

12. Various agreements and other control measures are in existence or contemplated at the regional level in relation to specific bodies of water. These instruments and measures reflect the growing concern with land-based sources, as well as the traditional maritime sources, of pollutants in the seas.

13. Preparations have been made by the Government of Kuwait for convening in January 1974 a "Regional Conference on Water Pollution in the Gulf" to consider the environmental situation in that body of water and to find ways and means to protect it from further pollutants. All riparian States will be invited to attend.

14. The Mediterranean in particular deserves high priority attention. Other seas of obvious interest are the Baltic and the Black Sea. Some governments are already actively negotiating the establishment of agreements relating to these bodies of water. A diplomatic conference on marine pollution in the Baltic is being prepared for early 1974, at which a convention for limiting the discharge of harmful substances into that sea will be considered.

A. Initiated actions

15. UNEP is supporting an inter-parliamentary conference on the control of pollution in the Mediterranean which is to focus attention on protection measures (conference to be held in March 1974 under the auspices of the Inter-Parliamentary Union). The objective of the conference is to bring members of legislative bodies together to discuss, with the help of experts and representatives of international and regional organizations concerned, the sources and the effects of pollution in the Mediterranean and to recommend early action by governments concerning specific matters.

16. UNEP is following closely the initiative of the Government of Kuwait in convening the regional conference referred to above, and is lending its support to the conference.

B. Planned actions

17. In the light of progress towards a political consensus on the control of pollution in the Mediterranean, the Executive Director will take the necessary steps for the drawing up of a regional convention for the control of this pollution.

18. In the light of the outcome of the "Regional Conference on Water Pollution in the Gulf", the Executive Director will consider supporting action, with a view to formulating a regional convention for the control of pollution in that body of water.

(3) Control of marine pollution from land-based sources, including rivers

Some relevant background information

18. Little is known about the impact of pollutions from land-based sources on the marine environment, and very little has been done at the international level to assess this impact scientifically, or to prepare international guidelines for the control of pollution from land-based sources.

19. A group was established within the framework of GIPME to review present knowledge of the transport of water and of dissolved and suspended substances from rivers to oceans, including their subsequent effect. This group will evaluate present methods and propose arrangements for monitoring these inputs.

20. Studies of environmental pollution through the atmosphere, including the atmospheric transport of pollutants from land to sea, are being co-ordinated by the WMO. Its Advisory Committee on Oceanic Meteorological Research (ACOMR) studies, jointly with SCOR, the tropospheric transport of pollutants and their transfer to the oceans.

21. A conference of twelve Western European Governments, convened in Paris on the initiative of the French Government, adopted on 19 December 1973 the text of a Convention for the prevention of marine pollution from land-based sources. The object of the convention is to prevent and control pollution of the North-East Atlantic from land-based sources situated in the territories of the parties through direct discharges and watercourses. By the terms of the Convention the parties undertake to eliminate pollution by organohalogen compounds which are not or not readily degradable, mercury and cadmium compounds, persistent synthetic materials and persistent oils and hydrocarbons, and to limit strictly pollution by organic compounds of phosphorus, silicon, tin, elemental phosphorus, non-persistent oils, arsenic, lead, copper, zinc, nickel and chromium. The Convention calls for appropriate measures to be taken by the parties to prevent pollution by radioactive substances. The parties are to enact specific regulations governing the quality of the environment, discharges into the seas and watercourses flowing into these seas, and the composition and use of substances and products. The Convention makes provision for monitoring. After ratification, a commission is to be established to ensure observance of the terms of the Convention. The participants in the Conference recommended that, pending ratification, a working group should be appointed within six months to study ways and means of giving effect to the objectives of the Convention.

A. Initiated actions

22. The joint SCOR/ECOR/IASH/ACMRR/UNESCO working group on River Inputs to Ocean Systems (RIOS) was supported in carrying out a review of the present state of knowledge and evaluating methods and arrangements for monitoring these inputs. The work of this group will be closely related to that of the International Hydrological Decade (IHD).

23. Arrangements were made to start action towards developing a register of clean rivers on an entirely voluntary basis, in co-operation with UNESCO and countries able to contribute to this programme. The initiated action consists of collecting and examining all available information within national and international organizations. An expert meeting will then be organized to establish criteria for selecting "clean" rivers. In particular an analysis will be made of the IHD network of river stations where discharge, quality of water and sediment transport are measured and reported.

24. Support was extended to a meeting of an ad hoc group of experts on Pollution of the Oceans Originating on Land (POOL) which was established within the framework of GIPME to study this problem and to suggest practical and effective means of obtaining information about the quantities of important pollutants introduced into the ocean from land-based sources, whatever route they may take. The activities of this group will be co-ordinated with those of the RIOS group.

25. Support was provided to allow inter-sessional work to be carried on by GESAMP on the establishment of criteria for the quality of coastal water for the impact of oil on the marine environment.

B. Planned actions

26. In the light of the outcome of the work of the groups mentioned above, and other work within and outside the United Nations system, the Executive Director will prepare a programme for future activities in this area. With respect to the development of a register of clean rivers, it is planned to convene, after criteria for selecting clean rivers have been established by a group of experts, an intergovernmental meeting to consider these criteria and agree on further action to be taken.

PROGRAMME ACTIVITIES

4.21 Protection of living resources against harmful effects of marine pollution and intensive exploitation

1. A number of international fishery councils and commissions exist. FAO's Intergovernmental Committee on Fisheries (COFI) advises on policies and programmes. Several FAO fishery councils and commissions are promoting and co-ordinating programmes for estimating the state and dynamics of the resources, the effects of fishing and their interaction with the environment. They will progressively become involved in pollution studies and protective measures.
2. FAO has a number of regional fishery bodies (e.g. those concerned with the African, Mediterranean and other regions) which undertake studies through experts from member countries on resource evaluation, aquaculture and pollution. They also formulate guidelines for fishery management and development.
3. The following is an outline of current and planned activities to be undertaken by some of these bodies:
 - (a) The General Fisheries Council for the Mediterranean (GFCM), together with the International Council for the Scientific Exploration of the Mediterranean (ICSEM), has prepared a report on "The state of marine pollution in the mediterranean and legislative controls". This report constituted the basis for the decision adopted by GFCM member governments to convene in December 1973, under the auspices of FAO, an intergovernmental consultation for discussing the principles to be observed for the purpose of protecting living aquatic resources and fisheries from marine pollution. GFCM is also promoting studies with a view to initiating pilot experiments in biological monitoring. These will contribute to general pollution studies and general monitoring within the framework of the Co-operative Investigations in the Mediterranean (CIM).
 - (b) The European Inland Fisheries Advisory Commission (EIFAC) is mainly concerned with freshwater pollution, but many of its activities (such as development of water quality criteria, standards, etc.) are relevant to the assessment of marine pollution and living resources.
 - (c) Fishery data services for both FAO regional fishery bodies and field projects are provided by the FAO Fishery Data Branch, which include: Advisory services relating to the collection and analysis of data, data inventories, the storage of data from regional bodies and field projects which have no data storage capability, and the preparation of regular summaries of statistics and data provided by national governments. The FAO Fisheries Data Centre is developing a programme for determining levels of contaminants in aquatic organisms.
 - (d) The FAO Aquatic Sciences and Fishery Information System (ASFIS) provides abstracts of scientific literature and maintains registers of experts, institutions, training opportunities, etc.
 - (e) The FAO Advisory Committee on Marine Resources Research (ACMRR), on its own and in conjunction with the International Association for Biological Oceanography (IABO), has established working parties whose studies are expected to help in evaluating the impact of pollution on aquatic resources.

4. Among other regional activities carried out recently, special mention should be made of the steadily progressing co-operation among the Baltic States which share a serious concern about the effects of marine pollution on living resources in the Baltic. The Convention on Fishing and Conservation of the Living Resources in the Baltic Sea and the Belts was signed on 13 September 1973 at a diplomatic conference held at Gdansk on the initiative of the Polish Government; standing machinery was established to give effect to the Convention.

A. Initiated actions

5. Action has been initiated to develop, in co-operation with the Fisheries Data Centre and the Aquatic Science and Fisheries Information Service (ASFIS) of FAO, a system for the compilation, analysis, storage and retrieval of relevant information and for obtaining data on the effects on resources of man-made changes in the environment, in particular the effects of pollution on living aquatic resources.

B. Planned actions

6. In the light of the outcome of the action initiated, the Executive Director will consider what subsequent activities may be required for the further development of the above-mentioned information system, in particular:

- (a) a survey of activities of international and regional organizations dealing with the conservation and management of the living resources of the oceans;
- (b) the development of a programme for evaluating and preparing guidelines for regional actions to protect aquatic resources from harmful effects caused by marine pollution.

4.22 Conservation of aquatic mammals

1. The FAO Advisory Committee on Marine Resources Research (ACMRR), acting on a recommendation of COFI, has established a Working Party on Marine Mammals, to examine and prepare a report on the identity, distribution and state of stocks of marine mammals which are exploited by man or affected by other human activities. The International Whaling Commission has adopted a resolution calling for the cessation of the commercial taking of antarctic fin whales as from the expiry of three years after the adoption of the resolution (1973).

A. Initiated actions

2. The Executive Director in a note dated 28 February 1973, sent to all member States engaged in whaling activities which are not parties to the International Whaling Convention, urged them to accede to that Convention.

3. Support was extended to enable the ACMRR Working Party on Marine Mammals to review existing data and resource evaluation and to draft proposals for further required research programmes and guidelines for the improvement of the collection of biological data.

4. Support is being given to FAO to enable it to undertake an evaluation and review of research work on biological effects of pollutants, on biological accumulators, and on ecological indices, and to provide guidelines for further research in this area in order to strengthen a scientific basis for monitoring of biological effects of marine pollution.

B. Planned actions

5. The formulation and implementation of an international whale research programme, aimed at a better understanding of whale populations, including improved methodologies for monitoring, will be supported.

6. The degree of international action so far evidenced to protect these species is rather inadequate, and further action is clearly needed to ensure the effective protection of whales and other threatened marine mammals.

7. On the basis of the evaluation of the report of the ACMRR Working Party and other initiated studies, further programmes in this area will be developed.

5. Conservation of nature, wildlife and genetic resources

1. The Governing Council noted the following objectives, which are specially relevant to this priority area:

- "To preserve threatened species of plant and animal life, particularly those which are important to human life and well-being;
- "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." ^{1/}

Context for action

2. The conservation of natural resources can ensure that the environment resulting from economic development will be satisfactory to the people involved and be self-sustaining or capable of being sustained and that it will be healthy, challenging and offer opportunities for future change. Ecological knowledge is as essential to conservation as it is to development. The conservation values to be considered in development planning ought, therefore, to be related to ecological information, without which sentiment and subjective evaluation will prevail. Equally, however, the economic values for the same development planning must take ecological information into account, failing which it is probable that the errors of the past will be repeated.

3. It is with this understanding that the Executive Director intends to proceed with the fulfilment of the above-mentioned objectives.

Estimated support from the Fund:

The estimated support from the Fund for planned activities within this priority area is set out below:

| 1974 | 1975 (in millions of US dollars) | 1976 |
|------|-------------------------------------|------|
| 1 | 1.5 | 1.75 |

The priority area of "Conservation of nature, wildlife and genetic resources" comprises the three sub-areas:

- 5.1 Plants, animals and endangered species
- 5.2 Ecosystems, sites and samples (parks and reserves)
- 5.3 Genetic resources

^{1/} Decision 1(I), para. 2(k and l).

5.1 Plants, animals and endangered species

1. In a further elaboration of the above-mentioned objectives, the Governing Council requested the Executive Director:

"To promote the protection and conservation of plants and animals, especially rare or endangered species"; 1/

and furthermore specifically authorized the Executive Director

"to provide secretariat services for the implementation of the Convention on International Trade in Endangered Species of Wild Fauna and Flora in accordance with its article XII, and further asks the Executive Director to give assistance as appropriate in the preparation of other international conventions in the environment field". 2/

Context for action

2. At the moment, the value of wildlife is not known because of inadequate statistics concerning its nature, quantity, physiological condition, productivity, etc. When better data become available, it will be possible for governments to decide how wildlife compares with other renewable resources and where wildlife management is required.

3. International conventions or treaties are needed to protect species inhabiting international waters and those which migrate from one country to another. As the environmental monitoring system develops, the effects of pollutants upon wildlife will receive adequate attention.

4. The Executive Director considers that it is important to evaluate the various programmes for wildlife utilization that are being carried on throughout the world in terms of their economics, ecological consequences and effects on conservation. Proposals for the cropping of wildlife can readily come into conflict with other proposals for its protection. It is essential to know to what extent these are compatible. Only after the economic value has been assessed, and the ecological implications analysed, can the appropriate land-use be determined. Programmes will be carefully developed on these lines, taking into account the activities under the heading "Conservation of ecosystems, sites and samples (parks and reserves)".

Estimated support from the Fund:

The estimated support from the Fund for planned activities within this sub-area is set out below:

| 1974 | 1975 | 1976 |
|-----------------------------|------|------|
| (in millions of US dollars) | | |
| 0.25 | 0.25 | 0.25 |

1/ Decision 1(I), para. 12 (f) (i).

2/ Ibid, para. 31.

Some relevant background information

5. The most important event which has occurred in this field since the Stockholm Conference is the conclusion of the Convention on International Trade in Endangered Species of Wild Fauna and Flora, concluded in Washington by an 80 - nation Plenipotentiary Conference in February 1973. Action has been taken with respect to the Governing Council decision cited above.
6. Other recent conventions concern the Protection of the World Cultural and Natural Heritage ^{1/} and the Wetlands of International Importance Especially as Waterfowl Habitat. ^{2/}
7. Under the regular FAO programmes for 1974/75, there is provision for a programme to communicate data on a global basis concerning the inventory and utilization of wildlife resources. FAO also envisages, under its regular budget, a programme for methodology of assessing the potential of outdoor recreation, including the economic and environmental implications of tourism.
8. The ICSU/International Biological Programme Conservation Sections have been concerned with the protection of certain islands for the benefit of science.
9. The primary non-governmental organization with competence in this field is the International Union for the Conservation of Nature and Natural Resources (IUCN).

^{1/} Adopted by the UNESCO General Conference at its 17th session, Paris, 16 November 1972.

^{2/} Adopted by the International Conference on the Conservation of Wetlands and Waterfowl, Ramsar (Iran), 2 February 1971.

PROGRAMME ACTIVITIES

5.11 Plants, animals and endangered species

A. Initiated actions

1. The Executive Director, after taking into account the technical and administrative limitations of his own secretariat, and having considered the various organizations which could undertake the secretariat functions related to the Convention on International Trade and Endangered Species of Wild Fauna and Flora, decided that the International Union for the Conservation of Nature and Natural Resources (IUCN) would be the most suitable. Arrangements for these services have been made with the IUCN on a project basis.
2. After consultation with IUCN, the Executive Director informed the Council that the Convention was expected to come into force in the first half of 1974. The IUCN has been in contact with the Swiss Government, as depositary of the Convention, and with agencies in various countries, urging that early action be taken on ratification and other matters. Further action is needed, however, to press governments to take formal action and to increase the number of participating States.
3. Under the terms of the Convention, a conference of ratifying States should be convened as soon as possible after entry into force of the Convention. It is expected that that conference will be called toward the end of 1974 or early in 1975.
4. The conference is expected to make recommendations to UNEP on the future work and role of UNEP in this area.
5. The FAO, in co-operation with the IUCN, is designing in detail a system for collecting and analysing data concerning trace substances in wildlife.

B. Planned actions

6. The Executive Director proposes:
 - (a) that UNEP should examine the possibilities of improving the capability of existing machinery to identify illegal exploiters of wildlife in international trade, as a supporting measure to the Convention on International Trade in Endangered Species of Fauna and Flora;
 - (b) that a long-term plan should be established for the provision of data on wildlife utilization, and their interpretation, to the governments of member States, with a view to assisting them to improve wildlife management as a source of protein and food, and for economic and recreational activities;
 - (c) that a detailed study should be carried out to compare the productivity and the return of game production with domestic animal production in several ecosystems. Bearing in mind the priorities proposed for action under the heading of "Land, water and desertification", it is expected that the first ecosystem to be studied will be arid lands.

5.2 Ecosystems, sites and samples (parks and reserves)

1. The Governing Council requested the Executive Director to:

"promote the identification and conservation of unique natural sites and especially representative samples of natural ecosystems". 1/

Context for action

2. While national parks and protected areas represent resources of great potential economic and environmental value to mankind, their very existence is seriously threatened because of various causes, such as the extension of agriculture, human settlements, widespread use of biocides as well as water, air and land pollution, tourism, game, and often because management is based on an inadequate understanding of the natural ecological balance in a given area. Special attention should, therefore, be given to the training requirements of, and the exchange of information about, the management of parks and protected areas. The management of protected areas shared by more than one nation should be co-ordinated. With the ever-increasing tourist traffic, planning and managing this heritage become even more important.

3. In order to conserve protected areas, countries should set aside certain zones which contain an adequate representation of all natural ecosystems. A great deal of work remains to be done if an adequate network of such reserves is to materialize. Whenever necessary and feasible, the conclusion of international agreements for the common administration of such reserves has to be encouraged. The Convention for the Protection of the World Cultural and Natural Heritage could act as a basis for the preparation of more comprehensive and broader international instruments.

4. Assistance has to be given on a regional basis to create machinery for consultation and co-operation between national park administrations to put the limited expertise available to better use, and to improve co-operation in the management of parks and reserves with inter-State boundaries. Education and training will naturally be the back-bone of any such programme (see the heading "Land, water and desertification").

5. The programme for sub-area 5.2 is to be co-ordinated with the programme for sub-area 2.1.

Estimated support from the Fund:

The estimated support from the Fund for planned activities within this sub-area is set out below:

| 1974 | 1975 | 1976 |
|------|-----------------------------|------|
| | (in millions of US dollars) | |
| 0.25 | 0.25 | 0.25 |

1/ Decision 1(I), para. 12 (f) (iii).

Some relevant background information

6. Several organizations are engaged in programmes in this field.
7. The FAO Regional Forestry Commission's Working Parties have been particularly concerned with the development of a network of national parks, game reserves and forest recreative areas. The FAO Regional Working Parties on National Parks and Wildlife Management periodically review research, training and development needs. In the FAO 1974/75 regular programme, provision is made for establishing a methodology for the purpose of assessing the impact of tourism on the environment.
8. The International Commission on National Parks has been actively concerned with the revision of the 1973 United Nations list of national parks and equivalent reserves. It has also assisted in the elaboration of draft guidelines for the establishment of marine national parks and of the system of classifying natural regions of the world into biotic provinces.

PROGRAMME ACTIVITIES

5.21 Ecosystems, sites and samples

A. Initiated actions

1. The national park and reserve system of East Africa is the best developed in the whole of Africa. It is not, however, fully representative of the ecosystems in the area. In particular,
 - (a) the northern countries - Sudan, Ethiopia, Somalia - need assistance in establishing a more comprehensive system of parks and reserves;
 - (b) the semi-desert areas, and
 - (c) the Ethiopian highlands require special attention.
2. The IUCN project which has been assisted envisages assessing the existing coverage of protected areas, the elaboration of proposals for the establishment of new parks and reserves and of machinery for collaboration between the national park authorities of the sub-region. A conference on the subject will be held in the second half of 1974. One of the countries will be asked to act as host for the meeting.
3. The conference, in which the directors of the national services of parks, representatives of United Nations agencies concerned and non-governmental organizations will participate, will endeavour to:
 - (a) decide upon the completion of the parks and reserves network in the sub-region;
 - (b) establish a joint programme of research and studies in order to determine the most appropriate scientific procedures of park management;
 - (c) define needs in training, legislation, etc.
4. Latin American countries whose parks and reserves are still in an early stage of development need assistance in preparing management plans for parks and working out a methodology for the administration and operation of parks and reserves, including a design course for the training of personnel.
5. IUCN has received assistance to carry out this project, involving examination of the existing parks and reserves and their potential extensions. Consultations with the national park administrations in the region will be followed by a working conference of these representatives to consider the establishment of machinery for consultations and co-operation and the initiation of follow-up action.
6. Close co-operation with UNESCO and FAO will be maintained in the execution of this project.

B. Planned actions

7. The Executive Director plans to undertake activities leading to the creation of a world network of parks and reserves representing the major biotic communities. In certain areas, no parks and reserves have been listed yet, e.g. Northern Mexican Highlands, Sahara, Malagasy Woodland Savannah. In other areas, they are few, as in the Atlas Mountains, the European sclerophyll forest, Sudano-Sahelian pseudo-steppe, etc.

8. As the protected areas of the West African sub-region do not cover more than a fraction of its ecosystem, it is proposed to examine rain forest, high mountain, pseudo-steppe and savannah desert areas in particular, and to initiate discussions with national authorities on the establishment of national parks. At the same time, co-operation between the park authorities of contiguous protected areas will be fostered, including the conclusion of bilateral agreements. The Executive Director plans to provide assistance for a working conference of the States concerned, which will be organized and serviced by the IUCN.

9. There is need for a comprehensive programme in each region for training nationals for park management. It is proposed to make a detailed assessment of work being done by governments, FAO and other bodies and, in consultation with interested governments, to elaborate a long-term programme of training at the regional level.

10. A summary of current activities and training needs in wildlife management will be prepared, indicating priorities for action and long-term requirements. A meeting of experts will be convened to define a global programme. Technical meetings in each of the regions will, as necessary, elaborate and refine the programme.

11. It is proposed to support MAB project 8 (Conservation of Natural areas and of the genetic material they contain), whose objective consists of surveying and analysing the possibilities of using this structure for creating a world system of biological reserves, including parks, contiguous zones, etc. An expert panel will then review the survey and define the criteria and the ways and means for establishing an adequate network of protected areas and biosphere reserves. Special attention would be given to problems of contiguous zones, including the use of these zones for bilateral and multilateral research activities.

12. The IUCN work so far includes the establishment of a world directory of national parks and other protected areas, and the creation of an ecological data bank maintained by IUCN in collaboration with the United Kingdom's Nature Conservancy Board, using the facilities of the Monks Wood Biological Records Centre and the co-ordinated work of the IBP national committees. It is proposed to extend assistance to IUCN to strengthen its contribution to MAB project 8.

13. It is proposed to support, as appropriate, a conference on the establishment of marine parks and reserves in South West Asia and North and East Africa, to be organized in early 1975 by IUCN and WWF; the Government of Iran will act as host to the conference.

14. It is also proposed to contribute to an international conference organized by the Marine Parks Centre of Japan, in collaboration with the IUCN (Tokyo, May 1975). The results of the conference in Iran will be taken into account by the Tokyo conference.

5.3 Genetic resources

1. The Governing Council requested the Executive Director:

"To initiate the preparation of a comprehensive catalogue of threatened species and varieties of crop plants, fish, domestic animals, and micro-organisms, and to co-operate with the Food and Agriculture Organization in its programme for genetic resource conservation;

"To support regional and national institutions in developing countries for promoting the collection, evaluation and conservation of gene pools of plants and animals for maintaining genetic diversity for the future use of mankind." 1/

Context for action

2. The diversity of and within species has to be maintained to sustain the ecological stability of the biosphere as a source of natural resources, and for scientific, educational and recreational purposes. But this diversity is disappearing as genetic resources - be they of crops or 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 the advanced domestication of genetic resources are undertaken in a few developed countries; but many genetic varieties originate in the developing countries and are threatened with extinction.

3. The Working Group of the Technical Advisory Committee of the FAO Consultative Group on International Agricultural Research recommended that a global network of genetic resources centres should be established in developed and developing countries, as well as a smaller number of crop-specific centres - including the existing and proposed "International Centres" being supported by members of the Consultative Group. A training effort has been proposed to strengthen national capacity to participate in the network.

4. The recent establishment of the International Board of Plant Genetic Resources will facilitate action in this area and is considered to be an important step forward.

5. The Executive Director considers that high priority should be given to supporting national activities in the fields of the exploration, evaluation and documentation of collections of crops, forest and animal genetic resources conservation, and the training of nationals for this purpose. For the present, it is felt that support for individual centres should be given on a bilateral basis or through the FAO Consultative Group. However, national centres in Asia, Africa and Latin America which are active in genetic resources work would qualify for support in setting up storage and exploration facilities.

6. So far as micro-organisms are concerned, it is considered that UNEP should leave the functions of collection and conservation to the organizations and national bodies at present engaged in this field. The Executive Director considers that the

1/ Decision 1(I), para. 12(f) (iv and v).

objective should be the establishment of an integrated programme of studies on the efficient use of micro-organisms for man's benefit and the training of nationals should form the framework of action in this area. Estimated support from the Fund: The estimated support from the Fund for planned activities within this sub-area is set out below:

| 1974 | 1975 | 1976 |
|-----------------------------|------|------|
| (in millions of US dollars) | | |
| 0.5 | 1 | 1.25 |

PROGRAMME ACTIVITIES

5.31 Genetic resources

A. Initiated actions

1. Crops: FAO is being supported in its activity relating to the conservation of crop genetic resources, the main objects of which are:
 - (a) to reinforce the exploratory work on endangered species, principally in three regions: the Near East, Ethiopia and tropical America;
 - (b) to support training activities in exploration, conservation and documentation, especially in developing countries.
2. Forests: Assistance has been extended to FAO for the preparation of guidelines as to the most appropriate methodology for the preservation of forest genetic resources. This will cover their conservation:
 - as natural stands in situ
 - as seed or other kinds of propagules
 - as artificial stands ex situ

Close liaison will be maintained with UNESCO, the International Union of Forestry Research Organizations and IUCN.

3. Animals: FAO, in co-operation with UNEP, will carry out a pilot study in two parts on the conservation of animal genetic resources. The first part is designed to make a preliminary survey of breeds of animals throughout the world, which will have to be considered for inclusion in the "Inventories of genetic resources most endangered by depletion or extinction". The second part is an action-oriented project and deals with the preservation of a unique cattle breed (the "Kuri" breed of Lake Chad) in its habitat. This latter part of the pilot study is expected to serve as a model for the preservation of other unique breeds in other developing countries.

4. Micro-organisms: A meeting of top scientists and representatives of FAO, UNESCO, WHO, IAEA and UNIDO is being convened by UNEP early in 1974 to suggest to the Executive Director activities that should be undertaken by UNEP relating to micro-biological genetic resources with a view to establishing programmes for:

- (a) the use of rhizobium for nitrogen fixation to replace artificial nitrogen fertilizers;
- (b) the use of micro-organisms for the treatment of waste and water; 1/

1/ see in this connexion the passages under the heading "Human settlements" concerning non-conventional sources of energy

- (c) the micro-biological control of insect vectors;
- (d) a training course for staffing centres in various countries.

B. Planned actions

5. The Executive Director proposes to convene expert meetings to work out a detailed programme for the establishment of germ plasm banks; the meetings will have the following tasks:

- (a) to determine the most urgent steps to be taken in this respect;
- (b) to identify the most interesting geographical zones;
- (c) to establish criteria governing assistance to existing institutions dealing with the preservation of genetic resources, and
- (d) to advise on the desirability of supporting the establishment of such new institutions as may be needed to create a world network of germ plasm banks.

6. He also plans to take full advantage of the newly established International Board of Plant Genetic Resources, which will have a major responsibility, in co-operation with FAO, for identifying general and specific needs for the exploration, collection, evaluation and conservation of plant genetic resources, with particular reference to species of major economic importance and their wild and cultivated relatives, with a view to determining priorities among them and to ensuring to the fullest possible extent that the materials conserved are made available for plant breeding and other scientific activities, as required.

6. Energy

1. The objective noted by the Governing Council for this area 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". 1/

2. The Governing Council requested the Executive Director:

"To collect detailed information on the problem of the world's energy crisis, which is highly complex and has many unforeseen ramifications, for presentation to the Governing Council at its next session". 2/

Initiated actions

3. The world energy picture and the facts underlying it are changing rapidly, and many studies have been undertaken concerning various of its aspects. A review of the current situation and prospects, including alternative energy sources, has been commissioned from a consultant. It will be the basic document for a meeting of experts, who will be asked to advise the Executive Director on his report to the Governing Council concerning the energy situation.

4. A process of consultation is being undertaken with the other principal parties involved in major energy studies to help develop a comprehensive framework for an overview of all principal activities in this area as a basis for reporting to the Governing Council.

5. In the light of these two reports the Executive Director expects to formulate proposals to the Governing Council for further work connected with major world energy problems.

Estimated support from the Fund: The estimated support from the Fund for planned activities in this area is set out below:

| 1974 | 1975 | 1976 |
|-----------------------------|------|------|
| (in millions of US dollars) | | |
| 0.1 | 0.1 | 0.1 |

1/ Decision 1(I), para. 2 (i).

2/ Ibid., para. 12 (g).

Chapter III

FUNCTIONAL TASKS

Introduction

1. The Governing Council decided that the major functional tasks of the Programme would consist of:

- (a) the identification and assessment of the major environmental problems for which "Earthwatch" will be one of the important instruments;
- (b) environmental management activities;
- (c) supporting measures.^{1/}

2. In connexion with the assessment component, the Council identified two functions for which it authorized the Executive Director to initiate action; these are treated below under the sub-headings Monitoring and International Referral System. These sub-headings correspond to two of the four functions pertaining to assessment, viz "monitoring" and "information exchange". The other two, "evaluation" and "research", are treated in connexion with each of the priority subject areas in the preceding chapter.

3. As an example, to achieve the objective of helping governments in managing forest resources so as to meet present and future needs, many functional activities will be necessary. Those that relate to research and evaluation leading to better understanding and overall assessment of the problem are considered primarily under the heading Land, water and desertification in the previous chapter where a separate sub-heading, Ecosystems, covers forests. Those activities which involve monitoring and exchange of information concerning forests are treated below under the relevant sub-headings. All four types of activities fall within the scope of "Earthwatch" even though they may be mentioned under different headings. This is an inherent difficulty in dealing with environmental problems. It was the recognition of the shortcomings of the traditional, sectoral approach which led governments to approve the functional approach as an alternative way of presenting information.

4. In connexion with the management component the Governing Council did not identify any particular activity - aside from those planning and management functions which are inherent in each of the priority subject areas - but set certain tasks which are considered under this sub-heading below.

5. Among the supporting measures the Council specified four types of activity as most important:

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

^{1/} Decision 1(I), para. 4.

- "(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 and the provision of assistance to governmental or non-governmental efforts aiming at increased availability of environmental information related to development." 1/

6. This chapter will, therefore, cover the following functional tasks:

- (i) environmental assessment: Earthwatch;
- (ii) environmental management;
- (iii) supporting measures: information, education and training, and technical assistance.

1/ Decision 1(I), para. 4.

1. Environmental assessment: Earthwatch

1. Particularly relevant to this functional task is the first of three general policy objectives enunciated by the Council:

"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, and for safeguarding human well-being as well as ecosystems." 1/

Context for action

2. "Earthwatch" is the name given to a programme which is designed to provide the global environmental assessment needed for the purpose of ensuring that decisions made concerning the management of the environment are sound and rational. The primary objectives of Earthwatch are to observe and assess the effects of man's activities upon the environment and the effects of the environment upon man. The functions involved in Earthwatch are evaluation, research, monitoring and information exchange.

3. The performance of certain functions connected with monitoring and information exchange was called for by the Council at its first session, and these are treated in this section of the document. The others - evaluation and research - form an integral part of each priority subject area and as such are treated in chapter II.

4. Actions in the areas of monitoring and information exchange are to be initiated and co-ordinated by UNEP under two sub-headings:

(a) The Global Environmental Monitoring System (GEMS)

(b) The International Referral System for Sources of Environmental Information (IRS).

Estimated support from the Fund: The estimated support from the Fund for planned activities within this area is set out below:

| 1974 | 1975 | 1976 |
|------|-----------------------------|------|
| | (in millions of US dollars) | |
| 1.7 | 2.7 | 3.5 |

1/ Decision I(I), para. 1.

1.1 Global Environment Monitoring System (GEMS)

Context for action

1. GEMS is conceived as a global environmental system composed of designated national and international facilities, services, research and other activities co-ordinated, and in some cases supported, by UNEP. In developing Earthwatch, UNEP is expected to build upon elements which already exist throughout the world, including the programmes and activities of many countries and international organizations. Thus, the Integrated Global Ocean Station System (IGOSS), the Global Investigation of Pollution in the Marine Environment, the WHO International Reference Centres and collaborating institutions, the International Hydrological Decade system of river stations, the World Appraisal of Fishery Resources, the World Forest Appraisal, the World Weather Watch and the Global Atmospheric Research Programme, are but a few examples of the many programmes and activities that must be utilized in building up an integrated GEMS.

Estimated support from the Fund: The estimated support from the Fund for planned activities in this sub-area is set out below:

| 1974 | 1975 | 1976 |
|------|-----------------------------|------|
| | (in millions of US dollars) | |
| 1 | 1.5 | 2 |

A. Initiated actions

2. The actions initiated in this sub-area have concentrated on the preparations for an Intergovernmental Meeting on Monitoring (Nairobi, 11 to 20 February 1974). This meeting was scheduled in compliance with the decision of the Governing Council during its first session, by which the Council

- decided that a monitoring system should be developed first for pollutants liable to affect weather and climate and persistent and widely distributed substances liable to accumulate in living organisms and to move through ecological systems, particularly along pathways leading to man; and
- requested the Executive Director to take necessary steps for the convening of a technical intergovernmental meeting in 1974 to assist in the identification of pollutants of international significance, and for defining the aims, general principles and intercalibration requirements for monitoring these pollutants, and to develop monitoring programmes for submission to the Governing Council. 1/

3. In preparation for that meeting, an inter-agency working group, which was established at the request of the Executive Director and with the agreement of the Environment Co-ordination Board, prepared a background report. In preparing this

1/ Decision 1(I), paras. 26 and 28.

report, the group drew extensively on an earlier report prepared for it by Dr. R.E. Munn, Co-Chairman of the SCOPE Commission on Environment Monitoring and Assessment, who served as a consultant for UNEP. The Executive Director is preparing another short document setting forth his views on the nature of the Global Environment Monitoring System and the steps to be taken to bring it into existence.

4. Preparations for the Intergovernmental Meeting on Monitoring include a survey of national and international monitoring activities, based on a world-wide inquiry carried out by the Smithsonian Institution with support from UNEP. The results of this survey will be made available to the Intergovernmental Meeting.
5. On the basis of these documents, the Intergovernmental Meeting on Monitoring will formulate a programme for the consideration of the Governing Council for the establishment of GEMS.
6. In these circumstances, and since information about current and planned activities in the area of monitoring and the Executive Director's proposals are contained in the aforementioned reports to be distributed to all governments well in advance of the meeting, they are not repeated in this document.
7. Apart from making these preparations for the Intergovernmental Meeting on Monitoring, the Executive Director agreed to extend limited assistance to certain current pre-programming monitoring activities of agencies, which are expected to become eventually integral parts of the future monitoring system. A summary of the support is given below:
 - (a) Support was given to the activities undertaken by WHO and WMO to assist developing countries in monitoring air pollution, by financing the participation of a number of persons from developing countries at a technical conference on the measurement of air pollution, which these two organizations jointly organized at Helsinki in July/August 1973.
 - (b) Support was given to FAO and WHO in the monitoring of levels of food contaminants with a view to determining hazards to human health and preparing a long-term programme for setting up internationally co-ordinated networks for monitoring the contamination.
 - (c) Agreement was reached to give support to WHO for the purpose of accelerating the establishment of air pollution monitoring systems in urban areas through the publication of manuals on routine methods for measuring air pollutants, preparing studies on siting of stations of air pollution in urban areas and the preparation of training courses.
 - (d) Assistance was given to the WHO programme for monitoring water quality parameters and co-ordinating existing UNDP/WHO projects for the Danube River, which will ultimately serve as models for water pollution control.
 - (e) Agreement was reached to give support to WHO and IAEA jointly in their first steps towards the establishment of a programme for monitoring radioactive and other contaminants from the growing nuclear industry. The programme will be carried out on the basis of preparatory work to be undertaken by a consultant, then considered by a group of representatives of the WHO International Referral Centres and collaborating institutions.

- (f) Agreement was reached to support the pilot project concerning the monitoring of marine pollution within the framework of IGOSS, under the auspices of WMO/IOC. This project includes the specifications of parameters to be monitored, the elaboration of methodology for the compilation and analysis of data, the determination of available basic facilities and potential areas and identification of requirements for processed data.
- (g) Support is being given to the IAEA International Laboratory of Marine Radioactivity, Monaco, which is preparing a work plan for the expansion of programmes of intercomparison and intercalibration dealing with trace elements and chlorinated hydrocarbons.
- (h) Agreement was reached to give support to the WMO programme designed to establish base-line and regional stations for monitoring background pollution. This assistance includes support for the provision of sampling equipment, the means of analysing the samples and other arrangements for collecting and publishing the results, helping in standardizing the observations and providing advice to developing countries.
- (i) Support was given to UNESCO-MAB in order to enable a task force to consider the role of the MAB structure in the monitoring of pollution, particularly the feasibility of using the structure established for the MAB programmes for implementing proposals relating to the monitoring of pollutants.

B. Planned actions

8. The establishment of a Global Environment Monitoring System will be based upon the decision of the Governing Council, in the light of the recommendations and proposals to be formulated by the Intergovernmental Meeting on Monitoring.

9. On the basis of the results of initiated activities, a programme is to be prepared, in collaboration with WHO and IAEA, concerning the monitoring of radioactive and other contaminants from the growing nuclear industry. This programme will operate within national monitoring systems and will include proposals for the comparison of methods for the collection, dissemination and assessment with respect to some selected radio-nuclides. The programme will also include plans for providing training and other forms of technical assistance to national and regional institutions in developing countries, as well as the preparation of manuals on environmental surveys proceeding nationally and internationally.

1.2 International Referral System (IRS)

1. It is proposed to bring into operation an International Referral System for Sources of Environmental Information.

2. The objective of the activity is defined in the Governing Council's decision to authorize the Executive Director:

- "To initiate the pilot phase of the International Referral System drawing upon the expertise of both developed and developing countries and of international organizations concerned and to [request him to] report the preliminary results to the Second Session of the Governing Council to permit further consideration by the Council prior to any final decision on the matter." 1/

3. In addition, the Council requested the Executive Director:

- "To continue further development of the scope, structure and capacity of the International Referral System with special consideration for timely and appropriate access by the developing countries, free of charge, to this facility." 2/

4. The Executive Director has decided that, although not expressly as part of the work of IRS, the undermentioned task should come within the scope of the pilot phase, viz:

- "To support and encourage the development of effective mechanisms for collecting, analysing and disseminating information bearing on environmental problems available in scientific, technical and legal literature and in various research institutions, keeping in mind the special needs of developing countries." 3/

Context for action

5. Any attempt to improve the environment must be based on quantified information about existing conditions. In order to plan and implement efficiently a programme for the improvement of the environment one should know about, and take into consideration, studies and activities already taking place throughout the world and designed to deal with similar problems. The IRS is designed to fill this need for internal purposes within UNEP and also as a means by which governments can be helped to gain access to environmental information, wherever it is held.

6. Reference has been made throughout this document to the need for improved facilities for the collection, storage and exchange of environmental information on an international as well as a more localized basis. The type of information to be made available includes not only quantitative data on the state of the environment (the analysed results of monitoring surveys, etc.) but also assessed documentary information about techniques for the monitoring, evaluation and control of environmental factors and bibliographical data. The IRS will be called upon to facilitate the work done in such areas as "human settlements" (for research and technology), "trade and transfer of technology" (techniques and controls), "genetic resources" and "oceans".

1/ Decision 1(I), para. 30.

2/ Ibid, para. 12(c)(v).

3/ Ibid, para.12(c)(i).

7. The International Referral System, established as a result of recommendations of the Stockholm Conference, is designed to facilitate the exchange of information, both about the physical state of the environment and about ways of improving it.

8. The demand for information about the environment arises in the context of measures designed to fulfil the general objective of promoting and implementing policies for sound environmental management, particularly in relation to the economic and social development of the developing countries. In such a context, the acquisition, storage, retrieval and dissemination of environmental information are clearly subjects for long-term planning. For the immediate future, however, the IRS is seen as the first step towards facilitating the exchange of information about local, regional and international experiences in environmental matters and relevant technologies.

Estimated support from the Fund: The estimated support from the Fund for planned activities within this sub-area is set out below:

| <u>1974</u> | <u>1975</u> | <u>1976</u> |
|-----------------------------|-------------|-------------|
| (in millions of US dollars) | | |
| 0.7 | 1.2 | 1.5 |

This sub-area comprises a single programme activity: the implementation of the pilot phase of IRS.

PROGRAMME ACTIVITIES

1.21 Implementation of the pilot phase of IRS

A. Initiated actions

1. In order to initiate the pilot phase of the IRS, the Executive Director has taken action in the form of projects carried out both internally within the secretariat, and externally by specialized agencies with the co-operation of governments. By the time of the second session of the Governing Council, meetings of experts will have been held in London, Geneva, Heidelberg and Nairobi, contributing to the design of a workable and practical IRS system.
2. As described in the brochure entitled "Introduction to the International Referral System", the IRS is now seen to have three primary functions:
 - (a) To act as a mechanism for the establishment of contacts between sources and users of environmental information, by providing in answer to a user's question, a list of those sources most likely to be able to satisfy his information needs;
 - (b) To provide a focus for an interconnected network of sources holding specialized environmental information so that such information can be readily exchanged;
 - (c) To collect and catalogue environmental information that is not held elsewhere in readily accessible form.
3. It is necessary to integrate the simultaneous development of each of these functions in order to provide ready access to the immense volume of environmental data which are being accumulated throughout the world.
4. In order to expand and improve the range of sources of information about the environment, the IRS will rely heavily on assistance from governments and from organizations concerned with the environment, using a system of national, regional and sectoral (or subject) focal points.
5. Each focal point will be asked to supply information about sources existing within the geographical or subject area concerned. Each focal point will be given the opportunity of possessing complete IRS directory facilities in a form varying from a simple loose leaf book with a comprehensive index to a fully computerized system. Each will have the capacity of directing internal queries to domestic sources as well as to the IRS and will normally be the initial receiving point of international queries channelled to such sources by IRS.
6. There will, naturally, be many degrees and kinds of co-operative arrangements. These arrangements also have to deal with the problems that may arise as a consequence of the additional load which falls on an information source as a result of close co-operation with the IRS. Furthermore, the source must accept responsibility for the veracity of the material it supplies.

7. As a matter of principle, every source of service listed by the IRS is invited to become a network partner. The build up of a network of sources and users will be most beneficial for the IRS and for all participants. By utilizing the efforts of others, it enables each source to reduce its own efforts. In addition, lively communication and efficient co-operation among the participants can be expected to develop.
8. Co-operative arrangements have been made with a large number of sources and the network of sources able to respond directly to user questions has been established. Among those already included are: the IOC Joint Task Team on Interdisciplinary and Inter-organizational Data on Information Management and Referral (in co-operation with UNESCO, FAO, WMO, IMCO and IAEA) with overall responsibility for oceans; the Environmental Law Information System of IUCN, with the co-operation of the FAO legislative library, on legislation; the Intergovernmental Centre for Documentation on Housing and the Environment ^{1/}; the IUCN on wildlife and national parks; and a number of governments which have already instituted national focal points in response to the Executive Director's request.
9. The directory of information sources has been expanded considerably, appropriate search and retrieval techniques have been designed and implemented, and a number of questions have been put to and answered by this system.

B. Planned actions

10. By the time of the second session of the Governing Council, the pilot phase project of the IRS will have been in operation for about five months. Development of techniques for information exchange can only take place in the light of experience, and while the basic simplicity of the system used in the pilot phase should not be rejected, more comprehensive techniques may be needed as the total coverage increases. Special emphasis will be laid on technical assistance and training designed to help developing countries take full advantage of the IRS. The financial aspects of the system should be the subject of a separate but related study, as precise budgeting is not possible with the present limited experience.

^{1/} Centre intergouvernemental de documentation sur l'habitat et l'environnement pour les pays de la Commission économique pour l'Europe (CIDHEC), which is sponsored by a number of States members of the ECE.

2. Environmental management

The general policy objective applicable to this area is:

"to encourage and support an integrated approach to the planning and management of development, including that of natural resources, so as to take account of environmental consequences, to achieve maximum social, economic and environmental benefits." 1/

Estimated support from the Fund: The estimated support from the Fund for planned activities within this area is set out below:

| <u>1974</u> | <u>1975</u> | <u>1976</u> |
|-----------------------------|-------------|-------------|
| (in millions of US dollars) | | |
| 0.2 | 0.3 | 0.5 |

1/ Decision 1(I), para. 1(a).

2.1 Integrated planning and management methods

1. The Governing Council requested the Executive Director to perform the following tasks:

"To assist countries, as appropriate, in the formulation of guidelines for project appraisal which take into account the environmental aspects;

"To encourage training of personnel in the techniques of incorporating environmental considerations into development planning, and of identifying and analysing the economic and social cost-benefit relationships of alternative approaches." 1/

2. Reference should also be made to the Governing Council's request to the Executive Director "to examine the degree to which the location of new industry is being or may be influenced by environmental factors and the risks and opportunities this may create especially for developing countries." 2/

Context for action

3. The Executive Director considers that, in order to take account of the full range of environmental considerations, the planning and management of natural resources should be integrated. This requires a comprehensive all-encompassing perspective in order to reconcile potentially conflicting parts. Appropriate techniques should accordingly be developed and continually refined, at both the macro and micro levels.

4. Furthermore, the Executive Director is of the opinion that national planning should reflect this approach through new methods, new structures and priorities. In order to achieve this goal, methods for drawing up environmental guidelines should be strengthened so that development planners may reach decision with better insight into the possible side-effects of development projects. To refine such guidelines, pilot actions and post-audits and audits of current projects should be undertaken to test the effectiveness of environmental measures. Existing training facilities should be strengthened and should admit a larger number of trainees from developing countries. Regional seminars should be held for planners and decision-makers on the subjects of methodology and criteria for integrated planning and management.

5. Many efforts are under way to explore means of modifying Gross National Product as an indicator of development so that it will provide a more accurate index of social welfare, broaden the traditional concept of productivity so as to allow for quality as well as quantity. These varied and not well co-ordinated efforts should be surveyed and the results should be compiled in a report to assist decision-makers at the national level.

1/ Decision 1(I), para. 12(d)(vi)(viii).

2/ Ibid, para. 12(d)(iii).

Estimated support from the Fund: The estimated support from the Fund for planned activities within this sub-area is set out below:

| 1974 | 1975 | 1976 |
|--------------------------|------|------|
| (in millions of dollars) | | |
| 0.2 | 0.3 | 0.5 |

Some relevant background information

6. UNESCO has been promoting the integrated survey approach for many years. Many of UNESCO's research programmes, such as the Arid Zone Research programme have been based on this approach. UNESCO assists several institutes. This approach is also followed by the Desert Research Institute at Jodhpur, India, and the Institute for Research on Natural Resources at Abu Gharib, Iraq (UNDP assisted project).
7. The UNESCO/ITC (International Training Centre for Aerial Survey and Earth Resources) at Enschede, Netherlands has been established to develop the integrated concept by means of training and research. The Centre has already collected considerable experience in such countries as Australia, Canada and the Netherlands.
8. In response to the relevant Stockholm recommendations, a first regional training course in tropical ecology is planned to be held by UNESCO in Venezuela later in 1973, with the support of funds-in-trust arrangements.
9. UNESCO sponsors and supports the following postgraduate courses (mostly for participants from developing countries) in integrated planning:
 - (a) ITC-UNESCO Centre, Enschede, Netherlands;
 - (b) Cours Post-Universitaire pour l'Etude et l'Aménagement du Milieu Naturel, Paris-Montpellier-Toulouse, France;
 - (c) International Postgraduate Course in Applied Geomorphology and Natural Resources Research, University of Sheffield, England.
10. A joint UNESCO/UNITAR Seminar for decision-makers is planned for the spring of 1974. An expert panel on education and training activities convened under the MAB programme in December 1972 has established a number of recommendations and guidelines for the organization of seminars for decision-makers and planners.
11. The FAO/FOR (Forest Resources Division) sub-programme concerning forest and wildlife conservation envisages the preparation of studies and methodologies for the integrated management of forest lands, with emphasis on environmental quality and based on the principle of multiple land-use. In future, emphasis will be placed on the evaluation and monitoring of environmental impacts of environmental protective measures (such as conflicts between various disciplines).
12. WHO provides guidelines for the planning, implementation and evaluation of national environmental health and pollution control programmes. The WHO/IBRD co-operative programme for water and sewerage assists governments in conducting sector studies and assessing the current status of these facilities, the constraints in reaching national targets and the suggested alternatives for solutions to the problems. These sector studies can be contributions to country programming.

13. UNIDO in co-operation with the United States Agency for International Development is implementing a programme for training national decision-makers in integrated planning and management.
14. Considerable work is being carried out by several aid giving organizations to establish common criteria for the environment. On this subject, UNIDO has produced guidelines for project evaluation. UNITAR has issued a paper on criteria governing development projects. A series of technical papers on the same subject have been proposed by the Office of Science and Technology of the United States Agency for International Development, the World Bank, the Smithsonian Institution, the International Union for the Conservation of Nature (IUCN) and others.
15. The Senior Advisers to ECE Governments held their first meeting on environmental problems at Geneva in April 1973. According to its 1973/77 programme of activities, ECE proposes to hold a seminar on systems of models and another on factors and conditions of long-term growth; these seminars will consider the role of basic products and energy and the environmental cost of growth.
16. ICSU/SCOPE released in 1972, a publication entitled "Man-made lakes as modified ecosystems". It has agreed to the continued functioning of the Working Group on Man-modified Ecosystems. It has completed a report on simulation modelling. SCOPE plans to assist developing countries in identifying major environmental problems at national or regional levels, particularly those calling for scientific research.
17. The International Union for Conservation of Nature and Natural Resources (IUCN), in conjunction with the World Wildlife Fund, is initiating a project relating to arid lands with a view to demonstrating how balanced ecosystems can be created which are economically viable.
18. For the time being, action in this sub-area is treated as constituting a single programme activity, viz development of methods.

PROGRAMME ACTIVITIES

2.11 Development of methodsA. Initiated actions

1. SCOPE has been assisted in holding a workshop, February 1974 in Canada on methods of assessing the environmental impacts of development. Environment Canada will act as host to and co-sponsor of this workshop. The workshop will prepare a consolidated review of existing methodologies, provide tentative guidelines for future evaluations and suggest methodological research that should be undertaken. Some 30 representatives, from the physical, engineering and sociological sciences, some economists, decision-makers and representatives of developing nations will participate.

2. A UNEP/SCOPE sponsored symposium on environmental sciences in the developing countries will be held early in 1974 in Nairobi (see chapter II, section 3.11, para. 2).

3. Technical assistance is being extended to ECLA in carrying out a survey of the main environmental problems, the existing legislation, institutional machinery and academic institutions which deal directly with or devote major attention to environment problems in Latin America. The survey will be carried out by ECLA in co-operation with national and regional offices of the United Nations, UNDP and specialized agencies. The results of the survey will be compiled in an inventory which is expected to help:

- (a) identify areas where UNEP can co-operate with Latin American governments in preparing diagnoses of certain environmental problems as a basis for incorporating environmental considerations into development planning;
- (b) assess the usefulness of applying the same technique in other areas of the world.

4. Assistance is being provided to enable experts from developing countries in Africa and Asia to participate in a remote-sensing training workshop being conducted by the Brazilian Space Research Institute. This workshop will stress the use of available data in development and environment planning and management, and is being held in conjunction with a seminar on the application of earth survey techniques to practical problems in developing countries during the June 1974 plenary meetings of the Committee on Space Research (COSPAR) established by ICSU.

B. Planned actions

5. Criteria for analysing and carrying out development projects in various ecosystems of international significance will be established, revised or broadened by a representative panel of experts from developed and developing countries.

6. As the environmental criteria envisaged above are established, certain pilot actions and post-audits, selected in co-operation with the World Bank, UNDP and other aid-giving agencies, will be initiated and training facilities organized. When these

criteria have been taken into account in some current projects, and in the light of the post-audit studies, it will be possible to anticipate and ultimately predict repercussions of development projects on the environment and to design suitable alternatives. In addition, suitable training materials will be prepared in conjunction with UNITAR.

7. The thorough review and assessment of new forms of environmental management in national pilot schemes should be conducted on a continuing basis, research needs identified, and experimental efforts by developing countries supported. The Information Referral System will be used as the focal point for exchanging information on these activities.

3. Supporting measures: information, education, training and technical assistance

1. The Governing Council approved the following general policy objective which is particularly relevant in this context:

"To assist all countries, especially developing countries, to deal with their environmental problems and to help mobilize additional financial resources for the purpose of providing the required technical assistance, education, training and free flow of information and exchange of experience, with a view to promoting the full participation of developing countries in the national and international efforts for the preservation and enhancement of the environment." 1/

2. In addition, the Governing Council specifically authorized the Executive Director:

"to proceed promptly with the implementation of his proposals regarding the support of environmental actions in the various countries, particularly the developing countries, through extending technical assistance, helping with the organization of training programmes, supporting the development of institutional capabilities, mobilizing additional financial resources and encouraging and supporting the development and widest possible dissemination of new, environmentally-sound technologies." 2/

3. The intricate problems of the physical capacity of the natural environment to support man and his activities will require for their solution certain actions with political and social dimensions:

- (a) Well-designed public information campaigns aimed at increasing both public awareness and appreciation of the various environmental problems resulting from man's activities:
- (b) The capacity of social systems to deal with environmental issues needs strengthening. This requires the evolution of existing and the devising of new institutional structures, particularly new forms of institutional machinery, specifically designed to cope with problems which cut across traditional disciplines, functions and sectors of activity.
- (c) The training of a professional corps of environmental planners, managers and technicians for service at the national as well as the international levels must be intensified. Alleviating the severe shortage of professionals capable of assessing and making decisions concerning the environment is a major requirement if man is to manage the critical interactions between the biosphere and the technosphere. This is a problem for both industrialized and developing countries which cannot be solved without their mutual co-operation.

1/ Decision I(I), para. 1.

2/ Ibid, para. 24.

4. Starting with this general view, the Executive Director proposes to act in conformity with the general policy objective cited above and to take the following supporting measures set out by the Council among the major functional tasks of the UNEP: 1/

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

"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;

"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;

"The provision of information and related material in support of national programmes of public information and education in the environmental field and the provision of assistance to governmental or non-governmental efforts aiming at increased availability of environmental information related to development."

5. It is clear from what has been said above that, in contrast to most other sections of the programme (which are concerned with specific problem areas, e.g. human settlements, land, water, energy, etc.) this section deals with a number of various activities which functionally support all other parts of the programme. The Governing Council specifically recognized the inter-relation between these functional activities and those in other priority areas and requested the Executive Director to proceed immediately both "with integrating this subject with the other subject areas as well as to develop action programmes specifically for this item." 2/ Consequently, this section would naturally cover various activities (e.g. training programmes) which are directly related and linked to other subject areas. It will also be noted there are internal links within this section. For example, there is a connexion between public information activities and educational programmes for adults. There is clearly a close link between education and training, particularly within the context of formal education. Finally, as some of the advanced training is in subjects involving various areas of research, there must be a link between education, training and technical assistance. Many other parts of the programme make provision for "technical assistance" for dealing with special problems; but the Governing Council felt there

1/ Decision 1(I), para. 4.

2/ Ibid, para. 11.

should also be general support to governments in evaluating their environmental needs and in planning and executing measures to meet them. Hence, "technical assistance" is grouped with the other "supporting measures" in this section.

Estimated support from the Fund: The estimated support from the Fund for planned activities within this area for each year is set out below:

| 1974 | 1975 | 1976 |
|-----------------------------|------|------|
| (in millions of US dollars) | | |
| 3 | 3.75 | 4.25 |

This priority area comprises, as indicated in the above introductory statement, the following sub-areas:

- 3.1 Information
- 3.2 Education and training
- 3.3 Technical assistance

3.1. Information

Context for action

1. A large volume of data concerning man's impact on the environment and the consequences of this impact for his continued well-being has already been collected by the United Nations family and by many scientific centres all over the world, the assembly and systematic analysis of which would make it possible to assess what further research, and especially further field research is needed. This is the precise aim of the review of environmental activities both within and outside the United Nations system, which it is hoped will be achieved with the active help of the International Referral System.
2. The Executive Director proposes to use this review as a specific tool for carrying out the specific task set by the Governing Council, namely:

"To support and encourage the development of effective mechanisms for collecting, analysing and disseminating information bearing on environmental problems available in scientific, technical and legal literature and in various research institutions, keeping in mind the special needs of developing countries." 1/
3. On the other hand, the functions of public information with which this sub-area is concerned is (a) to supplement formal education; (b) to provide background material relating to situations which the citizen will have to face and the decision which he will have to take in the course of his participation in public affairs; and (c) to ensure a wide-ranging exchange of experience so that people are not deprived of possible sources of inspiration for action or left to repeat past mistakes.
4. The existing network of television and radio stations and of newspapers is the principal means of transmitting information that UNEP must use if it is to "create awareness" and "increase consciousness and appreciation of environmental matters among the masses". 2/ Those operating and controlling these media of communication should be the primary target of UNEP's public information efforts.
5. To achieve these goals, emphasis will be laid on the assessment and collection or cataloguing of existing information about the environment to be used through the three basic means of communication:
 - (i) Audio-visual;
 - (ii) Print; and
 - (iii) People.

On the basis of this survey and by selecting the best current materials in production and in use, more effective new material could be produced within UNEP and in co-operation with other information centres. A system for distributing such present and projected materials to the mass media will be prepared, and a system for evaluating the usefulness and impact of the materials distributed, based on the audiences they ultimately reach, will be designed.

1/ Decision 1(I), para. 12(c)(i).

2/ Decision 1(I), para. 12(c)(iii).

6. Training seminars in global awareness designed for redisseminators, especially those from the publishing and broadcasting industries, are a prerequisite to the achievement of UNEP's goal in the area of public information. These seminars will be prepared in conjunction with the related industry and professional associations.

7. Throughout the foregoing processes, namely (a) the collection, assessment and reproduction of existing information materials; (b) the design and production of new materials; (c) the systematic transfer of these materials to users; (d) the evaluation of their impact; and (e) the training seminars, UNEP will ensure the inter dependence of its communication programme and of the priorities, knowledge and actions of its substantive programme, so that communications disciplines and resources will work on behalf of as well as within the programme, to provide communication support geared to programme implementation.

8. It is within this framework that the Executive Director proposes to carry out the specific tasks entrusted to him by the Governing Council, namely:

"To encourage environmental information at all levels in order to help increase consciousness and appreciation of environmental matters among the masses." 1/

"To ensure that the activities of UNEP are designed to complement and support national programmes in this area." 2/

Estimated support from the Fund: The estimated support from the Fund for planned activities in this sub-area is set out below:

| 1974 | 1975 | 1976 |
|-----------------------------|------|------|
| (in millions of US dollars) | | |
| 0.5 | 0.75 | 0.75 |

Some relevant background information

10. The strengthening of information-gathering systems within countries to ensure reliable exchange of information about local, national and regional conditions is of primary importance. The sectoral information systems of United Nations agencies are already functioning in the fields within their particular competence to integrate and disseminate information provided by national sources. Several agencies have proposed that this function should be supported by the greater participation of national information systems and by the strengthening of their part in promoting the exchange of environmental information.

1/ loc.cit.

2/ Decision 1(I), para 33

PROGRAMME ACTIVITIES

3.11 Information

A. Initiated actions

1. IUCN is being partly supported in one of its major projects, which aims at extending and making more effective existing mechanisms for informing the public about environmental problems and strengthening its awareness of these problems.
2. Preparations have been initiated with a view to establishing an Environment Programme Information Centre, which will be the main tool for the collection, assessment and reproduction of existing materials. The centre will ensure the maximum redissemination of material by traditional and modern mass media to the information services of governments, to national committees concerned with the environment throughout all levels of educational systems, to channels of mass communication and to non-governmental organizations.

B. Planned actions

3. The development of the environment programme information centre so that its services would include, among others: an "environmental fact file for journalists and broadcasters"; a master index of TV and film material on environmental subjects for television and film producers; a world review catalogue of documentary films on the human environment; and, a file describing action taken by citizens concerning the environment through non-governmental organizations at the community, national and international levels.
4. It is proposed to produce new public information materials, e.g., specialized publications, monthly bulletins, audio-visual material, to fill gaps in the information now being provided.
5. The organization of a system for the effective transfer of the appropriate information to the appropriate users, with special emphasis on testing of methods for shortening the time of delivering the materials.
6. A project for the evaluation of the impact of mass communication material on the public awareness of environmental problems will be carried out in conjunction with the International Association of Mass Communication Research.
7. Training programmes for communicators will be carried out in co-operation with the International Broadcasting Institute, the International Press Institute and several national and regional institutes of mass communication or associations of journalists.
8. A study will be carried out to examine the feasibility of extending the scope of the UNEP information programme by establishing an environmental information centre, in co-operation with the International Institute for Environment and Development with a view to supporting national environmental information programmes.
9. Preparations for the celebration of "World Environment Day 1974" will include meetings with the Directors of Information of the United Nations Agencies, international and regional organizations outside the United Nations and heads of national environmental information programmes to work out details of the production and utilization of suitable materials and vehicles for promoting the informed observance of World Environment Day.

10. Liaison with international non-governmental organizations will continue to be a major part of UNEP's information activities. The Environment Liaison Board of the non-governmental organizations is providing a useful focus for consultation with UNEP and among these organizations themselves.

11. In order to finance the production of information materials as described above, the Executive Director is also suggesting to the Governing Council that it should consider establishing, within the Fund Programme Reserve, a revolving fund (information). His suggestion to that effect is contained in document UNEP/GC/4/Add.1 which is before the Council at its second session in connexion with item 9 of the provisional agenda concerning "Matters arising from the General Procedures governing the operation of the Fund".

3.2 Education and training

1. With a view to achieving the objectives mentioned earlier, the Governing Council requested the Executive Director:

"To encourage environmental education ... at all levels in order to help increase consciousness and appreciation of environmental matters among the masses;

"To promote and support the organization of national, regional and international symposia, seminars and workshops for techniques of environmental education and research;

"To support and encourage the training of experts in various environmental fields, especially in developing countries to help in the development of local expertise;

"To support and encourage the development of relevant research capabilities in developing countries on environmental problems; 1/

"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/

Context for action

2. To satisfy the needs which the Governing Council has identified, a number of points should be taken into consideration:

- (a) Early education leading towards a consciousness of environmental management should ideally start at school level;
- (b) The formation of a professional class of environmental managers should assist significantly in involving the scientific community and in using the fruits of science as a contribution towards action to improve the environment;
- (c) While plans should be made for ensuring a more adequate supply of newly-trained environmental managers, it is essential to find new ways of injecting environmental awareness and management skills into existing organizational structures, especially at the highest levels of authority;
- (d) The design of curricula for training persons to deal with environmental issues at every level is still at a very early stage. Experimental projects should be widely encouraged.

3. An international programme of environmental education must strike a balance between the education of the masses of ordinary citizens, and the special training

1/ Decision 1(I), para. 12(c) (iii, vi, ii, iv).

2/ Ibid. para. 2(n).

of those members of the general public who affect the environment through their professional activities. The ordinary citizen must be reached both through a variety of out-of-school programmes for young and old alike (planned in conjunction with public information efforts) and through the formal school system. Specialized training can and should take place in regular or modified university programmes to some extent, but much of the activity will remain outside the context of formal education.

4. Accordingly, a balanced long-range programme should envisage: (a) mechanisms for the acquisition, analysis and dissemination of ideas and information about environmental education and training, (b) provision for the overall analysis of needs and problems and for the planning of action programmes, (c) experimentation with new methods and materials, and (d) the provision of training programmes relating to environmental problems and designed for decision-makers, middle-level and teacher training levels.

5. Within this framework the proposed programme for "Education and training" consists of the following activities chosen to meet the needs identified by the Governing Council:

3.21 Clearing house activities

3.22 Planning and pre-programming, experimentation and citizen-education programmes

3.23 Training programmes

Estimated support from the Fund: The estimated support from the Fund for planned activities within this sub-area is set out below:

| 1974 | 1975 | 1976 |
|-----------------------------|------|------|
| (in millions of US dollars) | | |
| 1.25 | 1.5 | 1.75 |

PROGRAMME ACTIVITIES

3.21. Clearing house activitiesA. Initiated actions

1. The preparation of a review of existing and planned resources and capabilities is considered a prerequisite to the formulation of an overall programme in the field of education in environmental management and administration. An activity relevant to the preparation of such a review has been initiated in co-operation with the Massachusetts Institute of Technology and the Centre d'études industrielles.

2. UNESCO possesses sources of information about environment education in a number of countries and a growing collection of illustrative material on environmental education. Other United Nations agencies have corresponding contacts in their specialized areas of environmental education and training, as do organizations such as IUCN, and a growing number of youth and student organizations and groups. Unfortunately, the links between such centres in the information network are very poor; the network should, if possible, be extended to include an increasing number of countries. In order to deal with these problems, the Executive Director will co-operate with UNESCO in developing and strengthening further a network of information about environmental education and training.

B. Planned actions

3. The initiated activities should form the basis for a long-term plan. Future activities will in part depend upon this plan. The co-operation of governments, as well as of inter-governmental and non-governmental organizations, with the Executive Director to bring an effective network into being is a clear prerequisite for achieving the goals set in this respect.

3.22 Planning, pre-programming, experimentation and citizen education programmes

A. Initiated actions

1. The Executive Director is collaborating with the Centre for International Studies of the University of Belgrade with a view to convening a workshop on "Environmental education and training programmes" in 1974. This programme is designed as a comprehensive step towards helping countries to evaluate their needs and to draw up programmes and work out methodologies in the field of environmental education and training.
2. The Executive Director has supported a pilot seminar which is to prepare suitable curriculum materials for East African education systems. It is to be organized by IUCN in co-operation with other specialized organizations.
3. The Arab League Educational, Cultural and Scientific Organization (ALECSO), in co-operation with UNEP, is carrying out a programme which aims to produce for the Arab States source books for planners of school curricula and for university students not studying ecology as a principal subject, and guidelines for a university degree in environmental management and for mass-media programmes.

B. Planned actions

4. The Executive Director is planning to support the following activities in this context:
 - (a) An International Congress on Environmental Education to be held in 1974/1975 to be organized by IUCN and UNESCO. In preparation for the Congress, due regard will be given to the results of the Belgrade Workshop mentioned above. The objectives of the Congress will be to analyse trends and problems in environmental education and to prepare a long-term co-operative international programme in environmental education and training.
 - (b) A series of well distributed pre-programming regional meetings for experts and specialists. They would elaborate alternative plans for introducing environmental elements into formal education systems at all levels; suggest necessary changes in post-university studies with a trans-disciplinary approach and recommend possible methodologies leading to the formation of a professional class of environmental managers. These meetings are expected to be spread over a two-year period.
5. As the needs in this field become more sharply defined through planning and programming, regional efforts (complementing efforts made through public information programmes) will be made to educate the citizen as to the simple steps he might take, within his means, to manage and control his environment.

3.23 Training programmes

1. It should be stated at the outset that training activity is necessary for each priority area and hence is an element common to all parts of the programme. There should also be training programmes of a more general nature (for example, planners and decision-makers should be taught to take environmental considerations into account in their plans and decisions). Through all these training programmes, it is the intention of the Executive Director to build up local capabilities and capacities to deal with the challenge which development poses for the environment.

2. The Executive Director will thus seek to arrange support for training national cadres in key areas of environmental management through the strengthening of appropriate national and regional institutions.

3. The activity will concentrate on problems and results, laying particular emphasis on the problem areas in national development efforts. Thus, the major emphasis of training programmes will be on:

Environment and development, with special reference to eco-development, administrative programmes, comprehensive development planning, special courses at institutes, faculties, etc., and techniques of environmental research and training.

4. When designing training programmes, it is important to bear in mind the relative newness of environment as an "inter-discipline" (both participants and staff are breaking new ground) and the need to ensure that a new attitude to the environment permeates all levels of decision-making.

A. Initiated actions

5. A start has been made through the systematization of a series of contacts with countries through regional UNEP representatives and by direct contacts with organizations and institutions.

6. The contacts have been made bearing in mind the requirements of "user" countries and the competence of "supply" countries and institutions, as well as those of the United Nations.

7. Arrangements are being made to support UNESCO's activities at the post-graduate level in the Netherlands and France, intended for specialists from developing countries, which would concentrate on integrated surveys and rational management practices. There will also be regional training courses in tropical and system ecology in Asia, Latin America and Africa, and a course to provide decision-makers and planners in the West African region with the elements of integrated environmental management. UNESCO is providing environmental training for engineers in institutions in developing countries. These activities will be carried out after the appropriate consultations, and participants will be drawn from the governmental and scientific sectors of developing countries.

8. The United Nations African Institute for Development and Planning is co-operating with UNEP in carrying out activities relating to the environmental problems of Africa. They involve training, seminars and conferences, preparation and distribution of documentation and textbooks on African environmental problems and advanced training for African research assistants.

9. Arrangements are being made to support a pilot seminar on environmental education methodology in East Africa (Nairobi) to be organized by the IUCN and the World Confederation of Organizations of the Teaching Professions. Consultants from "Total Environment in the Total Education" (TETE) of North America will work in this project and assist in evaluating and adapting the techniques for environmental education evolved by TETE to developing countries.

10. The Adlai Stevenson Institute of Chicago is undertaking a seminar on development and the environment in East Africa. Case studies of development projects will be used to illustrate means by which harmful environmental side effects can be avoided or minimized.

11. With the support of UNEP, UNIDO is injecting an environmental element into its existing training programmes.

B. Planned actions

12. In order to take account of considerations mentioned earlier, the Executive Director plans to consider reinforcing existing and planned training activities. Examples of such activities are cited below.

13. Tentative discussions have proceeded with certain international institutes (e.g. Battelle Memorial Institute, Geneva) concerning a series of seminars in different locations (called roving seminars) in ECAFE countries. It is likely that the participants in these seminars will be drawn from a wide range of professions.

14. Certain governments (e.g. that of the Federal Republic of Germany) and national institutes have proposed training courses designed to further the basic understanding of specific environmental problems and to establish a methodology for evaluating the environmental compatibility of government activities of various types, particularly those connected with development.

15. As may be seen from the foregoing, the planned activities in this area are still limited in range and number. It is hoped that the steps taken to establish contacts with countries, organizations and institutions will help the Executive Director to formulate a comprehensive plan leading to action programmes in this subject area.

16. In this respect, the ALECSO programme and the ECAFE roving seminars are to be used as model projects in addition to fulfilling their own purposes.

17. In the future, activities relating to training and education are to be carried out through three main channels:

- (a) an increasing number of qualified institutes in both developed and developing countries. Further possibilities exist, for example, in Canada, France, the Netherlands, the United Kingdom and the USSR, as well as in developing countries such as India and Egypt;

- (b) the various regional and sub-regional United Nations or international institutions (for example, the Latin American Institute for Economic and Social Planning, in Latin America; the African Institute for Economic Development and Planning, the African Training and Research Centre in Administration for Development, and others, in Africa; the Asian Institute for Economic Development and Planning, the Asian Centre for Development Administration, the Asian Statistical Institute, and others, in Asia and the Far East);
- (c) symposia, seminars and workshops, etc. It is proposed to rely particularly on existing international and national training institutes; and (very selectively) to organize such meetings directly under UNEP auspices.

18. For the purposes of promoting research capabilities a few centres of excellence distributed in the various regions will be selected. Collaboration between such centres is most desirable, and action will be taken to foster such collaboration.

3.3 Technical assistance

1. Among the major functional tasks decided upon by the Governing Council at its first session is:

"the provision of technical assistance to governments in evaluating their environmental needs and in planning and carrying out measures to meet them." ^{1/}

Context for action

2. The basic method of operation in the area of technical assistance will be to set up a clearing house through which the Executive Director can help those in need of assistance regarding environmental questions to gain access to, and obtain assistance from, various sources known to him. It is not intended that the Executive Director should act as a direct agent, since he is bound to avoid duplication of existing services and supplies. While the main inputs will be analytical or organizational, they will include supplementary financial support or assistance as appropriate, both by activating bilateral and multilateral help and by providing help from the Fund. A particular type of assistance that will be required relates to the availability of basic skills or institutions. Where these are lacking, the Executive Director's method of operation may have to go farther than that of the "clearing house" outlined above.

3. Any technical assistance operation is multi-faceted. Governments of developing countries, inter-governmental and trans-national groupings and national or regional institutions call for assistance. Trans-national groupings of advanced countries, United Nations bodies and agencies, and specialized institutions and institutes provide expertise (backed by resources where possible). In addition, there are capabilities within developing countries which could be tapped with the financial support of third countries.

4. Nevertheless, technical assistance will not be restricted to developing countries. There is both need and scope for the developed countries to systematize further technical co-operation among themselves. In the developing countries also there is ample scope for the exchange of technical data and common action.

Estimated support from the Fund: The estimated support from the Fund for planned activities within this sub-area is set out below:

| 1974 | 1975 | 1976 |
|-----------------------------|------|------|
| (in millions of US dollars) | | |
| 1.25 | 1.5 | 1.75 |

^{1/} Decision 1(I), para. 4(a).

PROGRAMME ACTIVITIES

3.31 Technical assistance

A. Initiated actions

1. UNEP is supporting ECLIA in preparing an inventory of the main environmental problems, the institutional and legal framework and the capacity for research in its region. This activity is designed as the first step towards determining precisely what are the environmental problems in Latin America; governments in the region consider that the specific problems are not yet well enough defined. When such an inventory has been produced, the Executive Director will:

- (a) be in a much better position to extend assistance to Latin American governments in solving environmental problems with regional or global implications;
- (b) use the preparation of the inventory as a model for the collection of analogous data about environmental problems in other areas of the world.

2. It is thought that such inventories should offer the tool for giving effect to the decision of the Governing Council which considers "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" 1/ as one of the major tasks of the UNEP.

B. Planned actions

3. In the immediate future the following actions are planned:

- (a) the assistance needed to carry out substantive projects discussed elsewhere in this document will be developed as required on a continuing basis;
- (b) as regards assistance beyond the needs arising out of the substantive programme, major emphasis is expected to be placed on formulating laws and regulations, and establishing necessary governmental and related machinery. In the case of a major problem area, technical assistance could be provided for devising low-cost environmentally sound technologies as discussed under the heading "human settlements technology". The assistance provided would also include, wherever possible, the element of on-the-job training.

4. One incidental (though quite important) element is the initiation of orientation and briefing arrangements for United Nations experts going on mission. In view of the nature of the task, it is hoped to rely at this stage on the regional representatives as contact points for experts. It is also hoped to be able to issue an appropriate brochure which could assist both the regional representative and the experts.

1/ Decision 1(I), para. 4(c).

5. So far as technical co-operation among countries is concerned, it is proposed:

- (a) in the case of developed countries, to provide means by which specific joint studies, research, exchange of information and mutual exchange of personnel concerned with environmental matters may take place on a wider basis; and
- (b) in the case of developing countries, to carry out similar action, though at a different level and with emphasis on different subjects.

6. In order to facilitate action at short notice in this sub-area, the Executive Director has suggested that the Governing Council should consider giving him discretionary authority to use the resources of the Fund Programme Reserve, up to a maximum amount of \$500,000 in any given financial period, for the purpose of the assignment of experts or of strengthening the capacity of institutions to support programmes relevant to the objectives of UNEP. His suggestion to that effect is contained in document UNEP/GC/4/Add.1, which is before the Council at its second session in connexion with item 9 of the provisional agenda concerning "Matters arising from the General Procedures governing the operation of the Fund".

Chapter IV

FUTURE DEVELOPMENT OF THE PROGRAMME

1. The Governing Council at its first session requested the Executive Director to perform specific tasks relating to certain areas of the then proposed action plan 1/ and invited him

"to assemble information and identify capabilities regarding the other areas of the action plan with a view to reaching a stage that permits the formulation of concrete programmes for their implementation." 2/

2. The Council also noted

"the intention of the Executive Director to initiate preliminary work in the following areas which may lead to specific proposals for consideration by the Governing Council at a later date:

"(a) Possible outer limits to changes which man's activities may engender in some elements of the biosphere;

"(b) Beneficial use of weather and climate modification technologies;

"(c) Particular environmental problems of specific industries;

"(d) 'Eco-development' designed to support the efforts of the people living in villages and other rural settlements to better understand and utilize in their own development the basic natural resources and human skills available in their own environment;

"(e) Arrangements by which Member States can reach agreement on standards and laws, and other processes to ensure that they perceive the safe limits of natural processes at work in the biosphere and warn them of impending risks." 3/

3. In the short period since the first session of the Governing Council it has been possible to carry out a limited number of activities in response to these decisions.

A. "Outer limits"

4. The Executive Director had the benefit of consultations with a distinguished group of scientists from around the world at a meeting held at Aspen (Colorado) in August 1973. The group considered various aspects of the question of outer limits under the following headings:

1/ UNEP/GC/5.

2/ decision 1(I), para. 13

3/ ibid, para. 15.

Climatic change, toxic substances, soil and water, energy, population contemporary stress, and managing environmental problems.

The main issues raised in these discussions are treated in the General Introduction, Part One (State of the environment) of the "Review of the environmental situation and of activities relating to the Environment Programme" (the "Review") 1/. Some of these discussions resulted in recommendations to the Executive Director, and the descriptions of certain initiated and planned actions in Chapters II and III above are in keeping with some of these recommendations. Others may be used in the development of new programme recommendations.

5. In particular, recommendations concerning soil and water, and concerning environmental management, have been taken into account in the drafting of the appropriate sections of earlier chapters of this document. In the case of some of the other subjects discussed at Aspen, however, additional work will be required before appropriate programmes can be worked out.

6. For example, in the case of climatic change, it is proposed to start pre-programming activities with a view to deciding whether additional parameters should be monitored. Such initial action would include convening, in co-operation with WMO and ICSU, an international study conference on the physical basis of climate and climate modelling and commissioning studies by consultants on man's contribution to national and regional climate changes, including the impact on the heat balance of the atmosphere exerted by the increasing release of energy and the influence on climate of man-made bush-fires in grasslands. The future development of programme activities in this area will depend on the outcome of these studies.

7. As a complementary action, an Aspen-like meeting will be held, the majority of the participants being selected from among eminent scientists in the field of climatology, to discuss further the specific outer limits of man's influence on climate and to make particular suggestions with regard to the development of a programme relating to this subject.

8. The discussion of toxic substances suggested that more intensive consideration should be given to problems associated with "the most toxic substances", since certain of these may raise extreme problems of irreversible environmental poisoning.

9. Some substances are now known to be so persistent and so toxic that, unless convincing assurance can be given that man will be able to contain them infallibly for the periods required, they may be simply too dangerous to make. Certain long-lived radio-isotopes - particularly transuranics (typically toxic in quantities of less than a millionth of a gram, and with half-lives of tens or hundreds of thousands of years) - are in this category, and the wisdom of manufacturing them at all should be seriously re-examined. Some persistent and powerful organic

1/ UN/PGC/14/Add.1

carcinogens may also give rise to extreme risk. It may be desirable to seek international agreement to ensure the destruction or perpetual isolation of such substances.

10. The Executive Director proposes to hold a special symposium to consider the problem of identifying substances which may warrant this attention, and to consider appropriate action for their control. It is expected that such a meeting will result in the formulation of an integrated programme for action in this field.

11. A third subject considered at Aspen and requiring further examination is that of contemporary stress caused, at least in part by changes in man's environment, including effects of overcrowding, pollution, endemic diseases, and degradation of the soil. The nature of the effects of such stress has important implications for environmental education and for environmental management. Accordingly, the Executive Director proposes to examine this subject further by convening a meeting of experts to define possible programmes of action.

B. Natural disasters

12. Although not assigned as a priority task by the Governing Council at its first session, the prevention and mitigation of natural disasters is a matter of high concern to many countries. In fact, for many disaster-prone developing countries damage caused by disasters far exceeds in absolute terms the external assistance received by these countries. Expressed in terms of percentage of GNP, the damage sustained by these countries is often higher than their real rate of growth, taken as the difference between the rate of growth of the economy and the rate of growth of the population. In South-East Asia, for instance, damage caused by typhoons alone amounts annually to 2 per cent of GNP, while the real rate of growth of the countries concerned is less than 1 per cent; as a result, the net development of these countries is in effect negative.

13. The Governing Council noted the following as one of the detailed objectives for UNEP action: "to anticipate natural disasters and to help governments in mitigating their consequences." ^{1/} However, in the absence of clear terms of reference relating to natural disasters, the Executive Director has limited his activity in this field to some pre-project assistance for a study of the "state-of-the-art" concerning disaster prevention and mitigation to be undertaken by the Office of the United Nations Disaster Relief Co-ordinator. Such a study is designed basically to identify existing knowledge immediately applicable in disaster-prone developing countries and existing gaps requiring further work on the part of the international community.

14. While the study of natural disasters and research into their prevention and mitigation are at present being carried out in literally hundreds of institutions around the world, and the results of research already carried out could be of direct benefit to disaster-prone developing countries, it is not possible at present to survey the full extent of such work. The study initiated will permit the production of a series of interim reports culminating in a "state-of-the-art" report on the main types of natural disasters (including tropical storms, floods

^{1/} decision 1(I), para. 2(g).

earthquakes, tsunamis and volcanic eruptions), identifying for each the mechanisms of the phenomena together with means devised so far to prevent or mitigate their harmful effects, and making recommendations, as appropriate.

15. Through this action, the Office of the United Nations Disaster Relief Co-ordinator will be able to increase its capacity for disseminating information concerning applicable technological developments to disaster-prone countries. On the other hand, the "state-of-the-art" report will enable the Executive Director to formulate an integrated programme for action, in this area. He thus suggests that this subject, with the Fund support proposed for it, should be considered as one of the priority subject areas defined by the Governing Council.

Estimated support from the Fund: The estimated support from the Fund for planned activities in this area is set out below:

| 1974 | 1976 | 1976 |
|-----------------------------|------|------|
| (in millions of US dollars) | | |
| 0.1 | 0.25 | 0.25 |

C. Particular environmental problems of specific industries

16. As stated in Chapter II above, consultations have begun with various sections of industry with a view to identifying particular environmental problems and opportunities including especially the questions of transfer of technology and location of industry. The Executive Director had the benefit of holding some preliminary discussions with representatives of members of the automobile industries, with encouraging results.

17. Another important development in this respect is the establishment in Nairobi by the International Chamber of Commerce of a "Centre for Industry and the Environment". The assistance of the new Centre is being sought in enlisting the co-operation of specific industries in preparing consultative meetings to consider the development of appropriate environmental principles and guidelines for each industry.

18. In the first instance these consultations will be concerned with the automobile, petrochemicals, and pulp and paper industries.

19. The ultimate objective of these consultations will be to establish machinery which will enable industries whose environmental impacts are significant to participate with the Executive Director actively at the policy and technical levels in a sustained effort to determine ways in which such industries, and industry as a whole, can work effectively to protect and enhance the environment, both nationally and internationally. These sustained efforts would include:

- (a) Analysing, in specific, technical terms, the principal environmental issues, problems and opportunities that affect those industries trans-nationally and internationally.
- (b) Setting as a specific goal the drafting of workable voluntary guidelines for each industry group which will be of direct operating use to industry managements, to governments and local authorities and to the UNEP in

devising viable, equitable environmental programmes for preserving and enhancing the environment with a minimum of distortion and conflict.

- (c) Enlisting industry's recognized managerial resources (technical and financial analysis, production, market planning and forecasting, research and development, capital mobilization and application, systems analysis and results control) in support of the work of UNEP and, through UNEP, of that of the scientific community (e.g. SCOPE) in carrying out this study programme on an industry basis and, where necessary, on a product basis.
- (d) Giving particular attention, on an industry basis, to problems arising from the different needs and perceptions of the developing and industrial countries.

20. The first series of the above-mentioned consultations will be designed with a view to:

- (a) Concentrating on the most urgent problems, i.e. air and water pollution;
- (b) Leading to the specification of international environmental problems or inequities which threaten a distortion or restriction of trade and investment or which could hamper required environmental action. It is assumed that it would be possible initially to reach consensus on egregiously threatening or harmful situations. It is hoped that a consensus favouring international action could be reached on such matters as:
 - (i) Transnational or international air and water pollution problems that have demonstrably harmful impacts on human health or well-being;
 - (ii) Actions by national governments that clearly threaten distortions in trade and investment, i.e. deliberate creation of non-tariff barriers;
 - (iii) Environmental policies or practices that would sharply exacerbate relations between the industrial and developing countries, or between foreign investors and host developing countries.

21. If specific progress can be made at the first consultative meetings on the subjects deserving high priority - air and water pollution - subsequent meetings, while extending and refining the original findings, could consider such environmental issues as: resource conservation, treatment and re-cycling of solid waste, radiation, land use and reclamation, noise abatement, etc. Again, the purpose would be to consider those issues in terms of the industry's perception of the need for international action leading to effective approaches to the problems by governments and their agencies and to complementary voluntary conduct by industry.

Estimated support from the Fund: The estimated support from the Fund for planned activities in this area is set out below:

| 1974 | 1975 | 1976 |
|-----------------------------|------|------|
| (in millions of US dollars) | | |
| 0.25 | 0.3 | 0.3 |

22. In the belief that a number of programme activities should be undertaken with regard to particular environmental problems of specific industries, the Executive Director proposes the inclusion of this activity (together with the Fund support proposed for it) in the sub-area "Technology and transfer of technology" of the priority subject area "Trade, economics, technology and transfer of technology".

D. Eco-development

23. As a result of continued study there has been an expansion of the concept of "Eco-development", originally designed "to support the efforts of the people living in villages and other rural settlements to better understand and utilize in their own development the basic natural resources and human skills available in their own environment" ^{1/}, so that eco-development now appears to be an alternative strategy for development of rather general applicability and considerable promise not only for natural and rural areas, but also for some forms of urban settlements. The main principles on which eco-development as a strategy for development is based could, in the light of the results of these studies, be summarized as follows:

- (a) In each eco-region, an effort is made to exploit the specific resources in order to meet the basic needs of the population in terms of food, housing, health and education, these needs being defined in a way which is realistic and autonomous to the region and not modelled on extraneous styles.
- (b) Man being the most precious resource, eco-development must contribute to the betterment of the quality of human life. This requires consideration of employment, security, good human relations, respect of the various cultures. It is believed that there is a symmetry between the possible contribution of ecology and that of social anthropology to planning.
- (c) Natural resources are identified, used and managed in diachronic solidarity with generations to come. Predatory practices are unacceptable. The exhaustion, unavoidable in the long term, of some non-renewable resources is retarded by eliminating wasteful uses, on the one hand, and, on the other, by using renewable resources in a manner ensuring their continuing productivity.
- (d) Negative impacts of human activities on the environment are reduced through the use of forms of organization of production which enable man to take advantage of complementarities and to utilize waste for productive purposes.
- (e) Especially in tropical and sub-tropical areas, but also everywhere else, eco-development rests on the natural ability of a region to convert solar energy by photosynthesis. Since the first principle mentioned above, when applied to energy, leads to great emphasis being placed on the use of local sources of energy, the role of other sources of energy (in particular hydrocarbons) is correspondingly lessened.

^{1/} decision 1(I), para. 15(d).

- (f) Because many of the concepts mentioned above cannot be worked out without the development of appropriate techniques, eco-development implies a special technological style.
- (g) The institutional framework of eco-development cannot be defined in general terms without regard for the conditions governing each specific case, or for the new forms of rural institutions called for by the World Bank in order to fight poverty in the rural areas and to take advantage of the potentialities of the poor masses of the developing countries by making available to the small farmer equipment and techniques of production adapted to his economic and ecological conditions.

24. As regards the institutional framework of eco-development three basic guidelines can be mentioned:

- (a) eco-development implies the creation of a horizontal authority able to transcend the sectoral approaches and to deal with various aspects of development, taking constantly into account the complementarity of various actions undertaken;
- (b) Such an authority cannot be efficient without the participation of the population concerned in the working out of eco-development strategies. Such participation is essential for the identification of concrete needs and of the productive potentialities of the eco-system, as well as for the organization of the collective effort for its utilization.
- (c) It is necessary to make sure that the populations with whose participation the strategy is worked out are not deprived of its results by intermediaries who stand between local communities and the national or international market.

25. It is believed that such guidelines could be applied without too many complications in different areas of the developing parts of the world where agrarian reform has been achieved.

26. A necessary complementary task is an education that prepares people for true participation in the various forms of eco-development.

27. In the final analysis, the main problems to be resolved are, at one extreme, how to change the system of values which at present manifests itself in domineering attitudes toward nature and, at the other, how to maintain or reinforce, where it exists, the attitude of respect for nature. The objective can be achieved by either formal or informal education.

28. It can thus be stated that eco-development - as defined in the light of existing theoretical considerations - is a style of development which stresses specific solutions for the particular problems in each eco-region taking into account ecological and cultural contexts as well as present and long-term needs. While the value of exchanges of experiences is undeniable, eco-development should be regarded as a reaction against the prevailing fashion of favouring so-called ready-made or universally applicable solutions. As an alternative to excessive reliance on external assistance, eco-development translates a belief in the ability of human societies to assess their problems and find original solutions, while drawing on the lessons of the experiences of others. Instead of depending on

passive transfers and on imitation, it stresses, on the contrary, the spirit of self-reliance. It is of the essence of eco-development that a knowledge of the environment and willingness to achieve a lasting balance between man and nature are necessary to success. The failures and disasters which some societies experienced bear eloquent testimony to the high price that must be paid when people are unable to manage relations between man and nature.

29. The Executive Director realizes that the concept of eco-development still needs to be tested through a number of pilot projects, the results of which should stimulate scientists in qualified research centres or institutes to develop the concept further until it reaches the stage of applicability as an alternative pattern for development. To achieve these goals the Executive Director proposes to start action by co-operating with one of the existing qualified research institutes which will act as a resources centre and whose task will be to collect and analyse appropriate techniques and information for eco-development and to arrange for appropriate continuation of research on the theoretical bases of eco-development. He also proposes to carry out a few pilot projects in eco-development in co-operation with interested governments. It is proposed that pilot projects should be initiated in at least two developing regions. These will be of two kinds: either the addition of an eco-development dimension to an existing project of a broader nature, or the establishment of a totally new rural development project based upon the principles of eco-development. Consultation has already begun with several governments that have expressed an interest in this idea.

30. Since the foregoing considerations show that action in this area can be initiated immediately, the Executive Director proposes the inclusion of this activity, with the Fund support proposed for it, among the programme activities in the sub-area "Trade and economics" of the priority subject area "Trade, economics, technology and transfer of technology".

Estimated support from the Fund: The estimated support from the Fund for planned activities in this area is set out below:

| 1974 | 1975 | 1976 |
|-----------------------------|------|------|
| (in millions of US dollars) | | |
| 0.5 | 0.75 | 1 |

E. Development of the international law of the environment

31. During July 1973, the Executive Director held informal consultations with a distinguished group of international jurists with a particular interest in environmental problems. While the expert jurists were present in their individual capacity, they came from 18 countries and five international organizations. The major points considered during these consultations were the development of general international environmental law and the organizational question regarding the flow of information in the field of environment. The discussion laid special emphasis on the role of UNEP in this respect. Some of the points considered under these general headings were :

- (i) International responsibility of States for environmental protection;

- (ii) Liability and compensation for damage to the environment;
- (iii) Maritime and land-based activities adversely affecting the marine environment;
- (iv) Weather modification;
- (v) Access of foreign States or persons to domestic procedures;
- (vi) Method of dissemination of information between interested parties in regard to national regulatory activities having an internationally significant environmental impact.

32. The Executive Director proposes to follow up his consultations regarding the development of the international law of the environment in a way that would enable him to submit to the Governing Council at its third session concrete proposals for action in this area.

F. Eutrophication

Eutrophication of lakes and still bodies of fresh water generally is a common problem throughout the world. This is further indicated by the great interest expressed by certain States, members of the Governing Council (e.g. the USSR) in attaching a high priority to studying this problem. Eutrophication is apparently frequently caused by the effects of the over-fertilization of the water flowing from highly fertilized agricultural land.

34. The OECD and several other bodies have for several years been carrying on intensive studies of eutrophication and means for dealing with it. The Executive Director proposes to consult further on the results of the existing programmes in order to identify gaps in the knowledge and to base proposals for further work on an analytical consideration of the work already done.

G. Comprehensive theory of comparative risk

35. At the present time there is no body of fully articulated and generally known and accepted theoretical material amounting to a comprehensive theory of comparative risk. For example, in the case of a pollutant giving rise to a certain level of threat to human health, there is no general body of data or theory which makes it possible to compare it with the risk posed by other pollutants or other kinds of threat to human health and well-being (e.g. risk of starvation or traffic accident). Hence one cannot decide in a rational way how much effort and resources to apply to the control of the pollutant, either immediately or over a long period of time.

36. In the absence of such a theory it is difficult to know how to allocate resources to management of the environment and even more difficult to know how to measure public perceptions of risk against reality. This latter problem poses clear difficulties for public environmental education and for the environmental training of decision makers.

37. This problem has already begun to be dealt with by SCOPE of ICSU in the framework of "Ecotoxicology".

38. In order to work out a methodology for dealing with this problem, the solution of which is clearly of great importance in assessing, for example, the comparative long and short-term risks to individuals all over the world posed by under-development and by pollution, the Executive Director is co-operating with SCOPE in the organization and preparation of an interdisciplinary workshop on the theory of risk assessment. This will also be connected with work that SCOPE has undertaken on the subjective perception of risk.

Estimated support from the Fund: The estimated support from the Fund for planned activities as described in sections A, E, F and G above is set out below:

| 1974 | 1975 | 1976 |
|-----------------------------|------|------|
| (in millions of US dollars) | | |
| 0.3 | 0.3 | 0.3 |