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ENVIRONMENT STATISTICS

CO-ORDINATION OF ENVIRONMENT STATISTICS

Report of the Secretary-General*

SUMMARY

In accordance with the wishes of the Statistical Commission at its eighteenth session, its Working Group on International Statistical Programmes and Co-ordination, at its sixth session, considered a paper on the activities of the United Nations system in environment statistics. The paper has been brought up to date and expanded to include the activities of organizations outside the United Nations system. It is being submitted to the Commission at the request of the Working Group.

The Commission may wish to comment on the extent, character and co-ordination of current and envisaged activities on statistics of the environment as set out by: (a) the United Nations (paras. 3-15); (b) ILO (para. 16); (c) FAO (paras. 17-19); (d) UNESCO (paras. 20-25); (e) WHO (paras. 26-30); (f) CMEA (paras. 31-33); and (g) OECD (paras. 34-36). In addition, an annex briefly describes Earthwatch.

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* The present document was prepared by the Statistical Office of the Department of Economic and Social Affairs of the United Nations, in co-operation with the statistical services of the specialized agencies and of agencies outside the United Nations system.

INTRODUCTION

1. Environment statistics are required for environmental studies for purposes of formulating government policies nationally and internationally, and, in particular, to elucidate the current and likely future condition of various elements of the natural and man-made environment, to delineate the cause-effect relationships between the environment and human activity and to determine the costs and effectiveness of preventive or remedial actions. Environment statistics should, therefore, be part of an interconnected framework rather than discrete sets of data on the various aspects of the environment, particularly with regard to concepts, definitions and classifications. Work on developing appropriate links will be an integral part of the proposed project on environment statistics which has been submitted by the United Nations Statistical Office to the United Nations Environment Programme (UNEP) for funding (see para. 6). In the meantime, however, work in the field of environment statistics is proceeding separately in a number of international organizations and the document, which has been discussed by the Sub-Committee on Statistical Activities of the Administrative Committee on Co-ordination (ACC) at its tenth session, summarizes this ongoing work.

I. ACTION BY THE COMMISSION

2. The Commission may wish to comment on the extent, character and co-ordination of the activities of international agencies on statistics of the environment. It may, furthermore, wish to indicate the future work that should be undertaken in reporting on, and extending the content and co-ordination of, the activities of international agencies on statistics of the environment.

II. UNITED NATIONS

A. Statistical Office

3. The medium-term programme of work on statistics of the environment of the Statistical Office, as set out in E/CN.3/452, consists of the following tasks:

(a) An inquiry to determine the requirements for environmental statistics and models and the data already available to meet these requirements;

(b) The collection and reorientation of available statistics on the environmental aspects of human settlements, on material balances, on energy balances and on the quality of the environment;

(c) The formulation of draft international guidelines for an initial set of integrated concepts, definitions and classifications for the environmental aspects of human settlements, material balances, energy balances and the quality of environmental reservoirs; and their testing in several countries.

4. At its eighteenth session, the Commission, in reviewing the programme of work set out in "Statistics of the environment" (E/CN.3/452), considered that work should begin as soon as possible, using a step-by-step approach in order to make the programme manageable.

5. The Commission was also informed of a proposal to establish a joint task force of the Sub-Committee on Statistical Activities of the Administrative Committee on Co-ordination (ACC) and of the United Nations Environment Programme (UNEP) Advisory Sub-Committee on Earthwatch, on the co-ordination of the plans and programmes of the United Nations family on statistics of the environment. (For additional information on UNEP, see the annex.) The proposal originated from the discussion at the eighth session of the ACC Sub-Committee concerning the need to co-ordinate international work on statistics of the environment.

6. The Department of Economic and Social Affairs submitted a revised, reduced project proposal, in line with the comments by the Commission, as set out in paragraph 3 above. The UNEP has been requested to finance the major portion of the revised project. In addition, UNEP had been requested to finance the joint task force of the ACC Sub-Committee on Statistical Activities and the UNEP Advisory Sub-Committee on Earthwatch on the co-ordination of the plans and programmes of the

United Nations family on environmental statistics. The UNEP has not yet officially approved the requests concerning the project on statistics of the environment, or the joint task force.

7. None the less, work has been under way with the aid of a consultant financed by the United Nations on the formulation of initial draft guidelines of integrated concepts, definitions and classifications of environmental aspects of energy and non-energy materials. A preliminary paper on these international guidelines was considered at a meeting in September 1975 of a group of rapporteurs of the Conference of European Statisticians. A more complete version of the paper, reflecting their comments, is before the Statistical Commission (E/CN.3/492).

8. For Habitat: United Nations Conference on Human Settlements, to be held at Vancouver, Canada, from 31 May to 11 June 1976, the Office prepared a Statistical Annex as a supplement to a background publication for the Conference, Global Review of Human Settlements. The Office was responsible for the preparation of the tables on demographic and housing conditions, for the provision of some data from the International Statistical Institute's International Statistical Yearbook of Large Towns and for the co-ordination of the statistical contributions from the specialized agencies (ILO, FAO, UNESCO, WHO and WMO). In addition, the Office prepared summaries of two projects - one in Calcutta and one in Venezuela - in order to illustrate the use of statistical data for urban and metropolitan planning. The next issue of the Compendium of Social Statistics (Statistical Papers, Series K), scheduled to be issued in 1977, will include several tables on the environmental aspects of housing.

9. The work outlined above is in addition to the regular activities of the Statistical Office on topics related to the environment. As far as energy statistics are concerned, the extension of current series into a system of energy balances is in the process of being harmonized with other international energy statistics, to enhance their comparability and their application to environmental considerations. Also, it is planned to examine the correspondences and linkages between energy statistics, as a subset of the System of National Accounts, related statistics of production, trade and consumption, and work in progress on the draft guidelines for statistics on materials/energy balances (see E/CN.3/476). The Office will maintain its regular activities on statistics of non-energy production and consumption and on statistics of population, housing and other social conditions pertinent to the development of environment statistics.

B. Economic Commission for Europe

10. Statistics for environmental studies and policies is a high priority item in the programme of work of the Conference of European Statisticians. The programme of work for 1975-1976 included three main issues on which work was to be undertaken: (a) collection of information on national practices, experience, plans and priorities in data requirements in environment statistics in general; (b) statistics for the study of the quality of the environment; and (c) materials balances. The

programme of work in this field is carried on jointly with the Senior Advisers to ECE Governments on Environmental Problems and is fully co-ordinated with the work programme of the United Nations Statistical Office and UNEP. In regard to item (a), a questionnaire is being prepared and will be cleared with the United Nations Statistical Office before it is issued. On (b), the ECE secretariat hoped to be able to complete a paper for consideration by a group of national rapporteurs at the beginning of 1976. On (c), the Statistical Office prepared a preliminary paper, which was considered by a group of rapporteurs in September 1975 (see para. 7 above).

11. Several other items in the programme of work of the Conference of European Statisticians involve consideration of aspects of the environment. Mention should be made in particular of the development of a classification of government expenditure by purpose, a classification of the cost structure and general energy statistics. Aspects of the environment are also considered in the context of statistical work carried out under the auspices of other subsidiary bodies of ECE, such as the Inland Transport Committee. Efforts are being made to co-ordinate this work in particular areas with the general work on environment statistics.

C. Economic and Social Commission for Asia and the Pacific

12. The subject of "statistics for environmental studies and policies" was discussed at the first session of the Committee on Statistics, held at Jakarta in November 1974. Although the countries of the ESCAP region have no specific programme for the development of such statistics, the Committee made the following observations:

"While expressing a general interest in the development of environmental statistics, the Committee recognized that the subject was not of the same urgent concern to the developing countries of the region as to the developed ones. None the less, the countries of the region could not remain indifferent to the development of environmental statistics. The Committee, therefore, welcomed the initiative of the Statistical Office of the United Nations in formulating an international programme of work for the development of environmental statistics.

"The Committee agreed with the assignment of top priority within the international programme to the development of statistics relating to the environment of human settlements. Other priority areas included pollution in relation to human activities and welfare, pollution relating to the production and processing of energy and non-energy minerals, and the quality of the environmental reservoirs. The Committee recommended that preliminary work be initiated towards the development of statistics relating to those priority areas. Such preliminary steps might include (a) identification of data requirements, (b) formulation of the relevant concepts, definitions, classifications and tabulations, (c) inventory of the available data and (d) elaboration of the methods of data collection. The Committee emphasized, however, that that recommendation in no way implied any commitment to the remainder of the proposed long-term programme.

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"The Committee agreed that environmental problems differed from country to country and, therefore, that each country should determine its own priorities in the development of environmental statistics. Work at the country level would have to be planned in consultation with the national authorities responsible for the control of the environment, and undertaken in close collaboration with the concerned data-producing agencies, including scientific bodies responsible for environmental studies and surveys.

"The Committee was assured that, while the main responsibility for the development of international guidelines would rest with the Statistical Office of the United Nations, the regional commissions would be associated with the programme as partners in a collaborative effort, would be kept informed of the developments from time to time and would be consulted at appropriate stages. The Committee recommended in that connexion that the requisite resources be made available to the regional commission for developmental and promotional work at the regional level. The resources might be sought from the United Nations Environment Programme." (E/CN.11/1191, paras. 54-57)

13. The ESCAP Committee on Natural Resources discussed the subject at its session held from 14 to 20 October 1975. From the deliberations of these meetings and in co-operation with the recently organized regional office specific projects for statistics on the environment will be developed for the region.

D. Economic Commission for Africa

14. ECA compiles annual statistics on African countries which cover important environment-related topics such as:

(a) Energy - annual statistics on hydroelectric power production and the installed capacity in each country, the consumption of power by industrial concerns and per capita consumption as an indicator of the quality of life in the various African countries; and

(b) Housing and human settlements - data on both quality and quantity of housing available to the African population, both urban and rural, reflecting the quality of the environment of the respective African populations.

15. Additionally, plans are under way for field teams to evaluate, qualitatively and quantitatively, industries already operating in Africa and to assess the extent to which they will contribute to the pollution of the African environment. Another plan is being formulated to use remote sensing facilities, that is, constructing ground stations to receive data directly from earth resources satellites to survey Africa's natural resources and to evaluate the extent to which this can contribute towards development in Africa.

III. INTERNATIONAL LABOUR ORGANISATION

16. The 1976-1977 programme of work of the ILO contains a project on statistical indicators concerning the working environment. The improvement of the working environment calls for an effective follow-up system and a regular flow of information on factors related to the working environment and their influence on workers. The ILO will accordingly develop statistical schemes and sets of indicators on the working environment for use in member States for such purposes as planning for occupational safety and health measures, new legislation, the administration and supervision of labour protection and research in occupational safety and health. The type of statistics to be developed include information based on measurements concerning physical and, as far as possible, psychosocial factors, such as the industrial branch, the region, the type of machinery, the process or equipment used, changes in the health of workers and changes caused by labour protection measures. Such indicators, describing the state of the working environment, will also provide the basis for an alarm system to assist national authorities in detecting new dangers in the working environment at an early stage and taking preventative action accordingly.

IV. FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS

17. The problems related to the human environment are not only those of pollution, but above all those associated with the rational management of renewable natural resources, such as soils, cultivated plants, grasslands, forests and wildlife, water resources and living aquatic organisms. These resources constitute the environment of the largest part of the population of the globe. The maintenance of the productive capacity of these resources is of concern to all.

18. The main areas of concern to FAO in environment-related statistics are therefore:

(a) Data on the current use of resources, such as statistics on current land and water use in cultivated areas, grasslands, forests, fish stocks etc;

(b) Data on production related to these resources on the health of living resources and as indicators of their state of pollution, degradation or depletion;

(c) Data on activities that are or may in some cases be associated with certain processes of degradation of the environment, such as the production and use of agrochemicals, the development of certain agro-industries that are major sources of pollution, the mechanization of agriculture, the development of irrigation and the clearing of forest lands.

19. In addition, there are other data and information on the nature and potentialities of the resources themselves that are essential to the assessment of the state of the environment for agriculture, forestry, fisheries and food. The FAO is involved in several global inventories and assessments of natural resources, such as soils, forests, grasslands, fishery resources and genetic resources. On the basis of these activities, FAO is evolving a series of

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monitoring programmes for specific processes of environmental degradation, such as soil degradation, depletion of the world forest cover, endangered fish stocks, and, in collaboration with WHO, food contamination. Moreover, FAO is engaged with UNEP and other agencies in a broader process of programme formulation for a global system of environmental monitoring. Environment statistics inventories and the monitoring of natural resources are different facets of the same broad range of activities of the collection and processing of data on the state of the environment for food and agriculture. The FAO, at its seventeenth conference, established a programme framework for developing these activities in co-operation with UNEP and other United Nations and non-United Nations agencies. One of the major aims of this programme framework (entitled "Natural resources for food and agriculture") is progressively to achieve a better link between environment statistics and data on natural resources for food and agriculture in order to enable FAO to provide its member Governments with periodic global assessments of the state of natural resources for agriculture, forestry, fisheries and food in the same way that FAO publishes periodic reports on the demand for and production of agricultural commodities.

V. UNITED NATIONS EDUCATIONAL, SCIENTIFIC AND CULTURAL ORGANIZATION

20. So far, UNESCO has no specific projects in environment statistics. The following is, therefore, a general presentation of the statistical activities undertaken or envisaged by the organization, that have a special relationship to the environment.

21. UNESCO is currently undertaking a survey of member States to evaluate their needs and priorities with respect to education on the environment. The survey covers teaching material on environment education, institutions where environment education is provided, students, teachers, organizations and associations involved, financial provision and legislation. The survey questionnaire does not ask for quantitative data. Each subject is to be evaluated on a five-point scale indicating the extent of national needs and priorities.

22. In the biennial questionnaires circulated among member States in 1971 and 1973, data were requested on expenditure for research and experimental development (R and D), allocated by major national aims or purposes. Among these was R and D on pollution, which was defined to include all R and D on water and air pollution and on noise, except R and D projects for which an aim other than health and welfare was specified.

23. The 1975 UNESCO statistical survey on scientific and technological activities contains a table showing the allocation of national R and D expenditures among 12 major aims. One of these aims is entitled "protection of the environment".

24. UNESCO proposes to request data not only about human and financial resources devoted to scientific research and experimental development directly related to the environment but also such related scientific activities as: teaching at the higher-education level (for example, specialized post-graduate courses in universities), routine data collection for pollutant detection purposes, and

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publications and the dissemination of information, the number of expert meetings, symposia, seminars etc. organized or attended at the national and international levels, the number and activities of scientific associations, etc. The degree of detail of the data requested will not be decided until a draft questionnaire is examined by a group of experts and/or tested in a few countries. It would most likely be confined to R and D and related scientific and technological activities in the three main areas of study: water pollution (inland waters and seas and oceans), atmospheric pollution (urban and industrial aspects) and soil pollution (agriculture and forestry).

25. With regard to the "man-made environment" of which cultural structures are one of the elements, statistics actually collected by UNESCO provide some information on cultural facilities and participation in cultural life for the whole of the population in a country.

VI. WORLD HEALTH ORGANIZATION

26. Long- and medium-term planning in various fields of environmental health require technical, administrative, economic and financial data from Governments. One of the areas in which an urgent need existed for such information was that of basic sanitary services, particularly community water supply and sewage disposal services. Based on the recommendations formulated by the experts WHO had convened on this topic, statistics were collected on the status of community water supply and sewage disposal in developing countries and published in World Health Statistics Report (vol. 26, No. 11, 1973). The questionnaire has been revised and is being sent to the countries for data collection as from 1975.

27. An information guide is under preparation by WHO for the planning and evaluation of community water supply and community waste water disposal programmes. The guide will deal with methodology for the collection, analysis and presentation of statistical and technical information on the subject.

28. In the field of environmental pollution control, plans are being developed in connexion with the UNEP Global Environmental Monitoring System (GEMS). During 1976-1977, a world-wide collection of data on air and water quality will be carried out. Prior to the routine handling of data, a survey of current monitoring activities on air and water quality will be undertaken in the member States. These surveys, which have already been initiated in some of the regions, might well provide information which can be entered into a more comprehensive environment statistics file, such as the one proposed by the United Nations. These surveys will render information on the institutional aspects of environmental data handling, while the subsequent monitoring programme will provide data on the quality of the environment itself. In addition, a plan is being developed in respect of a classification of environmental hazards to health.

29. The collection and analysis of international statistics on the other areas of environmental health have not yet reached the stage of implementation. Series of meetings have, however, been convened by WHO in recent years on priority programme areas in environmental health, in which requirements on statistical

support to the planning, management and evaluation of environmental health programmes were also discussed. These priority programme areas include basic sanitary measures, urban-industrial environmental health, and planning, infrastructure and institutions. Statistical activities are being developed in response to these needs.

30. All WHO statistical activities on the environment are undertaken in close collaboration with the Divisions of Environmental Health and Health Statistics.

VII. COUNCIL FOR MUTUAL ECONOMIC ASSISTANCE

31. The development of environmental statistics was started under the auspices of the Permanent Statistical Commission of the CMEA in 1972. The main aims consist of assisting member States in the creation and improvement of environment statistics and also of developing a unified set of recommendations and definitions for the international comparison of the statistical indicators. First, a draft system of environment statistics was worked out and sent to the countries for comment. In 1975, a second draft system was prepared, taking into account the comments, and considered by an expert group, 21-24 October 1975. The draft includes indicators on changes in conditions of such important elements of the environment as air, water, soil and others, that is, on undesirable changes brought about as a result of economic activity.

32. The system consists of eight divisions containing more than 150 indicators:

Division I: Six general indicators defining territory and population of the country;

Division II: More than 40 indicators connected with soil area;

Division III: More than 50 indicators connected with water;

Division IV: More than 10 indicators connected with waste materials;

Division V: More than 30 indicators connected with conditions of air;

Division VI: Two indicators connected with noise;

Division VII: Fifteen indicators connected with the environment of human settlements;

Division VIII: About 20 indicators concerning capital investment connected with environmental protection.

33. A substantial number of the proposed indicators will be introduced into practice based on some systematic surveys which will be taking place. At this stage, there is particularly important spade-work which must be undertaken for developing such accounts. Questions concerning the compilation of a minimum number of indicators will also be discussed in order that all interested countries will be able to move forward with the aim of international comparisons.

VIII. ORGANISATION FOR ECONOMIC CO-OPERATION AND DEVELOPMENT

34. The project on urban environmental indicators aims at the development of appropriate quantitative and synthetic information to improve the formulation, implementation and evaluation of policies concerned with the urban environment. The group in charge of the work has (i) produced concepts and methods for the development of urban environmental indicators; this provided the basis for the contributions on urban environmental indicators transmitted by the Secretary-General of the Organisation for Economic Co-operation and Development to the Secretary-General of Habitat: United Nations Conference on Human Settlements; (ii) developed a set of indicators and tested them with real measurement on a set of towns in OECD member countries; (iii) engaged in the preparation of case studies reporting on developments in that field within member countries. This work has been developed in close co-operation with the OECD programme on social indicators.

35. In 1976, completion of the evaluation of the test results and measurement of the set of indicators should permit the submission of proposals of urban environmental indicators to assess the quality of the environment in cities. A special meeting on urban environmental indicators in September 1976 will provide the opportunity for the presentation and discussion of a set of case studies and reports on the development and use of urban indicators in member countries. Conclusions will be drawn concerning the development and use of such indicators by local and central authorities.

36. The project on pollution control costs aims at providing governmental decision makers with statistical information concerning the costs of pollution control. Three industries have received particular attention, the aluminium industry, the iron and steel industry and the fertilizer industry.

ANNEX

EARTHWATCH a/

1. The Earthwatch global environmental assessment programme is one part of the functional framework of the United Nations Environment Programme (UNEP). Earthwatch is a subsidiary body of the Environment Board and is composed of subgroups for monitoring and evaluating the environment and for research (Global Environment Monitoring System (GEMS)) and for promoting interchange of environmental information (International Referral Service (IRS)). Two other major areas can also be identified: (i) environmental management (goals, criteria and conventions); and (ii) supporting measures (education, training, public information and technical assistance).

2. At the Intergovernmental Meeting on Monitoring held at Nairobi in 1974, the following list of priority pollutants was drawn up (the medium is given in parentheses): (i) sulphur dioxide plus suspended particulates (air), radionuclides (food); (ii) ozone (air), DDT, organochlorine compounds (biota, man); (iii) cadmium and compounds (food, man, water), nitrates and nitrites (drinking water, food), NO and NO₂ (air); (iv) mercury and compounds (food, water), lead (air, food), carbon dioxide (air); (v) carbon monoxide (air), petroleum hydrocarbons (sea); (vi) fluorides (fresh water); (vii) asbestos (air), arsenic (drinking water); (viii) mycotoxins (food), microbial contaminants (food), reactive hydrocarbons (air).

3. While Earthwatch is not yet fully developed as a United Nations programme activity, it can draw on and integrate ongoing and relevant national and international environment programmes, such as: (i) Global Atmospheric Research Programme; (ii) Long Term and Expanded Programme for Ocean Research; (iii) Man and the Biosphere; (iv) Global Investigations of Pollution in the Marine Environment; (v) Marine Mammals Programme; (vi) Human Health; (vii) Integrated Global Ocean Station System; (viii) World Weather Watch; (ix) Fisheries Programme; (x) International Hydrologic Programme; (xi) other environment programmes.

4. The major programme areas for Earthwatch stem from the priorities established at the Stockholm Conference in June 1972: (i) human settlements and habitat; (ii) health of people and the environment; (iii) terrestrial ecosystems; (iv) environment and development; (v) oceans; (vi) energy; and (vii) natural disasters. Among existing programmes, the International Council of Scientific Unions (ICSU) is responsible for a major existing activity, the World Data Center, which provides the international community with data storage and dissemination services for meteorology, geophysics, geochemistry, glaciology, oceanographic, seismological and other information. FAO stores and disseminates agricultural, forestry and fisheries related information.

a/ Summarized from an article by Clayton E. Jensen, Dail W. Brown and John A. Mirabito, "Earthwatch", Science, vol. 190 (31 October 1975), pp. 432-438.