



UNITED NATIONS
ECONOMIC
AND
SOCIAL COUNCIL



Distr.
GENERAL

E/4667
26 May 1969

ORIGINAL: ENGLISH

Forty-seventh session
Agenda item 10

PROBLEMS OF THE HUMAN ENVIRONMENT

Report of the Secretary-General

CONTENTS

	<u>Paragraphs</u>
PREFACE	
INTRODUCTION	1 - 8
I. THE MAIN PROBLEMS	9 - 10
A. Problems of human settlements	11 - 28
B. Territorial problems	29 - 43
C. Global problems	44 - 50
II. NATURE, SCOPE AND PROGRESS OF PRESENT WORK	51 - 81
III. UNITED NATIONS CONFERENCE ON THE HUMAN ENVIRONMENT	82 - 143
A. Purposes and objectives	82 - 92
B. Delimitation of scope	93 - 101
C. Participation	102 - 105
D. Structure and content	106 - 121
E. Documentation	122 - 129
F. Preparations	130 - 135
G. Time and place	136 - 138
H. Financial implications	139 - 143
ANNEX: ACTIVITIES AND PROGRAMMES OF UNITED NATIONS BODIES RELEVANT TO THE HUMAN ENVIRONMENT	
A. United Nations	
B. International Labour Organisation	
C. Food and Agriculture Organization of the United Nations	

CONTENTS (continued)

ANNEX: ACTIVITIES AND PROGRAMMES OF UNITED NATIONS BODIES
RELEVANT TO THE HUMAN ENVIRONMENT (continued)

- D. United Nations Educational, Scientific and Cultural Organization
- E. World Health Organization
- F. World Meteorological Organization
- G. International Maritime Consultative Organization
- H. International Atomic Energy Agency
- I. International Civil Aviation Organization

PREFACE

This report has been prepared in response to operative paragraphs 2 and 3 of General Assembly resolution 2398 (XXIII) on the problems of the human environment.

The resolution was referred to the Advisory Committee on the Application of Science and Technology to Development which set up an ad hoc working group to consider it. At its eleventh session, the Advisory Committee adopted a statement which is reproduced in full in the record of the session (E/AC.52/L.65). The views expressed in the Advisory Committee's statement have formed the main basis in developing the views contained in this report.

Because of the requirement for submitting this report to the General Assembly through the Economic and Social Council, the time available for its preparation has been very short. The Secretary-General has consulted by correspondence Governments of States Members of the United Nations and members of the specialized agencies and of IAEA, though in the time available, the response has been limited. The views of appropriate intergovernmental and non-governmental organizations have also been obtained.

There has been close consultation with organizations of the United Nations system and several agencies have provided staff to assist in the preparation of the report. A senior staff member from UNESCO has been seconded to the Secretariat for several weeks in this respect. Several consultants have also been retained.

There has been a high degree of unanimity in the views expressed by Governments, as well as by agencies, about the importance of the problems of the human environment and about the general features of the conference to be convened in 1972. This report makes recommendations about the scope and arrangements of the conference which, it is believed, would fulfil the objectives of the resolution and be in line with the views of Governments, agencies and other bodies concerned. It should be emphasized, however, that in a field so wide-ranging and complex, a great deal more consideration will need to be given to the details of the conference before the arrangements for it are finalized. The Secretary-General therefore places great importance on the need to establish the conference organization at as early a stage as possible. It can then proceed with the work of organizing the conference along the general lines which are suggested in this report and to which it is hoped the General Assembly will agree.

INTRODUCTION

1. In the discussions held by the General Assembly at its twenty-third session it was emphasized that for the first time in the history of mankind, there is arising a crisis of world-wide proportions involving developed and developing countries alike, - the crisis of the human environment. Portents of this crisis have long been apparent - in the explosive growth of human populations, in the poor integration of a powerful and efficient technology with environmental requirements, in the deterioration of agricultural lands, in the unplanned extension of urban areas, in the decrease of available space and the growing danger of extinction of many forms of animal and plant life. It is becoming apparent that if current trends continue, the future of life on earth could be endangered. It is urgent, therefore, to focus world attention on those problems which threaten humanity in an environment that permits the realization of the highest human aspirations, and on the action necessary to deal with them.

2. For most of the time that man has been on earth, his numbers have been small and his power limited. Damage to his environment was at worst local, and usually subject to repair by the regenerative powers of nature. It is estimated that only a few centuries ago in 1600 A.D., the numbers of men were no more than half a billion and much of the world was uninhabited or little affected by man's activities. In these few centuries, the numbers of mankind have increased sevenfold and all areas on the earth's surface have been to some degree modified by man. What were once local problems are now global in extent and call for concerted effort by the nations of the world if they are to be solved. With the prospect of another doubling of the world's population in less than a half century, the need for action becomes even more acute. The need to provide food, water, minerals, fuel and other necessities for such increasing numbers of people will place pressures upon virtually all areas of the earth and demand the most careful planning and management of natural resources. No nation can any longer be isolated from these global pressures. It has become clear that we all live in one biosphere within which space and resources, though vast, are limited.

3. Accompanying the growth of populations in recent decades has been the spread of urbanization. Forty per cent of the world's people now live in urban areas. In somewhat more than half a century, if present trends continue, urbanization will have reached its maximum and the great majority of people will live in towns and cities. The rate of urbanization is more rapid in the developing nations. According to national estimates, in 1920, the urban population was 100 million in these countries. By the year 2000, it may well have increased twentyfold. In the developed nations, the urban population in the same period will have increased fourfold. Urbanization is not in principle destructive to the environment. With proper planning and control, and if it were proceeding at a slower rate, it should enhance and not detract from environmental quality - by relieving pressure on rural lands, by providing goods and services in quantity and diversity, by providing new and attractive habitats and ways of life. However, in most areas, Governments have neither prepared for, nor have they been able to cope with, the mass migration into urban areas. In the large cities, slums of the most wretched nature often become the environment of people who once lived in greater dignity and better health

on rural lands. Pollution of air, water, and land, concentrated in urban areas, have become universal problems, threatening man's health. Diseases associated with urban living in developing nations have increased greatly despite advances in medicine. Noise and congestion in urban areas add to physical and mental distress.

4. Accompanying population growth and urbanization is the accelerated impact of industrialization, and of an advanced technology that is often poorly integrated with human needs and environmental necessities. The rate of industrial growth can be indicated by various statistics. Thus, the production of crude petroleum was negligible a century ago. By 1965, however, it amounted to 1,641 million metric tons per year. Between 1937 and 1965, the annual rate of production increased sixfold. In the same period, the passenger motor vehicle, scarcely known at the start of this century, was produced at a rate that grew from 5 million to 19 million per year. In the most recent decade, the total value of all industrial production has doubled. Virtually all measures of industrialization show an increasing rate. Industrialization is of vital importance to nations which seek to elevate the living standards of their people. Improved technology is necessary if productivity is to increase and the products of industry be provided to growing numbers of people. However, the side effects of poorly planned or uncontrolled industrialization and of the one-sided application of technology have been a direct cause of many serious environmental problems. During the discussions of the General Assembly at the twenty-third session, it was pointed out that the reliance of modern technology upon the combustion of fossil fuels has brought a 10 per cent increase in atmospheric carbon dioxide over the past century. With increased rates of combustion, this could rise to 25 per cent by the year 2000 A.D. The consequence of such an increase upon world weather and climate are uncertain, but could eventually be catastrophic. The increased use of modern technology has brought major increases in the amount of waste products which serve as environmental pollutants. It has been stated that in the United States of America alone, this amounts each year to 142 million tons of smoke and noxious fumes, 7 million automobiles, 20 million tons of paper, 48,000 million cans, 25,000 million bottles and jars, 3,000 million tons of waste rock and mill tailings and 50 trillion gallons of hot water along with a variety of other waste products. Other industrialized nations make their comparable contributions of debris and toxic materials. While technology is adequate to cope with these problems of pollution, the planning and application of pollution control lags far behind what is required, often due to economic considerations.

5. The spread of the urban-industrial network with its associated transportation facilities is consuming open space at a rate known to be high, but not yet possible to estimate for the world as a whole. In the United Kingdom, it has been estimated that such expansion will consume one sixth of the farming land in the next three decades. Properly planned and controlled, the spread of an urban-industrial-transportation complex could enhance the human habitat. Too often, however, uncontrolled urban sprawl destroys valuable resources, landscapes and living things.

6. Increasing populations bring increasing demands upon the productivity of agricultural lands in order to meet needs for food and fibre. Application of technology to these lands has brought greatly increased production in developed nations so that most of the material needs of their people can be supplied. Elsewhere, however, further gains in productivity must exceed the considerable

progress already achieved if human misery is to be prevented. It is of great importance, however, that such gains be not offset by environmental deterioration. Thus, increased food crop yields have accompanied the increased use of fertilizers and new varieties of pesticides produced by chemical industries. However, some of these agricultural chemicals have side effects on the environment that we are only now beginning to comprehend. Thus the maintenance of both atmospheric oxygen and the productivity of marine environments depends upon photosynthesis by marine plants, mostly the floating algae of microscopic size. Minute amounts of such pesticides as DDT have been found to inhibit photosynthesis in these algae by 75 per cent. Nevertheless, we have dumped an estimated billion pounds of DDT into our environment and are adding an estimated 100 million pounds per year. The total world production of pesticides is estimated at over 1,300 million pounds annually. The United States of America alone exports over 400 million pounds per year. Apart from their potential effects upon the productivity of the oceans, many of these have known effects upon fish, wildlife and human health, which have been of serious consequence in many areas. Such damage to the environment should be avoided. It is possible to achieve the same goals without danger to the environment by application of knowledge that is already available, or by the development of new approaches.

7. The land upon which man depends for his sustenance has been seriously impaired by many of his past activities and in many areas this process continues. It has been estimated that 500 million hectares of arable lands have already been lost through erosion and salinization, that two thirds of the world's forest area has been lost to production and that 150 types of birds and animals have become extinct through human agency. Approximately 1,000 species or races of wild animals are considered to be rare or endangered. Erosion, soil deterioration, deforestation, watershed damage and the destruction of animal and plant life continue and in some areas are accelerating. The loss to mankind is of serious concern.

8. The deterioration of the human environment may thus be related to three basic causes: accelerated population growth, increased urbanization, and an expanded and efficient new technology, with their associated increase in demands for space, food and natural resources. None of these need be damaging to the environment. However, the efforts to accommodate population, to integrate technology into complex environments, to plan and control industrialization and urbanization, and to properly manage land and resources, have fallen far short of those required. In consequence, all nations of the world face dangers which in some fields and in some areas have already achieved critical proportions. To overcome them will require carefully planned and vigorous action at the local, regional, national and international levels. There are so many problems that choices must be made and priorities established. The economic results of failure to take action, as well as the costs involved in attacking these problems must be carefully analysed. The proposed 1972 Conference on the Problems of the Human Environment must bear all these factors in mind and provide a focus for world-wide action to avoid a possible crisis which could endanger the well-being of mankind.

I. THE MAIN PROBLEMS

9. In a brief report such as this, it is only possible to describe in a generalized and perhaps over-simplified way the main problems of the environment in

which mankind exists. These problems can be classified in many different ways, emphasizing for instance whether they are predominantly of a physical, biological, social or cultural nature, or what their geographical dimensions are. From the latter point of view, they fall into three main categories which have been identified by the Advisory Committee on the Application of Science and Technology to Development and can be described as follows:

(a) Human settlements problems, i.e. problems affecting local areas of human concentration, for which action is primarily the responsibility of national governments and city and local authorities;

(b) Territorial problems, i.e. problems of land areas including also non-oceanic and coastal waters, for which action is primarily the responsibility of national Governments, but which also have regional aspects;

(c) Global problems, i.e. problems of world-wide dimensions, potentially affecting all countries and amenable to solution only by international agreement and a willingness of countries to act in concert for their common betterment.

10. It is clear that no classification can accommodate perfectly the wide range of existing environmental problems. Water pollution for instance occurs at the level of human settlements, at the territorial level, and also at the global level. The above classification appears convenient, however, for the purpose of describing briefly the main problems affecting developed and developing countries in the field of the human environment.

A. Problems of human settlements

11. The environment of human settlements differs from all others in the degree to which it is created and controlled by man. It would be expected that man, being presumably rational, would have constructed for himself urban centres ideally suited to his occupancy. In fact, the very opposite often appears true. It is within one of man's most impressive creations, the cities, that some of the most severe environmental problems occur. The reasons for this paradox are in part revealed by the history of human settlements. Most originated at an early stage in man's technological development and have since been changed and modified to suit his changing needs, but it is often difficult to accommodate a modern society in a physical framework designed for pre-industrial cultures.

12. Rapid urban growth usually linked with a heavy influx of population from rural areas, has occurred in many countries over the past 150 years. Today it is occurring in almost every quarter of the world, in developed and developing countries alike, even in the small island communities of the Pacific.

13. For many countries, urbanization and industrialization have been a normal way of life for decades. The problems associated with these processes occur in an acute form in developing countries, where an economy based on agriculture and animal husbandry is being supplemented or replaced by intensive industrial development. Migration towards the towns is influenced by the prospect of employment, high rates of growth and large increments in rural population, educational and health facilities which are presumed to exist there, and by a desire for family reunion and company.

14. In most developing nations, it has rarely been possible to provide in advance the urban planning and design that would lead to a rational arrangement of space for living, working, transportation and recreation, or to provide rapidly enough housing, water, sewage disposal, education, or the other necessities or amenities of urban life. The very time factor involved in development of urban facilities is a major aggravating factor. Migration into cities is often associated with the importation of disease such as trachoma, tuberculosis, parasitosis and skin diseases. The influx of people tends to bring enormous pressure on water supplies and the arrangements for waste disposal, with the consequent appearance of diarrhoeal diseases. Overcrowding of premises and sites is typical. Inadequate housing accommodation is accompanied by shanty type construction and further unsatisfiable demands are made upon water supply and waste disposal facilities. Food supplies may be inadequate, badly distributed, or prepared and sold under unhygienic conditions. Malnutrition is not uncommon and in association with bowel infections is a common cause of death in young children born and living under those unsanitary conditions. Propinquity and overcrowding encourage upper respiratory infections and venereal disease. This pattern in the propagation of disease overtaxes the whole medical care organization.

15. In rapid urbanization every form of publicly provided service, including transport and education, tends to be overloaded. Schools are heavily overcrowded, and as a result attendance tends to fall, and juvenile delinquency becomes more common. Social change often leads to disintegration of the family and other primary institutions of society. Social disorders seem to be more prevalent in urban areas where there is a danger of the dissolution, fragmentation and lack of functional capacity of primary social institutions. The stress that often accompanies accelerated change results in emotional tension and a feeling of insecurity. These may find their expression in mental breakdowns, psychosomatic manifestations, suicide attempts, increased frequency of crime, drug dependence and anti-social behaviour.

16. A number of other social problems appear to be linked with urban environmental factors, such as the inadequate distribution of population by age groups in urban and suburban areas, the non-adaptation of rural migrants, the dissatisfaction due to instability of employment opportunities and the difficulty of integrating youth. Similarly, there appears to be a link between indoor living and working conditions with physical and mental health, and with safety and accident prevention. Little is known, however, on the relationships between these problems, which have predominantly local characteristics, and the environment.

17. The deterioration of the physical environment, the natural as well as its man-made component, has social implications which can hardly be separated from the problem as a whole. Areas of natural beauty with an abundant wildlife within reach of urban areas have a social function of providing recreation facilities for city-dwellers, beside their intrinsic value as part of a common heritage. Historic sites and monuments form a part of the man-made human environment, the value of which cannot be overestimated. Their cultural and social values for the individuals living close to them as well as for humanity as a whole are evident, and their conservation, along with that of the natural environment, merits the attention of the international community.

18. The magnitude of the problem in some developing nations appears to defy solution by anything less than a massive national and international effort. A first requirement is that of urban planning and design in which adequate consideration is given to the social needs of the population, including services. A second is for a major programme of construction and reconstruction. In some places the establishment of complete new towns and cities with their own industries and other sources of employment may be called for. There is great need to explore new patterns and frameworks for urban living based on greater understanding of human biology and behaviour and consideration of social and cultural factors.

19. The cost of such major programmes of planning and construction far exceeds any amount that has been expended on cities at any period in history. The need is for new facilities greater in size and extent than all existing facilities to accommodate urban populations that will have increased twentyfold over a period of only eighty years, from 1920 to 2000 A.D. The alternative to such a programme is accelerating human misery and mortality.

20. In developed regions the urban environment is afflicted with many of the same difficulties encountered in developing regions. Urban planning and design lag far behind urban growth. Where plans have been made they are often pushed aside by political, economic or social pressures. Unplanned or poorly planned suburbs spread over the countryside surrounding formerly well-defined urban centres, merging indistinguishably with those spreading out from other centres. The result is an urban conurbation, a poorly defined and little differentiated mass of urban tissue within which the individual has difficulty identifying with a community and is beset with problems of transportation, congestion and pollution. It is impossible to describe such areas as cities, but only as urbanized regions.

21. Pollution is one of the most omnipresent characteristics of cities in developed nations. Air pollution resulting from the combustion of fossil fuels for space heating, industrial power, or transportation represents a danger to human health, causes damage to materials and structures, and impairs agricultural productivity in surrounding lands. It respects no national boundaries and becomes an international and even global problem. Efforts of cities to cope with air pollution have not yet been fully effective. London has improved the quality of its air through restricting the use of coal and high sulphur petroleum, but has gained ever-increasing amounts of by-products from automobile exhausts. In Los Angeles virtually all sources of pollution except automobiles have been brought under control, yet smog resulting from internal combustion engines is serious and appears to be growing worse.

22. Water pollution in urbanized areas is a huge problem affecting developed as well as developing countries and will require expenditures of billions of dollars. In the United States of America alone, for instance, it is estimated that \$200 billion have already been spent on water pollution control at all levels by the Government and private agencies. The problem is still growing despite the provision of \$3.5 billion to provide for the construction of urban sewage plants over the next five years. New York City alone is investing \$2 billion over ten years for pollution control.

23. Pollution from noise is having unknown effects on human health, but is considered by more and more people as a most undesirable additional stress of urban

life which could be reduced relatively easily. The proposed development of supersonic transport gives this a new dimension.

24. In urban areas, pollution from human wastes is of primary concern in developing regions. However, pollution of other types is a problem that grows more severe as developing nations move toward their goals of economic development. Often the devices and regulations used in developed nations to control pollution are not applied to industrial processes in developing nations with equal efficiency or stringency. In the effort to provide increased economic well-being, the environmental safeguards are thus neglected. Water supplies are not only contaminated with human wastes, but grow increasingly toxic as they receive the effluent from burgeoning industries. Air pollution increases with the material well-being of the urban population and derives from power plants, industries, space heating and the growing number of motor vehicles.

25. Most developing nations suffer from a shortage of personnel, trained in the skills needed to solve their urban problems. Increased programmes of education are a prerequisite to self-sufficiency. In the meantime, international agencies and bilateral assistance programmes must be relied upon to provide technical and financial aid to these areas. Although many national and international programmes are under way, all of them fall short of needs. Brazil has built an entire new city for its capital, but Brasilia is already plagued with urban slums. Pakistan has taken a lead in the planning and design of Islamabad, but its over-all urban problems are incredibly complex. Over \$9 million are being provided to construct an experimental housing project in Lima, but hundreds of millions must be spent before the problems of barriadas can be solved. Although estimates vary considerably, it has been stated that in the United States of America a new city for 250,000 people will cost \$1 billion. In the developing world, in addition to an increment in urban population of 1.5 billion from 1960 to the year 2000 there may be an increment in rural population of 1.1 billion during the same period. The total increment in population of the developing regions over a period of forty years may be distributed as follows: 56 per cent in urban areas and 44 per cent in rural areas. The future situation may again be particularly critical in the high density areas.

26. Related to the problem of urbanization is another problem developing increasingly in many countries, the problem of rural settlements, small towns, villages and individual farms. The number of people wishing to live on the farm or in the village is diminishing, and the same could be said about the number of people, who have been attached to rural settlements because of their work in agriculture. The increase in productivity of labour in agriculture and its new technology frees people from their farms and villages. Many of these, notably the younger people, move into the towns. From this cause the average age of rural population is increasing - the villages "grow old". On the other hand, in developed countries the number of people wishing to have a second residence in the country for week-ends and for recreation is rapidly increasing. Because of this, there arises, beside the existing, although diminishing, villages, new patterns of rural settlements - week-end and recreational villages and towns. Often the locations of these are damaging to the environment and unsatisfactory to the inhabitants. Houses and communities alike have grossly inadequate facilities and amenities.

27. In certain regions, the need for a new organization of rural settlements is extremely urgent, because the existing ones are being slowly deserted, their houses falling into ruin, and their fields becoming overgrown. It is obviously impossible to provide the smallest villages with all the necessary equipment and infrastructure for modern urban life. Nevertheless, if rural life can be made more attractive, and living standards raised, fewer people will crowd into urban areas, and more satisfactory patterns of land use can be developed. Many countries see a desirable solution in new institutional arrangements for rural administration - in the creation of so-called rural centres, in manifold development of movable equipment, in agrarian reform, and in improved educational, cultural and social opportunities. None the less, the definitive solution is not yet found and requires much time, intensive and skilled work and international mutual exchange of experience and assistance. All this obviously influences the relationship between rural populations and rural environments. Bearing in mind the future development of countries, which are still predominantly agricultural, it will require attention from all Governments.

28. The process of industrialization generally accompanies urbanization, and a number of the problems mentioned above can be indeed attributed more directly to industrialization than to urbanization. There are, however, specific problems of human settlements related to development of industries outside cities. Location of certain plants like cement factories, power plants, mining and metallurgical industries is largely dictated by the presence of water, power or minerals. Artificial human settlements develop around these plants, often without any urban and social planning, thus leading to the creation of unsatisfactory living conditions for the workers and their families.

B. Territorial problems

29. Territorial problems include those arising from the lack of proper design, planning, control and management of land and water in non-urban continental areas. They are thus a result of a failure to apply what is known in France as aménagement du territoire, and a failure to take into consideration the requirements for long-term conservation and rational use of the human environment.

30. It has been stated that efforts to develop and reclaim lands for urban, industrial and transport development and to increase productivity in agriculture, forestry and fisheries to meet growing needs are a potent force not only for the improvement of man's welfare, but also for the degradation or destruction of his natural environment. The need exists, therefore, to provide for adequate planning of over-all land use, including conservation of natural environments, and the entire array of wild species and biological communities necessary for scientific and cultural purposes, while still increasing the supply of food and materials and the organization of space required for man's survival.

31. Many territorial problems have developed over past centuries in relation to management and mismanagement of land resources. They tend to differ in degree between developing nations, most of which occur in tropical or arid regions, and the developed nations of temperate and sub-arctic regions.

32. In the lands of the humid tropics, for example, shifting cultivation of areas at best marginal for agriculture causes serious difficulties. Many areas suffer in greater or less degree from watershed damage, soil erosion, laterization, loss of soil fertility, destruction of valuable forest resources or destruction of wild areas better suited to parks or tourism. These deteriorations coupled with rapid population growth are causes of widespread rural poverty. Despite considerable past efforts, deterioration of the human environment continues, increasing populations often face increasing poverty and the humid tropics remain a major region requiring environmental stabilization and improvements.

33. In the dry tropics and sub-tropics the major original economic base has been a subsistence pastoralism with limited development of irrigated agriculture. The destruction of vegetation and soil and the advance of barren deserts, most often caused by inadequate control over the numbers and movement of livestock, is a continuing process. Efforts to improve carrying capacity for livestock through water development are often defeated by failure to provide control over livestock concentrations. Wild animal resources in these regions are often of great potential economic value, both directly and as an attraction for tourism. However, to a considerable degree, these have been neglected or destroyed. The problems of nomadic people have generally not solved in ways suitable either to the nomads or the total environment. The choice among alternative uses of limited water resources particularly in relation to irrigation has not often been made on a rational basis optimizing costs and benefits with long-term economic returns, conservation of water and of soils, and proper social and health adjustments.

34. Most of the nations of the developed world are centred in the temperate zone where stable patterns of land use have been developed over centuries. Despite this, there appears a widespread imbalance between efforts to further enhance economic productivity and efforts to maintain a stable or improving environment. Conflicts between the demands of the urban-industrial centres for water, power, transportation networks and space for buildings, on the one hand, and the necessity of maintaining rural productivity and rural amenities, on the other, are widespread. Particularly round urbanizing areas, widespread deterioration of rural lands occurs and pollution also presents a major problem for the surrounding natural environment and its resources. Cultivated lands, river systems, lakes, estuaries and marsh lands are particularly hard-hit. At the same time, modernization of agriculture leads to abandonment of less productive rural areas such as mountainous areas, creating unbalanced human environments in these areas as well as accelerated migration towards urban centres.

35. The sub-arctic and arctic regions form an undeveloped part of developed nations. Only a few nations are concerned, all face common problems, and all could benefit from greater sharing of research and experience. As yet, the environmental problems resulting from human activity are few but all are widely shared. These include protection and rational use of the resources of the sea; development of a suitable economic base and social environment for the indigenous peoples of these regions; protection of wildlife; proper management of forest resources; enhancement of agricultural productivity through new varieties of crops and new techniques of production; and development of fuel and mineral resources without environmental damage. Although this is primarily a matter for national concern, suitable exchange of information and agreements between nations to protect and enhance the arctic and sub-arctic environment are essential.

36. Of particular interest among territorial problems are those arising from large-scale construction of dams, reservoirs, canals, power stations and other structures for the movement and control of water in major river basins or the transfer of water from one basin to another, to provide for power, irrigation, transport or urban water supplies. Such major development has already occurred on the Nile, Niger, Volta, Colorado, Columbia, Missouri, Volga, Rhone, Indus and many other systems. Work of international significance is under way on the Mekong, La Plata, Danube, Senegal and other international rivers. Major interbasin transfers of water have been discussed for Canada and Siteria. Schemes to modify the entire Amazon river basin or to open a sea-level canal across the Panama Isthmus are under consideration. Although economic and engineering factors are given full weight in most of these plans, the broader environmental impact is inadequately considered. Often little or no attention is given to proper management of lands in the watersheds developed by these engineering techniques. Among the deleterious effects that occur are siltation of reservoirs, loss of delta lands, salinization, spread of water-borne diseases and displacement of peoples. The need for more adequate analysis of total environmental costs and benefits is apparent.

37. While the environmental problems resulting from industrialization are generally associated with problems of human settlements, there are a number of specific issues raised by industry in relation to over-all land use. These relate, first of all, to the location of industries and the development of transport systems associated with it, which is rarely planned in taking full account of other factors including, for instance, the value of agricultural lands which are going to be used.

38. Different industries have different effects on the territorial environment. Many of them, such as paper mills and chemical plants, have serious consequences on water pollution. Special problems arise in relation to mining industries. Although they are usually carried out in non-urban areas, they can constitute a serious threat to the environment. As a matter of fact, the mining industry in some countries has long ago been forced either by legislation or economic necessity to take remedial action, such as storing tailings behind dams to protect agricultural lands downstream. Copper smelter operators in Tennessee and in Peru, who were devastating the vegetation over large areas with acid fumes have now set up plants to make acid from fumes. Since smelter dust often contains valuable by-products, many operators have now installed dust treatment equipment. Slag from the steel industry is used on construction, and over 2.5 million tons of fertilizer were produced in 1967 in France alone, using the Thomas slag which has a high phosphorous content. But every precaution has to be taken to avoid damage to agricultural lands, destruction of scenery and pollution of air, water and soil through mining operations.

39. A number of pollution problems can indeed be considered as territorial. For instance pollution by solid waste is growing rapidly with urbanization and production of industrial goods not easily destructible or bio-degradable. Pollution of rivers and lakes, including international ones is obviously a major problem of the greatest concern. The task of cleaning up Lake Erie, one of the most polluted lakes, has been estimated to cost over \$40 billion. Virtually every stream and lake in an urbanized and industrialized region is heavily polluted and the well-known touristic lakes of Switzerland are no longer clean, through urban and industrial pollution. Thermal pollution is becoming of greater concern since it

can be expected to increase with the growing development of nuclear power. Soils are polluted in agricultural regions by the intense use of certain fertilizers as well as by biocides. The effects of long-lasting, broad spectrum pesticides is most notable. These have already caused a decline of many kinds of wildlife including sea-birds in remote areas. They have had major deleterious effects upon fisheries in estuarine waters, and in all likelihood are having long-range effects upon the total marine environment. Although effective pest control is essential to the enhancement of agricultural productivity and to the control of sectors of disease, the use of biocides must be reconsidered since, in addition to their harmful effects, it has been shown that in the long run most of these have a limited effective duration in pest control. There appears to be a need for international agreement to control the use of all long-lasting biocides.

40. It must be recognized that, despite the growth of urbanization, most of the world's people still live in rural areas. In fact, many land use problems such as use of marginal lands and accelerated erosion arise from rural over-population, particularly in semi-arid regions. The entire survival of the massive urban-industrial network is dependent upon the continued output of food, water and other natural resources from these areas. The well-being of urban people depends among other things on their opportunity to obtain recreation and zest in the wilder lands outside the cities, including the beaches, streams, lakes and ocean shores. The opportunity exists to meet the needs of mankind for food and other resources from these rural lands while preserving at the same time their plant and animal life and the aesthetic, scientific and recreational values of their landscapes, but this opportunity can be lost rapidly. What is required is major attention to proper planning, control and management for all land areas and a greater emphasis on conservation in all programmes for economic development.

41. It is generally observed that planning for one segment of the economy fails to take into account the needs of others. Transportation networks are developed to the detriment of farm lands, wet lands, scenic areas and other rural resources. The exploitation of forests for timber may fail to take into account the values of forests for recreation, tourism, wildlife and the maintenance of stream quality and fisheries productivity. Biocides used on farm lands produce damage to other resources over wide regions. The development of waterways for power, irrigation or transportation may proceed with little regard for aesthetic or conservation requirements in the human environment. Better land use planning and control is needed everywhere.

42. The priority areas for action on "territorial" problems include proper management of eco-systems including waters, land, plant, fish and animal resources not only in the interest of technical objectives as they relate to agriculture, forestry, fisheries, food production, urbanization, industrialization, tourism and transports, but also in the interest of integrated social and economic objectives, which together may further the well-being of man and society.

43. The above areas of action apply equally to the developed and the developing countries. However, in the developing countries, which are primarily concerned in developing their agricultural, mineral and water resources, one of the main problems in taking corrective and ameliorative action is the need for recognition that regulation is not a restriction but is an integral part of the long-term and sustained development of resources and the environment, and should be considered

even in the earliest stages of development. There is therefore urgent need for prompt action in all countries to develop and strengthen regulatory services, including administration and management, legislation, and laboratories for analytical control as well as for the research needed to provide the technical knowledge on which regulation must be based. Training of staff of various kinds is also an essential requirement. Public information and education is equally important in arousing awareness and obtaining co-operation from the general public.

C. Global problems

44. These are problems affecting directly or indirectly all countries, which are amenable to solution only by international agreement and a willingness of nations to act in concert for their common betterment. Among these are some problems deriving from human settlements and rural lands and others more directly related to the world's oceans and atmosphere.

45. While conservation problems are usually considered as local, there are a number of problems of this type which have a global effect. Many national parks, nature reserves, undisturbed islands and wild species have value as part of a world heritage of wild and scenic resources. Their proper conservation becomes an international obligation which must be exercised in concert with the national agencies having responsibility over them. Many birds, marine mammals, and marine reptiles are migratory by nature and can only be protected through international agreement. The protection of many endangered species requires international agreements governing their export, import and sale.

46. The greatest apparent man-made changes in biological environments are those related to pollution. These include the increase in carbon dioxide, particulate matter, and various toxic and radioactive materials in the atmosphere which could have long-term deleterious effects and must be studied and where necessary controlled. Water pollution may also be a global problem, as may the release of radioactive isotopes, the discharge of toxic materials, excessive nutrients, or heated water into estuaries of coastal waters on which the productivity of the oceans is dependent. The agricultural regions of the world are the source of many pollutants which affect the entire world as previously described.

47. Pollution from radioactive material is a danger which could become of greater significance as increased reliance is placed on nuclear power and, eventually, if nuclear explosives for engineering purposes were to be used. Although very serious measures have been taken and are being taken by the nuclear industry, all possible contamination problems have not yet been fully solved. Krypton 85 and tritium are of particular concern in this respect.

48. In the marine environment there is an obvious need, already considered by the United Nations, for international control over the exploitation of marine resources and for the institution of rational use of the resources of the sea. Destruction or depletion of marine resources has been a continuing process in the absence of effective control and management. The decline of certain species of whales and seals, of sea turtles, of the Pacific sardine and Atlantic salmon fisheries, as well as the continuing over-exploitation of the eastern Pacific anchoveta fishery are examples. The growing dependence of mankind upon the sea as a source of protein requires that its resources be properly managed. Pollution of the sea is a

continual threat to its future productivity. Although the International Convention for the Prevention of Pollution of the Sea by Oil has been in existence since 1954, oil pollution remains a major concern, and other forms of equally damaging pollution continue with little or no control.

49. Weather and climate are widely recognized as fundamental elements of the human environment. That they play such important roles in all of man's plans and activities, and that they are intimately related to all other environmental factors, are facts which are so self-evident that often they are simply taken for granted. The use of meteorological and climatological data for planning for efficient use of the land, for water resources, agriculture, and human settlements is not as yet receiving adequate attention. The need for continual monitoring to detect changes in the earth's atmosphere and its weather and climate is also apparent, but projects under way such as the World Weather Watch, still require more adequate support.

50. Both at national and international levels, action programmes and institutional measures to correct and prevent pollution of the air, of land, water and ocean resources, and of food, are urgently needed. So are legislative and administrative controls, in the interest of both social and economic objectives, on the use of pesticides and other chemicals which are essential in modern agriculture and industry but which, when wrongly used, can be harmful to man and his environment.

II. NATURE, SCOPE AND PROGRESS OF PRESENT WORK

51. The diversity, the magnitude and the universality of the problems of the human environment which have been briefly outlined above are such that a considerable effort has been and is being devoted to their solution, at the local, national and international levels. Item (a) of operative paragraph 2 of General Assembly resolution 2398 (XXIII) calls for the presentation in this report of "the nature, scope and progress of work at present being done in the field of human environment". It is clearly impossible within the limits of such a report to give a detailed review and analysis of this work. Also, it is impracticable, within the very short time available for the presentation of the report, and on the basis of the very limited material so far received from Governments, to attempt a comprehensive assessment of the nature, scope and progress of such work. It is, however, possible to indicate certain important trends appearing in this field and to provide a very rough evaluation of what is at present being done in relation to the problems of the human environment. This is the object of the following paragraphs.

Environmental sciences research

52. A very large volume of research work covering the entire range of subjects related to the human environment is in progress in most industrialized countries. In a number of countries, a rapidly growing awareness of environmental problems has very recently been giving significant impetus to such research work. At the international level, such programmes as the International Geophysical Year, the International Biological Programme, the International Hydrological Decade, and the Intergovernmental Oceanographic Commission, have provided significant stimulation to research in important sectors of the environment. It should be noted, however,

that more emphasis has been placed so far on research in the physical and earth sciences than in the biological and social sciences, and that even in the most advanced countries an ecological and integrated approach has rarely been followed in research programmes. In the developing countries, much basic environmental research remains to be done in all fields, particularly in the biological sciences.

53. Significant research problems on global scale environmental phenomena, such as those of the global atmospheric circulation and composition, or the interactions between the oceans and the atmosphere, require major international programmes which are now only in the planning stage.

54. Finally, both in developed and developing countries, little is known about many socio-cultural and psychological problems of the environment. Such problems are extremely complex and a considerably expanded research effort appears to be required in this area.

Technological research and development

55. Many environmental problems, as for instance most pollution problems, could be solved now through technological means. A considerable amount of technological research is being done in industrialized countries, and through international groups, in relation to air and water pollution. In fact, technological "solutions" exist to most industrial pollution problems but are not applied, usually for economic or political reasons. Technological pollution research is accompanied by practical experimentation both in the public and private sectors of industry, each particular industry usually having specific pollution problems to solve. Current research efforts in the United States of America, the Union of Soviet Socialist Republics, Europe and Japan are directed towards new pollutants (biocides, detergents, radio-nuclides etc.), air-water-land interchange of pollutants, and cheaper pollution abatement technology.

56. Technological research associated with environmental problems other than those of industrial pollution, such as housing research, generally appears to receive less attention, although significant research on urban problems is being carried out in many developed countries like Czechoslovakia, France, Poland and the United Kingdom and in some developing countries like India and Venezuela. Research and development in improved agricultural practices or in improved industrial working conditions can be exemplified from many countries.

57. Transfer of technology from developed to developing countries in the environmental field is hampered by inadequate institutions and the shortage of personnel. Technological research under local conditions is, however, in progress in such institutes as the Central Engineering Institute of the State of Guanabara in Brazil or the Institute of Occupational Health and Air Pollution Research in Santiago, Chile. The Centre for Research on the Utilization of Saline Water in Irrigation, in Tunisia, and the Soil Research Institute in Iran, provide examples of technological research to solve environmental problems in the agricultural sector. Research on reclamation and re-use of water in Israel, or on oxidation ponds in India, constitute examples of efforts to adapt existing technology to local conditions and available means.

Standards in monitoring

58. While a number of industrialized countries are attempting to define necessary standards on factors of environmental quality, there is not often agreement on such standards at the national level, and consequently very rarely at the international level. Such lack of agreement seriously impairs possibilities of environmental control. Ambient air quality standards exist in Czechoslovakia, the Federal Republic of Germany, Poland, Romania, Union of Soviet Socialist Republics and the United States of America. Some regional efforts have been made in this field. For instance, ten countries co-operate with WHO in Latin America on an air pollution sampling network and CMEA has developed an agreement on measurement of water pollution levels in eastern Europe. Standards in water quality, food quality, radioactivity hazards etc. are being prepared at the international level but much remains to be done in this line of action.

59. Apart from some major parameters, mainly in the fields of geophysics, meteorology, radioactivity, or in other physical sciences, there is little international agreement on methods for measuring and on monitoring environmental parameters. While several existing or planned international research programmes (World Weather Watch, International Hydrological Decade, Man and the Biosphere Programme etc.) provide a suitable machinery for such monitoring, agreed methodologies are not yet fully available.

Environmental education

60. As clearly underlined by the 1968 UNESCO Conference on the Resources of the Biosphere, education at all levels and in all countries is at present not properly designed to produce adequate understanding and appreciation of the very nature of environmental problems. Only scattered efforts are being made in this respect in some countries, mainly developed countries, including a new emphasis on ecology at university level. Very little educational material suited to the actual requirements of developing countries is as yet available in this field, although efforts by UNESCO and the International Union for the Conservation of Nature are in progress to produce such material.

61. Training of specialists and technicians at all levels to handle environmental problems is obviously a major need in developing countries. Efforts are being made to train qualified staff in their own country through national institutions, or in conditions similar to those existing in their own country through regional institutions such as the Middle East Technical University at Ankara, the Training Centre for Sanitary Engineering at Morocco, the Turrialba Inter-American Institute for Agricultural Sciences in Costa Rica, or the Inter-American Housing and Planning Center at Bogota.

Public information

62. Recent trends in mass media show a very significant increase in public attention to environmental problems. This is particularly marked in many of the developed countries where, however, emphasis is more often placed on sensational, but relatively unimportant issues, ignoring less spectacular, but more urgent and fundamental questions. Objective, well presented, and balanced information on

current environmental problems is hardly available anywhere to assist in forming public opinion. Perhaps even more aggravating is the fact that in a vast majority of countries appropriate arrangements do not seem to exist for the provision of such information to the authorities and personalities responsible for management and control of the environment. The establishment of information services dealing with environmental problems is only starting in a few countries.

Economic planning and analysis

63. In spite of some recent changes in ideas, environmental factors and values including the value of recreation and tourism are generally ignored in economic planning and analysis at the very time when these two disciplines are spreading and being given prominent roles in governmental action in many countries. The economic evaluation of the effects of environmental deterioration is at best considered as a separate element, but seldom integrated with the other elements of a given development programme. Alternative development projects having different environmental consequences are rarely studied and economic choices are made with little reference to environmental consequences, particularly those of an ecological nature. This applies particularly to large-scale development projects in less developed countries. In some countries, however, cost-benefit analysis is applied on environmental evaluation and modern computing techniques are used to define the optimal choice of projects in relation to environmental problems. For example, water quality management in the Ohio valley and Delaware estuary in the United States of America is based on such a methodology for the assessment of damages and benefits.

Preventive action on environmental deterioration

64. It is a very general feature of environmental deterioration that relatively simple preventive action is not taken, thus leading to more costly and difficult curative measures. In some countries, advisory or regulatory bodies such as soil conservation services have been organized for control and prevention of environmental damage caused by human activity. More often, however, preventive action is decided in a somewhat improvised manner, with a view to avoiding the repetition of a serious environmental catastrophe.

65. Since environmental consequences are often in a field different from the cause that has created them, there is practically nowhere clear responsibility among governmental authorities for preventive action on environmental deterioration. And, as indicated earlier in relation to economic analysis, there is generally no action to prevent possible harmful consequences of major changes made on the environment.

Curative action on environmental deterioration

66. Efforts to restore environmental quality and to reduce detrimental effects of environmental deterioration are widely spread in developed as well as developing countries. Such curative action is generally taken in response to single factor effects, such as water pollution, soil erosion, or slum congestion, without general plans for remedial action and without consideration of interrelations between the various factors of the environment. Such fragmentary approaches sometimes result in the creation of new problems while attempting to solve existing ones.

67. Curative action on environmental deterioration is often too costly and too difficult to be thoroughly implemented and there is, in fact, a tendency to limit it to temporary and local relief, thus postponing truly painful decisions to the future.

68. A number of cases where decisive curative action has been conducted can be quoted, such as air pollution control at Pittsburgh (United States of America), water pollution control in the Ruhr Valley (Federal Republic of Germany), prohibition of DDT in Sweden, erosion control through terraces in north Africa, watershed management in central New Zealand, housing and urban equipment project "R" in Czechoslovakia, national parks in east Africa and control of salinization in the Danube plain in Hungary.

Prospective and creative action on environmental management

69. An increasing awareness of environmental problems leads in a number of countries to prospective and planning measures for environmental management. In this respect can be quoted the French plan for management of the Paris region, the master plan for the Karachi area in Pakistan, the physical development plan for the south Adriatic region in Yugoslavia, and similar urban or regional planning carried out in both developed and developing countries. Land capability surveys as a basis for rural planning have been or are being conducted in many developed and developing countries, such as in the Dominican Republic, Argentina and Botswana.

70. Creation of new man-made environments is going on at an increasing rate all over the world. This ranges from creation of new towns, such as those recently built in the United Kingdom, a field where experience is progressively building up, to creation of large man-made lakes in Africa and elsewhere for power and irrigation, where the entire ecological framework of a vast area is transformed and where unfortunately necessary ecological studies have so far been neglected at the planning stage.

71. In planning and management of the human environment emphasis is generally placed on economic criteria and on physical and quantitative aspects of the problems more than on qualitative and socio-cultural aspects. This results in many large-scale developments, particularly in housing, which do not fully respond to legitimate human aspirations and social needs.

Administrative structures

72. In general, environmental problems at governmental level have been handled in all countries through traditional technical ministries, such as ministries of public works, health, agriculture and housing. Within these ministries, there is need to develop and strengthen advisory or regulatory services, management administration and control laboratories. While observation, measurement and analysis of environmental parameters can legitimately be handled by separate governmental services (e.g. meteorological service, hydrological service and soil service), governmental planning, management and control of the human environment usually suffers from the lack of nation-wide approach to population settlement, inadequacies in co-ordination, rigidity in intergovernmental relations, and the lack of adaptability of regional and local administration units to changing circumstances.

73. Until recently, there has been little awareness that environmental problems require an interdisciplinary approach and concomitantly make demands on organization for decision-making and for co-ordination on functions having a significant effect on the human environment. Governmental organization for decision-making has generally so far been conducive to a fragmented approach, functionally and territorially. Some countries have recently attempted to establish central co-ordinating or consultative bodies (e.g. the Delegation a l'Aménagement du Territoire et a l'Action Regionale (DATAR) in France, the National Nature Conservation Office, the Environmental Council in Sweden, and the Regional Planning Authority for Malaya) to develop such a national approach. The severity of pollution in urban regions is also forcing consideration of new forms of government for these regions, especially in technologically advanced countries. Moreover, comparative research on urban problems has sharpened awareness of the need for greater adaptability of governmental organization to changing conditions and for institutions to facilitate the required changes in governmental organization.

Financial, fiscal and trade arrangements

74. The cost of maintaining or restoring environmental quality is often high and the methods through which this cost can be met, and by whom, create a whole range of problems in both developed and developing countries. In the latter case in particular, inadequacy of financial means is such that long-term environmental problems are easily neglected for immediate short-term benefits.

75. Certain environmental problems relating particularly to pollution are in fact the consequence of industrial processes which could be modified, provided appropriate fiscal and trade arrangements of an international character imposing equal constraints on all concerned, were made. In fact, with the exception of certain regulations like those concerning pollution of the sea resulting from ship fueling, no such international arrangements have been sought so far.

Legislation

76. A very considerable amount of national legislation exists in many countries on certain aspects of the environment. In most cases, however, this legislation has accumulated throughout the history of the country and is not adapted to present conditions. It is fragmented, neglecting interactions between environmental factors and is not accompanied by the governmental financial assistance which could make it effective. Obsolete legal patterns, including obsolete land and water rights, hinder rational development and conservation of resources in many areas. Regulation in the environmental field is generally considered as an unjustified restriction of human enterprise and is not understood as an integral part of long-term and sustained development of resources.

77. In a number of countries, recent major legislative measures have been taken in the field of pollution control. Among these can be cited the Clean Air Act (1956) and the Radioactive Substances Act (1960) in the United Kingdom, the water pollution control legislation of 1963 in France, and similar recent legislation in the United States of America and Czechoslovakia. Important legislation in the field of water management and of land management has also been recently

adopted in a number of countries. A central authority for water resources management has been created in Hungary for instance. A general trend seems to exist for reviewing and revising national legislation and also for providing an over-all legislative framework on environmental questions. The United States Congressional White Paper on a National Policy for the Environment (1968) is a good example of this trend.

78. At the international level, conventions and agreements are not numerous. Among these are such instruments as the African Convention on Conservation of Natural Resources adopted by the Organization for African Unity in 1968, the International Commission for the Protection of the River Rhine against Pollution, the International Convention for the Prevention of Pollution of the Sea by Oil, the International Plant Protection Convention, the Convention on Fishing and Conservation of the Living Resources of the High Seas and the Water Charter of the Council of Europe. This legislation is still very fragmentary and there is much room for decisive progress in this field. When formal international legislation appears premature, agreed codes of practice can play a very useful part and progress is being made in the preparation of such codes of practice. The degree of implementation of existing legislation, both at national and international levels, remains uncertain in a number of instances where actual control is difficult.

International action and assistance

79. Most United Nations bodies are very active in the environmental field, both as regards studies, stimulation and normative action on the one hand, and technical assistance, training and operational work on the other. A large majority of all existing UNDP Special Fund projects are related to environmental and natural resources activities. When the Economic and Social Council discussed at its forty-fifth session the possibility of holding a Conference on the Human Environment, it had before it a document which presented in a brief form a review of the most important activities in this field carried out by the United Nations bodies concerned (E/4553). An updated and somewhat expanded review of these activities is given as an annex to this report. This annex indicates the diversity and magnitude of these current and planned activities.

80. A number of regional intergovernmental agencies, including OECD, the Council of Europe, the European Economic Community, CMEA, the Organization of American States and the Organization of African Unity also maintain activities in the field of the human environment. Non-governmental organizations as well as a number of private foundations have important activities related to specific aspects of the subject.

Summary

81. While an evaluation of present work and progress is difficult to make, the following points could be advanced:

(a) The universality of environmental problems results in an important amount of work being carried out both in developed and developing countries as an attempt to meet these problems;

(b) This work however is mainly conducted by traditional instrumentalities on a fragmentary basis without integrated approach at the national level and without sufficient over-all view at the international level;

(c) While preventive action would usually be preferable on many grounds, developments affecting the environment are usually not planned or conducted in such a way as to prevent or minimize harmful consequences, thus leading to the need for difficult costly and imperfect corrective measures;

(d) There is considerable amount of scientific and technological knowledge which is available and not being applied or properly applied; most problems of the human environment appear amenable to solution by wise and proper management, including not only protection from degradation but rational utilization and improvement for future generations; such management requires appropriate administrative measures, and practices, enlightened economic and social planning and support of national and international legislation;

(e) However, there is need for further research on certain scientific and technological problems particularly on global, physical and biological phenomena, on socio-cultural factors, on non-polluting techniques and on rational and conservative use of resources.

(f) There would be great advantages in developing further international action in the field of the human environment such as the promotion of research and monitoring programmes (which are under way or being planned), educational and technical assistance programmes (which could be significantly developed), and arrangements for technical meetings and specialized studies. A major area for international action will be in world-wide or regional legislation, standardization and conventions.

III. UNITED NATIONS CONFERENCE ON THE HUMAN ENVIRONMENT

A. Purposes and objectives

82. The basic purposes which are to be served by the convening of a United Nations Conference on the Human Environment are set out in general terms in General Assembly resolution 2398 (XXIII) particularly where it believes it "desirable to provide a framework for comprehensive consideration within the United Nations of the problems of human environment in order to focus the attention of Governments and public opinion on the importance and urgency of this question and also to identify those aspects of it that can only or best be solved through international co-operation and agreement".

83. The analysis of current environmental problems, and the brief evaluation of the nature, scope and progress of work at present being done which have been attempted in the preceding sections suggest lines along which the purposes and objectives of the proposed Conference can be further defined.

84. The universality of serious and growing environmental problems in both developed and developing countries calls everywhere for governmental and intergovernmental action of increasing magnitude, carried out with the full

support and understanding of public opinion. There is a wealth of scientific knowledge and technological skill available for the solution of most of these problems. This information has been reviewed and discussed in many scientific and technical meetings and congresses sponsored by national governments and international agencies. The 1968 Conference on the Resources of the Biosphere, organized by UNESCO, with the participation of the United Nations, FAO and WHO, and in co-operation with the International Biological Programme and the International Union for Conservation of Nature is an example. The General Assembly clearly did not wish the 1972 Conference to be conceived as a huge gathering of scientists for detailed discussion of the innumerable specialized problems pertaining to the maintenance and improvement of the physico-biological and socio-cultural environment of man, nor did it suggest the initiation by the United Nations of new research projects on these problems.

85. The Conference should rather be conceived as an important means of stimulating, and providing guidelines for action by national governments and international organizations in their attempts to achieve concrete and valid solutions to the problems of the human environment. It must be emphasized in this respect that the decision to convene the Conference, and the preparations for it, should in no way be used to postpone or to cancel already initiated or planned programmes of research or co-operation, be they at the national, regional or international level. On the contrary, the problems involved are so numerous and so complicated that all efforts to deal with them immediately should be continued and intensified. The Conference, and the preparations for it, should further encourage such efforts, as well as identify areas where insufficient work is being done.

86. The principal specific *raison d'être* of the Conference would therefore be its concentration on the need for action by public authorities, at the local, national, regional and international levels, to deal with the problems of planning, management and control of the human environment for economic and social development.

87. Only such concentration of the Conference on governmental action appears to be able to provide a strong link and guiding thread in the diversity and multiplicity of problems which will necessarily come within its scope. In this context, governmental action can develop at the local level (with local governments and city authorities involved), at the national level, at the regional level (in particular in the case of international river basins) or at the world level (with agencies particularly involved).

88. With this principle in mind, the purposes of the Conference could be further described as follows:

(a) To focus the attention of governments and public opinion on the importance and urgency of environmental problems so that increased attention thereto be given in policies and programmes of economic and social development, both in developed and developing countries;

(b) To provide a forum for exchange of views among governments on the ways and means of handling environmental problems, including machinery required for administrative and legislative action;

(c) To identify those aspects of such problems which can only, or best, be solved through international or regional co-operation and agreement;

(d) To consider methods to meet the need for intensified action at the national, regional and international level and in particular, how developing countries can through increased international co-operation, derive benefit from the mobilization of knowledge and experience about the problems of the human environment, enabling them, inter alia, to forestall the occurrence of many such problems;

(e) To focus attention on and encourage wider participation and support for present and future activities and programmes of United Nations organizations and other international organizations related to the human environment and to give them a common outlook and direction.

89. A number of specific objectives could be assigned to the Conference among which could be mentioned the adoption of certain basic premises and considerations to guide the action of governments and intergovernmental organizations, as well as of individuals in relation to the environment. Such premises could include the recognition of the environment as a public resource essential to the survival of man, the acknowledgement of the responsibility of governments, local authorities, industrialists, agriculturists, as well as individual citizens in the maintenance and enhancement of environmental quality, the need for establishing effective and rational management of the environment and of its resources. In this connexion, the Conference should consider the proposal advanced by the Intergovernmental Conference of Experts on the Scientific Basis for Rational Use and Conservation of the Resources of the Biosphere and supported by the Advisory Committee on the Application of Science and Technology to Development for the preparation of a declaration on the protection and betterment of the human environment.

90. The development of procedures to identify criteria and standards of environmental quality, to improve systems of measurement for assessing changes in environmental quality and their impact on human welfare, and to achieve subsequent international or regional agreements on specific environmental problems could be mentioned also as objectives of the Conference.

91. It is clear that the Conference itself will not be able to reach specific agreement on standards, legislation, and common action in the many technical and specialized fields where it is increasingly required. But, it should provide a basis and prepare a favourable climate for subsequent international and regional action in which many United Nations bodies and other international organizations will be involved.

92. Although the primary emphasis of the Conference will be on action, equal importance must be given to the provision of information for and the education of mankind on the nature and importance of the problems of their common environment, since on these will depend the public support needed for effective action. Necessary steps should therefore be taken before, during and after the Conference to bring to public attention the issues, deliberations and recommendations of the Conference. The presentation of films and the organization of a governmental exhibition on national and international programmes during the Conference could also be envisaged.

B. Delimitation of scope

93. The term "human environment" may be interpreted in many ways. In one approach, attention is drawn to the physical and biological environment which surrounds man, whether this environment is "natural" or whether it is the result of man's actions. (In fact, at a time when man has imposed his domination on every square mile of his planet, the boundaries between "natural" environments and man-made or man-affected environments tend to disappear.) In another approach, attention is directed towards man himself in his total relation to his environment. Here, not only physical and biological factors of the environment external to man are involved, but equally their reactions on man himself, so that socio-economic and socio-cultural considerations become predominant.

94. The debate in the General Assembly, and the resolution itself, did not attempt to give a precise definition of the term "human environment". Two main types of problems however were emphasized:

(a) The changes in natural surroundings of man brought about by increasing population and the use without adequate control of modern technological advances in industry and agriculture, and

(b) The impact of these changes on man himself, on his health, and working and living conditions.

95. The emphasis was therefore clearly placed on the consequences of human action on the environment, thus excluding purely natural phenomena even if they may affect man, such as typhoons and earthquakes. Socio-cultural environmental (including health and living conditions) problems were also to be considered in so far as can be directly related to physico-biological changes of the environment. Other socio-cultural problems including some of those mentioned at the end of section I which can only be indirectly related to these changes should be excluded.

96. Within the context of this interpretation, the Conference should not be involved in narrow technical discussions, but address itself to broad topics of general human concern. In other words, it should principally consider the economic, social, cultural and health consequences of human action on the physical and biological environments. These environments are considered to include natural environments as well as those profoundly modified or created by human action. More emphasis would be placed on the environment in cities or in agricultural areas, than on the environment of such areas as the Antarctic continent which is only of marginal immediate concern to man. The social, economic and political environment, resulting from the interaction between people and groups, such as labour-industry relationships or marriage and family relationships, or from such matters as fiscal policy, international trade or pricing agreements, would clearly be excluded from consideration.

97. The delimitation of the scope of the Conference which results from the above remarks still leaves a very broad field to be covered. It would seem, however, that any further limitation of the subject-matter to be considered by the Conference would tend to be arbitrary and would necessarily ignore priority problems which have been identified as such by many countries. A first United Nations Conference on a general theme of such importance and significance to the

future of mankind should probably not attempt an artificial limitation in scope which could prove subsequently detrimental, and the very fact that environmental problems often result from fragmentary approaches militates against any such limitation.

98. But, in fact, the real limitation of the Conference will not be so much in its scope as in its purposes and objectives as they have been defined above. The concentration of the Conference on problems of action and management by public authorities will automatically leave aside those aspects of the problems which do not call for or are not amenable to such action, including for instance problems which relate more to the appreciation of individual persons. Topics of interest, no matter how great their theoretical importance, should not be considered unless they can conceivably lead to an action programme. Admittedly, on some topics of global importance, the only action involved at this time may be research on an international scale. However, research problems or studies on specific topics of less than global importance would not be stressed in this Conference.

99. Since the objectives of the Conference involve action by governments and international organizations, it will be essential that national delegations to the Conference include representation from a wide range of governmental agencies or agencies with the broadest environmental responsibilities. Thus departments concerned with agriculture, urbanization, pollution, preservation of nature, education, public administration, development, planning, health and welfare and population could all appropriately be involved and could include as advisers, experts in the physical, biological and social sciences, education, information, health, engineering and technology, population and planning. The solution of environmental problems requires political, economic and social action and may have political, economic and social effects. Therefore, the social sciences will have a major role to play in this Conference, where emphasis should be placed on the interdisciplinary aspects of the problems.

100. In scope and content the Conference should avoid detailed consideration of specialized topics and underline those areas of broad, interdisciplinary concern. Thus, purely physiological problems, such as physiological adaptability, which is adequately covered by the International Biological Programme, need not be discussed at this Conference. Nor is it believed necessary to attempt to establish environmental standards, since these are highly technical matters which are being dealt with through other international and national channels. Similarly, detailed technology for the control of pollution from internal combustion engines would not be a topic for consideration while the prospects and technologies available for air pollution control in general would be. The status of a specific or rare species of animal or plant would not be considered while the over-all status of endangered wild species and their importance to the future of mankind would be relevant. Human population problems would only be considered in relation to their environmental effects. The status and trends in world population might be the subject of an introductory paper. The physics of the atmosphere would not be considered, whereas the deterioration in air quality or the effects of changes in the atmosphere on man's future would be. Techniques for increasing food production would not be stressed but the environmental effects, in a broad sense, of the application of these techniques would be.

101. The topics selected for the Conference and the method of preparation of the working document related to each topic which are suggested below should avoid unnecessary dispersion on too many highly specialized problems and should provide as well for each problem a thorough interdisciplinary treatment of technical, economic, social and other aspects.

C. Participation

102. The type of participation in the Conference has already been referred to above and is a consequence of its main purposes. These would lead to a conference consisting of governmental delegations at a policy-making level (political leaders, senior administrators concerned with planning, management and control of the environment) assisted by a relatively small number of technical advisers (including medical and agricultural scientists), economists, physical planners and other social scientists having broad concern with major environmental problems and where possible, opinion formers (including educators, writers and mass media professionals). It is however, in the preparatory stages of the Conference, both within each country and in the elaboration of the documentation, that the participation of the specialists will be most important.

103. The Conference consisting of delegations representative of all States Members of the United Nations or of the specialized agencies and IAEA would be empowered to make recommendations to governments as well as recommendations for consideration by the General Assembly and the governing bodies of the specialized agencies concerned.

104. The United Nations, specialized agencies and IAEA, which will be closely associated with the preparation of the Conference will of course be represented. In addition, appropriate intergovernmental and non-governmental organizations will be invited to send observers to the Conference.

105. For the Conference to achieve its objectives, and particularly in view of the universality of the subjects to be discussed and the fact that environmental problems in any country may have repercussions in the entire world, it is essential that all Member States be adequately represented. Experience in the 1963 Conference on the Application of Science and Technology for the Benefit of the Less Developed Areas has shown the difficulty for many developing countries to send delegations to such important conferences. As the Advisory Committee on the Application of Science and Technology to Development has suggested, it is hoped that the General Assembly would consider concrete steps which could be taken to ensure adequate representation from developing countries.

D. Structure and content

106. Having considered the main problems facing developed and developing nations, the nature, scope and progress of work going on in the field of the human environment, and keeping in mind the objectives and the scope of the Conference and the desirable composition of the delegations, it is possible to make some concrete suggestions as to its structure and content.

107. A conference at the policy-making level which is not intended to enter into detailed technical discussions should not be of too long duration. It is proposed that the Conference be organized within two weeks, i.e. ten working days.

108. The multiplicity and complexity of subjects to be discussed are such that the Conference could be structured in many different ways. It must however provide a framework broad enough for interdisciplinary exchange of views consistent with its nature, and at the same time make room for more technical debates through the establishment of specialized commissions devoted to major groups of problems.

109. Sections I and II of this report have laid particular emphasis on two different kinds of problems. One relates to particular situations in the human environment, and includes topics such as urban planning, national land use, water pollution or national parks. These problems can be defined as substantive or sectoral. The other, which cuts across different environmental situations, and can therefore be called strategic or horizontal problems, relates to such domains of action as environmental values in economic analysis, fiscal methods of preventing pollution, administration for regional planning or international agreements. It is considered advisable therefore to subdivide the study of problems and the domains of action into two broad groups: substantive problems and strategic problems. It will be desirable that participants in the Conference review substantive problems providing a common background of knowledge before they take up the more interdisciplinary strategic problems.

110. A possible structure for the Conference could be conceived schematically with the following sequential parts:

Plenary sessions

111. (a) Opening ceremony followed by introductory papers on the major world problems (e.g. population, food, health, housing and education) which are closely related to and constitute the framework of all problems of the human environment.

(b) General debate covering all facets of problems and experiences arising from national reports prepared by governments.

Commission sessions

(c) Discussion of working documents related to substantive problems in four commissions devoted respectively to:

- (i) Problems of human settlements and industrial development
- (ii) Problems of rational use and development of natural resources
- (iii) Problems of environmental pollution
- (iv) Problems of maintenance of values of the human environment.

Plenary session

(d) Presentation of main conclusions reached by the four substantive commissions.

Commission sessions

(e) Discussion of working documents related to strategic problems in four new commissions devoted respectively to environmental aspects of:

- (i) Economic and social planning
- (ii) Financial, fiscal and pricing policies
- (iii) Public administration and legislation
- (iv) Regional and international co-operation

Plenary sessions

(f) Presentation of main conclusions reached by the four strategic commissions.

(g) Preparation and adoption of report and recommendations of the Conference.

112. Each commission of the Conference could be opened by the presentation of an introductory report giving a general framework and orientation for its work followed by the discussion of the working papers related to that particular commission. These introductory reports might be based inter alia on an analysis of the national reports prepared by the Governments for the Conference. Each commission will prepare its own report and proposed recommendations. A possible mandate and examples of topics for working documents is given below for each of the proposed eight commissions. It should be recalled that only four commissions meet at the same time, the substantive commissions having completed their work before the strategic commissions meet; the same participants can therefore take part successively in a substantive commission and in a strategic commission.

Commissions for substantive problems

Commission on problems of human settlements and industrial development

113. This commission would consider essentially sectorial problems in man-made environments including their economic, social and human aspects. Particular attention would be drawn to the interactions between different types of environmental problems which are an obvious attribute of large human settlements, but also occur in industrial zones and rural and recreational settlements. Problems of traffic and public transportation would be considered in relation to the settlements themselves and to communication among them. The background of this commission should be seen in population size, population growth and accelerated urbanization. Among possible topics for working papers for this commission, the following can be given as examples: creation of new towns and new cities; health and social problems of life under slum conditions; prospects for limiting urban growth in large cities; city planning and organization of the urban environment; slum clearance; regional frameworks for land use and population distribution; urban design and human well-being; location and setting of new industries; housing in tropical climates; working conditions in industry;

improvement of technology for urban utilities including district heating. In addition, a number of case studies relating to management of problems in typical human settlements and industrial areas could be presented.

Commission on rational use and development of natural resources

114. This commission would deal with problems of management and mismanagement related to land use, agriculture, forestry, fisheries, water development, mineral resources exploitation and with the formulation of long-term policies and the ways and means of achieving methods of rational use of resources while preserving sustained yields and environmental quality. Among possible topics for working papers, the following examples can be given: ecological and social consequences of river basin development and watershed management; problems of inter-basin water transfer; benefits of tree cover and other vegetation; ecological and social consequences of increased livestock production; mining and landscape stability; salinity, waterlogging, health and social problems of irrigation development; rehabilitation of waste land; rational use of non-oceanic bodies of water. In addition, a number of case studies on rational management of specific rural and mining areas and river basins could be presented.

Commission on environmental pollution

115. This commission would consider problems of pollution in all their aspects - technical, economic, social, health, financial, administrative, legal - and should identify reasonable solutions and appropriate preventive or curative action. Attention would be drawn to the long-term impact of pollution on man, essential resources, and environmental quality, and on formulation of long-term governmental policies and strategies. Among possible topics for working papers, the following examples can be given: air pollution (nature and scope of problem, organization for pollution control, economics of control and legislation required); inland waters pollution; soil pollution; biocides as pollutants and new approaches to pest control; pollution of the sea; radio-active hazards in air, water and soil; noise in urban areas; environmental problems arising from supersonic transport; solid waste problems; recycling and reclaiming of wastes; potential long-term problems in atmospheric and ocean pollution. In addition a number of case studies on pollution abatement and control could be presented.

Commission on maintenance of values of the human environment

116. This commission would consider problems of maintaining natural or man-made environmental values for their scientific, cultural, aesthetic, recreational and touristic as well as economic interest. These include monuments, sites, wildlife, natural areas and national parks. Attention should be drawn to their conservation and enhancement, and to their economic and cultural impact on human societies. Formulation of practical and long-term governmental policies and international action should be derived. This commission will be dealing with problems that are particularly suitable to international agreement. Many of the problems to be considered by this commission can also be solved with little financial cost to the nations involved. Among possible topics for working papers, the following examples can be given: economics and administration of nature conservation; scientific importance of the natural world; protection of sites and monuments; extinction of wild plant and animal species and its consequences; national parks, nature preserves and rational land use; island eco-systems for research and

experimentation; green belts around cities for recreation and food production; living resources of the sea; disintegration of social institutions and environmental quality; recreation and cultural tourism in relation to environmental values. In addition, a number of case studies on conservation and management of natural and man-made environmental values could be presented.

Commissions for strategic problems

Commission on environmental aspects of economic and social planning

117. This commission would concentrate on relating the entire range of environmental problems to long-term planning of economic and social development. Special attention should be paid to the economic and social evaluation of environmental values and of the maintenance or restoration of environmental quality. It should consider the methodology for such evaluation and formulate long-term governmental policies and strategies. It should pay special attention to the necessary changes in attitudes among political leaders, government officials, businessmen and industrialists, and to general education and public interest and concern in relation to environmental problems. The work of this commission, as well as of other strategic commissions, would be based on a number of working documents and on the results of the discussions in the substantive commissions. Working papers for this commission could include such items as: methods of assessment of environmental values in economic analysis; relative costs and definition of priorities in restoration and maintenance of environmental quality; social and behavioural responses to environmental problems; general education for understanding environmental problems, public information on environmental issues.

Commission on financial, fiscal and pricing policies

118. This commission would concentrate on the financial, fiscal and pricing obstacles or incentives which often determine attitudes and action in dealing with environmental problems. Encouragement of desirable activities or discouragement of undesirable ones through financial, fiscal and pricing policies should be considered. Recommendations for practical immediate and long-term policies should be drawn up. Working papers for this commission could include such items as: taxation policies for improving the environment; repartition of charges and penalties for environmental deterioration; implications for internal and external trade of environmental control legislation.

Commission on public administration and legislation

119. This commission would concentrate on the institutional arrangements required for effective planning, management and control of environmental problems. It should examine alternative approaches to governmental organization, including consultative as well as executive bodies, at national, regional, and local levels for this purpose. It should also consider distinctive problems involved in formulating legislation and regulations for rational management and control of the environment. The following are illustrative of the topics which this commission might consider: organizational implications of a national policy for population settlement and environmental control; comparative review of existing national machinery for environmental planning, management and control; relationships between levels of government to facilitate environmental control and management by regional and local

authorities; alternative arrangements at regional (sub-national) and local levels for environmental planning, management and control; distinctive personnel requirements for environmental management; arrangements for assessing environmental consequences of major development and other projects; arrangements for research, training and other activities to facilitate institutional changes necessitated by environmental changes; and formulating and reformulating legislation and regulations for environmental management and control.

Commission on regional and international co-operation

120. This commission could review existing regional and international activities and programmes, and identify gaps or areas for increased international co-operation in the field of the human environment. It could study ways and means of promoting new international and regional conventions, agreements, regulations, standards and codes of practice. It could also study the question of a declaration on the protection and betterment of the human environment mentioned in section III, paragraph 89. The work of this commission would be based, inter alia, on background papers prepared by the United Nations bodies and other international organizations. Review of such research, monitoring and development planning programmes as the World Weather Watch, the Man and the Biosphere programme, the International Hydrological Decade, the Global Atmospheric Research Programme, the Ocean Exploration programme, the Indicative World Plan for Agricultural Development and the FAO War on Waste could be made with a view to achieving increased support for these programmes. Possible international agreement in such fields as discharge of DDT, river basin pollution, protection of migratory birds and marine animals, trade of endangered species and sea pollution could be studied. Attention would be given to the possibilities of international assistance to develop rational management practices in all countries. The creation or strengthening of regional institutions for planning, research and training would also be explored.

121. It should be underlined that the above suggestions concerning a possible structure and content for the Conference are only given as a general illustration of how it could be organized. The actual programme of the Conference will require much detailed study before it can be finalized. Meanwhile, it is essential to maintain sufficient flexibility in any decisions concerning the structure, content and programme.

E. Documentation

122. A basic principle deriving from the above general approach is that the Conference would have prepared for it in advance a limited number of working documents relating to the various problems and types of action included in its programme. These papers would be prepared under the responsibility of the secretariat of the Conference by individual experts, followed by a review by a number of others or by interdisciplinary panels of experts. In addition, the Conference would have available material called for from Governments and international organizations. The documentation for the Conference could be divided as follows:

National reports

123. Each country would be invited to prepare a national report under its sole responsibility. This report would analyse, preferably in accordance with a uniform general outline the main environmental problems of the country, the ways in which they are handled, and the experience acquired in this respect. National reports should be sent to the Secretariat well in advance so that their content could be analysed and utilized in the preparation of the working documents for the Conference. National reports would not be considered as conference documents. They would not be translated or published by the Secretariat, but they could be distributed by the delegations at the time of the Conference, or made available before the Conference to other countries through the Conference secretariat or directly.

Case studies

124. The need for presentation of a limited number of case studies describing concrete examples of management of human environmental problems in specific geographical areas or locations has been indicated in relation to the work of the four sectional commissions. Case studies would be prepared under the responsibility of the countries concerned in accordance with suggested general outlines. All countries would be invited to offer suggestions for the preparation of such case studies. Only a limited number would be selected for actual preparation and presentation at the Conference. The selected case studies would be translated, reproduced and distributed as Conference documents.

International organizations reports

125. International organizations would have the possibility to distribute under their responsibility information material which would not be considered as Conference documents. In addition, a limited number of reports covering important programmes and activities of international or regional character would be requested from the international organizations concerned for presentation as Conference documents in the appropriate parts of the Conference, particularly the commission on regional and international co-operation.

Introductory papers

126. In order to set the framework of the Conference in the first plenary session and to review the major problems to be discussed in each commission, a small number of introductory papers will be prepared under the responsibility of the Secretariat by high level experts and consultants with appropriate review by other experts. These introductory papers will in particular take into account the main conclusions deriving from national reports.

Commission papers

127. Discussion papers will be prepared under the responsibility of the Secretariat for each of the main topics selected for the programme in the sectional and in the strategic commissions. Each paper will be of a limited size and will be entrusted for preparation in draft form to a leading expert, followed by a review by a number

of other experts from other countries. In some cases, an interdisciplinary panel may be needed to finalize drafting. Each paper should provide up-to-date integrated information from administrators as well as from scientists, economists and others on which commissions should base their discussions and draft recommendations. Discussion papers would naturally be considered as Conference documents and translated, reproduced and circulated in advance.

Volume of official documentation

128. With the above arrangements for documentation, it is expected that the total number of official substantive Conference documents (consisting of introductory papers, discussion papers, selected case studies and a number of international reports) would not exceed eighty. This official documentation for the Conference would be available in English, French, Russian and Spanish. It should be sent at least four months in advance in a pre-printed form to all Governments and organizations participating in the Conference.

Proceedings

129. The proceedings of the Conference should consist only of the pre-printed official documentation mentioned above as Conference documents, of the reports of the commissions and of the general report of the Conference including its recommendations. In this manner the total volume of official documentation before, during and after the Conference would be kept to a far smaller volume than in the case of former conferences such as the 1963 Conference on the Application of Science and Technology for the Benefit of the Less Developed Areas. The utilization of pre-printing would also save time and expense in the production of the proceedings.

F. Preparations

130. The magnitude of the task involved in preparing for the Conference will be clear from what has been written in the preceding sections. The time available for organizing such a complex and comprehensive meeting is minimal. The programme and list of working documents must be established, appropriate consultants appointed to prepare drafts of such documents, panels of reviewers set up on an international basis for commenting on and improving these drafts and final documents edited, translated, reproduced and circulated. A great deal of work will also be necessary to ensure full preparation for the Conference in the Member States. It is therefore imperative that complete preparatory arrangements become operative as soon as possible after the General Assembly has considered this report.

131. It is proposed that, as in earlier similar conferences, the Secretary-General should be given the responsibility for organizing and preparing for the Conference.

132. In establishing machinery for the preparation of the Conference two important aspects need to be borne in mind. The first is the requirement to provide the Secretary-General, in discharging his responsibilities for organizing the Conference, with expert advice on such matters as the agenda and programme for the meeting, the working documents required, the proposed outline for national reports

and the selection of case studies. The second is the need to stimulate and maintain political interest and involvement in the meeting. Both these needs could be met by the establishment of a preparatory committee to assist the Secretary-General. It would be desirable that it should be limited in size (about fifteen members) and consist of high-level experts from developed and developing countries familiar with one or other aspects of the Conference.

133. A conference secretariat should be established as early as possible in 1970, and progressively staffed. It should be headed by an executive secretary who should be appointed immediately. He would be assisted by qualified technical and general service staff recruited for the Conference. He should also receive technical staff assistance from the United Nations bodies concerned. The executive secretary would act as secretary of the preparatory committee and would be able to call on the services of consultants or panels of consultants as required. The Conference secretariat would maintain close relationships with appropriate intergovernmental and non-governmental organizations.

134. Full participation by the United Nations bodies will be essential at all stages of preparation of the Conference, including participation in the meetings of the preparatory committee. Most of the specialized agencies, as is shown in the annex, are directly involved in major sectors of the problems to be discussed at the Conference. It is hoped that some of the agencies (such as FAO, WHO and UNESCO), which have a particular concern with a broad area of the subject matter of the Conference, will be able to assign staff members to work on a full or part-time basis with the Conference secretariat.

135. Preparations for the Conference in the countries themselves should also begin immediately. As a first step for this purpose, it is suggested that they be invited to establish from the beginning ad hoc committees or similar focal points in the governmental machinery to ensure appropriate liaison within the country and to facilitate contacts with the Conference secretariat. The preparation of national reports should also help in focusing interest among the different groups and organizations concerned within each country. It is proposed that the chairman and members of the preparatory committee and the executive secretary should, at a later stage in the preparation, visit a number of countries to promote their active participation in the Conference.

G. Time and place

136. The General Assembly has already decided in its resolution 2398 (XXIII) that the Conference on the Human Environment should be convened in 1972. The exact time at which it should be held will, of course, be dependent on a number of factors. These include (a) the dates fixed for other major United Nations meetings, (b) the need to ensure sufficient time for thorough preparations to be made for the Conference, and (c) the views of the host country.

137. As regards the place for the Conference, an invitation for the meeting to be held in Sweden has been received from the Government of Sweden, which has also indicated that if the decision is taken to hold the Conference in Sweden, June 1972 would be convenient (A/7514). The Government of Sweden has indicated that it is aware of the requirements under General Assembly resolution 2116 (XX) with regard to the defraying of the extra costs that arise when a meeting is held outside an

established United Nations site. For the purposes of estimating these extra costs, Geneva should be regarded as the United Nations site at which the Conference would otherwise have been held.

138. Following the usual practice of the United Nations in regard to the holding of conferences away from established United Nations offices, an agreement concerning the holding of the Conference would be entered into between the United Nations and the host Government.

H. Financial implications

139. The General Assembly in its resolution 2398 (XXIII) requested that this report should provide "the range of financial implications for the United Nations of the holding of the Conference. Since the final details of the scope, preparation, documentation and organization still remain to be decided, it is not possible at this stage to provide precise financial estimates of the convening of the Conference.

140. An outline of the range of the possible financial implications is provided below. This outline has been prepared on the basis of a series of assumptions governing the preparation and the convening of the Conference, bearing in mind the necessity of keeping the costs at a minimum level, particularly with regard to the volume of documentation and publication, without impairing the effectiveness of the Conference. The assumptions are as follows:

(a) The Conference would be held at Geneva for a period of two weeks, in 1972, at a time when the United Nations Office at Geneva would be able to provide the necessary services with a minimum recourse to temporary staff;

(b) Approximately 1,200 participants would be expected to attend the Conference;

(c) A preparatory committee composed of individuals acting in their personal capacities and appointed by the Secretary-General would be constituted to advise on the programme and the final arrangements of the Conference. The preparatory committee would hold a series of pre-conference meetings in 1970, 1971 and 1972;

(d) Most of the background documents for the Conference would be prepared by consultants and reviewed by experts in various fields of the human environment problem;

(e) Papers to be submitted to the Conference would comprise approximately 2,500 printed pages to be produced in the four languages of the Conference; it is intended to print these papers for distribution before the Conference and to hold the type for subsequent use in connexion with the printing of the proceedings of the Conference;

(f) Preparatory, in-session and post-conference documentation would amount to approximately 1,000 mimeographed pages produced in the four languages of the Conference;

(g) Interpretation into the four languages of the Conference would be provided for the meetings of the preparatory committee, as well as for the Conference plenary meetings and meetings of its four commissions;

(h) In accordance with the wishes of the General Assembly, it has been assumed that extensive public information coverage would be given to the Conference.

141. On the basis of the above assumptions, using existing rates and prices, the costs of convening the Conference may be summarized as follows:

(In United States dollars)

(a) Costs of preparatory committee (see paragraph 132) (travel and subsistence of members, Conference servicing)	108,700
(b) Temporary Conference secretariat (see paragraphs 133-134)	361,000
(c) Travel of staff on official business (see paragraph 135)	20,000
(d) Experts and consultants (see paragraph 133)	240,000
(e) Substantive background documentation (see paragraphs 122, 124, 126 and 127) (translation, typing, printing and copy preparation)	862,000
(f) Conference servicing costs (travel and subsistence of substantive staff from Headquarters, temporary Conference servicing staff, in-conference documentation and final report, general expenses)	123,300
(g) Public information services	58,500
(h) Printing of final report and proceedings (report, summary of discussions, and papers submitted to the Conference) (see paragraph 129)	<u>144,000</u>
	<u>1,918,000</u>

142. A breakdown of the above estimates on a year-by-year basis is given below:

(In United States dollars)

	1970	1971	1972	1973	Total
(a) Cost of preparatory committee (travel and subsistence of members, conference servicing)	55,200	27,500	26,000	-	108,700
(b) Temporary Conference secretariat	81,000	160,000	120,000	-	361,000
(c) Travel of staff	5,000	5,000	10,000	-	20,000
(d) Experts and consultants	98,500	66,500	75,000	-	240,000
(e) Substantive background documentation	-	862,000	-	-	862,000
(f) Conference servicing costs (travel and subsistence of substantive staff from Headquarters, temporary Conference servicing staff, in-conference documentation and final report, general expenses)	-	-	123,800	-	123,800
(g) Public information services	-	-	58,500	-	58,500
(h) Printing of final report and proceedings (report, summary of discussions, and papers submitted to the Conference)	-	-	-	144,000	144,000
Total	239,700	1,121,000	413,300	144,000	1,918,000

143. The above statement of financial implications will be revised, if necessary, in the light of the discussion of the subject at the Economic and Social Council, before submission to the General Assembly.

ANNEX

ACTIVITIES AND PROGRAMMES OF UNITED NATIONS BODIES RELEVANT TO THE HUMAN ENVIRONMENT

A. United Nations

Department of Economic and Social Affairs of the United Nations Secretariat

1. The organs of the department which are particularly concerned with activities in fields related to the human environment are the following: The Office for Science and Technology, the Social Development Division, the Centre for Housing, Building and Planning, the Resources and Transport Division and the Public Administration Division.*

2. The Office for Science and Technology services the Advisory Committee on the Application of Science and Technology to Development, the Science Advisory Committee and the ACC Sub-Committee on Science and Technology. It acts within the Secretariat as a focal point for questions relating to science and technology for development. The work of the Office covers a number of specific aspects concerned with the human environment. The Advisory Committee has prepared a report on the development and rational utilization of natural resources which, it is intended, should provide Governments of developing countries with guidelines for the development of their natural resources. This report (E/4603) was to be considered by the Economic and Social Council at its forty-sixth session. The Office was also involved in the preparations for the Intergovernmental Conference on the Scientific Basis for the Rational Use and Conservation of the Resources of the Biosphere convened by UNESCO from 4 to 13 September 1968. In addition, the current work of the Advisory Committee and the Office for Science and Technology in drawing up the World Plan of Action for the Application of Science and Technology to Development which, it is intended, should be integrated with the plans for the Second United Nations Development Decade, is intimately connected with many aspects of the human environment.

3. The present work programme of the Social Development Division reflects the concern felt for the effect on man of his surroundings. Mention should be made of the following parts of the work programme.

(a) Social aspects of industrialization: A concerted programme on the social aspects of industrialization, prepared in co-operation with UNIEC and the specialized agencies concerned, was submitted to the Commission for Social Development at its nineteenth session in February 1968 which approved it and to

* In addition, the Population Division carries out studies and projections of urban and rural population trends which have an important bearing on problems of the human environment.

the Industrial Development Board at its second session in April/May 1968. The advisory services to countries envisaged under the programme relate inter alia to social factors, problems and policies in connexion with the establishment of large-scale projects, to social consequences of particular industrial projects and to making available knowledge of social consequences of industrialization in general and of particular types of industrial projects. General and specific studies will be undertaken on social preconditions, obstacles and consequences of industrialization, including the effects on man and harmful changes in the natural surroundings caused by industrialization.

(b) Social aspects of urbanization: The programme of studies in this field, initiated in the mid-1950s, will focus in the current year on problems of urban marginal populations. The first issue of the International Social Development Review a/ dealt with urbanization development policies and planning.

(c) Research-training programme for regional development: This long-term programme is expected to provide and distribute valuable information on planning and policies for the development of regions within countries, including a more balanced rural-urban development, and taking into consideration the need for and feasibility of urban and industrial decentralization. Training has already been started at two centres in Japan and Israel. Considerable research has been initiated by the United Nations Research Institute for Social Development in Geneva, including a collection of information on regional development activities in different geographic regions. In 1968 a workshop was held by the United Nations Research Institute for Social Development to discuss the sociological aspects of regional development and in 1969 a proposed study group will investigate the role of growth poles and growth centres on the basis of practical experience with a view to undertaking specific studies within these areas. There is an increasing number of field projects which are being carried out with the object of achieving a more balanced regional growth.

(d) Development and utilization of human resources: Following up on a first report on this subject, which was submitted to the Council at its forty-third session (E/4353 and Add.1), b/ and in accordance with the request contained in resolution 1274 (XLIII), a second report was prepared (E/4483) c/ in 1968 after consultations with interested organizations of the United Nations system. An addendum to the second report entitled "Development and Utilization of Human Resources: Outflow of Trained Personnel from Developing Countries" (E/4483/Add.1), d/ based on observations of twenty-one States Members of the United Nations was submitted to the Economic and Social Council at its forty-fifth session. The Council reaffirmed the importance it attached to the subject and asked the Secretariat to continue its work in this field, particularly in connexion with the preparations for the second United Nations Development Decade. Also included within the framework of this general subject are programmes of concerted action in the field of youth and in women's activities, popular participation in development, social welfare planning, and the participation of the public in the prevention of crime and juvenile delinquency.

a/ United Nations publication, Sales No.: E/68.IV.1.

b/ See Official Records of the Economic and Social Council, Forty-third Session, Annexes, agenda item 8.

c/ Ibid., Forty-fifth Session, Annexes, agenda items 9 and 10.

d/ Ibid.

4. The Centre for Housing, Building and Planning has as its main objective to promote the planned development of the human environment, particularly the basic functions of human settlements. This includes such broad fields as: (a) regional and urban planning; (b) housing as one of the basic functions of human settlements; (c) building materials and building technology as a means of meeting the demands for housing and community facilities; (d) necessary policies and legislations; (e) administrative, financial and training institutions; and (f) exchange of experience and dissemination of information. The work of the Centre is also related to the development of measures to prevent deterioration of the human environment resulting from urban sprawl, over-crowding, noise, air pollution, water pollution, traffic congestion etc. The Centre is also engaged in specific fields such as physical planning for tourism development, locational aspects of industrial development and planning and implementation of emergency programmes following natural disasters.

5. Studies and publications of the Centre recently completed or under preparation which have a bearing on the human environment are in the following areas: (a) urban land policy and land control measures, being detailed surveys of a selected number of countries; (b) demonstration and pilot projects aimed at the improvement of living conditions in squatter settlements and slums in urban and rural areas; (c) policies, programming and administration in the fields of housing, building and planning; (d) development of traditional building methods which will facilitate better, faster and cheaper construction of dwellings; (e) industrialization of building, with reference to construction techniques for seismic and hurricane areas; (f) low-cost housing design in relation to climate; (g) social aspects of housing, including case studies on relevant experience from various regions; (h) planning of metropolitan areas and urban centres in general; (i) rural housing and community facilities; (j) methods for establishing targets and standards for housing and environmental development; and (k) planning man's future urban environments.

6. It may also be appropriate to recall that the Council in its resolution 1300 (XLIV) had recommended an examination of the possibilities of convening regional conferences, initiating programmes of public information in this field, and designating an international year for housing and urban and rural development during the next United Nations Development Decade. The Council had also requested the Secretary-General to ascertain the views of Member States on these matters; the report of the Secretary-General should be before the Council at its spring session of 1970. It is hoped that the proposed campaign will further the objectives of the Centre as described above and have an impact on the programmes for improvement of the human environment.

7. The Resources and Transport Division is engaged in a number of activities, mainly of an operational and practical nature, directly relevant to various aspects of the human environment. Its primary function is to assist developing countries in natural resources and transport development. The activities make a direct, positive contribution to the development of facilities and amenities, such as water and energy supply, mineral exploitation and transport systems. The human environment is often directly improved through its projects for the finding and development of water resources or for energy planning and electrification, including promotion of small-scale electrification of villages and equipment suitable for them. The introduction of electricity in about half a million villages in India alone obviously revolutionizes the environment. Similarly, projects for transport

planning and development have a very direct effect, as do extensive activities in water desalination. Another broad, relevant area within the competence of the Division is the large-scale planning and integrated development of whole river basins, including international basins.

8. In some respects, the problems of the environment can be looked upon as the negative aspects of natural resources development, and the Resources and Transport Division is obviously active in the prevention and minimizing of such negative aspects whether man-made or natural. Water pollution and flood control, for example, figure prominently in the activities of the Division, as do similar problems of environmental deterioration in connexion with mineral, energy and transport development. Pollution of the sea stemming from sub-sea mineral exploitation, notably the danger of blow-outs of off-shore oil drilling, is also receiving close attention in the Division, which is servicing the Economic and Technical Sub-Committee of the Committee on the Peaceful Uses of the Sea-Bed and Ocean Floor Beyond the Limits of National Jurisdiction (A/AC.138/SC.2/6). Other danger problems are encountered in earthquake areas, with which geothermal energy development is usually associated and in which special precautions have to be taken in dam projects handled by the Division. Its staff includes specialists with relevant experience in these problems. The negative aspects are sometimes in direct conflict with the positive aspects of the resources and transport development, and have to be judged, on the basis of considerable accumulated experience and knowledge, in rendering advice in the best interest of the developing countries.

9. The Public Administration Division is concerned with the organization, staffing, management and operations of government at all levels for promoting economic and social development, including special requirements to solve problems of the human environment. The Division has completed studies on appraisal of administrative capability for development, on decentralization for national and local development, on administrative aspects of new towns, on personnel administration and training at national and local levels, and on other subjects that are pertinent to the theme of the Conference. Its preliminary study of the distinctive administrative problems of small States is suggestive of the possibilities of co-operative arrangements among such States for the administration of certain functions, including some involved in management and control of the human environment.

10. The Division will complete in 1969 a comparative study of administrative aspects of urbanization which was carried out with the collaboration of the Institute of Public Administration of New York. It has also initiated studies on administration for regional development, on administrative aspects of planning and plan implementation, on regulatory administration, and on administration of major development functions that also bear directly on the role of public administration in relation to human environment. The Division is conducting an interregional seminar in the Union of Soviet Socialist Republics in October 1969 on the employment, development and role of scientists and technical personnel in the public service of developing countries, and another in 1970 on the use of modern management techniques in the public administration of developing countries, both of which have relevance for effective environmental management.

The regional economic commissions

11. The regional economic commissions of the United Nations are engaged in work which directly or indirectly is related to many of the areas of the human environment as outlined in this report.

12. The work of the Economic Commission for Asia and the Far East has included conferences on water resources development and industrial development in which a subject such as river pollution is treated as an adjunct subject to other main items such as pulp, paper and rayon and basic chemicals. Permanent damage to human environment by deforestation and soil erosion has been considered, marginally, when discussing hydroelectric development and the hazards of flooding and silting of reservoirs. Means of preventing the creation of unsightly dumps and cavities due to irresponsible mining methods has been discussed marginally during meetings on mineral resources development and mining legislation. Prevention of the growth of slums and the importance of the regional planning approach have been discussed at meetings on urban and regional planning. Air pollution caused by thermal power stations has been discussed in connexion with the development of electric power.

13. Similar activities are undertaken by the Economic Commission for Africa. Its Natural Resources Division has been providing assistance in establishing policy-making and planning machinery within regional administrations of its member States for directing the technical and economic evaluation of the exploitation of natural resources, including water resources, and taking appropriate account of the environmental implications. ECA organizes seminars and conferences for the examination of problems of common concern and assists with the organization of intergovernmental meetings to deal with the development of specific resources and to review the technologies in order to ensure the rational exploitation of resources.

14. The Economic Commission for Latin America began at the end of the 1950s a preliminary examination of water resources in Latin America, and of their present and future utilization in so far as possible for multiple purposes, such as energy, irrigation and water supply, taking into account other factors, such as land reclamation, drainage and other benefits arising from the construction of such works and the use of water.

15. For this purpose, the Commission established a joint working group, now comprising members from ECLA, OTC, WMO, PAHO and WHO, to study water resources within the context of economic and social development. The research undertaken by the joint working group covers a number of areas closely related to the environment, for example, meteorology and hydro-meteorology, vegetation, irrigation and water for livestock, erosion, water supply for drinking purposes and for industry, treatment and disposal of waste water, pollution of rivers and streams, floods and flood control and drainage. Problems are identified and evaluated, and guidelines for their solution are developed. The studies are carried out at the country level and also on major river basins within each country.

16. Reports are available on Bolivia, Chile, Colombia, Peru and Venezuela, and a summary report on Ecuador. Reports are being prepared on Argentina, Costa Rica, El Salvador, Guatemala, Honduras, Nicaragua, Panama, Paraguay and Uruguay. There is also a special report available on the Federal District of Brasilia and a further special report being prepared on the Paraiba Valley in Brazil.

17. The Economic Commission for Europe, pursuant to its resolution 5 (XXII) and its decision C (XXIII), will convene a meeting of governmental experts on problems relating to environment at the invitation of the Government of Czechoslovakia in that country in spring of 1971. The Preparatory Group for the Meeting of Governmental Experts on Problems relating to Environment, which met at Geneva in February 1969, worked out a provisional agenda of the Meeting, including the methods of the preparation for, as well as the scope and organization of, this Meeting, and the arrangements for the participation and contribution of the secretariats of the specialized agencies and other international organizations concerned.

18. As set out in the report of the Preparatory Group (E/ECE/726), the ECE Meeting will concentrate on economic aspects of government policies and on institutional problems in relation to the influence on environment of measures taken to promote economic growth and to ensure an increase in the standard of living. Some of the main topics to be separately examined at the ECE regional meeting on environment are: relevant national legislation, government strategies and planning; organizational and institutional arrangements at different government levels; environmental research, training and education; financial and fiscal measures; and cost/benefit and other methodologies aimed at environmental improvement. The result of this regional meeting should be of particular value to the Conference.

19. The Commission has carried out intensive pollution abatement programmes, particularly emphasizing policy problems facing Governments and industries and prevention at the source. While programmes in particular sectors are implemented by its Committees on Agricultural Problems, Coal, Electric Power, Gas, Steel, Timber and Transport, the Commission has established a subsidiary body on water resources and water pollution control problems and has undertaken special comprehensive programmes on air pollution.

20. Some of the more important activities in the past concerning pollution of inland waters include the adoption of an ECE Declaration of Policy on Water Pollution Control (Commission resolution 10 (XXI)), a study of economic aspects of treatment and disposal of certain industrial effluents e/ and a survey of the prevention of water pollution by detergents (E/ECE/600/Add.1, E/ECE/673 and WATER POLL/GEN 5). It is planned to hold a seminar on the protection of ground and surface waters against pollution by oil and oil products in December 1969 and studies are also being undertaken on such subjects as methods for determining the economic losses caused by pollution of water bodies, sludge treatment, disposal and utilization, and optimal methods for combined treatment of sewage and industrial wastes. Furthermore, studies have been completed or are in preparation on such subjects as hot water discharge in rivers, application of fertilizers, water pollution by coking plants, by thermal power stations, by the iron and steel industry, by forest industries, by the underground storage of gas near water-bearing beds for drinking water supplies, and by inland water craft.

21. In respect of air pollution the following studies have been completed: "Solid smokeless fuels" (ST/ECE/COAL/22), "Air pollution by coking plants" (ST/ECE/COAL/26) and "Protection of the atmosphere from pollution by fuel gases from thermal power

e/ United Nations publication, Sales No.: 67.II.E/Mim.56.

stations" (ST/ECE/EP/25, vol. II). Studies and regulations are in preparation on the following subjects: use of gas for heating and air-conditioning, methods of control for air pollution and regulations for maximum admissible levels of carbon monoxide with regard to exhaust gases from petrol engines, methods used in measuring the opacity of diesel engine exhaust gases, approval of petrol-driven motor vehicles as regards air pollution, limitation of smoke emitted by diesel-driven vehicles, air pollution by chemical wastes of coking plants, problems of air pollution from thermal power stations, use of solid smokeless fuels, and air pollution in the iron and steel industry. Besides these sectoral activities carried out under the auspices of several ECE Committees, an ad hoc Meeting of Governmental Officials on the Prevention of Air Pollution was held in February 1969 which worked out an ECE work programme in this field. This work programme provides for the undertaking of a number of economic studies, the holding of a seminar on the desulphurization of fuels and combustion gases and, in general, the keeping under review of current trends and developments in the field of air pollution control.

22. Other activities aimed at the protection of environment undertaken by the ECE subsidiary organs include studies and reports on problems of soil erosion, irrigation, land clearance and land restoration, afforestation and reafforestation, utilization of ash and of waste products from the coal industry, limitation of noise made by engine exhausts and produced by motor vessels, location of industry with regard to environmental pollution, and damage caused to forests from pollution.

23. An analysis of changes in environment and infrastructure as part of a study on the long-term trends in the economy of the ECE region is envisaged.

23a. Under the auspices of the Committee on Housing, Building and Planning extensive studies are being undertaken and seminars and symposia organized on such subjects as the housing situation and perspectives for long-term housing requirements, the planning and development of recreational areas and the development of the national environment, urban renewal, future patterns and forms of urban settlements, the quality of dwellings and housing areas, current trends and policies in the field of housing and building and planning.

United Nations Scientific Committee on the Effects of Atomic Radiation

24. The Scientific Committee on the Effects of Atomic Radiation receives, assembles and evaluates reports on observed levels of ionizing radiation and radio-activity in the environment, as well as reports on observations and experiments relevant to the effects of ionizing radiation upon man and his environment. Since its establishment in 1955, the Committee has published four technical reports to the General Assembly (A/3838, f/ A/5216, g/ A/5814 h/ and A/6314 i/) assessing, among other things, current levels of natural and man-made radio-activity in the

f/ Official Records of the General Assembly, Thirteenth Session, Supplement No. 17.

g/ Ibid., Seventeenth Session, Supplement No. 16.

h/ Ibid., Nineteenth Session, Supplement No. 14.

i/ Ibid., Twenty-first Session, Supplement No. 14.

environment (atmosphere, soil and oceans), in food chains and in human tissues, and estimating the attendant mean doses to populations and corresponding risks of harmful effects in the exposed individuals and in future generations. In particular, these reports have discussed in detail the problems associated with the deposition and distribution over the surface of the globe, and transfer to man, of the radio-active material released into the atmosphere by nuclear tests. A new report, currently in preparation, will include a further review of radio-active contamination and reviews of the induction of chromosome aberrations in human cells by radiation and of the effects of radiation on the nervous system.

United Nations Development Programme

25. UNDP involvement in problems of the human environment has reflected the marginal interest shown by developing countries in receiving assistance from UNDP for such projects.

26. UNDP has approved two Special Fund projects dealing with water and air pollution, namely Institute of Occupations Health and Air Pollution, Santiago and Protection of River Waters Against Pollution. UNDP has under study a request on Federal Research and Development Centre for Environmental Pollution Control. WHO is the participating and executing agency for these projects.

27. With UNIDO, UNDP has approved both under SIS and TA, requests for experts concerned with industrial pollution to give advice to Governments on the need to introduce legislation in this area.

28. Under the TA component UNDP has approved a number of requests for experts as well as awarding fellowships concerned with the disposal and treatment of industrial and atomic wastes.

29. Other projects include Lake Nasser Development Centre, Volta Lake Research, Kainji Lake Research Projects which are concerned with the ecological changes in the environment as a result of the creation of large bodies of water by man. This is an important area to be considered by countries, which sometimes is overlooked during the planning stage. An example is the possible erosion by the sea of the land in the United Arab Republic. Because of the dam at Aswan silt is no longer transported by the annual floods which previously built up the land. In the swamp areas of the Nile in the north there is a danger that an ocean storm could break through the narrow land barriers. A request for a project to study coastal erosion in the United Arab Republic is under study.

30. Problems of conditions of work for workers' industrial safety, "human environment", have been dealt with under both components of UNDP. With the ILO as the participating and executing agency, UNDP has approved two Special Fund projects in occupational safety and health: Occupational Safety and Health Centre, Ankara and Occupational Safety and Health Institute, Heliopolis. Both are directly concerned with promoting conditions of safety for industrial workers.

31. The UNDP urban planning projects emphasize the location of industry and the necessity to provide proper water and sewerage facilities. The following projects in urban planning are currently operational: Urban Research and Planning, Assistance in Urban Research and Planning, Physical Development Plan for the South

Adriatic Region, Master Plan for the Metropolitan Area of Karachi, Assistance in Physical Development Planning, Urban Planning and Housing, and Central Authority for Housing and Town Planning.

32. The UNDP projects executed by FAO have assisted Governments in countering the effects of deforestation in a number of countries. Examples of UNDP (SF) projects include the Forestry and Watershed Management Training Institute in Buenos Aires, Argentina, similar institutes in Turkey and Chile, and forestry training projects in the Philippines, Lebanon and Jordan.

33. Watershed management has been the subject of a number of UNDP (SF) projects, executed by FAO, in Venezuela, Korea, Nepal and the Philippines.

34. A hydrometeorological survey of the catchments of Lakes Victoria, Kioga and Albert in Africa, aims partly to counteract the effects of soil depletion; in the Philippines a feasibility survey for hydraulic control of the Laguna Old Bay necessarily takes environmental factors into account. The establishment of a soil conservation programme in Argentina is the subject of a further UNDP (SF) project.

35. Land reclamation is the subject of two projects in China and in the Viedina Valley in Argentina. Meanwhile, coastal erosion has already become the subject for a project in Guyana.

36. The salinization of the soil and ground-water level maintenance are components of numerous projects in Africa, such as the intensification of ground-water exploitation and research and training on irrigation with saline water in Tunisia executed by UNESCO. Elsewhere in north Africa four projects in Morocco carried out by FAO are concerned in varying degrees with similar problems including the hydro-agricultural development in the Souss Valley, feasibility studies and pilot development in the Sebou Basin and western Rif region. Irrigation projects also take account of salinization and ground-water level maintenance: examples are the Wadi Fizan project in Saudi Arabia, the Pangani and Waini River Basin irrigation projects in Tanzania and small-scale irrigation development in Zambia.

B. International Labour Organisation

1. The ILO has constitutional obligations in respect of the protection of the worker against sickness, disease and injuries arising out of his employment. The over-all question of prevention of pollution in the working environment is consequently of its concern.

2. The more recent work carried out by the organization has been focused on atmospheric control in mining operations. A comprehensive guide on the prevention and suppression of dust in mining, tunnelling and quarrying has been published and reports on this subject based on government contributions are published at five yearly intervals. A set of recommendations have also been issued. Also in mining, the question of methane control is dealt with in a code of practice. As regards radon and radio-active dust control in uranium mining, the ILO, together with IAEA, have prepared a code of practice supplemented by a technical addendum.

3. The question of air pollution control in industrial establishments is dealt with in the ILO Model Code of Safety Regulations for Industrial Establishments for the Guidance of Governments and Industry. Also a guide to atmospheric control in foundries is being prepared. Further, in the framework of its technical co-operation programme, the ILO organized in 1965 (in collaboration with Hungarian trade unions) an interregional course on dust prevention in industry.
4. With regard to standard-setting in relation to the over-all question of atmospheric pollution control of the working environment, the ILO is examining the opportunity of preparing one or more international instruments (convention and/or recommendation).
5. The International Occupational Safety and Health Information Centre (CIS), which operates in the framework of the ILO, is disseminating information in the form of abstracts, received from more than thirty national centres, on publications and other material dealing with air pollution questions.
6. The ILO is in permanent touch with other international organizations working in the field of prevention of atmospheric pollution of the workplace.
7. The ILO is thus in a position to contribute actively to the promotion of atmospheric pollution control in the working environment. The technical measures applicable to this environment may further lead to a reduction in the release of dangerous pollutants in the general atmosphere, to the benefit of the whole community.

C. Food and Agriculture Organization of the United Nations

1. Since its establishment, FAO has been deeply involved in a very broad range of subjects concerned with the protection, rational utilization and improvement of the physical and biological natural resources in the rural and aquatic sectors of the human environment.
2. The FAO participates closely in activities aiming at the fullest development of land and terrestrial water resources through the best allocation and regulation of their use between agriculture and other sectors of the economy, consistent with conservation aspects in order to ensure their purity and continuous productive use.

Water development, management and conservation

3. It is part of FAO's work to assist Governments in the better planning of water development and use to avoid harmful side effects, to abate them if they exist, to prevent them from arising in the future, and to keep under permanent review the related problems. This is accomplished through a very large number of field projects operated by FAO under UNDP and other sources of finance. Because of the strong intersectoral nature of water use and water quality management, FAO's work includes co-operation with other United Nations bodies and international organizations active in connexion with water use.
4. The FAO also assists Member States by organizing seminars and training centres, among which the Seminar on Waterlogging in relation to Irrigation and Salinity Problems (Lahore, 1964) and the Land and Water Use Seminar for the Near East (Beirut, 1967) should be mentioned.

Land development and soil conservation

5. The FAO helps countries to assess the use capability of soil resources, assists in building up land use plans which will permit an optimal use and management of these resources without soil deterioration, and is active in helping member nations to develop the full productive potential of land resources by improvement in structures and methods of use which at the same time will help not only to preserve but also to improve this potential. FAO is developing a computerized data system which will match fertilizer and herbicide application to soil properties for rational use and the prevention of pollution. A specific type of pollution that under certain circumstances could present a hazard is that arising from radioactive contamination, which is of greater potential significance in soils poor in calcium content. FAO has been studying this question incidentally in connexion with the preparation of the Soil Map of the World, which will show the world distribution of soils well supplied with calcium.

6. It is of concern to FAO that some of the most productive soils are being lost to agriculture as the urbanization and industrialization of both developing and developed countries proceeds. Through its European Forestry and Agriculture Commissions, FAO is active in assisting Member States in their efforts to preserve good agricultural and forest lands and decrease encroachment by other land user categories. This is done through land use planning to indicate the desirable direction and speed of change in land use to meet specific policy objectives.

7. In addition to cultural and structural practices for preventing soil erosion by wind and water, provision of productive cover for soils, especially in the form of forest cover, is one of the readiest means to stop their movement. FAO has issued a number of publications dealing with this matter such as Soil conservation - an international study (1946), and Guide to sixty soil and water conservation practices. Symposia and conferences are also held under the auspices of FAO on the subject of soil conservation.

Institutional and legal aspects of the development and management of land and terrestrial water resources

8. The activities of FAO in these aspects are manifold and include the following:

(a) Collection, elaboration and dissemination of information on these aspects to Member States;

(b) Preparation of a large number of comparative studies and working papers; j/

j/ These include: Water Laws in the United States of America (1950); Community Organization for Irrigation Development in the United States of America (1953); Water Laws in Italy (1953); Water Laws in Moslem Countries (1954); Water Laws in South America (1956); Principles of Tenancy Legislation (1957); Principles of Land Consolidation Legislation (1962); Groundwater Legislation in Europe (1964); Wildlife Legislation and Policy in Africa (1965); Principles of Land Tenancy Legislation (1966); Customary Law in Africa (1967); Legislation on Land Use Planning in Europe (1966-1968); Legislative and Administrative Provisions in European Countries to ensure proper distribution of water resources (1968); National Legislation and Policy on Water Pollution Control (1968).

(c) Rendering of technical assistance, advisory services and consultant services to Member States and the execution of Special Fund Projects on land and water administration and legislation (in almost thirty countries so far);

(d) Participation and co-operation with other agencies and bodies active in these fields, such as the United Nations, UNESCO, WHO, IMCO, ECE, the Council of Europe, AIDA (International Association for Water Law), often providing a secretariat for specific programmes;

(e) In the case of international, legal and institutional aspects, participation and encouragement either by itself or in co-operation with other agencies in international integrated development of drainage basins through the medium of projects financed by UNDP (Chad, Senegal, Marim Lagoon, Lake Victoria, Lake Kariba, Gambia, Niger, Hari-Rud, Terai Plain, Indus, Euphrates and the Mekong) and active participation in and support of the work of the International Law Association's Committee on the Law of International Waters.

The conservation and development of plant resources

9. Plants are of primary importance as sources of food for man and his livestock, as well as providing directly or indirectly many of the materials used by him to modify his environment and to extend and enlarge the nature and quality of his existence. By drawing upon his plant resources man has established himself in habitats of every extreme. This exploration has led to the creation of a vast array of varieties of plants adapted to a wide range of natural and man-made environments, where they provide man's staple foods, oils, fibres, fruits, timber and fuel, as well as grazing and forage for his livestock. FAO is actively assisting in the further breeding of improved varieties of all these different kinds of plants with higher yield and better quality. On the other hand the extensive cultivation of improved varieties is also leading to the disappearance of primitive forms and earlier varieties which may be needed in the future for further advances of the same sort under changing conditions. FAO is therefore also encouraging national and international action to conserve such plant genetic resources so that they are not totally lost.

10. FAO is engaged in many activities to protect crop resources from the ravages of pests and diseases of various kinds. These include bacteria, viruses, fungi, nematodes, insects, rodents and birds. In connexion with the strengthening of intergovernmental co-operation in measures for controlling destructive pests and diseases and for preventing their spread, special mention may be made of the International Plant Protection Convention, which has been signed by thirty-seven Governments and adhered to by a number of others and under which a network of regional plant protection organizations has been established.

11. In order to increase the efficiency of control measures and to reduce the possible hazardous effects, FAO promotes the study of integrated pest control techniques and encourages their application in developing areas. Such techniques are designed to apply compatible methods in combination to obtain more lasting and more economic control and to reduce the use of toxic materials.

12. The FAO has an extensive programme designed to ensure safe and effective use of pesticides, with due consideration being given to the adverse effects of these compounds upon consumers and beneficial forms of life. This programme aims, inter alia, at reducing the excessive and uncontrolled use of biocides. A publication entitled Guide-lines for the drafting of legislation for the registration for marketing and sale of pesticides and a series of monographs on pesticides dealing with toxicological and agricultural aspects have been issued. Related problems receiving continuous attention are pesticide residues and pest resistance to pesticides.

The conservation and development of forest resources

13. The establishment and protection of forests is often one of man's best tools for creating a stable and productive plant environment. In 1951, the sixth FAO Conference, recognizing that forests influence the general welfare of both rural and urban people, approved "Principles of forest policy" which were recommended for the attention of all Member States. As a result regional forestry commissions to promote and co-ordinate sound forest policies have been established in all major regions. Through publications and seminars and through field experts in forest departments, universities and ranger schools, FAO endeavours to establish modern silvicultural practices in many developing countries. A panel of experts on forest gene resources was established to help and co-ordinate FAO's efforts to explore, utilise and conserve the gene resources of forest trees.

14. The FAO has also been concerned with the multiple use of forests and various publications have been published and meetings held on grazing and forest economy, shifting cultivation in Africa, Far East and Latin America, and on the role of forestry in watershed management and national parks in Africa, Latin America and Far East; and, in co-operation with the International Union for the Conservation of Nature, the Africa Special Project made it possible to identify problems in twenty African countries and plan technical assistance. Working parties on wildlife management and national parks have also been set up in the regional forestry commissions in Africa, Latin America and Far East.

The conservation and development of animal resources

15. The influence on the biology of man exerted by the livestock which share his environment can be profound. The task of FAO in the field of livestock production is not necessarily to increase the total numbers of animals but rather to improve the quality, productivity and health of the world's herds and flocks.

16. Adequate quarantine legislation for animals and animal products is the first line of defence against the introduction of diseases which can disrupt agriculture and wildlife over very wide areas. FAO has provided for many years advice and assistance in the formulation of such legislation. There has been a long-standing agreement between FAO and l'Office International des Epizooties, in Paris on all matters of quarantine. Close liaison exists with WHO on matters of common interest in the field of zoonoses - diseases which are common to and intercommunicable between man and animals and exact a heavy toll in both of them.

17. The FAO has long been encouraging the breeding of livestock better adapted to prevailing environments in various parts of the world and the conservation and use of animal genetic resources which are currently neglected. In areas marginal to conventional forms of pastoralism attention is being directed to the need for the wise conservation and use of wild game which can provide an environmental resource of considerable importance.

18. The FAO also concerns itself, in particular through its joint FAO/IAEA Division, with the problems of the accumulation of radioactive fall-out in the food chain, as a result of which certain foods, including animal products, may become unsuitable for human consumption. Similar problems arise with the accumulation, in animal products, of certain pesticides used against plant pests; these problems are dealt with in co-operation with the relevant FAO/WHO Expert Committee.

Problems of the environment relating to fisheries

19. The FAO is also much concerned with the effects of inland water and marine pollution on the development of fisheries resources. In connexion with inland water pollution, FAO is undertaking studies on water quality criteria for fish, in some cases through its regional fisheries councils and commissions, as well as on pesticides and pollution, on pulp and paper mill effluents, and on the use of sewage effluents for agriculture, forestry and fisheries.

20. With respect to marine pollution, the initiative to develop a concerted interagency programme was taken several years ago through the ACC Sub-Committee on Marine Science and its Applications. This followed requests by some Member States for an active programme with respect to problems of increasing concern in some areas, and general consideration of these problems by FAO Advisory Committee on Marine Resources Research. FAO, UNESCO, WMO and IMCO have now established a joint group of experts on the scientific aspects of marine pollution, which met at London in March 1969. It advised on the development of an information system (including storage, retrieval and exchange) on marine pollution and its effects; on the needs for scientific research on various problems associated with marine pollution, including chemical methods of dispersing, precipitating and removing pollutants (including oil) from the sea; on research priorities with a view to facilitating international action for control of major categories of marine pollution; on the organization of on-the-spot investigations and advice in the event of major pollution accidents; on the question of determination of permissible concentrations of certain pollutants; and on arrangements for the FAO Technical Conference on Marine Pollution and its Effects on Living Resources and Fishing, to be held at Rome in December 1970, and which it regarded as an important preparatory step for the United Nations Conference on the Problems of the Human Environment planned for 1972. The joint group also advised on aspects of pollution and other harmful effects arising from exploration and exploitation of the sea-bed beyond the limits of national jurisdiction, as specified in United Nations General Assembly resolutions 2414 (XXIII) and 2467 (XXIII) B; FAO will bring the question of how the Secretary-General's forthcoming study of these matters is to be prepared, and especially how the necessary interagency co-operation is to be achieved, for consideration by the ACC Sub-Committee on Marine Science.

21. Many of the general activities of FAO in the fields of education and training, including rural youth, rural sociology and general public information, are of prime importance for a better understanding, knowledge and conservation of natural resources and the environment, and especially for the better involvement and participation of the public.

FAO concern in international and regional agreements relating to problems of the human environment

22. The FAO is involved in a number of other important aspects of international action relating to the human environment. Its responsibilities for a number of international conventions and agreements already in operation include, for example, Agreements on Fisheries Councils in the Indo-Pacific and Mediterranean regions (1948 and 1949 respectively), Commissions for Controlling the Desert Locust in the Near East and in South-West Asia, a Commission for the Control of Foot-and-Mouth Disease in Europe, an Intergovernmental Agreement for the Control of African Horse Sickness in the Near East region, and the International Plant Protection Convention and its network of related regional plant protection agreements. A convention under the auspices of FAO for the establishment of an international commission for the conservation of atlantic tunas came into force in March 1969 and a further fisheries commission for the south-east Atlantic region is in course of establishment. FAO also has a substantial concern in existing conventions and agreements for which other agencies are responsible, including, for example, the United Nations Conventions on Fishing and Conservation of the Living Resources of the High Seas (1958), on the United Nations Prevention of Pollution of the Sea by Oil (1954) and on the Conservation of Nature and Natural Resources in Africa (IUCN/OAU, 1969).

D. United Nations Educational, Scientific and Cultural Organization

1. The UNESCO has from the beginning conducted or stimulated important activities relating to the scientific problems of the environment and to the study and conservation of natural resources. These scientific activities have developed along the years with such landmarks as the multidisciplinary programmes on Arid Zone Research and on Humid Tropics Research, the establishment of the Intergovernmental Oceanographic Commission and the launching of the International Hydrological Decade. A natural resources research division with a section for ecology and conservation was established in 1961, and recently the Department of Environmental Sciences and Natural Resources Research has been set up where all related scientific activities are concentrated.

2. The UNESCO is increasingly concerned with the scientific aspects as well as with the educational and cultural aspects of deterioration of the global environment and of its relationships with man. In this respect the Intergovernmental Conference on the Scientific Basis for Rational Use and Conservation of the Resources of the Biosphere organized in September 1968 at Paris - usually referred to as the Biosphere Conference - has created a new and major impetus in the activities of the Organization. This has been amplified by the debates of the fifteenth session of the General Conference, which has endorsed the recommendations of the Biosphere Conference and has at the same time decided that "Man and his environment" would constitute a major theme in the future programmes of the Organization, not only in the scientific sector, but equally in the social sciences, education and information sectors.

Marine science

3. The UNESCO programme in marine science is conducted by the Office of Oceanography which also serves as secretariat for the Intergovernmental Oceanographic Commission (IOC). The UNESCO programme is concerned with basic physical and biological oceanic research and associated scientific and educational work throughout the world, including scientific aspects of sea pollution. The IOC has responsibility for organizing co-operative scientific research in the ocean and maintaining through World Data Centres the international exchange of oceanographic data. One of the new programmes concerns, inter alia, the development of an Integrated Global Ocean Station System (IGOSS) for monitoring the ocean environment. UNESCO and its IOC are preparing to play an important role in the proposed International Decade of Ocean Exploration to be launched in pursuance of General Assembly resolution 2467 D (XXIII).

Hydrology

4. A major undertaking of UNESCO relevant to the environment in relation to man is the International Hydrological Decade (IHD). The programme of the Decade constitutes a concerted international effort to promote the study of the world's water resources and to intensify research and training in scientific hydrology encompassing all the phases of the hydrological cycle. Scientific aspects of water pollution are included in this ten-year programme started in 1965. It is directed by a co-ordinating council comprising twenty-one member States and representatives from the United Nations bodies concerned. A mid-decade intergovernmental conference is to be convened by UNESCO in 1969 to review progress made and provide guidance for the second half of the IHD. Monitoring of non-oceanic water resources in quantity and quality is a feature of the IHD.

Earth sciences

5. The natural resources research programme of UNESCO, which is directed by an international advisory committee, is dominated by an integrated approach to the study of the environment and of its resources. This is exemplified by the creation of interdisciplinary natural resources research and training institutions or by the organization of training centres for integrated surveys of the environment.

6. This programme includes promotion of international action in all disciplines in the earth sciences, including particularly, geology, soil science, geomorphology, geophysics and geochemistry. Activities in soil cartography, soil salinity control and soil biology are carried out in co-operation with FAO. An important part of the programme is devoted to the study and prevention of natural disasters, such as earthquakes, volcanic eruptions and floods, including recent taking over of certain responsibilities of the International Relief Union.

Ecology and conservation

7. Terrestrial and fresh water ecology constitutes a significant part of natural resources research programmes of UNESCO. The ecological programme consists of promotion of research projects, including for instance an inter-agency programme

with FAO and WMO in agricultural biometeorology, organization of scientific meetings and symposia, standardization of methodologies, publication of thematic maps and reviews of research, development of educational and training activities, and creation or strengthening of research and training institutions in the Member States. It also includes continued support to the International Biological Programme through grants-in-aid, joint projects and staff assistance.

8. Besides continued support to the International Union for Conservation of Nature (IUCN) which was created in 1949 under its auspices, UNESCO has always been concerned with conservation of natural resources such as soils, waters, flora and fauna and assists Governments in taking appropriate steps to this effect, including research and education activities, establishment of national parks and nature reserves, setting up of appropriate structures such as conservation boards, and development of tourism.

9. The UNESCO has prepared in co-operation with FAO, the report on Conservation and Rational Use of the Environment (E/4458) which was submitted to the forty-fourth session of the Economic and Social Council. This report contained important background material and recommendations for action in this field at the national and international level.

Social sciences

10. The integrated approach to environmental and natural resources research which is mentioned above in relation to ecology implies in most cases a social sciences component. In addition, UNESCO has included in its social sciences programme since 1966 a long-term project on the theme "Man and his environment - design for living". This constitutes a multidisciplinary approach towards determining the most effective means of achieving a design for living that would encourage the pursuit of beauty and the enhancement of dignity in human relationships - particularly in urban environments. An interdisciplinary symposium on this subject, with participation of architects, city planners, social scientists and philosophers is planned for 1970.

Preservation of sites and monuments and development of cultural tourism

11. The Department of Cultural Activities of UNESCO has been continuously involved in the problem of preservation of sites and monuments, which constitutes an important area in the protection and enhancement of the human environment. Most significant activities in this respect include:

(a) Providing Member States with the services required for the implementation of the International Convention for the Protection of Cultural Property in the event of Armed Conflict (1961) and of the international recommendations adopted by the General Conference concerning

- (i) safeguarding the beauty and character of landscapes and sites (1962), and
- (ii) the preservation of cultural property endangered by public and private works (1968);

(b) Assisting Member States in the preservation and development of monuments and sites as well as the protection of landscape and wildlife as a means of promoting tourism;

(c) Launching international safeguard campaigns such as those related to the Monuments of Nubia, Florence and Venice.

The Biosphere Conference

12. The Intergovernmental Conference on the Scientific Basis for Rational Use and Conservation of the Resources of the Biosphere was convened by UNESCO from 4 to 13 September 1968 with the participation of the United Nations, FAO and WHO and the co-operation of IUCN and IBP. This Conference constituted a major step forward in formulating proposals for action at the national and international levels.

13. The twenty recommendations of the Conference have been brought to the attention of the General Assembly in document A/7291. k/ These recommendations are devoted to research, to monitoring, to education and to structures and policy in relation to terrestrial and fresh water environments, their rational use, their conservation and their pollution. The final recommendation calls for the preparation during 1969-1970 of a long-term intergovernmental and interdisciplinary programme on "Man and the Biosphere", concentrated on the scientific, technical and educational aspects of the problems involved in the rational utilization and conservation of the resources of the biosphere and in the improvement of the human environment. This programme is meant, among other objectives, to provide follow-up and adequate extension of the International Biological Programme.

Present trends

14. Throughout the world, ecology and conservation are being given high priorities by many Member States which recognize national and international shortcomings in these fields, and are demanding action. This places a heavy responsibility on UNESCO which has particular obligations in these fields because it is becoming increasingly clear that development programmes must be structured on the basis of sound ecological principles and that there is no rational use without conservation.

15. As a result of the Biosphere Conference, and in accordance with resolution 2.313 of the fifteenth session of its General Conference, UNESCO is now engaged in the preparation of the long-term scientific and educational programme on "Man and the Biosphere" which is mentioned above. This preparation is carried out in consultation with the United Nations, FAO, WMO, WHO, the International Council of Scientific Unions, the International Biological Programme and IUCN with a view to having these organizations associated to the guidance and implementation of the future programme. The proposed content and organization of the programme will be submitted to the UNESCO General Conference at its sixteenth session in October 1970

k/ See Official Records of the General Assembly, Twenty-third Session, Annexes, agenda item 91. For the text of the recommendations see the mimeographed version of document A/7291.

with a view to having the programme in operation in the biennium 1971-1972 at the time when the International Biological Programme will be terminating. This new international scientific programme may be conceived in a somewhat similar manner to the IHD and will involve promotion of national activities, international co-ordination of methods and objectives, monitoring of environmental parameters, scientific meetings, seminars, training courses and creation and strengthening of national or international institutions, particularly in those areas that demand an interdisciplinary approach.

16. As a support to this programme, UNESCO will probably enlarge its present activities in terrestrial and fresh water environmental research. Missions dealing with problems connected with natural resources research planning and better knowledge of the basic ecological factors leading to possible applications for increased productivity and more rational use of biological resources will be developed. Applied ecological studies leading to the establishment of national parks, site protection, biological preserves etc. will be strengthened. The preservation of the fauna and flora and the maintenance of botanical and zoological collections will also be encouraged, either directly or through appropriate national and international organizations. This scientific and educational programme will increasingly call upon the contribution of social sciences and will be supplemented by stronger UNDP activities in developing Member States.

17. In all these activities, and in co-operation with all organizations concerned, UNESCO will particularly promote action in natural geographical areas, such as river basins or large-scale ecological zones distributed throughout the world. Combining this information with that obtained by other institutions, knowledge over a wide array of environmental conditions should provide a scientific basis for development plans ensuring the rational use and conservation of the resources of the biosphere.

E. World Health Organization

1. The World Health Organization has been deeply concerned with the problem of the human environment and its relation to health and disease. In general terms, WHO's activities in this field refer to three major aspects, namely:

- (a) The definition of environmental standards;
- (b) The identification of environmental hazards;
- (c) The study of the effect of induced changes in the environment.

1. Definition of environmental standards

2. In attempting to define minimal or optimal environmental standards, WHO approaches the problem from the physiological as well as from the physical point of view. It stimulates and sponsors research designed to establish the limits of human adaptability to different stress factors. In this aspect of its work, WHO collaborates closely with the human adaptability section of the International Biological Programme (IBP/HA).

3. It co-operates with FAO in the study of matters related to food production and preservation, and studies nutritional requirements under different ecological situations. It studies and defines standards for food additives and for food hygiene in general.

4. It assists Governments in the improvement of water supplies, both for rural and urban populations and defines standards of quality and safety of water for drinking, washing, recreation and irrigation purposes. A study made by WHO in 1962 showed that approximately 40 per cent of the urban population and at least 70 per cent of all peoples in the countries studied had no access to safe water supplies. The organization stimulates and supports research into water treatment and utilization, and gives technical assistance to Member States for the purpose.

5. In co-operation with IAEA, the United Nations Scientific Committee on the Effects of Atomic Radiation and with international non-governmental organizations, WHO studies measures for the protection of man from radio-active wastes and determines standards for the peaceful uses of ionizing radiation.

6. In co-operation with the ILO, WHO promotes and provides technical guidance on the development of occupational health services, ergonomics, industrial physiology and toxicology, and accident prevention in industry.

2. Identification of environmental hazards

7. Under this heading the organization's activities are concerned mainly with problems of environmental pollution (air, water, soil, food), the increasing use of pesticides, the ecology and biology of disease vectors, the abuse of drugs and noise. In addition to identification of these hazards, the WHO activities aim at removing the existing environmental deficiencies and at improving environmental sanitation both in rural and urban environments by assisting the Member States in training of qualified staff at all levels, by elaborating the master plans for community water supply and wastes disposal, by setting up adequate organizational structures, and by developing applied research institutes.

8. The WHO has for a number of years studied and provided guidance on such questions as methods for measuring the pollution of the environment, on the effects of pollution, and on the technical and administrative measures for its prevention. In 1967, it established an international reference centre for air pollution and in 1968 the International Reference Centre on Waste Disposal and Community Water Supply. In so far as water is concerned, WHO has assisted in conducting water pollution surveys in a large number of countries and has collaborated with international and national organizations concerned with social and economic planning, with the objective of ensuring that high priority is given to the health implications of water resources development and water pollution control. Soil pollution is closely bound to the problem of liquid and solid waste disposal. WHO supports studies and field programmes concerned with soil pollution by biological agents and with the prevention of soil-transmitted bacterial and parasitic diseases.

9. Bacterial and chemical contamination of food has a direct, extensive and important bearing on public health. WHO's programme in this field aims at ensuring the safety, wholesomeness and soundness of food at all stages from growth, production or manufacture until its final consumption.

10. The increasing production of pesticides and their use for public health and agricultural purposes constitute an important health hazard to man and domestic animals. The problem is intensified by the fact that subsequent development of resistance to certain pesticides makes it imperative to introduce new compounds at periodic intervals. WHO has been studying the ill-effects of pesticides on man and advising on measures for their prevention. A number of international reference centres have been designated on vector biology and control and the toxicology of pesticides.

11. A problem of major concern to WHO is the increasing hazard of vector-borne diseases due to urbanization, water resources development, movement of population and settlement, and other development projects. Mosquitoes, rats, snails and other disease vectors follow in man's wake and endanger his health. The WHO programme for the control of vectors covers a wide range of activities. Initially, the programme relied mainly on the use of control chemicals. However, the emphasis is now being shifted to the investigation of the genetic and biological aspects of vector control. Intensive studies on the ecology of vectors and on the factors involved in the spread and abundance of particular species and races are now being undertaken.

12. The abuse of drugs, including the use of dependence-inducing drugs, is a problem which concerns the social and psycho-social environment. WHO, in co-operation with other United Nations bodies, is active in the field. It studies the causes and effects of drugs abuse and provides guidance on mental health and health education.

13. The health hazards attributable to noise are difficult to assess, but added to the many other stresses of the urban and industrial environment, they certainly contribute to the increase in mental and behavioural disorders. WHO is studying the effect of noise under various conditions in order to determine the role played by it in mental health and industrial health.

3. The study of effects of induced changes in the environment

14. Induced changes in environmental conditions - whether intentional or unintentional, whether planned or unplanned - have a profound influence on the pattern of health and disease in man. Thus, swift population changes, massive migration, urbanization, the construction of irrigation dams, man-made lakes and rapid industrialization, are all matters of concern to WHO. Their effect is manifested in a multiplicity of ways. Population changes result in a disturbance of the balance of immunity giving way to epidemic outbreaks. Migrant population spreads both the agents and the vectors of diseases. To quote only one of the many examples, man-made lakes are potential habitats of the snail host of schistosomiasis.

15. WHO's activities include assistance for carrying out health surveys in areas where such programmes are envisaged and provide advice on the technical aspects and the preventive measures to be taken. It collaborates where appropriate in the long-term planning of environmental health work and assists in the assessment of related UNDP projects. It carries out a programme of surveillance designed to determine the immunological status of populations and the spread of disease agents.

It provides guidance and gives technical assistance to countries on the planning, organization and operation of sanitation and health services in urban communities, and advises on the public health aspects of housing and urbanization. It conducts immunization campaigns and assists in the establishment of health services for migrant populations.

F. World Meteorological Organization

1. The World Meteorological Organization is the specialized agency charged with the responsibility of furthering "the application of meteorology to aviation, shipping and other maritime affairs, agriculture, water problems and other human activities". It is also required by its basic convention "to facilitate world-wide co-operation in the establishment of networks of stations for the making of meteorological observations and other geophysical observations related to meteorology". WMO is engaged in or is encouraging and co-ordinating many programmes of interest to and directly applicable in the problems of the human environment.
2. WMO is now engaged in a broad and far-reaching programme called the World Weather Watch (WWW) which is designed to improve considerably both the collection system for and the amount of meteorological observations all over the world and to foster research projects. The World Weather Watch will involve a systematic development of the existing arrangements for observing the weather over the whole globe, for processing the observations in the form of charts of global weather analyses and prognoses and for exchanging internationally both the original observations and the processed data. The World Weather Watch will be implemented in several stages.
3. The WWW plan is closely linked with related activities in the fields of hydrology and oceanography, often in close collaboration with other specialized agencies.
4. Each member State of WMO is responsible for all meteorological activity connected with the implementation of WWW on its own territory; so far as possible this work should be carried out from national resources. Developing countries requiring assistance may request help from the United Nations Development Programme, from bilateral and multilateral arrangements or from the newly established WMO Voluntary Assistance Programme. A survey carried out by WMO at the end of 1968 showed that plans already exist for establishing most of the new facilities called for in the plan for 1968-1971; full details are given in the first of a series of annual status reports. The conference might well call attention to the importance of implementing fully the World Weather Watch plan and urge all countries to increase their efforts towards this end.
5. The scientific and practical benefits of the World Weather Watch will not be fully realized for several years. In the meantime it is most important that all countries take proper steps to prevent the pollution of man's environment from becoming worse than it is at present. The conference could usefully discuss appropriate measures to be taken.
6. Studies in these fields and on their interactions will form an important part of the Global Atmospheric Research Programme, which is being planned jointly

by WMO and ICSU. On the operational side, the Integrated Global Ocean Station System, planned in co-operation with UNESCO's International Oceanographic Commission, is to be based on and co-ordinated closely with the WWF.

7. The use of climatological data and weather forecasting promotes efficiency in the effective use of land and planning in agriculture. Most national meteorological services deal directly with these matters through sections for agricultural meteorology. WMO assists in these activities through its Commission for Climatology. WMO also co-operates with FAO and UNESCO in these particular fields.

8. Similar planning and forecasting activities are needed in relation to the use of water resources and it is obvious that these are closely related to hydrometeorological phenomena such as precipitation, evaporation and surface run-off. WMO promotes the collection, processing and analysis of data and standardization of instruments and techniques in this field through its Commission for Hydrometeorology. WMO is participating in the International Hydrological Decade by several projects which provide adequate methodology for the establishment of a practical water balance for operational purposes.

9. The WMO and its member States have noted a growing interest in making use of meteorological data and forecasts in planning urban settlements and for various purposes in the activities of building and related industries. Hence, WMO arranged a symposium at Brussels in October 1968 on urban climate and building climatology.

10. In all such planning activities, it is essential to know both the usual atmospheric conditions and the extent to which they are stable. Hence, the problem of changes of climate enters as an important issue which is considered by the WMO Commissions for Atmospheric Sciences and Climatology. This question includes changes which may have been influenced or introduced by man and those occurring through natural atmospheric events. The Working Group on Cloud Physics of the WMO Commission for Atmospheric Sciences is now considering a draft Technical Note on the "Artificial Control of Clouds and Precipitation". Similar material has been prepared to appraise the changes in water balance resulting from such control. It is expected that from these studies future policy will evolve giving guidance to Member States in this field.

11. With regard to problems of pollution of the atmosphere, the WMO has been active in studying the meteorological factors involved. The Commission for Agricultural Meteorology (CAGM) established a working group comprising world experts in the field to prepare a report on plant injury and reduction of yield by non-radioactive air pollutants, a subject of undoubted interest in protection of the human environment. The report of the group has been published in the WMO Technical Note series (Technical Note No. 96) entitled Air Pollutants, Meteorology and Plant Injury.

12. Another Technical Commission for Atmospheric Sciences (CAS) is examining other aspects of the air pollution problem. Local scale problems of high concentration in connexion with industrialized areas and urban developments have often been emphasized in this regard. However, of equal or possibly greater importance to the human environment in the long run is the gradual increase of low-concentration air-pollution over rather large areas such as regions, continents and even the globe as a whole. In both cases, meteorological considerations are of

great importance. The CAS Working Group on Atmospheric Pollution and Atmospheric Chemistry has made proposals for the establishment of a global network of background stations to monitor the low concentration (background) pollution. The Group is also concerned with reviewing the various techniques available to analyse and forecast dispersion of high concentration pollution in cities and industrial areas.

13. WMO has been collaborating with IAEA in the establishment of a global network to measure isotopes in precipitation. For the past seven years, more than 100 weather stations from sixty-seven countries and territories have been collecting monthly precipitation samples for the WMO/IAEA Isotopes-in-Precipitation Network. Analyses of the oxygen and hydrogen isotope content from these samples have been used to answer successfully, and sometimes uniquely, questions and problems in the fields of meteorology, oceanography and hydrology. Isotope data have been used for such diverse purposes as study of the structure of hurricanes and for estimating the volume of the ground-water reservoir of a volcanic island.

14. Although environmental pollution has received increasing publicity in recent years, it is believed that the very serious problems now facing mankind should be brought much more forcefully to the notice of the general public. Special attention might be given to the need to improve our knowledge of the atmosphere, hydrosphere and oceans and the need to avoid pollution. Such activity should be helpful in getting public support for such projects as World Weather Watch and GARP.

G. International Maritime Consultative Organization

1. In connexion with problems of the human environment, IMCO has a direct responsibility for placing restraints upon the contamination of the sea, land and air or other similar injury by or from ships and other equipment operating in the marine environment and for devising and promulgating methods for the prevention of such contamination or injury. One of the most essential means of preventing such contamination is to ensure the safety of ships carrying potential pollutants, including oil and other noxious or hazardous substances. In this connexion, IMCO is directly concerned with the construction and equipping of ships carrying oil or other hazardous or noxious cargoes with the aim of limiting the risk of collision or stranding and avoiding the escape into the sea of these cargoes. IMCO is also concerned with the routing of merchant ships, separating traffic and establishing prohibited areas for ships of certain classes and sizes.

2. A potential cause of massive pollution is that arising from the activities of ships and other equipment engaged in exploration and exploitation of the resources of the sea-bed and ocean floor. In pursuance of resolution 2467 (XXIII) of the General Assembly, IMCO is examining, from both the technical and legal viewpoints, the possibility of formulating, in co-operation with other United Nations bodies, suitable international agreements aimed at preventing pollution from such activities and protecting the resources of the sea from the consequences of pollution.

3. Apart from dealing with accidental pollution, IMCO, as the depositary of the International Convention for the Prevention of Pollution of the Sea by Oil, 1954, has a distinct responsibility for preventing oil pollution of the sea and coasts

which has, in the past, occurred through the normal tank cleaning and ballasting operations of tankers. Certain proposed amendments now under consideration will, if adopted, base the Convention, apart from certain exemptions, upon the principle of total prohibition of oil discharge from such ships and obviate the need for "free zones" in which the dumping or discharge of oil has not hitherto been regulated.

4. In addition to devising methods of preventing oil pollution, considerable attention is being paid to the development of improved methods of dealing with spillages of oil, if, by some misadventure, they should occur. Such studies include:

(a) New agents for absorbing or precipitating oil and new methods for removal of pollutants from the sea;

(b) New chemical and mechanical agents for protecting coastal areas from pollution, including construction and use of booms, emulsifiers;

(c) Detection and penalization of deliberate marine pollution.

5. The IMCO has long been concerned with the safe transport of dangerous goods in packages for which, in co-operation with other interested organizations of the United Nations family and the international organizations governing other modes of transport, the International Maritime Dangerous Goods Code has been compiled and is becoming widely accepted. Many dangerous substances, however, particularly liquids, are now being transported in large portable tanks and in bulk carriers. IMCO is currently studying the constructional features of both ships and tanks, to ensure that the cargo containment is adequate and properly designed, with a view to establishing internationally recognized provisions in this field.

6. The control of pollution in marine environment raises problems of legal nature such as measures which States can take outside their territorial seas in self-protection against pollution; liabilities arising from casualties involving discharge of oil or other pollutants, powers of surveillance by coastal States to implement measures for improving the safety of navigation and controlling maritime pollution. IMCO is convening a conference, to be held at Brussels from 10 to 28 November 1969, with a view to adopting conventions on both the private and public law aspects of these problems.

7. Pollution of the air which may be caused by ships is another matter which falls within the technical competence of IMCO. The organization is collecting and analysing national regulations in this field which indicate a need for understanding combustion processes and the techniques of boiler operation and control to ensure the practicability of any measures of prevention adopted.

H. International Atomic Energy Agency

General

1. The IAEA has a continuing programme on all aspects of radioactive pollution caused by peaceful uses of atomic energy, in close co-operation with other international organizations, in particular the ILO, ECE, FAO, WHO, WMO, IMCO and

ICRP. The programme consists of conferences, panels and other meetings to discuss technical and scientific problems; publications to disseminate information; support and co-ordination of research; advisory services to Member States upon their request and technical assistance to Member States, including various forms of training. It should, however, be stressed that the contribution of radio-active pollution to the environment is entirely negligible in comparison with all other kinds of pollution.

Radio-active air pollution

2. In 1967, IAEA published a revised edition of its Basic Safety Standards and a report on risk evaluation for protection of the public in radiation accidents, prepared jointly with WHO. In the same year the IAEA held a symposium on the containing and siting of nuclear power plants, another one on air monitoring techniques, and a joint meeting with WMO on meteorological and nuclear establishments. In 1968, a travelling seminar on radiation monitoring, including air monitoring, was undertaken in Latin America and a symposium will be held on the treatment of airborne radio-active wastes in the United States of America.

3. The IAEA laboratory has analysed the radio-activity of air samples for several Member States and is in a position to advise Governments and international organizations on the programming of air and precipitation monitoring schemes. It co-operates with WMO in this field and is represented in the WMO Commission on Instruments and Methods of Observation, where an IAEA representative was appointed Rapporteur on Measurements of Atmospheric Radioactivity.

The radio-active pollution of fresh and sea-water

4. The releasing of low-level radio-active wastes into the sea is practised by a number of countries; certain other countries do not agree with this means of disposal.

5. The IAEA's activities are directed mainly to the study of standards of permissible concentration of released liquid wastes, methods of determination of radio-nuclides released into the sea and fresh-water and water biota.

6. The IAEA published a number of basic recommendations concerning radio-active water pollution problems. 1/ Manuals concerning the methods of treatment of radio-active wastes have been prepared for use by those Member States which are developing nuclear establishments and the reports of panels on the treatment of radio-active wastes and the economics and of waste management have been published. WHO is co-operating, where appropriate, in the revision of these manuals.

7. The newly elaborated programme of the IAEA Monaco Laboratory deals chiefly with the standardization of experimental techniques to study the effects of

1/ For example: Safety Series No. 5 (1961), "Radioactive Waste Disposal into the Sea". Safety Series No. 10 (1963), "Disposal of Radioactive Wastes into Fresh Water", revised after January 1969 panel meeting. Safety Series No. 11 (1965), "Methods of Surveying and Monitoring Marine Radioactivity".

radio-activity in the marine environment. A first panel on "Reference Methods for Marine Radioactivity Studies" was held in November 1968 at Vienna.

The radio-active pollution of the ground

8. Radio-nuclides can enter the soil either directly by the introduction of liquid or gaseous wastes, or indirectly by way of infiltrating through the soil and leaching contaminants from the surface of solid waste.

9. Safe radio-active waste disposal into the ground is the subject of IAEA Safety Series No. 15 (1965), in which recommendations are made as to the siting, behaviour of wastes in the ground and standards and control techniques and was discussed widely at the symposium held in 1967.

10. As the radio-active pollution of the ground allows the uptake of radio-nuclides by plants, methods of determination of radio-nuclides (resulting from fall-out as well as radio-active waste) have been studied in the Seibersdorf laboratory of IAEA. The intercomparison of these methods and training courses on this subject are helping the Member States to organize control of this kind of radio-active pollution.

I. International Civil Aviation Organization

1. The interest of the International Civil Aviation Organization in what concerns human environment centres on two subjects: aircraft noise in the vicinity of airports and "sonic boom" which is associated with the introduction of supersonic aircraft to commercial service.

2. The ICAO considers the problem of aircraft noise in the vicinity of airports as one requiring urgent measures with regard to both the present situation and to the introduction of future aircraft types.

3. The following aspects of the problem will be dealt with at a special meeting later in 1969: procedures for describing and measuring aircraft noise in the vicinity of airports, human tolerance to aircraft noise, land use control and incorporation of provisions dealing with noise in ICAO air navigation documents.

4. With regard to "sonic boom", this is peculiar to supersonic flight and it is dealt with separately from aircraft noise in the vicinity of airports. The study of the problem includes the development of a uniform method of describing and measuring "sonic boom". In this connexion, liaison is being maintained with the International Organization for Standardization.

5. The Council of ICAO has recently agreed on a plan of action consisting of various stages to deal with the problem of "sonic boom". The plan concludes with a provision for convening a world-wide meeting for the main purpose of establishing international acceptance of the plan.