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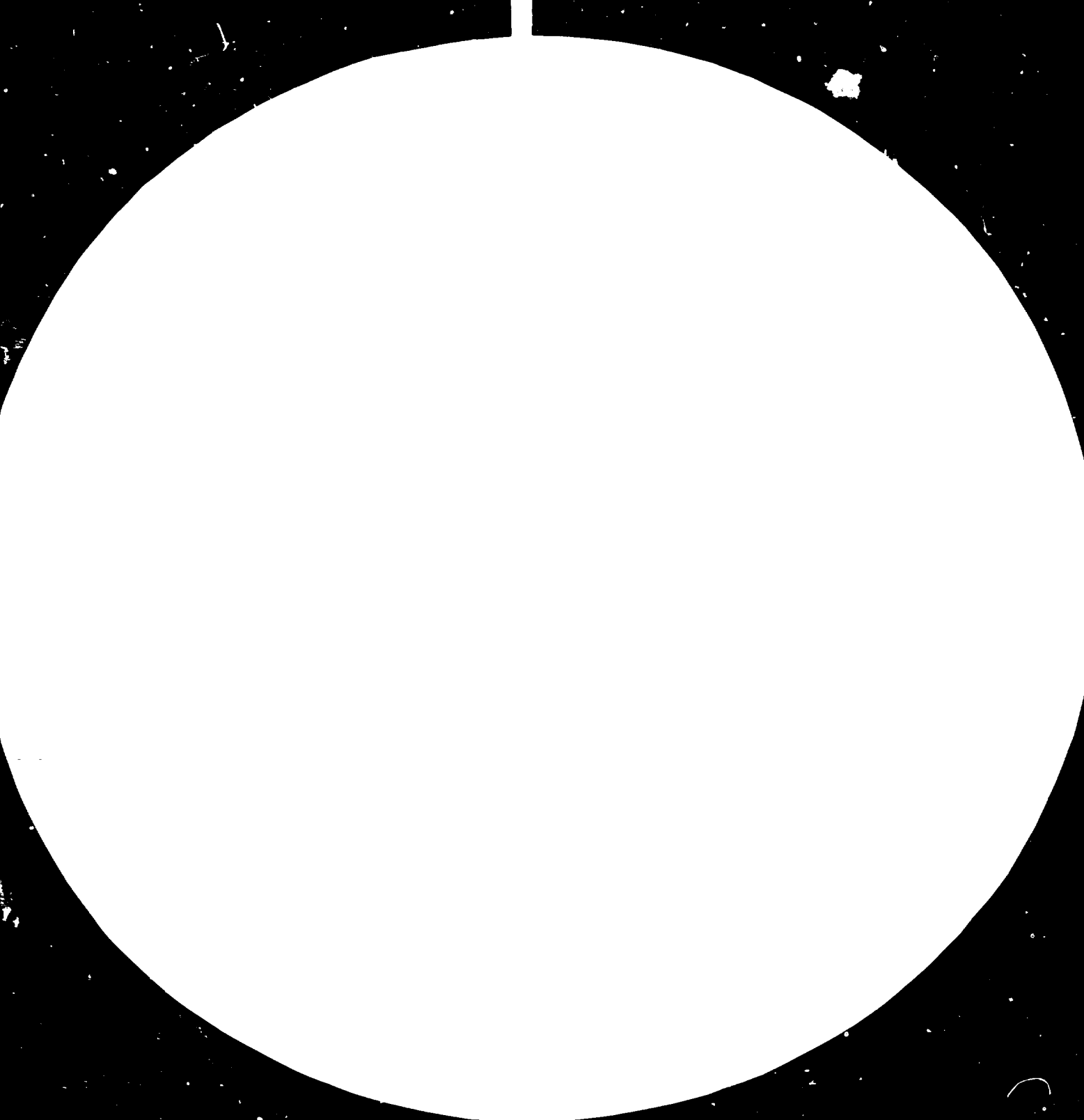
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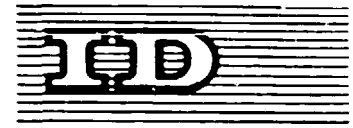
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INDUSTRIAL WATER USE AND TREATMENT PRACTICES

Note by the Secretariat

001001

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Summary

Prepared in response to Economic and Social Council resolution 1979/70 (August 1979) which inter alia recommends that the Board examine proposals by the UNIDO Secretariat as follow-up to the Mar del Plata Action Plan adopted by the United Nations Water Conference held in 1977. Outlines suggested future action with respect to technical assistance, studies and promotional activities, and the evolution of a data base. Lists, in an annex, ongoing or recently completed activities related to the subject matter.

Background

1. On 3 August 1979, the Economic and Social Council adopted resolution 1979/70 on follow-up to and implementation of the Mar del Plata Action Plan adopted by the United Nations Water Conference in March 1977. In section IV ("Industrial water use") of its resolution, the Council urged governments:

- "(a) To intensify their efforts to economize on water consumption in the industrial sector and to reduce to the maximum extent possible the level of pollution caused by waste waters at the source through the development and application of appropriate technologies for this purpose;
- "(b) To establish suitable mechanisms for a systematic exchange of experience and the transfer of technological know-how from developed to developing countries, and within the framework of technical co-operation among developing countries."

The Council also recommended that:

"... the Industrial Development Board should examine detailed proposals on industrial water use and treatment practices made by the United Nations Industrial Development Organization in the light of the recommendations in paragraph 27 of the Mar del Plata Action Plan".

2. Paragraph 27 of the Mar del Plata Action Plan^{1/} reads as follows:

"International organizations and other supporting bodies should, as appropriate, and on request, take the following action:

- (i) Assist countries in making an assessment of water requirements for industrial purposes in different countries, subregions and river basins, and evolve economical methods for the re-use and recycling of water, where necessary;
- (ii) Strengthen programmes for the exchange of information, inter alia, by arranging expert and other meetings;
- (iii) Support or arrange research and study programmes, particularly in relation to pricing policy and also methods of water and waste-water treatment which are conducive to a reduction in cost of treating effluents;
- (iv) Evolve a common international statistical data base that will relate water use, particularly the effects of water quality available, to process technologies and the degree of re-use and recycling."

^{1/} E/CONF.70/29, chap. I (United Nations publication, sales No. E.77.II.A.12).

3. The formulation of proposals in response to resolution 1979/70 and their subsequent consideration by the Board will be facilitated by a general appreciation of the current and planned activities of the relevant organizations within the United Nations system. Soon after the Water Conference, some of those organizations, notably the World Meteorological Organization (WMO) and the United Nations Educational, Scientific and Cultural Organization (UNESCO) initiated follow-up action. Review and appraisal of progress on the Action Plan were conducted at several levels in the system. The Committee on Natural Resources^{2/} conducted the first intergovernmental review, based on a report that had been prepared jointly by WMO and UNESCO in 1978.^{3/} Subsequently, the Economic and Social Council considered the issue and adopted resolution 1979/70.

4. Endorsing that resolution, the General Assembly requested the Committee on Natural Resources, in resolution 34/191, to review progress made by governments in implementing the Action Plan and to provide continued guidance to the water-related activities of the United Nations system. An Intersecretariat Working Group for Water Resources, established by the Administrative Committee on Co-ordination (ACC) to co-ordinate activities, is currently preparing comprehensive reports on the status of progress in water resource development since the Water Conference, as well as on prospects for development in that area. Progress is being assessed, inter alia, through a questionnaire sent to a large number of countries.

5. A general appreciation of the wide-ranging activities envisaged in the Action Plan can be gained from the contents of Economic and Social Council resolution 1979/70, particularly section II entitled "Assessment of water resources" in which the Council urged Governments:

"... to develop and/or intensify national activities in the assessment of water resources, with particular emphasis on data collection and processing methods for the evaluation of hydrological parameters under specific conditions, in particular in developing countries".

The Council further decided:

^{2/} A standing committee of the Economic and Social Council.

^{3/} "Assessment of water resources" (E/C.7/78).

- "(a) To endorse the strategy, presented in the report on the assessment of water resources, for the implementation of resolution I of the United Nations Water Conference at the regional and international levels, in order to assist developing countries in maintaining and strengthening adequate programmes for the assessment of their water resources;
- "(b) To request the United Nations Educational, Scientific and Cultural Organization and the World Meteorological Organization, in co-operation with the regional commissions and other United Nations organizations concerned, to carry out an international project along the lines indicated in their report on the assessment of water resources, with a focus on the national level, designed to provide guidance and practical aid to countries that require assistance in implementing their national plans for water resources assessment."

I. INTERNATIONAL PROJECT

6. The Joint WMO/UNESCC report^{3/} and its offspring, the international project, constitute - as mentioned above - a comprehensive and practical response for the implementation of resolution I of the Water Conference. A brief look at the objectives and operational modalities of the project will be relevant to the charting, on UNIDO's part, of a productive course of action in line with the directive given in section D (Policy, planning and management) of the Mar del Plata Action Plan^{4/} to the effect that increased attention should be given to the integrated planning, development and management of water resources and that integrated interdisciplinary approaches to the formulation of water policies are important components of national water management.

7. The international project prepared by WMO and UNESCO aims at helping countries, particularly developing countries, in the ultimate establishment of a continuing system of local water resources assessment, planning and development. The methodology of assistance takes full account of the differences in capacities in this field that obtain in various countries. In order to facilitate the operations of the project, countries with similar hydrologic and development characteristics are grouped together and provided with, or given recommendations on, the type of assistance that would boost their capability to the level of self-sufficiency. The project stresses the system of water resource assessment as the foundation for all subsequent action, and divides that into three distinct stages:

4/ E/CONF.70/29, chap. I, paras.41-61.

- (a) Collection and processing of hydrological and hydrogeological data to permit a preliminary assessment of available resources on which a regional or national plan can be founded;
- (b) Extension of networks and more detailed investigations capable of yielding water balances and water master plans;
- (c) Adoption, to control over-exploitation, of measures necessary for the management and control of abstraction and disposal.

It may not be necessary here to expand upon those elements of the project which cover areas like legislation and identification of and linkages between various agencies concerned with water resource development and use.

II. PROPOSED UNIDO ACTIVITIES IN PURSUANCE OF THE MAR DEL PLATA ACTION PLAN

8. From the foregoing, it will be seen that water resources assessment has been taken up on a system-wide and integrated basis within the framework of the international project. The Secretariat of UNIDO has been in contact with the WMO with a view to deriving such benefit from the exercise as will assist specifically in projecting water requirements for the industrial sector. It would not appear necessary or productive to launch a separate programme in respect of the assessment of water resources. The following may therefore constitute the basis of UNIDO Secretariat's action in pursuance of paragraph 27 of the Action Plan, subject to the availability of resources and the requests of the developing countries:

- (a) Liaison and co-operation with WMO and UNESCO in the international project with a view to exploring the possibility of launching a complementary programme to assist developing countries in ascertaining water demand for industrial purposes;
- (b) Similar liaison with these and other United Nations bodies, specifically through the Intersecretariat Working Group (para.4 above) to stimulate the United Nations system to action in pursuance of items (iii) and (iv) of paragraph 27 of the Action Plan, and then to contribute as appropriate to the Plan;
- (c) Assistance to developing countries in evolving economical methods for the re-use and recycling of water;
- (d) Strengthening programmes for the exchange of information.

9. Although the technical assistance and studies programmes of UNIDO have substantially covered the water/industry interface - particularly the treatment of industrial water waste, the provision of water to the manufacturing and agricultural sectors, and the use of water in power generation - these programmes do not generally have as their focus the assessment of water requirements for industrial purposes, the development of pricing policies, or (except in a few cases) studies or actions conducive to reduction in cost of treating effluents. An annex to the present document gives a brief description of some of the current studies and technical assistance programmes of UNIDO relevant to the subject matter.

10. The Secretariat contemplates the gradual establishment of a practical programme deeply rooted in the basic objective of assisting developing countries at various levels (national, subregional and regional) to build up internal capacities for assessing and managing water resources for the industrial sector in an economical manner, including re-use and recycling of water at reduced cost. The guiding principles may be: first, to preserve and strengthen the integrated approach of the United Nations system to the subject as a whole, to ensure that the programmes of the various constituent bodies of the system reinforce each other; secondly, to initiate technical assistance projects only in response to official requests in recognition of the fact that country situations and priorities differ widely and that local initiative is the most reliable determinant of the latter; and, thirdly, the appreciation of the grim reality that the scarce resources of UNIDO may preferably be largely devoted to the pursuit of the most important and painstaking activity, namely, the Organization's contribution to the evolution of a common international statistical data base that will relate water use (particularly the effects of water quality available) to processing technologies and degree of re-use and recycling.

11. The following proposals concerning (a) a technical assistance programme, (b) studies and promotional activities, and (c) evolution of a data base are accordingly submitted for the consideration of the Industrial Development Board.

Technical assistance programme

12. It is neither feasible nor necessary to establish a model programme or project for implementation in a large number of countries, due to substantial differences in local situations, priorities and programmes. The parameters of work enumerated below constitute a broad listing of areas in which technical assistance could be given. Some of these could be pieced together to formulate a project tailored to the specific requirements of a country, subregion or region, or some of them could be the basis of global projects for the solution of a common set of problems:

- (a) Assessment of present and potential water requirements for various industries;
- (b) Elaboration of economical methods for re-using and recycling water;
- (c) Promotion of research and study programmes on efficient and economic use of water and on waste water treatment;
- (d) Maintenance and repair of equipment (pipes, screens, grinders, grits etc.) in chemical and biological treatment;
- (e) Manufacture of equipment;
- (f) Development and implementation of training programmes;
- (g) Exchange of technical information.

Studies and promotional activities

13. These would cover:

- (a) The preparation of guidelines for formulating, initiating, conducting and evaluating research and studies programmes on the efficient and economic use of water and on waste water treatment;
- (b) The organizing of expert group meetings with a view to reaching conclusions helpful in examining common issues such as -

- Pricing policies
- Economical methods of treatment of effluents
- Establishment of data bases helpful in relating the quality of water with the use of water process technologies
- Training of personnel
- Manufacture and maintenance of equipment.

Evolution of a common international data base
for relating water use and effects

14. This objective, attainable obviously over a sufficiently long period of time, calls for a systematic and integrated approach. It demands, in addition to sizeable resources, perseverance and enduring efforts both at national and international levels. Not much seems to have been done so far, within the knowledge of the UNIDO Secretariat, at either of the two levels. It is considered that UNIDO cannot possibly be expected to have the full or main responsibility for the subject, nor does it have the resources for it. Admittedly, the Organization has an important role in one particular aspect of the venture. The guidance of the Board in determining the nature and extent of that role is sought with the help of the analysis that follows:

- (a) A "common international statistical data base" with specific characteristics mentioned in sub-paragraph (iv) of paragraph 27 of the Mar del Plata Action Plan does not exist. It has to be built up from the grass-roots level, and for this the bulk of the effort will have to come from the countries themselves. The catalytic, co-ordinating and organizational role can be assumed by the United Nations system - appropriately by the Department of International Economic and Social Affairs, with the active involvement of the Division of Natural Resources and Energy of the Department of Technical Co-operation for Development.
- (b) Subject to modifications and adjustments by the leading partners, the UNIDO Secretariat visualizes that the evolutionary approach mentioned in the relevant part of the Action Plan is the most appropriate one and its adoption through the national censuses, including all aspects of water use in manufacturing, the only economical methodology for building a durable and reliable data base. One possible way for the United Nations system to catalyse national activities on a global basis may be to initiate, through the Inter-Secretariat Working Group, the process of planning and formulating another international project on this subject, under the auspices of the units concerned, with the objective of establishing the parameters of a long-term system of evolving the data base and providing, to countries, appropriate assistance in this work. The UNIDO Secretariat intends to raise this issue in the Working Group.
- (c) The work of relating water use and water quality to process technologies (insofar as it concerns UNIDO) will have to be planned and pursued as appropriate, after the data base is available at least in a few developing countries.

III. ACTION REQUIRED OF THE BOARD

15. The guidance of the Industrial Development Board on the proposals contained in paras.11-14 above is solicited.

Annex

UNIDO ACTIVITIES IN WATER RESOURCES
DEVELOPMENT AND USE

1. On the water/industry interface, UNIDO activities have covered inter alia the repair, maintenance and manufacturing of different types of equipment related to water generation, irrigation and distribution; mini-hydro plants; and the treatment of waste-water. Many of these activities have been planned in co-operation with the United Nations Environment Programme (UNEP) (with which a Joint Committee has been established) and other organizations in the system.
2. UNIDO has provided assistance to several countries in the following areas:
 - (a) Development of control systems for the reduction and abatement of water wastes through the installation of different waste-water treatment technologies: primary, secondary and tertiary treatment with biological and physical/chemical processes;
 - (b) Establishment of water-monitoring systems;
 - (c) Environmental legislation and standards for water wastes;
 - (d) Development of low, and non-waste technology in recycling wastes produced by industries.
3. Two projects planned for the near future relate to the development of plastic technology for water management in industry. Several other projects are in planning for implementation in developing countries.
4. The following list gives further examples of technical assistance projects completed or on-going at the end of 1980:

Technical assistance

Africa, regional

Pilot unit for the manufacture of sprinkler irrigation equipment
(RAF/80/015)

Assistance to the Sahel Institute in development and application
of irrigation technology and agricultural machinery

Assistance in industrial pollution control, with emphasis on
effluent treatment control (TS/RAF/78/023)

Ethiopia

Research and development in water pumping and windmill technology
for rural areas (ETH/77/013)

Hongkong

Environmental control in air and water pollution (DP/HOK/80/001)

India

Desilication pilot plant for the Ashok Paper Mills Limited
(UF/IND/79/206)

Technical training assistance for the Indian Oil Corporation Limited
(DP/IND/73/005)

Assistance to the Indian Petrochemical Corporation Limited
(DP/IND/73/010)

Kenya

Development and manufacture of low-cost water-lifting device
machinery industry (KEN/75/010)

Latin America, regional

Assistance to OLADE in manufacturing hydro-power equipment,
specifically with regard to mini-hydro-generating plants
(RLA/79/802)

Assistance to OLADE. Planning and programming of a meeting
to aid in development of small hydro-power generating plants
(ECU/79/801)

Poland

Environmental protection by effluent treatment and material
recovery in metal-finishing industry (SI/POL/75/801)

Qatar

Assessment and control of industrial pollution (DP/QAT/79/001)

Senegal

Establishment of a maintenance system for irrigation pumps, with
additional training in the policy of agriculture irrigation
(SEN/78/014)

Somalia

Study for progressive local manufacture of water pumps (SOM/78/191)

United Republic of Cameroon

Assistance to industrial pollution control environment (SI/CMR/78/801)

Upper Volta

Assistance to the Voltaic Society of Textiles (VOLTEX) in the
treatment of residual wastes (320 UPV)

Assistance to VOLTEX (State owned textile enterprise) for water
purification (SI/UPV/79/803)

Uruguay

Assistance in mini-hydro power plants (URU/79/806)

Yugoslavia

Reduction of water pollution in the Spreca River Basin (DP/YUG/78/006)

Studies and research programme

5. In the Sectoral Studies carried out by UNIDO, consideration has been given to various aspects of water use and treatment practices, particularly in studies related to leather and leather products, petrochemicals, vegetable oils and fats and fertilizers. The depth and breadth of treatment of the subject have, however, varied considerably.

6. UNIDO has also provided inputs to several UNEP studies and assessments, including the following:

- (a) Assessment of pollutants from land-based sources into the Mediterranean sea;
- (b) Study of marine pollution in the wider Caribbean sea;
- (c) Survey of marine pollutants from industrial sources in the West African region;
- (d) Kuwait Action Plan region (proposals):
 - (i) Survey of land-based sources of industrial wastes discharged directly or indirectly into the sea or reaching it through the atmosphere;
 - (ii) Assessment of present and future development activities and their environmental impacts;
 - (iii) Assistance in development of national capabilities in engineering knowledge needed for regional environmental protection;
 - (iv) Co-ordination of national water management policies whenever they may have impact on the marine environment of the region.

7. UNIDO also carried out a study on the use of water in (a) iron and steel and (b) pulp and paper industries. It was presented to the special session of the Committee on Natural Resources in June 1979.

