Statements and Recommendations from Major International Meetings on Water Resources, Water Supply and Sanitation

compiled by

The Science, Technology and Private Sector Division

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Introduction

This publication represents a ready reference to statements and recommendations which have emerged from major international meetings addressing water issues.

These meetings looked at water issues from different vantage points, e.g. water supply, public health and sanitation; irrigated agriculture; water and the environment; the management of water and sanitation utilities; comprehensive water resources management; water sector capacity building.

It is no exaggeration to state that the information contained in this volume reflects the best experience and knowledge available today. Countless people and institutions across the world should be able to benefit from this state-of-the-art publication in the preparation and implementation of water policies, strategies, programmes and projects. Furthermore it will facilitate the monitoring and evaluation of trends at the national, regional and global levels.

Frank Hartvelt, Deputy Director
Science, Technology and Private Sector Division
United Nations Development Programme

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References

Further information concerning the different meetings may be obtained from the following persons:

United Nations Water Conference, Mar del Plata, 14-25 March 1977	Mr. Pierre Najlis Department for Policy Coordination and Sustainable Development United Nations Two UN Plaza, room DC2-2022 New York, NY 10017 USA fax: (1) 212 9631795
Global Consultation on Safe Water and Sanitation for the 1990s, New Delhi, 10-14 September 1990	Mr. Frank Hartvelt, Deputy Director Science, Technology and Private Sector Division UNDP One UN Plaza, room FF-12102 New York, NY 10017 USA fax; (1) 212 9066350
Symposium 'A Strategy for Water Sector Capacity Building', Delft, The Netherlands, 3-5 June 1991	Mr. Frank Hartvelt, Deputy Director Science, Technology and Private Sector Division UNDP One UN Plaza, room FF-12102 New York, NY 10017 USA fax: (1) 212 9066350
International Conference on Water and the Environment, Dublin, 26-31 January 1992	Director Hydrology and Water Resources Department WMO 41, Giuseppe Motta CH-1211 Genève Switzerland fax: (41) 22 7348250
Conference on Water and Sanitation Utilities, Brussels, 11-13 May 1992	Mr. John Briscoe, Chief Water & Sanitation Division (TWUWS) The World Bank 1818 H Street NW Washington, DC 20433 USA fax: (1) 202 5223228

United Nations Conference on Environment and Development, Rio de Janeiro, 3-14 June 1992	Mr. Luis Gomez-Echeverri, Acting Director Sustainable Energy and Environment Division UNDP One UN Plaza, room FF-12102 New York, NY 10017 USA fax: (1) 212 9066973
Round Table on Water and Health, Sophia Antipolis, France, 21-23 February 1994	Mr. Joël Mancel, Director International Office for Water BP 75 06902 Sophia Antipolis Cedex France fax: (33) 93 65 44 02
Ministerial Conference on Drinking Water and Environmental Sanitation, Noordwijk, The Netherlands, 19-23 March 1994	Mr. Gerrit Ardon Ministry of Housing, Spatial Planning and Environment PO Box 30945 2500 GX The Hague The Netherlands fax: (31) 70 3391288

REPORT OF THE UNITED NATIONS WATER CONFERENCE

Mar del Plata, 14-25 March 1977

UNITED NATIONS
New York, 1977

RESOLUTIONS

I. Assessment of water resources

The United Nations Water Conference,

Recognizing that for the plans of action adopted by the Conference for the intensification and improvement of water use and development in agriculture and for providing safe drinking water and sanitation for all human settlements by 1990, a proper assessment is necessary of water resources in all countries of the world, and in particular in developing countries,

Considering that this assessment can be achieved only if all countries strengthen and co-ordinate arrangements for the collection of data in accordance with the recommendations of the Conference,

Resolves that:

(a) All efforts should be undertaken at the national level to increase substantially financial resources for activities related to water-resources assessment and to strengthen related institutions and operational services as necessary and appropriate at the national and regional levels;

(b) Training programmes and facilities for meteorologists, hydrologists and hydrogeologists should be established or strengthened;

(c) National scientific infrastructure for water-assessment activities be strengthened or established, particularly in developing countries;

(d) International co-operation aimed at the strengthening of water-resources assessment, particularly within the International Hydrological Programme and Operational Hydrological Programme be keyed to the targets set by the United Nations Water Conference and appropriately supported by national and international governmental and non-governmental institutions.

II. Community water supply

The United Nations Water Conference,

In view of the course taken by the discussions and the aspirations of the countries represented at the United Nations Water Conference and in view also of what was proposed at Habitat: United Nations Conference on Human Settlements, and

Considering that:

(a) All peoples, whatever their stage of development and their social and economic conditions, have the right to have access to drinking water in quantities and of a quality equal to their basic needs;

(b) It is universally recognized that the availability to man of that resource is essential both for life and his full development, both as an individual and as an integral part of society;

(c) To a significant extent similar considerations apply to all that concerns the disposal of waste water, including sewage, industrial and agricultural wastes and other harmful sources, which are the main task of the public sanitation systems of each country;

(d) The fundamental challenge facing all mankind can be met only with full international co-operation in all its aspects, entailing the mobilization of physical, economic and human resources;

(e) It is imperative to facilitate ways of achieving this essential co-operation, so that water is attainable and is justly and equitably distributed among the people within the respective countries;

(f) Those countries which are in a position to provide assistance, as well as international or regional organizations, should undertake to do so until the objective is attained, seeking to simplify regulations and administrative arrangements;

(g) Organizations of the United Nations system and other international organizations are making progress towards possible establishment of a consultative group mechanism on community water programmes.

Recommends:

(a) That where human needs have not yet been satisfied, national development policies and plans should give priority to the supplying of drinking water for the entire population and to the final disposal of waste water; and should also actively involve, encourage and support efforts being undertaken by local voluntary organizations;

(b) That Governments reaffirm their commitment made at Habitat to "adopt programmes with realistic standards for quality and quantity to provide water for urban and rural areas by 1990, if possible";

(c) That with a view to achieving these ends, the nations which need to develop their systems for providing drinking water and sanitation should prepare for 1980 programmes and plans to provide coverage for populations and to expand and maintain existing systems; institutional development and human resources utilization; and identification of the resources which are found to be necessary;

(d) That the United Nations agencies should co-ordinate their work efforts to help Member States, when they so request, in the work of preparation referred to in subparagraph (c) above;

(e) That in 1980 the national programmes which have been implemented for that purpose, and the extent to which the countries concerned have succeeded in

mobilizing local and national support should be reviewed by an appropriate mechanism to be determined by the Economic and Social Council and based on the use of existing machinery, with a view to attaining co-ordinated action toward agreed targets;

(f) That in accordance with the decisions of the existing structures of the Economic and Social Council, appropriate external assistance should be available in order to assist in building, operating and maintaining these systems;

(g) That the Plan of Action formulated below should be implemented in a co-ordinated manner at the national and international levels.

PLAN OF ACTION

In order to be able to reach the targets of Habitat recommendation C.12, drastic measures have to be taken. This will need firm commitment on the part of countries and the international community.

A. Priority areas for action

1. Action must focus on promoting (a) increased awareness of the problem; (b) commitment of national Governments to provide all people with water of safe quality and adequate quantity and basic sanitary facilities by 1990, according priority to the poor and less privileged and to water scarce areas; and (c) larger allocation to this sector from the total resources available for general economic and social development.

2. Action must be taken to remedy constraints of manpower shortage (especially at the intermediate and lower levels), inadequacies in institutions and organization, and lack of appropriate and cost-effective technology.

3. New approaches should be developed which will result in larger flows of national, international and bilateral funds on more favourable and flexible conditions, so as to enable countries to increase the speed of implementation and, more important, enable the more effective use of the additional resources.

4. Communities must be provided with effective education on domestic hygiene and must be motivated and involved as appropriate at every level of the programme, including the planning, construction, operation, maintenance and financing of services, and the monitoring and safeguarding of the quality of the water supplied.

B. Recommendations for action at national level

5. Each country should establish goals for 1990 which match as far as possible the global targets adopted. In order to attain these goals, each country should:

(a) Develop national plans and programmes for community water supply and sanitation, and identify intermediate milestones within the context of the

socio-economic development plan periods and objectives, giving priority attention to the segments of the population in greatest need;

(b) Immediately initiate engineering and feasibility studies on projects that are considered to be of the highest priority, and are based on a cost-effective technology appropriate to local conditions, with community participation, good management, and provision for operation and maintenance;

(c) Assess the manpower situation and, on the basis of this assessment, establish training programmes at the national level, to meet the immediate and future needs for additional professional staff, intermediate level technicians and, most important, village technicians;

(d) Promote massive national campaigns to mobilize public opinion regarding the provision of basic sanitary services, and develop appropriate procedures to ensure the active participation of communities in the programme;

(e) Establish appropriate institutions, if these do not exist, and assign to them specific responsibilities for the planning, implementation and monitoring of progress of the programme;

(f) Co-ordinate the efforts of all sectors active in rural areas, utilizing the manpower and other resources available, to ensure the provision of technically and socially acceptable sanitary facilities in rural areas;

(g) Develop a national revolving fund, in the first instance financed from substantially increased loans and grants from national and foreign sources, for water supply and sanitation which will encourage both the mobilization of resources for this sector and the equitable participation of beneficiaries; discourage wasteful consumption; and include a flexible combination of rates and, where necessary, explicit subsidies or other measures designed to achieve the economic and social objectives of the programme.

C. Recommendations for action through international co-operation

6. To achieve the Habitat targets, the international community must adopt new approaches to support increased national commitments with particular reference to the least developed and most seriously affected countries. It is, therefore, recommended that:

(a) Financial contributions be increased to strengthen the capabilities of international and bilateral agencies co-operating with Governments in the extension of community water supply and sanitation;

(b) At the request of national Governments, co-operation be extended to the formulation and implementation of high priority projects and programmes for community water supply and sanitation, with analysis of goals, methods and resources;

(c) Collaboration with the ongoing activity of the World Health Organization for monitoring and reporting on the status and progress of community water supply and sanitation be intensified.

7. The international community should give high priority to collaborating with Governments with regard to manpower surveys, the establishment of national training programmes (to meet immediate and future needs for professional staff, intermediate level technicians, and village technicians), research, and the promotion of community participation.

8. There should be even greater emphasis on social benefits. Multilateral and bilateral financing institutions should recognize the need for a higher level of grants and low interest-bearing loans to community water supply and sanitation programmes and, where this practice is already accepted, increase the proportion of such loans. They should be prepared to shoulder a higher proportion of local costs when financing community water supply and sanitation, increase their total allocations especially to rural water supply and sanitation, and complement local efforts in the rehabilitation and maintenance of systems.

9. Developing countries should foster co-operation among themselves, inter alia, in the establishment of intercountry training facilities; the development of appropriate technologies and of methodologies for training and management, and the exchange of experts and information, so that experience available elsewhere can be adapted to local conditions.

10. An effective clearing-house mechanism should be developed through international co-operation, by strengthening existing mechanisms if available, at the national, regional and international levels, to provide for the communication of selected information concerning all elements of community water supply and sanitation. An interrelated communication function should be included at every stage in all community water supply and sanitation projects.

11. Regular consultations should be held among Governments, international organizations, the international scientific community and relevant non-governmental organizations to ensure co-ordinated and accelerated action in the area of rural water supply and sanitation.

12. Co-ordination within the United Nations system should be improved at country level in order to ensure (a) a multidisciplinary approach in the development of community water supply and sanitation services; and (b) that rural water supplies and sanitation form part of integrated rural development projects.

III. Agricultural water use

The United Nations Water Conference,

Recognizing that the enormous deficit of food and agricultural production identified by the World Food Conference of 1974 calls for solutions of similar magnitude,

Accepting the vital role of water in expanding and intensifying agricultural production and in providing improved livelihood for the populations of developing countries,

Realizing that the scale of action required is immense in terms of investments and manpower for land areas to be developed and improved,

Considering that considerable national and international resources have to be allocated for the development of institutional services and human skills to provide the technical, managerial, administrative and farming expertise to meet the future demands of agriculture,

Recommends that the Action Programme on Water for Agriculture formulated below should be implemented with high priority in a co-ordinated manner at the national and international levels.

ACTION PROGRAMME ON WATER FOR AGRICULTURE

1. Faced with the enormous and continuing deficit in the production of food and of agricultural products revealed at the World Food Conference in 1974, and in recognition of the potential role of water development in correcting this deficit through activities proposed in the resolutions of that Conference, attention is drawn to the now urgent need for action to initiate a world-wide programme for the intensification and improvement of water development in agriculture.

2. Such a programme should in particular, though not exclusively, be directed at:

(a) The improvement of existing irrigation with the objectives of raising productivity with minimum cost and delay, improving the efficiency of water use and preventing waste and degradation of water resources;

(b) Developing efficient new irrigation for the further expansion of production;

(c) Improving and extending rain-fed agriculture and livestock production, through both better soil moisture management and the opening up of new land through the provision of water supplies to human settlements and livestock;

(d) The protection of agricultural land against the harmful effects of flooding and waterlogging and, where necessary, its reclamation;

(e) The introduction or expansion of fish rearing in conjunction with over-all rural development activities.

3. As an indication of a major programme component, that of irrigation and drainage development, the magnitude of a 15-year global programme is estimated at some 45 million hectares of improved and 22 million hectares of new irrigation development.

A. Recommendation on phased action programmes

4. It is recommended that national action, where appropriate with supporting assistance from the international community, be directed at formulating phased programmes for action in the development and use of water for agriculture, showing the activities required, the estimated costs and the timing, and that reports on progress made in this area should be regularly reviewed by the appropriate intergovernmental bodies.

5. It is therefore proposed that national programmes be prepared containing the essential elements for:

(a) Analysis and assessment of the problem, its magnitude and potential for development;

(b) Planning for agricultural water development within a co-ordinated framework for national development, agricultural and over-all water planning;

(c) Financing, with indications of the role of national finance and needs for external aid;

(d) Building-up of national advisory services in government and private sectors for project planning, design, construction, operation and maintenance within the framework of the programmes envisaged;

(e) Training, extension, research and strengthening of formal education to support the heavier technical demands;

(f) Establishing and improving institutions for management, administration and legislative support.

B. Recommendations on financing

6. It is recommended that national efforts be concentrated on the sound formulation and planning of attractive programmes for water use and development for agriculture, and that the mobilization of local sources of finance be encouraged. It is further recommended that, within two years of the United Nations Water Conference, phased programmes of financial requirements be available for presentation to the appropriate intergovernmental bodies.

7. It is recommended that the attention of international financing agencies be drawn to the need to adapt to the intensified programme, in recognition in particular of the severe constraints imposed by current methods of project financing for the development of water in agriculture. This calls for a shift in the apportionment of funds giving higher priority to water for agriculture. It also requires more flexibility in local currency financing and in introducing integrated programme financing in addition to traditional project financing, together with the development of new evaluation criteria and methodologies. Finally this requires greater use of national and regional financing facilities and of local human and material resources.

C. Recommendations on training, extension and research

8. It is recommended that, in conjunction with the formulation of agricultural water development programmes, and immediately following the United Nations Water Conference, the present and future needs for trained manpower should be assessed. These requirements should not be limited only to directly water-related activities, but should include supporting disciplines in agriculture and associated subjects and the development of necessary interdisciplinary skills. The manpower needs for the three distinct components of technical training, extension services and research must be evaluated at the national level. Additionally, where necessary, attention must be given to the improvement of basic levels of formal education to facilitate subsequent training.

9. Co-ordinated research programmes should be undertaken to meet selected complex research requirements of the global water-development programme. A report should be prepared for presentation to the appropriate intergovernmental bodies on world training and research facilities and activities. This report should be available within two years of the United Nations Water Conference, and should include proposals for mobilizing and expanding such resources, and for the establishment of new facilities and programmes as and where appropriate. The report should also include the continual review of progress of all training and research programmes in the field of water resources to ensure their adequacy and appropriateness in support of development. The potential role of the United Nations University should also be considered.

D. Recommendations for the promotion of national advisory services

10. With the objective of building up technical and administrative capabilities to cope with the large-scale programmes envisaged, the full use of national manpower potential and material resources should be encouraged in the planning, design, construction, operation and maintenance of water-development programmes. It is further recommended that immediate action be taken to develop the appropriate services, utilizing the skills and resources available in both public and private sectors. This would include consulting and supply services as well as development of local industries geared to the agricultural sector.

11. International aid for professional and technical training should give highest priority to the acquisition of skills in support of this specific objective, and organizations providing financial or material resources should clearly indicate their preference for the employment of local goods and services, as appropriate. The national advisory services should give particular attention to, and should be supported in the development of, technologies and the adaptation of methods and material most appropriate to local needs in the over-all aim of deriving optimal benefits from available investment, expertise and manpower.

E. Recommendations on international programme support

12. Recognizing the importance of international co-operation and support for implementing the proposed actions at the national level, it is recommended to co-ordinate international support programmes for the mobilization, planning,

co-ordination and monitoring of international financial and technical assistance in the field of water development and use for agriculture. For this, it is proposed that support be given to:

(a) The co-ordination of international financial assistance to the activities of the programme;

(b) The co-ordination of technical assistance and backstopping of the programme, including analysis and assessment of the problem, planning for agricultural water development and establishing and improving institutions;

(c) Reporting to the appropriate intergovernmental bodies on progress made on the implementation of the programme on water for agriculture.

IV. Research and development of industrial technologies

The United Nations Water Conference,

Bearing in mind the need to adopt rational water management methods,

Considering that rational water management entails not only using it economically and in the manner best calculated to prevent wastage and squandering but also using it properly so as to avoid in so far as possible the deterioration of the resource, to facilitate recycling and to maintain its potential usability for all the purposes for which it is intended,

Noting that industrial water use is one of the factors which are most intensively conducive to the qualitative degradation of water and its quantitative reduction in terms of its over-all use, contributing not only to the deterioration of the resource considered specifically and in relation to its various uses but also to the general pollution of the environment,

Recognizing that technology can contribute decisively to minimizing these negative effects of industrial water use,

Recommends that both Governments and international bodies, to the extent of their competence, include in their economic, environmental and technological policies measures to facilitate, promote and stimulate research and development of industrial technologies requiring the least possible use of water and to facilitate recycling and even the replacement of methods entailing the use of water or other liquids by the use of other non-polluting liquids or by dry methods, so as to eliminate environmental contamination in so far as possible.

V. Role of water in combating desertification

The United Nations Water Conference,

Bearing in mind the recommendations of the United Nations Conference on the Environment held in Stockholm in June 1972,

Taking into account the urgent need for concerted action to combat desertification and the forthcoming United Nations Conference on Desertification,

1. Urges all Governments to support and participate fully in the United Nations Conference on Desertification and in its preparatory meetings, including the regional meetings, in order to ensure the achievement of the objectives of the Conference;

2. Considers that water is one of the main factors limiting production and settlement in dry lands; and that lack of water, lack of the development of, or wasteful uses of, this resource are fundamental causes of many problems of desertification and environmental degradation;

3. Considers that proper planning, adequate development and wise management of water resources should receive priority in the efforts to combat desertification, to prevent environmental deterioration and to promote economic and social development in arid and semi-arid regions;

4. Recommends that nations should formulate specific action programmes to be considered by the forthcoming United Nations Conference on Desertification;

5. Recommends further that in most countries facing problems of desertification, urgent action is necessary to:

(a) Clearly define water policy in the current efforts to combat desertification and to formulate a comprehensive programme for the development and management of water resources, outlining both short-term and long-term specific objectives and targets for the future;

(b) Intensify and improve the arrangements existing for the assessment of water resources - surface as well as ground water;

(c) Consider, on the basis of prior environmental and health impact studies, a programme of surface and ground-water use and conservation with intensive mobilization of public participation on the basis of self-help. Such a programme should provide for the construction and maintenance of existing small dams or wells, with appropriate national and international assistance;

(d) Prepare feasibility studies for specific water projects expeditiously within the framework of over-all policies and programmes to combat desertification;

(e) Set up appropriate institutional arrangements at the national and regional levels in order that adequate attention be given to the problems of management and

development of surface and ground-water resources in arid and semi-arid regions, including collation of related policies, promotion of efficient use of water by developing appropriate technologies, including the application of water-saving technologies;

(f) Promote research into all aspects of water-resources technology, with special reference to the problems and needs of arid and semi-arid areas;

6. Urges that international assistance be given to assist member Governments in the formulation of specific plans and projects for the development and management of water resources to combat desertification, the location of sources of financing for the implementation of projects for use in combating desertification, and the preparation and execution of training programmes at all levels.

VI. Technical co-operation among developing countries in the water sector

The United Nations Water Conference,

Recalling General Assembly resolutions 3201 (S-VI) and 3202 (S-VI) of 1 May 1974, containing the Declaration and the Programme of Action on the Establishment of a New International Economic Order, 3281 (XXIX) of 12 December 1974, containing the Charter of Economic Rights and Duties of States, and 3362 (S-VII) of 16 September 1975 on development and international economic co-operation,

Noting the recommendations contained in the report of the Ad Hoc Group of Experts on Technical Co-operation among Developing Countries in Water Resources Development, 1/

Convinced that the management and development of water resources provides a promising area where technical co-operation among developing countries can be achieved,

Aware that alternate appropriate technologies in the field of the water sector have been developed by some developing countries and may be usefully applied by other developing countries,

1. Welcomes the convening of the United Nations Conference on Technical Co-operation among Developing Countries in Argentina in 1978;

2. Urges that all Governments support and participate fully in the United Nations Conference on Technical Co-operation among Developing Countries, as well as in the preparatory process for this Conference;

1/ E/CONF.70/12.

3. Invites the Administrator of the United Nations Development Programme to formulate immediately, and in consultation with the Governments concerned, a pilot project in water-resource management 2/ and submit his proposal to the Governing Council of the United Nations Development Programme at its twenty-fourth session, if possible;

4. Further recommends that, at the request of the Governments concerned, the regional commissions put forward proposals for the strengthening or, where appropriate, the establishment of regional institutes for training and research in the water sector;

5. Recommends further that the United Nations Development Programme in co-operation with the regional commissions and the United Nations system assist in promoting programmes of technical co-operation among developing countries in the field of water-resources development, which may include such areas as surface and ground-water development, drainage and reclamation, hydropower development and inland navigation;

6. Recommends further that all Governments, particularly those of developing countries, and the relevant United Nations agencies submit information to the United Nations Conference on Technical Co-operation among Developing Countries indicating the progress made in implementing recommendations for technical co-operation among developing countries in the water resource sector as delineated at the United Nations Water Conference with a view to defining future action and specific objectives in this area.

VII. River commissions

The United Nations Water Conference,

Bearing in mind the relevant recommendations of the United Nations,

Recommends to the Secretary-General to explore the possibility of organizing meetings between representatives of existing international river commissions involved that have competence in the management and development of international waters, with a view to developing a dialogue between the different river-basin organizations on potential ways of promoting the exchange of their experiences. Representatives from individual countries which share water resources but yet have no established basin-wide institutional framework should be invited to participate in the meetings. The regional commissions should be called upon to facilitate this task at the regional level.

2/ Defined in document E/CONF.70/12, para. 54.

VIII. Institutional arrangements for international co-operation in the water sector

The United Nations Water Conference,

Recognizing the imperative need for accelerated progress in the investigation and development of water resources, and its integrated management for efficient use,

Aware of the efforts being undertaken by the United Nations system at various levels to assist the countries in their endeavours to achieve these objectives,

Recognizing the difficulties in the area of co-ordination which affect the United Nations bodies in execution of their tasks,

Further recognizing the complementary roles of global and regional bodies in the United Nations system, and the role of the regional commissions as outlined in Economic and Social Council resolution 2043 (LXI) of 5 August 1976,

Deeply conscious of the fundamental importance of water for economic and social development,

Requests the Economic and Social Council, in particular in its consideration of the restructuring of the economic and social sectors of the United Nations system, to give priority consideration to the following recommendations:

(a) That at the intergovernmental level the Economic and Social Council, the Committee on Natural Resources and the regional commissions within their respective regions, should play a central role in the promotion of intergovernmental co-operation as a follow-up to the Plan of Action on integrated water resources development and management recommended by this Conference;

(b) That for this purpose, among other measures, steps be taken to intensify the work in the water sector of the Economic and Social Council and the Committee on Natural Resources through, inter alia, strengthening the secretariat support services to these organs by all United Nations organizations and bodies involved in the water resources sector and, if required, through the convening of special or subject-oriented sessions;

(c) That the proposals for interagency co-ordination presented to the Conference in the report of the Administrative Committee on Co-ordination and the Environment Co-ordination Board 3/ be examined by the Committee on Natural Resources at its fifth session with a view to submitting its recommendations to the Economic and Social Council at its sixty-third session for consideration and implementation;

3/ Present and future activities of the United Nations system in water resources development (E/CONF.70/CBP/4).

(d) That the regional commissions should, taking into account the central role of the Economic and Social Council and the Committee on Natural Resources at the global level, and the special needs and conditions of the respective regions:

(i) Assist the United Nations Development Programme and the United Nations specialized agencies and organizations, at the request of the Governments of developing countries concerned, in identifying intersectoral subregional, regional and interregional projects and preparing programmes;

(ii) Intensify their efforts in the water sector, and, with the assistance of the competent organizations of the United Nations system and at the request of the Governments concerned, enlarge co-operation among the countries in the water field at the subregional, regional and interregional levels;

(iii) Assign specific responsibility on water to an existing intergovernmental committee within the regional commissions, or if necessary, create a new one, and establish or strengthen, as appropriate, the secretariat units of the commissions dealing with water, which would serve as the secretariat of the intergovernmental committee referred to in this subparagraph;

(iv) Establish ad hoc groups of experts, as and when necessary, who should preferably be drawn from the countries of the region concerned;

(e) That, for the purposes outlined in the preceding paragraphs, the General Assembly should consider providing, as necessary, additional resources to the regional commissions and other relevant sectors of the United Nations within the budget of the United Nations;

(f) That at the country level, under the leadership of the United Nations Development Programme resident representatives, the United Nations system should intensify the co-ordination of projects and programmes undertaken at the request of the Governments of developing countries.

IX. Financing arrangements for international co-operation in the water sector

The United Nations Water Conference,

Realizing the gravity of the problem of water resources and the crisis that mankind may have to face unless timely action is taken to avert it,

Recognizing that the Action Plan recommended by the Conference is designed to promote activities at the national, regional and interregional levels to avert such a crisis,

Further recognizing that the implementation of the Plan will require, inter alia, mobilization of increased financial resources,

Taking note of the suggestion for the establishment of a voluntary fund for the development and management of water resources,

Aware of the need for additional resources required for the implementation of the Action Plan,

1. Requests the Secretary-General to prepare, on the basis of consultations with Governments and competent organizations within the United Nations system, a study of the most effective and flexible mechanisms to increase the flow of financial resources specifically for water development and management through existing organizations and proposed mechanisms and to present the study to the General Assembly at its thirty-second session, through the Economic and Social Council at its sixty-third session;

2. Recommends that additional financial allocations be made to existing:

(a) Organizations within the United Nations system, particularly the United Nations Development Programme, in order to increase the funds available to all developing and in particular the least developed countries to meet their needs in technical assistance and programmes related to water resources development;

(b) Bilateral, subregional, regional and international organizations and programmes, including the International Bank for Reconstruction and Development and the regional development banks, within their respective areas of responsibilities, and recommends that they review their terms and conditions in view of the economic and social implications of water development projects with the objective of providing the best possible terms, taking into account the results of the United Nations Water Conference;

3. Recommends further that priority be given to projects for the development and management of water resources based on co-operation among developing countries.

X. Water policies in the occupied territories

The United Nations Water Conference,

Recalling General Assembly resolution 3171 (XXVIII) of 17 December 1973, entitled "Permanent sovereignty over natural resources", and taking into consideration the statements made by the representatives of the United Nations Council for Namibia and the Palestine Liberation Organization,

Further recalling General Assembly resolution 31/186 of 21 December 1976, entitled "Permanent sovereignty over national resources in the occupied Arab territories",

Noting with great concern the illegitimate exploitation of the water resources of the countries and peoples subject to colonialism, alien domination, racial discrimination and apartheid, to the detriment of the indigenous peoples,

1. Affirms the inalienable right of the people of the countries under colonial and alien domination in their struggle to regain effective control over their natural resources, including water resources;

2. Recognizes that the development of water resources in territories subjected to colonialism, alien domination, racial discrimination and apartheid should be directed for the beneficial use of the indigenous peoples who are the legitimate beneficiaries of their natural resources, including their water resources;

3. Denounces any policies or actions by the colonizing and/or dominating Powers contrary to the provision of paragraph 2 of the present resolution, and particularly in Palestine, Zimbabwe, Namibia and Azania.

Report of the Global Consultation on Safe Water and Sanitation for the 1990s

Safe Water 2000

10 - 14 September 1990
New Delhi, India

The New Delhi Statement

The New Delhi Statement is an appeal to all nations for concerted action to enable people to obtain two of the most basic human needs — safe drinking water and environmental sanitation.

The Statement was adopted by 600 participants from 115 countries at the Global Consultation on Safe Water and Sanitation for the 1990s held in New Delhi, from 10 to 14 September 1990. Organized by the United Nations Development Programme and hosted by the Government of India, the Consultation was co-sponsored by the UN Steering Committee for The International Drinking Water Supply and Sanitation Decade and by the Water Supply and Sanitation Collaborative Council.

"Some for all rather than more for some."

New Delhi, India, 14 September 1990

Safe water supplies and environmental sanitation are vital for protecting the environment, improving health, and alleviating poverty. Disease, drudgery and millions of deaths every year are directly attributable to lack of these essential services. The poor, especially women and children, are the main victims.

Concerted efforts during the 1980s brought water and sanitation services to hundreds of millions of the world's poorest people. But even this unprecedented progress was not enough. One in three people in the developing world still lack these two most basic requirements for health and dignity.

Every developing country learned its own lessons during The International Drinking Water Supply and Sanitation Decade (1981-1990). The global community must now more effectively combine these experiences with a renewed commitment to sustainable water and sanitation systems for all. Access to water and sanitation is not simply a technical issue; it is a crucial component of social and economic development. Sustainable and socially acceptable services can be extended by using appropriate technologies, adopting community management and enhancing human resources.

Political commitment is essential and must be accompanied by intensive efforts to raise awareness through communication and mobilization of all sections of society.

Challenge

Entering the 1990s, governments face formidable challenges. Population growth continues apace. Infrastructure in many cities is stretched to the breaking point. Uncontrolled pollution is putting greater stress on the living environment. Depletion and degradation of water resources are causing the costs of new water supplies to escalate. Without fundamentally new approaches, the broad-scale deprivation will turn into an unmanageable crisis.

Creating the right conditions for accelerated progress will often involve profound institutional, economic and social changes, as well as reallocation of resources and responsibilities at all levels.

To achieve full coverage by the year 2000 using conventional technologies and approaches would require five times the current level of investment. However, there is a realistic two-pronged alternative:

- Substantial reduction in costs of services, through increased efficiency and use of low-cost appropriate technologies.
- Mobilization of additional funds from existing and new sources, including governments, donors and consumers.

If costs were halved and financial resources at least doubled, universal coverage could be within range by the end of the century.

Guiding Principles

For countries taking up this challenge — *Some for all, rather than more for some,* the New Delhi Global Consultation recommends four Guiding Principles:

- Protection of the environment and safeguarding of health through the integrated management of water resources and liquid and solid wastes.
- Institutional reforms promoting an integrated approach and including changes in procedures, attitudes and behaviour, and the full participation of women at all levels in sector institutions.
- Community management of services, backed by measures to strengthen local institutions in implementing and sustaining water and sanitation programmes.
- Sound financial practices, achieved through better management of existing assets, and widespread use of appropriate technologies

Principle No. 1: The Environment and Health

Safe water and proper means of waste disposal are essential for environmental sustainability and better human health, and must be at the center of integrated water resources management.

Rapid population growth and accelerating urbanization, threaten health and the environment, presenting governments with daunting challenges in the 1990s. The poor, especially women and children, will continue to be the hardest hit.

Every day, water-related diseases cause the deaths of thousands of children, and untold suffering and loss of working time for millions. Safe water combined with improved hygiene and better nutrition can reduce, and sometimes even eliminate these diseases.

The dramatic reduction of *dracunculiasis* (Guinea worm disease) has resulted from the provision of improved water supplies and hygiene education in endemic areas. The target of total eradication by 1995 should be fully supported. Affected countries should accord it high priority in investment programmes.

Toxic and industrial wastes pose increasing dangers to the environment in developing countries. They represent a significant threat to human health through direct contact and the pollution of water and soil. Governments and responsible agencies must take steps to control these health hazards.

Improvements to the household environment can be best achieved through the community's involvement as an equal partner with government and sector agencies. This means building on indigenous knowledge, so that policies and programmes are credible and relevant to the beneficiaries. Emphasis must be placed on education, social mobilization and community participation.

Proper drainage and disposal of solid wastes have a major impact on the neighbourhood environment. New solutions are needed which are environmentally appropriate and affordable to the communities they serve and which also conserve water resources and minimize pollution.

Integrated water resources management is necessary to combat increasing water scarcity and pollution. This includes water conservation and reuse, water harvesting, and waste management. An appropriate mix of legislation, pricing policies and enforcement measures is essential to optimise water conservation and protection.

Principle No. 2: People and Institutions

Strong institutions are essential for sustainable development.

They require sound management, motivated people and an enabling environment of appropriate policies, legislation and incentives. Institutional development takes time. The short-term achievement of production targets should not take precedence over the need for capacity building. The overall objective is achieving sustainable facilities which are used effectively by the beneficiaries.

A changing role of government is envisaged, from that of provider to that of promoter and facilitator. This will enable local public, private and community institutions to deliver better services. Decentralization demands a strong policy and support role from central governments, while local private enterprise can assist in improving the efficiency and expansion of service delivery.

The special role in development of non-governmental organizations (NGOs) and of volunteers must be acknowledged and strengthened. NGOs are flexible, credible, ready and able to experiment with innovative approaches. Governments should support the NGOs in replicating these approaches, and include NGOs, wherever appropriate, as partners in projects.

Human resources development (HRD) at all levels, from community members to politicians, is essential to institutional development. Training of professionals, managers, technicians and extension workers builds competence and confidence. Information, education and communication strategies must be integrated within HRD policies. Women must be trained and guaranteed equal

employment opportunities at all levels of staff and management. National professional associations can play an important role in better HRD.

Education is a key part of the new approach. Schools offer a vast, most receptive audience for hygiene education. Polytechnics and universities already include water and sanitation related subjects in their curricula, but must be encouraged to respond to this sector's needs for multi-disciplinary skills. Sanitary and environmental engineering curricula should incorporate substantial elements of community development, communications, appropriate technology, and project management.

Principle No. 3: Community Management

Community management goes beyond simple participation. It aims to empower and equip communities to own and control their own systems.

Community management is a key to sustaining services for the rural poor and is a viable option for poor urban settlements. Governments should support community management, through legislation and extension, and give it priority in national sector strategies for the 1990s.

Communities should have prominent roles in planning, resource mobilization, and all subsequent aspects of development. Within these strategies, gender issues will be all important. Women should be encouraged to play influential roles in both water management and hygiene education. Capacity building is necessary to make community management effective and enable women to play leading roles.

Linkages must be established to ensure that national plans and programmes are responsive to community needs and desires. Methods for evaluating community management have been developed for rural areas. They should now be adopted at the national level and implemented through participatory monitoring and evaluation techniques.

Principle No. 4: Finance and Technology

Given the number of people unserved and the growing demand, more effective financial strategies must be adopted in the 1990s for the long-term sustainability of the sector.

Current levels of investment in the sector are about US$10 billion per year.It is estimated that approximately $50 billion a year would be needed to reach full coverage by the year 2000, using conventional approaches. Such a five-fold increase is not immediately feasible.

New strategies should aim towards two key objectives:

- increased efficiency in the use of available funds;
- mobilization of additional funds from existing and new sources, including governments, donors and consumers.

Substantially increased effectiveness in the use of financial resources can yield major gains in sustained coverage. This will require changes in the way service agencies operate, to make them more cost-effective and responsive to consumer needs and demands. Involving consumers in choice of technology and service levels has proved to have a positive impact on cost recovery and sustainability.

A powerful case can be made for greater government and external support agency support. However, economic and social benefits need to be better quantified. Clear sector strategies and action plans increase the likelihood of water and sanitation programmes receiving higher priority in national planning processes. They may also make the sector more attractive for support from external support agencies (ESAs).

The high debt burden of many developing countries makes it particularly difficult for them to consider loans at market interest rates for all investments in this sector. With this in mind, lending agencies and donors are urged to look favourably on requests for grants or soft loans to support water and sanitation programmes. ESAs can also help by developing procedures or guidelines which will reduce project preparation and approval time. Support should also be given for the establishment of financial intermediaries to make credit more widely available.

Restructuring the utilization of funds for sector investments and setting of user charges are key issues in sector finance. Maximum benefits can be accrued by allocating a higher proportion of funds to affordable and appropriate projects in rural and low-income urban areas, where needs are greatest.

Rehabilitation of defective systems, reductions in wastage and unaccounted for water, recycling and reuse of wastewater, and improved operation and maintenance can often be more effective than investment in new services. Choices of technology and levels of service are major factors in determining construction, operation and maintenance costs of new projects. Due attention must be given to operation and maintenance arrangements which will ensure sustainability before investments are made.

Higher budget allocations and recovery of recurrent costs of operation and maintenance to ensure system sustainability are primary goals to be achieved. Effective cost recovery requires that

sector institutions be given autonomy and authority. Further, there must be widespread promotion of the fact that safe water is not a free good. Appropriate charging mechanisms must be adopted, which reflect local socio-cultural and economic conditions. Collection should be decentralized so that revenues are available for management and operation of services.

Public sector institutions frequently default on payments for water supply and waste disposal services. For reasons of financial viability and equity, this practice is unacceptable. Increasing collection efficiency must be part of better financial management.

Research and development in developing countries has resulted in widespread application of much improved handpump and on-site sanitation technologies. The momentum established during the 1980s must be maintained and increased in the next ten years. Among the priority needs for the 1990s are improved household technologies for protecting water quality from source to mouth and low-cost wastewater disposal systems for low-income urban areas. Exchanges of information and experience among developing countries (South-South co-operation) must be further developed.

Follow-up

Implementation of the approaches outlined in this Statement will need to be part of country specific strategies.

Countries and ESAs are urged to formulate and implement action plans for water and sanitation incorporating the Guiding Principles of the New Delhi Statement. UNDP is invited to take a leading role in this process, in collaboration with other UN agencies.

The Water and Sanitation Collaborative Council, created immediately prior to the New Delhi Global Consultation, offers a new global forum for the exchange of information and promotion of the sector.

This New Delhi Statement will be reflected in a document to be presented to the World Summit for Children in late September 1990, along with a UNICEF-initiated statement on behalf of children, which was adopted at the Global Consultation.

The New Delhi Statement will be presented by the Government of India to the 45th session of the United Nations General Assembly in October 1990.

In addition, it is recommended that this Statement be brought to the attention of the organizers of the 1992 United Nations Conference on Environment and Development in Brazil, with a request that it be tabled to emphasize the special importance of water and sanitation in environmental management.

Note: The Secretariat wishes to thank the delegations which have expressed strong views on such issues as institutional development, allocation of resources, efficiency, cost recovery, and operation and maintainance.

Edited by
G.J. Alaerts
T.L. Blair
F.J.A. Hartvelt

IHE Report Series 24

A Strategy for Water Sector Capacity Building

Proceedings of the UNDP Symposium, Delft, 3-5 June, 1991

International Institute for
Hydraulic and Environmental
Engineering

Delft, The Netherlands

United Nations
Development Programme

New York, NY, USA

The Delft Declaration

We, the participants in the UNDP Symposium - A Strategy for Water Resources Capacity Building - held in Delft, The Netherlands, June 3-5, 1991, coming from developing countries, External Support Agencies and supporting institutes, are committed to a new initiative for capacity building and have, therefore, prepared recommendations as a contribution to a global policy dialogue as a basis for local, national and international action.

Global Needs for a New Strategy for Water Sector Capacity Building in the Next Century

Between 1950 and 2000, the world population will have more than doubled. By 2000, of 22 metropolises of more than 10 million people, 18 will be in the developing countries of Asia, Africa and Latin America. By 2025, 60% of the world population, more than 5 billion people, will be living in cities. Water directly affects their public health and economic development opportunities. In addition, large proportions of the rural population are likely to remain unserved.

The challenge to satisfy the water needs of the exploding cities is daunting, given the equally increasing need for water for irrigated agriculture and the problems arising from urban and industrial pollution. In addition, to do this in a sustainable way, measures have to be taken to protect and conserve the water as a major resource and unifying element of our environment.

Experience shows that institutional weaknesses and malfunctions are a major cause of ineffective and unsustainable water services. This requires urgent attention to building institutional capacity at all levels. Pressure for improved local delivery of water services suggests that development of institutional capacity be more demand-responsive. Also, the need to better manage overall water resources coherently and facilitate allocation of water among all users suggests an expansion of national, integrated planning. The critical, new institutional challenge is to become much better in developing policies, rules, organizations and management skills to address both needs simultaneously without constraining the major aims of each.

An improved strategy, stressing capacity building in the water sector, has been proposed in Delft. It will, if initiated in a timely fashion, assist the developing countries to meet their future needs.

Countries and External Support Agencies (ESAs) increasingly recognize the importance of the capacity building process for sustainable development at national, sub-regional and local levels. Capacity building consists of three basic elements:

- creating an enabling environment with appropriate policy and legal frameworks;
- institutional development, including community participation; and
- human resources development and strengthening of managerial systems.

Capacity building is foremost a global concept and a strategic element in the sustainable development of the water sector; it is a long-term, continuing process that has to permeate all activities in the sector. Capacity building also entails the application of a number of specific techniques to strengthen performance of sector and sector supporting organizations.

With regard to a strategy for water sector capacity building, it must first of all be recognized that each country and region has its specific characteristics and requirements with respect to its water resources situation and its institutional framework. Therefore operational strategies must be tailor-made. To achieve this it is recommended that, based on the insights emerging from this Symposium, **water sector assessments** be initiated to provide a basis for country strategies.

The strategy involves several approaches:

- Developing improved policy and legal frameworks, institutional development and a commitment to development of human resources and managerial systems for the sector;
- Managing water and environmental resources, including modifying demand by pricing, conservation, reclamation and reuse of waste water, thereby reducing fresh water demands and pollution;
- Having the ESAs adopt capacity building as an essential element of their assistance efforts, including such initiatives as supporting community and water user associations, on farms and in the cities, so that they can participate productively in investments made on their behalf; continued attention needs to be given to the pivotal role of women in water related activities, and their proven capabilities to fulfil managerial tasks at all levels;
- Urging governments to coordinate ESA activities in their countries, and encouraging the ESAs themselves to coordinate their agendas;
- Involving, where appropriate, the private sector in managing or providing water related services;
- Encouraging local and foreign universities, institutes, consulting organizations, professional associations and others to participate in capacity building as is most appropriate to their own capacities; and ESAs are urged to facilitate this effort;
- Encouraging countries to conduct water sector assessments; these assessments must include the need for capacity building in addition to traditional technical, social and economic aspects; and
- Creating awareness of the vital role and finiteness of water on the part of decision-makers and the public at large.

In view of the pressing need in the water sector, this strategy is being presented to the countries and the ESAs for their adoption and immediate implementation.

Having considered the results of the deliberations of the participants in working groups and in the plenary sessions, which are presented in an annex, we recommend the following actions:

1. That developing countries adopt strategies and launch, intensify or expand capacity building activities in the water sector in partnership with ESAs. UNDP is invited to take a leading role.

2. That the Delft Declaration be transmitted to the 1992 Dublin Conference on Water and Environment, and subsequently to the United Nations Conference on Environment and Development in Rio de Janeiro, to emphasize the special importance of capacity building in integrated water sector management.

If we are to satisfy the acute needs of hundreds of millions of people today, and those of billions tomorrow, we must take a quantum leap by doing things differently and start doing them now.

Annex to the Delft Declaration

Helping countries to solve their problems themselves

Background and Definition: Water Resources and Capacity Building

1. Water is a finite resource.
   Everywhere, but specifically in regions with water scarcity, people are realizing that water is no longer free anymore. The scarcity of the resource, the threats of water resources development to the environment and the conflicting interests of the water users, imply that water resources planning and management should be an integral part of overall national economic planning. The objectives and strategies for the water sector should be derived from the national planning process.

2. Integrated water resources planning and management is an inter-sectoral, multi-interest activity, and as such must be cognizant of competing interests among subsectors in the country, and among countries. The nature of the planning process is dynamic, interactive and multi-sectoral. Decision making must take place at the appropriate levels.

3. Allocation policies and mechanisms, for water resources, are required to address the ever increasing water demands of the different subsectors, and particularly between large urban centers of population and irrigated agriculture. More than ever national planning and management of water resources within and across national boundaries should be given the strongest possible emphasis.

4. Many national and local institutions responsible for water management and water service delivery do not work efficiently nor effectively because of:
   - inappropriate policies for water management, and unclear definition of the mandates of the institutions;
   - lack of resources (inadequate funding and human resources);
   - working in an environment that is not conducive for institutions and inhibits job satisfaction;
   - inadequate education and training facilities; and
   - lack of participation and commitment from communities and customers.

5. Countries and External Support Agencies (ESAs) recognize the importance of capacity building for sustainable development at national, sub- regional and local level. Capacity building consists of three basic elements:
   - creating an enabling environment with appropriate policy and legal frameworks;
   - institutional development, including community participation; and
   - human resources development and strengthening of managerial systems.

6. The main objective of capacity building is to improve the quality of decision making, sector efficiency and managerial performance in the planning and implementation of water sector programmes and projects.

The specific objectives are to:
- improve the capabilities of assessing water resources;
- plan better, sustainable water resources development in the context of national development planning;
- arrive at a financially and environmentally sustainable, more efficient and more effective delivery of water services, particularly for the cities and for agriculture.

7. To meet the needs of the various users in an efficient, equitable and sustainable fashion, the adoption of concepts of demand management is a matter of urgency.

8. Capacity building activities are essential to the long-term sustainability of water sector programmes and projects. Therefore capacity building calls for a long-term strategy and is of equal importance as financial, economic, technical, environmental and health aspects.

General Recommendations Regarding Capacity Building

9. Capacity building activities should be undertaken both within and among water subsectors, like irrigation, water supply and sanitation, and hydropower, thereby providing improved coordination. The collaboration between subsectors is becoming increasingly important and urgent in dealing with water availability and quality issues created by competing users, in particular with regard to demand from large urban areas and irrigation, and pollution caused by users. To this end, it may be necessary to establish, in many countries, control and coordination bodies at the highest national as well as local levels, together with a suitable legislative framework. In addition, collaboration with related sectors outside the water sector such as the public and environmental health sector is called for.
Efforts should be oriented not only to develop new capacity, but also to maintain and consolidate what has been developed before.

10. Capacity building should be aimed at three levels:
- **sectoral level**: provision of an enabling environment for effective sector and sub-sector management;
- **institutional level**: development of planning and management processes so that the collective skills of the staff can be effectively used in the achievement of the institution's objectives;
- **individual level**: comprehensive human resources development strategies and programmes to enhance skills of individuals in accordance with institutional needs.

11. Capacity building is a long-term continuous process which should be phased to accommodate requirements of national governments and ESAs. Each individual phase should have clearly defined and measurable targets. A necessary prerequisite therefore is the setting of realistic and achievable goals based on the available resources.

A First Step to Strategy Development: Water Sector Assessments

12. Water sector assessments are a first and vital step in the water sector development process.

13. Water sector assessments are an instrument for country capacity building at national, regional and local levels. They include (in addition to examination of national development policies, water sector, legal and institutional policies and options, and human resources development) the following subjects:
    - water resources, including the impact of pollution;
    - water requirements for agriculture, water supply, industry and other water related uses, including the needs for sewerage and waste water disposal;
    - public and private facilities and services available for water related activities;
    - the need for and availability of human resources and institutions for their development;
    - the need for and support of community and user organizations;
    - the financial situation with regard to capital and operation and maintenance, including the potential for cost recovery; and
    - identification of priority programs for technical and capital assistance including identification of potential ESAs.

    It is particularly important that the assessment be undertaken by teams provided by both the government and the ESAs, with the former constituting the nucleus and corporate memory of the planning process.

14. In addition, the water sector assessment will have to devote special attention to national policy analysis, study of customary law and practices, review/design/drafting of legislation, public awareness of rights and obligations, and implementation and enforcement of laws.
    Similarly, due attention must be given to the legal and institutional arrangements needed to address the development, use and protection of internationally shared water resources.
    In reviewing the existing legislation, the impact of legislation on facilitating or constraining the roles of both the public and private sectors needs to be assessed.

15. The country water sector assessments should be executed by the countries, assisted where necessary by ESAs. The assessments will play an important role in capacity building, and their Terms of Reference should adequately reflect this.

16. One of the most important criteria for measuring capacity building success would be the extent to which activities in the water sector are sustained locally, recognizing that this implies the acceptance of an appropriate degree of cost recovery.

The Institutional Framework of The Water Sector

17. The institutional framework required for the planning and management of water resources is nation specific and should develop from the existing situation.

18. Due to the inherent complexities in water resources management, it is rarely feasible or wise to allocate all necessary management functions to one institution. Planning, decision making, technical implementation, management, etc. have to

be distributed over institutions at various levels. The coordination of functions from grass roots to central level is therefore an important element in achieving integrated water resources management, and may need strengthening.

19. In order to improve services, governments may wish to consider options for the involvement of the private sector. This could range from delegated management services to ownership and would always require provisions for accountability.

Information, Communication and Awareness

20. Since information plays an important role in decision making, the management of information is an integral part of the decision making process involving partners at all levels in a continuous process.

21. Supported by NGOs and ESAs, the water sector professionals should undertake initiatives directed towards politicians, decision-makers and the general public to raise awareness of the finite and fragile character of the water resources.

Specific Recommendations for Capacity Building

22. To allow for more rational decision making research needs to be conducted on costs and benefits of alternative policy options and institutional arrangements.

23. Governments and ESAs should allow for more flexibility in project preparation to involve future beneficiaries on key points in the decision making process, and develop commitment and hence sustainable demand.
It needs to be stressed again that in this process recognition must be given to the roles of women in the water related activities, and to their proven suitability as staff to carry out tasks at various levels of management.

24. For the post-project phase, withdrawal of external support should be gradual in order to guide the local managing institutions to take effective charge of operation and maintenance.

25. The process of involving communities should be used as a mechanism to reverse the trend of supply-driven policies to demand-oriented ones. This should be compatible with consideration of social dimensions.

26. In regions with water scarcity, institutions must be capable of orienting demand of households, industry and agriculture, using tariff structures, regulations (e.g. on groundwater abstraction) and other arrangements. This should include water reuse and the whole range of demand management techniques.

27. In decentralized administrative structures, introduced in developing countries, local level institutions need a proper mandate which is comprehensive, relevant and unique to them. They should also have clear programmes and plans with objectives, targets, monitoring and evaluation systems.

28. Administrative rules and regulations must be checked for suitability, to enable institutions to act in a more flexible manner. These include staff and personnel

management, salary scales, water use, institutional mandates and autonomy. These rules and regulations may require review. Rules and regulations that support integrated water resources management (e.g. waste water discharge regulations) on the other hand need to be further developed and expanded.

29. In many countries a continued need exists for governments to adopt an appropriate community participation approach, including creation of community organizations and build adequate staff capacity to this end.

30. If possible and suitable, training should be given simultaneously at all levels. A pronounced need exists for novel training methods in integrated water resources management and planning, as well as to further promote training on community participation approaches for water supply, sanitation and irrigation institutions. These concepts should be included as well in the training and education curricula for related professions in the water sector, specifically at the level of university and polytechnic education.

31. Management skills training should be extended to the levels of local institutions and communities.

32. Training activities should be better geared toward function and objectives of the institutions in the sector.

33. Universities and training and education institutes, as well as the ITN (International Training Network for Water and Waste Management) should be mobilized wherever possible, and used as instruments to implement capacity building in water resources planning and management.

Recommendations to Countries and ESAs

34. For the purpose of optimum utilization of resources, countries and ESAs are encouraged to adopt common policies tailored to each country to the greatest possible extent.
ESAs, when dealing with countries, should coordinate their agendas and address conflicting interests with each other. This coordination could take place through consultative groups, round tables or local consultations organized by the governments or through UNDP Resident Representatives/UN Coordinators. Countries should make an effort to coordinate effectively the ESA contributions.

35. Developing countries and ESAs are encouraged to use local and inter-national institutes, professional associations, water and sewerage utilities, twinning arrangements and consulting firms as additional ways of obtaining expertise and of sharing information.

36. The countries and ESAs should look to utilize the private sector's facilities and expertise as well as appropriate market based incentives.

37. Specifically the ESAs have to play an important role in assisting developing countries in strengthening their capacity to deal with water systems, e.g. to collect and manage information on surface and ground-water hydrology, as well as on water quality - and to integrate this information into data systems, interrelating

these with demographic, economic and social data, and information on water uses. It must be understood that this is a long-term, continuing process.

38. ESAs should be committed to capacity building and assign qualified staff to assist developing countries, with water sector assessments and with addressing capacity building needs in a timely and sustained fashion.

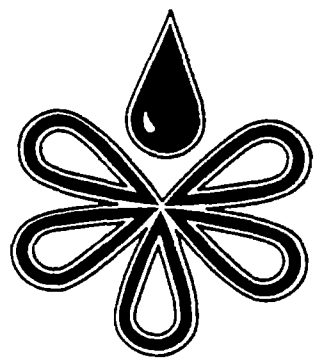
39. In order to enhance the capacity building process, institutional success and failures should be kept under review by regular monitoring and evaluation using adequate criteria.

40. In conclusion, capacity building should be a fundamental component of cost and target national action plans.

International Conference on
Water and the Environment:

Development Issues for the 21st century

26–31 January 1992, Dublin, Ireland



THE DUBLIN STATEMENT
AND
REPORT OF THE CONFERENCE

THE DUBLIN STATEMENT ON WATER AND SUSTAINABLE DEVELOPMENT

Scarcity and misuse of fresh water pose a serious and growing threat to sustainable development and protection of the environment. Human health and welfare, food security, industrial development and the ecosystems on which they depend, are all at risk, unless water and land resources are managed more effectively in the present decade and beyond than they have been in the past.

Five hundred participants, including government-designated experts from a hundred countries and representatives of eighty international, intergovernmental and non-governmental organizations attended the International Conference on Water and the Environment (ICWE) in Dublin, Ireland, on 26–31 January 1992. The experts saw the emerging global water resources picture as critical. At its closing session, the Conference adopted this Dublin Statement and the Conference Report. The problems highlighted are not speculative in nature; nor are they likely to affect our planet only in the distant future. They are here and they affect humanity now. The future survival of many millions of people demands immediate and effective action.

The Conference participants call for fundamental new approaches to the assessment, development and management of freshwater resources, which can only be brought about through political commitment and involvement from the highest levels of government to the smallest communities. Commitment will need to be backed by substantial and immediate investments, public awareness campaigns, legislative and institutional changes, technology development, and capacity building programmes. Underlying all these must be a greater recognition of the interdependence of all peoples, and of their place in the natural world.

In commending this Dublin Statement to the world leaders assembled at the United Nations Conference on Environment and Development (UNCED) in Rio de Janeiro in June 1992, the Conference participants urge all governments to study carefully the specific activities and means of implementation recommended in the Conference Report, and to translate those recommendations into urgent action programmes for

WATER AND SUSTAINABLE DEVELOPMENT.

GUIDING PRINCIPLES

Concerted action is needed to reverse the present trends of overconsumption, pollution, and rising threats from drought and floods. The Conference Report sets out recommendations for action at local, national and international levels, based on four guiding principles.

Principle No. 1 – Fresh water is a finite and vulnerable resource, essential to sustain life, development and the environment

Since water sustains life, effective management of water resources demands a holistic approach, linking social and economic development with protection of natural ecosystems. Effective management links land and water uses across the whole of a catchment area or groundwater aquifer.

Principle No. 2 – Water development and management should be based on a participatory approach, involving users, planners and policy-makers at all levels

The participatory approach involves raising awareness of the importance of water among policy-makers and the general public. It means that decisions are taken at the lowest appropriate level, with full public consultation and involvement of users in the planning and implementation of water projects.

Principle No. 3 – Women play a central part in the provision, management and safeguarding of water

This pivotal role of women as providers and users of water and guardians of the living environment has seldom been reflected in institutional arrangements for the development and management of water resources. Acceptance and implementation of this principle requires positive policies to address women's specific needs and to equip and empower women to participate at all levels in water resources programmes, including decision-making and implementation, in ways defined by them.

Principle No. 4 – Water has an economic value in all its competing uses and should be recognized as an economic good

Within this principle, it is vital to recognize first the basic right of all human beings to have access to clean water and sanitation at an affordable price. Past failure to recognize the economic value of water has led to wasteful and environmentally damaging uses of the resource. Managing water as an economic good is an important way of achieving efficient and equitable use, and of encouraging conservation and protection of water resources.

THE ACTION AGENDA

Based on these four guiding principles, the Conference participants developed recommendations which enable countries to tackle their water resources problems on a wide range of fronts. The major benefits to come from implementation of the Dublin recommendations will be:

Alleviation of poverty and disease

At the start of the 1990s, more than a quarter of the world's population still lack the basic human needs of enough food to eat, a clean water supply and hygienic means of sanitation. The Conference recommends that priority be given in water resources development and management to the accelerated provision of food, water and sanitation to these unserved millions.

Protection against natural disasters

Lack of preparedness, often aggravated by lack of data, means that droughts and floods take a huge toll in deaths, misery and economic loss. Economic losses from natural disasters, including floods and droughts, increased three-fold between the 1960s and the 1980s. Development is being set back for years in some developing countries, because investments have not been made in basic data collection and disaster preparedness. Projected climate change and rising sea-levels will intensify the risk for some, while also threatening the apparent security of existing water resources.

Damages and loss of life from floods and droughts can be drastically reduced by the disaster preparedness actions recommended in the Dublin Conference Report.

Water conservation and reuse

Current patterns of water use involve excessive waste. There is great scope for water savings in agriculture, in industry and in domestic water supplies.

Irrigated agriculture accounts for about 80% of water withdrawals in the world. In many irrigation schemes, up to 60% of this water is lost on its way from the source to the plant. More efficient irrigation practices will lead to substantial freshwater savings.

Recycling could reduce the consumption of many industrial consumers by 50% or more, with the additional benefit of reduced pollution. Application of the 'polluter pays' principle and realistic water pricing will encourage conservation and reuse. On average, 36% of the water produced by urban water utilities in developing countries is 'unaccounted for'. Better management could reduce these costly losses.

Combined savings in agriculture, industry and domestic water supplies could significantly defer investment in costly new water-resource development and have enormous impact on the sustainability of future supplies. More savings will come from multiple use of water. Compliance with effective discharge standards, based on new water protection objectives, will enable successive downstream consumers to reuse water which presently is too contaminated after the first use.

Sustainable urban development

The sustainability of urban growth is threatened by curtailment of the copious supplies of cheap water, as a result of the depletion and degradation caused by past profligacy. After a generation or more of excessive water use and reckless discharge of municipal and industrial wastes, the situation in the majority of the world's major cities is appalling and getting worse. As water scarcity and pollution force development of ever more distant sources, marginal costs of meeting fresh demands are growing rapidly. Future guaranteed supplies must be based on appropriate water charges and discharge controls. Residual contamination of land and water can no longer be seen as a reasonable trade-off for the jobs and prosperity brought by industrial growth.

Agricultural production and rural water supply

Achieving food security is a high priority in many countries, and agriculture must not only provide food for rising populations, but also save water for other uses. The challenge is to develop and apply water-saving technology and management methods, and, through capacity building, enable communities to introduce institutions and incentives for the rural population to adopt new approaches, for both rainfed and irrigated agriculture. The rural population must also have better access to a potable water supply and to sanitation services. It is an immense task, but not an impossible one, provided appropriate policies and programmes are adopted at all levels—local, national and international.

Protecting aquatic ecosystems

Water is a vital part of the environment and a home for many forms of life on which the well-being of humans ultimately depends. Disruption of flows has reduced the productivity of many such ecosystems, devastated fisheries, agriculture and grazing, and marginalized the rural communities which rely on these. Various kinds of pollution, including transboundary pollution, exacerbate these problems, degrade water supplies, require more expensive water treatment, destroy aquatic fauna, and deny recreation opportunities.

Integrated management of river basins provides the opportunity to safeguard aquatic ecosystems, and make their benefits available to society on a sustainable basis.

Resolving water conflicts

The most appropriate geographical entity for the planning and management of water resources is the river basin, including surface and groundwater. Ideally, the effective integrated planning and development of transboundary river or lake basins has similar institutional requirements to a basin entirely within one country. The essential function of existing international basin organizations is one of reconciling and harmonizing the interests of riparian countries, monitoring water quantity and quality, development of concerted action programmes, exchange of information, and enforcing agreements.

In the coming decades, management of international watersheds will greatly increase in importance. A high priority should therefore be given to the preparation and implementation of integrated management plans, endorsed by all affected governments and backed by international agreements.

The enabling environment

Implementation of action programmes for water and sustainable development will require a substantial investment, not only in the capital projects concerned, but, crucially, in building the capacity of people and institutions to plan and implement those projects.

The knowledge base

Measurement of components of the water cycle, in quantity and quality, and of other characteristics of the environment affecting water are an essential basis for undertaking effective water management. Research and analysis techniques, applied on an interdisciplinary basis, permit the understanding of these data and their application to many uses.

With the threat of global warming due to increasing greenhouse gas concentrations in the atmosphere, the need for measurements and data exchange on the hydrological cycle on a global scale is evident. The data are required to understand both the world's climate system and the potential impacts on water resources of climate change and sea level rise. All countries must participate and, where necessary, be assisted to take part in the global monitoring, the study of the effects and the development of appropriate response strategies.

Capacity building

All actions identified in the Dublin Conference Report require well-trained and qualified personnel. Countries should identify, as part of national development plans, training needs for water-resources assessment and management, and take steps internally and, if necessary with technical co-operation agencies, to provide the required training, and working conditions which help to retain the trained personnel.

Governments must also assess their capacity to equip their water and other specialists to implement the full range of activities for integrated water-resources management. This requires provision of an enabling environment in terms of institutional and legal arrangements, including those for effective water-demand management.

Awareness raising is a vital part of a participatory approach to water resources management. Information, education and communication support programmes must be an integral part of the development process.

Follow-up

Experience has shown that progress towards implementing the actions and achieving the goals of water programmes requires follow-up mechanisms for periodic assessments at national and international levels.

In the framework of the follow-up procedures developed by UNCED for Agenda 21, all Governments should initiate periodic assessments of progress. At the international level, United Nations institutions concerned with water should be strengthened to undertake the assessment and follow-up process. In addition, to involve private institutions, regional and non-governmental organizations along with all interested

governments in the assessment and follow-up, the Conference proposes, for consideration by UNCED, a world water forum or council to which all such groups could adhere.

It is proposed that the first full assessment on implementation of the recommended programme should be undertaken by the year 2000.

UNCED is urged to consider the financial requirements for water-related programmes, in accordance with the above principles, in the funding for implementation of Agenda 21. Such considerations must include realistic targets for the timeframe for implementation of the programmes, the internal and external resources needed, and the means of mobilizing these.

The International Conference on Water and the Environment began with a Water Ceremony in which children from all parts of the world made a moving plea to the assembled experts to play their part in preserving precious water resources for future generations. In transmitting this Dublin Statement to a world audience, the Conference participants urge all those involved in the development and management of our water resources to allow the message of those children to direct their future actions.

Report #1

BUILDING THE CAPACITIES OF WATER AND SANITATION UTILITIES

REPORT ON THE BRUSSELS WORKSHOP, 11-13 MAY 1992

A new "Utilities Partnership" aimed at reform in the water and sanitation sector was forged during an international conference held in Brussels from May 11 to 13. Created to address the most pressing problems plaguing urban utilities in the developing world, the Partnership will seek broad participation of concerned agencies and institutions in finding hands-on solutions, especially to institutional problems. Ultimately, the Partnership aims to improve the availability of water and sanitation services, especially for the urban poor.

Sponsored by UNDP and the World Bank, the global meeting brought together 50 representatives from developing country utilities and from bilateral and multilateral aid agencies, who strongly endorsed the Partnership concept. One of the multilateral participants described the Partnership as "the most important new idea for the sector in this decade." Another participant from a developing country acknowledged that sectoral reform was vital and said the Partnership could serve as a primary means "to save lives."

The Utilities Partnership has been created just as a "window of opportunity" for institutional change is opening in many countries. At the same time, a new set of ideas about the ingredients to achieve change has come together. One participant from a bilateral aid agency observed that the conference and the creation of the Partnership were the important first steps in taking the "right actions at the right time."

Virtually all agreed that there is a fundamental need for reform that includes all stakeholders in the process.

Throughout the working group and plenary sessions, several key points emerged that will guide the Partnership. first, many things remain to be learned about developing an impetus for reform and determining what reform measures have the greatest chance of success. The challenge will be to increase the range and level of learning from sector experience and translate that learning into effective action.

A second point recognized was that the participants and the constituencies they represent have many good ideas about what needs to be learned and how to get the job done. This confirms the concept of the "Partnership" as a joint effort of all interested stakeholders in improving the quality and availability of sector services through a learning process, rather than a prescribed set of solutions issued by only a few. The conference supported the "Partnership" as a means of converting the "private" knowledge of individuals and organizations into a "public good" more widely

available to those working for reform.

Why the Partnership?

- Cities in the developing world continue to grow rapidly, and formal utilities are the predominant mode of delivery for urban water and sanitation service deliveries.

  But the performance of many, if not most, public utilities in developing countries is poor and fails to achieve either efficiency or equity objectives.

- A consensus has been emerging among sector and donor agency professionals that most problems of sector performance have their origins in the institutional and managerial realms. This consensus opinion has been encouraged by several previous initiatives, including UNDP's capacity building initiative leading to the Delft Conference, the global consultation on safe water and sanitation in Delhi, the conference on water and the environment in Dublin, and the World Bank's World Development Report on the environment and development, which emphasizes water and sanitation. Most fundamental to this consensus is the concept contained in the Dublin Statement: that water is an economic resource and requires management at the lowest appropriate level to achieve efficiency, equity, and environmental balance.

- The climate for institutional reform in developing countries has been improving. Governments throughout the developing world are reconsidering the roles that are appropriate for the government and the private sector to play in improving services.

  These factors have brought into being a broad-based partnership of developing country decision makers, managers, user groups, professional associations, and bilateral and multilateral donor agencies to support reform efforts. These efforts will be initiated through provision of information to decision makers on why reform is necessary, the pros and cons of options, and, through practical advice based on working experience, what works, and why.

Most problems of sector performance have their origins in institutional and managerial shortcomings.

Who participated?

Conference participants included developing country professionals known to be action-oriented, representatives of professional associations, international consultants with sector experience, bilateral aid agencies, multilateral banks, and UNDP. Meeting in regional working groups (Africa, Asia, and Latin America) and plenary sessions, they debated several key issues: What needs to be done to initiate reform and to make it successful within the public sector? How can greater private sector involvement be encouraged while dealing with public sector regulatory issues? How can the partnership contribute to these efforts? Who are the major actors the partnership might include?

What were the conclusions of the conference?

1. ***There is a fundamental need for reform, and all stakeholders must be involved in the process.***

   There was virtual unanimity on this point. Particular concerns were expressed about how to involve political decision makers on one hand and user groups on the other, as well as how to engage, inform, and train sector management and staff. It was also generally agreed that the best resource to support these purposes is factual information about experience in real-world settings with different options. The Africa working group placed emphasis on stimulating political decision makers to encourage reform, and on encouraging supply institutions to achieve greater efficiency. Most believed that this latter goal would require greater autonomy, increased authority for management, participation of the private sector, and improved pricing of services.

   The Asia working group concluded that steps need to be taken to create a better climate for reform, and that more intensive analysis of institutional capacity and operational parameters for assessment were essen-

tial They also highlighted the needs for a business orientation in the sector and the encouragement of a training and management culture that promotes human resource development and a climate of "friendly competition between utilities."

The working group from Latin Amenca--perhaps reflecting a more favorable regional climate for radical reform–focused on the need for better documentation and dissemination of experience with various reform initiatives that involve the private sector. Their interests ranged from impacts on different stakeholders (users, employees, politicians, etc.) to specific types of contracts with the private sector and methods of monitoring performance of systems.

Working groups emphasized the value of practical information about what works, and why. In-country workshops can organize and disseminate pertinent information.

2. ***What kinds of support are being planned?***

The regional groups and the conference together concluded that the best help is "hands-on" in real-world situations where options are being tested. The best operational circumstances are those where there is explicit recognition of the experimental, time-consuming nature of institutional and managerial reform, and of the need for learning from others, as well as adapting while undertaking reform efforts. Sector reform cannot be considered a once-and-for-all solution. There is clearly a need for a long-term, cooperative effort.

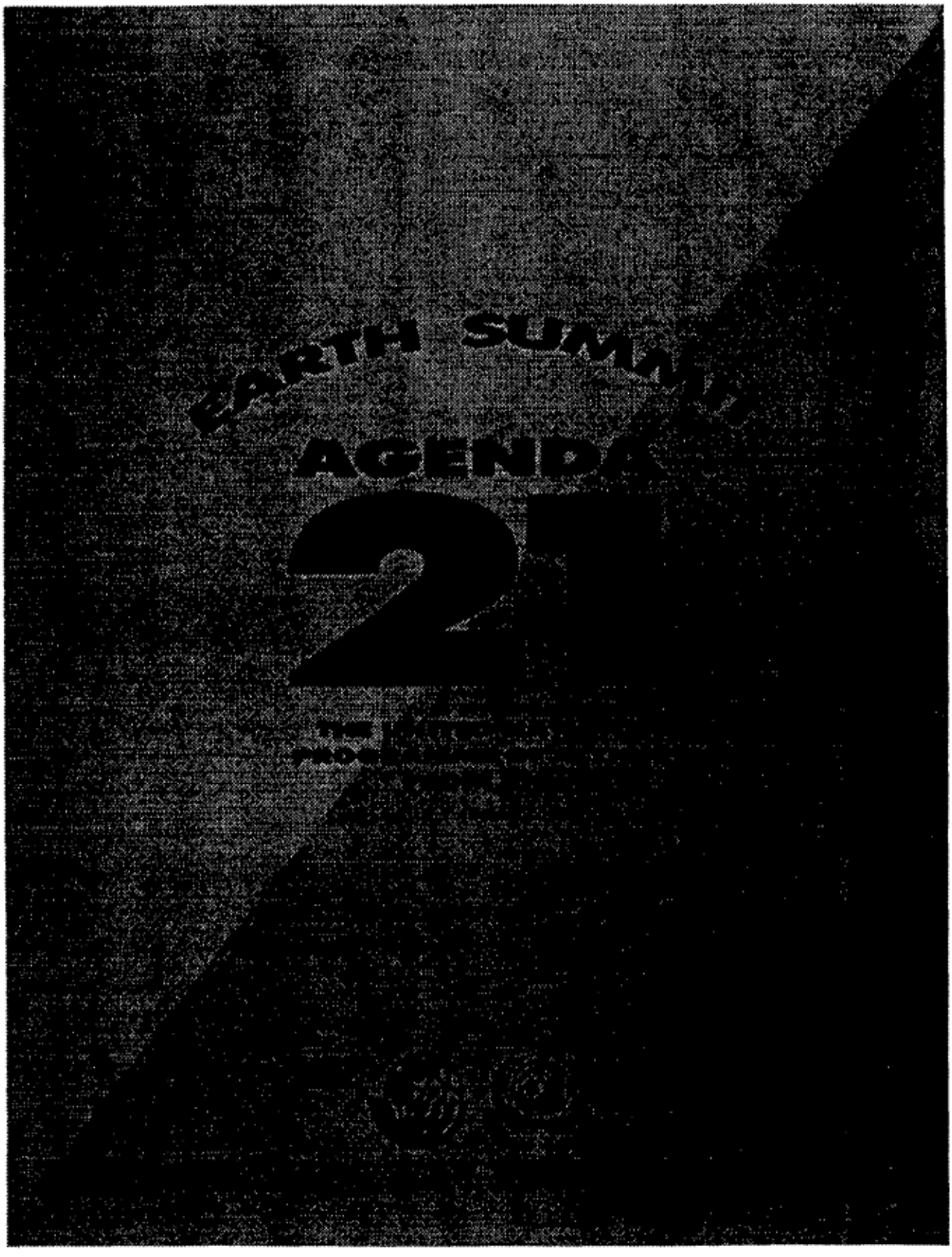
All working groups emphasized the value of practical documentation of what works, and why, in different settings. The conference proposed in-country workshops as a means of organizing and disseminating pertinent information Technical assistance, it was strongly felt, must go beyond the management of individual utilities in order to address broader institutional issues. Moreover, there remains a continuing need for training of both sector decision makers and management and staff of utilities.

3. ***What are the next steps?***

The participants supported the creation of the global "Utilities Partnership" and the establishment of an informal but accountable coordinating unit in the World Bank. They also urged the sponsors of the conference (UNDP and the World Bank) to follow through to ensure that the partnership concept is realized. The regional working groups recommended the creation of an advisory group that would include country and external support agency (ESA) representative to assist in the development of an agenda for follow-on activities and additional ideas for the work program of the Partnership

Naturally, there is a danger of spreading efforts too thin and losing the primary focus of the Partnership Most participants recommended that the Partnership concentrate on issues associated with institutional reform. A representative from Latin American put it well, saying, "Concentrate on institutional reform and not on technical issues and organizational strengthening."

One very positive result of the conference was that participants agreed that, given the complexity of reform efforts, all interested stakeholders, not just the conference participants, need to continue talking and exchanging views. One participant emphasized that the stakes are high, saying that "the success of reform will be measured in lives saved, as well as in the quality and quantity of services delivered." With continuing commitment, the newly created Partnership can become both the vehicle for that continuing dialogue and the catalyst for reform in improving urban water and sanitation services.


EARTH SUMMIT
AGENDA
21

This is a compilation of the textual references Agenda 21 makes to freshwater-related issues. It contains excerpts from:

Section I	Social and economic dimensions
Chapter 5	Demographic dynamics and sustainability
Chapter 6	Protecting and promoting human health
Chapter 7	Promoting sustainable human settlements development
Chapter 8	Integrating environment and development in decision-making
Section II	Conservation and management of resources
Chapter 9	Protection of the atmosphere
Chapter 10	Integrated approach to the planning and management of land resources
Chapter 11	Combating deforestation
Chapter 12	Managing fragile ecosystems: Combating desertification and drought
Chapter 13	Managing fragile ecosystems: Sustainable mountain development
Chapter 14	Promoting sustainable agriculture and rural development
Chapter 15	Conservation of biological diversity
Chapter 16	Environmentally sound management of biotechnology
Chapter 17	Protection of the oceans, all kinds of seas, including enclosed and semi-enclosed seas, and coastal areas and the protection, rational use and development of their living resources
Chapter 18	Protection of the quality and supply of freshwater resources: application of integrated approaches to the development, management and use of water resources
Chapter 19	Environmentally sound management of toxic chemicals, including prevention of illegal international traffic in toxic and dangerous products
Chapter 21	Environmentally sound management of solid wastes and sewage-related issues
Section III	Strengthening the role of major groups
Chapter 24	Global action for women towards sustainable and equitable development
Chapter 32	Strengthening the role of farmers
Section IV	Means of implementation
Chapter 35	Science for sustainable development
Chapter 36	Promoting education, public awareness and training
Chapter 38	International institutional arrangements
Chapter 40	Information for decision-making

SECTION I SOCIAL AND ECONOMIC DIMENSIONS

Chapter 5

DEMOGRAPHIC DYNAMICS AND SUSTAINABILITY

5.3 The growth of world population and production combined with unsustainable consumption patterns places increasingly severe stress on the life-supporting capacities of our planet. These interactive processes affect the use of land, water, air, energy and other resources. Rapidly growing cities, unless well-managed, face major environmental problems. The increase in both the number and size of cities calls for greater attention to issues of local government and municipal management. The human dimensions are key elements to consider in this intricate set of relationships and they should be adequately taken into consideration in comprehensive policies for sustainable development. Such policies should address the linkages of demographic trends and factors, resource use, appropriate technology dissemination, and development. Population policy should also recognize the role played by human beings in environmental and development concerns. There is a need to increase awareness of this issue among decision makers at all levels and to provide both better information on which to base national and international policies and a framework against which to interpret this information.

Chapter 6

PROTECTING AND PROMOTING HUMAN HEALTH

6.3 Health ultimately depends on the ability to manage successfully the interaction between the physical, spiritual, biological and economic/social environment. Sound development is not possible without a healthy population; yet most developmental activities affect the environment to some degree, which in turn causes or exacerbates many health problems. Conversely, it is the very lack of development that adversely affects the health condition of many people, which can be alleviated only through development. The health sector cannot meet basic needs and objectives on its own; it is dependent on social, economic and spiritual development, while directly contributing to such development. It is also dependent on a healthy environment, including the provision of a safe water supply and sanitation and the promotion of a safe food supply and proper nutrition. Particular attention should be directed towards food safety, with priority placed on the elimination of food contamination; comprehensive and sustainable water policies to ensure safe drinking water and sanitation to preclude both microbial and chemical contamination; and promotion of health education, immunization and provision of essential drugs. Education and appropriate services regarding responsible planning of family size, with respect for cultural, religious and social aspects, in keeping with freedom, dignity and personally held values and taking into account ethical and cultural considerations, also contribute to these intersectoral activities.

6.5 National Governments and local authorities, with the support of relevant non-governmental organizations and international organizations, in the light of countries' specific conditions and needs, should strengthen their health sector programmes, with special attention to rural needs, to:

(a) Build basic health infrastructures, monitoring and planning systems:

(i) Develop and strengthen primary health care systems that are practical, community-based, scientifically sound, socially acceptable and appropriate to their needs and that meet basic health needs for clean water, safe food and sanitation;

6.10 Advances in the development of vaccines and chemotherapeutic agents have brought many communicable diseases under control. However, there remain many important communicable diseases for which environmental control measures are indispensable, especially in the field of water supply and sanitation. Such diseases include cholera, diarrhoeal diseases, leishmaniasis, malaria and schistosomiasis. In all such instances, the environmental measures, either as an integral part of primary health care or undertaken outside the health sector, form an indispensable component of overall disease control strategies, together with health and hygiene education, and in some cases, are the only component.

6.12 A number of goals have been formulated through extensive consultations in various international forums attended by virtually all Governments, relevant United Nations organizations (including WHO, UNICEF, UNFPA, UNESCO, UNDP and the World Bank) and a number of non-governmental organizations. Goals (including but not limited to those listed below) are recommended for implementation by all countries where they are applicable, with appropriate adaptation to the specific situation of each country in terms of phasing, standards, priorities and availability of resources, with respect for cultural, religious and social aspects, in keeping with freedom, dignity and personally held values and taking into account ethical considerations. Additional goals that are particularly relevant to a country's specific situation should be added in the country's national plan of action (Plan of Action for Implementing the World Declaration on the Survival, Protection and Development of Children in the 1990s). Such national level action plans should be coordinated and monitored from within the public health sector. Some major goals are:

(a) By the year 2000, to eliminate guinea worm disease (dracunculiasis);

(c) By the year 2000, to effectively control onchocerciasis (river blindness) and leprosy;

(e) By continued efforts, to provide health and hygiene education and to ensure universal access to safe drinking water and universal access to sanitary measures of excreta disposal, thereby markedly reducing waterborne diseases such as cholera and schistosomiasis and reducing:

(i) By the year 2000, the number of deaths from childhood diarrhoea in developing countries by 50 to 70 per cent;

(ii) By the year 2000, the incidence of childhood diarrhoea in developing countries by at least 25 to 50 per cent;

(i) By the year 2000, to implement control programmes in countries where major human parasitic infections are endemic and achieve an overall reduction in the prevalence of schistosomiasis and of other trematode infections by 40 per cent and 25 per cent, respectively, from a 1984 baseline, as well as a marked reduction in incidence, prevalence and intensity of filarial infections;

6.13 Each national Government, in accordance with national plans for public health, priorities and objectives, should consider developing a national health action plan with appropriate international assistance and support, including, at a minimum, the following components:

(d) Control of environmental factors that influence the spread of communicable diseases: Apply methods for the prevention and control of communicable diseases, including water supply and sanitation control, water pollution control, food quality control, integrated vector control, garbage collection and disposal and environmentally sound irrigation practices;

6.16 National and regional training institutions should promote broad intersectoral approaches to prevention and control of communicable diseases, including training in epidemiology and community prevention and control, immunology, molecular biology and the application of new vaccines. Health education materials should be developed for use by community workers and for the education of mothers for the prevention and treatment of diarrhoeal diseases in the home.

6.19 Infants and children. Approximately one third of the world's population are children under 15 years old. At least 15 million of these children die annually from such preventable causes as birth trauma, birth asphyxia, acute respiratory infections, malnutrition, communicable diseases and diarrhoea. The health of children is affected more severely than other population groups by malnutrition and adverse environmental factors, and many children risk exploitation as cheap labour or in prostitution.

6.24 Specific major goals for child survival, development and protection were agreed upon at the World Summit for Children and remain valid also for Agenda 21. Supporting and sectoral goals cover women's health and education, nutrition, child health, water and sanitation, basic education and children in difficult circumstances.

6.33 The health and well-being of all urban dwellers must be improved so that they can contribute to economic and social development. The global objective is to achieve a 10 to 40 per cent improvement in health indicators by the year 2000. The same rate of improvement should be achieved for environmental, housing and health service indicators. These include the development of quantitative objectives for infant mortality, maternal mortality, percentage of low birth weight newborns and specific indicators (e.g. tuberculosis as an indicator of crowded housing, diarrhoeal diseases as indicators of inadequate water and sanitation, rates of industrial and transportation accidents that indicate possible opportunities for prevention of injury, and social problems such as drug abuse, violence and crime that indicate underlying social disorders).

6.39 In many locations around the world the general environment (air, water and land), workplaces and even individual dwellings are so badly polluted that the health of hundreds of millions of people is adversely affected. This is, *inter alia*, due to past and present developments in consumption and production patterns and lifestyles, in energy production and use, in industry, in transportation etc., with little or no regard for environmental protection. There have been notable improvements in some countries, but deterioration of the environment continues. The ability of countries to tackle pollution and health problems is greatly restrained because of lack of resources. Pollution control and health protection measures have often not kept pace with economic development. Considerable development-related environmental health hazards exist in the newly industrializing countries. Furthermore, the recent analysis of WHO has clearly established the interdependence among the factors of health, environment and development and has revealed that most countries are lacking such integration as would lead to an effective pollution control mechanism. Without prejudice to such criteria as may be agreed upon by the international community, or to standards which will have to be determined nationally, it will be essential in all cases to consider the systems of values prevailing in each country and the extent of the applicability of standards that are valid for the most advanced countries but may be inappropriate and of unwarranted social cost for the developing countries.

6.41 Nationally determined action programmes, with international assistance, support and coordination, where necessary, in this area should include:

(c) Water pollution:

(i) Develop appropriate water pollution control technologies on the basis of health risk assessment;

(ii) Develop water pollution control capacities in large cities;

Chapter 7

PROMOTING SUSTAINABLE HUMAN SETTLEMENT DEVELOPMENT

7.16 One existing framework for strengthening management is in the United Nations Development Programme/World Bank/United Nations Centre for Human Settlements (Habitat) Urban Management Programme (UMP), a concerted global effort to assist developing countries in addressing urban management issues. Its coverage should be extended to all interested countries during the period 1993-2000. All countries should, as appropriate and in accordance with national plans, objectives and priorities and with the assistance of non-governmental organizations and representatives of local authorities, undertake the following activities at the national, state/provincial and local levels, with the assistance of relevant programmes and support agencies:

(c) Adopting innovative city planning strategies to address environmental and social issues by:

(i) Reducing subsidies on, and recovering the full costs of, environmental and other services of high standard (e.g. water supply, sanitation, waste collection, roads, telecommunications) provided to higher income neighbourhoods;

7.35 The sustainability of urban development is defined by many parameters relating to the availability of water supplies, air quality and the provision of environmental infrastructure for sanitation and waste management. As a result of the density of users, urbanization, if properly managed, offers unique opportunities for the supply of sustainable environmental infrastructure through adequate pricing policies, educational programmes and equitable access mechanisms that are economically and environmentally sound. In most developing countries, however, the inadequacy and lack of environmental infrastructure is responsible for widespread ill-health and a large number of preventable deaths each year. In those countries conditions are set to worsen due to growing needs that exceed the capacity of Governments to respond adequately.

7.39 All countries should assess the environmental suitability of infrastructure in human settlements, develop national goals for sustainable management of waste, and implement environmentally sound technology to ensure that the environment, human health and quality of life are protected. Settlement infrastructure and environmental programmes designed to promote an integrated human settlements approach to the planning, development, maintenance and management of environmental infrastructure (water supply, sanitation, drainage, solid-waste management) should be strengthened with the assistance of bilateral and multilateral agencies. Coordination among these agencies and with collaboration from international and national representatives of local authorities, the private sector and community groups should also be strengthened. The activities of all agencies engaged in providing environmental infrastructure should, where possible, reflect an ecosystem or metropolitan area approach to settlements and should include monitoring, applied research, capacity-building, transfer of appropriate technology and technical cooperation among the range of programme activities.

7.40 Developing countries should be assisted at the national and local levels in adopting an integrated approach to the provision of water supply, energy, sanitation, drainage and solid-waste management, and external funding agencies should ensure that this approach is applied in particular to environmental infrastructure improvement in informal settlements based on regulations and standards that take into account the living conditions and resources of the communities to be served.

7.61 Pre-disaster planning should form an integral part of human settlement planning in all countries. The following should be included:

(a) Undertaking complete multi-hazard research into risk and vulnerability of human settlements and settlement infrastructure, including water and sewerage, communication and transportation networks, as one type of risk reduction may increase vulnerability to another (e.g., an earthquake-resistant house made of wood will be more vulnerable to wind storms);

Chapter 8

INTEGRATING ENVIRONMENT AND DEVELOPMENT IN DECISION-MAKING

8.33 In particular, Governments should explore, in cooperation with business and industry, as appropriate, how effective use can be made of economic instruments and market mechanisms in the following areas:

(a) Issues related to energy, transportation, agriculture and forestry, water, wastes, health, tourism and tertiary services;

(b) Global and transboundary issues;

SECTION II CONSERVATION AND MANAGEMENT OF RESOURCES

Chapter 9

PROTECTION OF THE ATMOSPHERE

9.7 The basic objective of this programme area is to improve the understanding of processes that influence and are influenced by the Earth's atmosphere on a global, regional and local scale, including, *inter alia*, physical, chemical, geological, biological, oceanic, hydrological, economic and social processes; to build capacity and enhance international cooperation; and to improve understanding of the economic and social consequences of atmospheric changes and of mitigation and response measures addressing such changes.

9.19 Land-use and resource policies will both affect and be affected by changes in the atmosphere. Certain practices related to terrestrial and marine resources and land use can decrease greenhouse gas sinks and increase atmospheric emissions. The loss of biological diversity may reduce the resilience of ecosystems to climatic variations and air pollution damage. Atmospheric changes can have important impacts on forests, biodiversity, and freshwater and marine ecosystems, as well as on economic activities, such as agriculture. Policy objectives in different sectors may often diverge and will need to be handled in an integrated manner.

9.25 Transboundary air pollution has adverse health impacts on humans and other detrimental environmental impacts, such as tree and forest loss and the acidification of water bodies. The geographical distribution of atmospheric pollution monitoring networks is uneven, with the developing countries severely underrepresented. The lack of reliable emissions data outside Europe and North America is a major constraint to measuring transboundary air pollution. There is also insufficient information on the environmental and health effects of air pollution in other regions.

Chapter 10

INTEGRATED APPROACH TO THE PLANNING AND MANAGEMENT OF LAND RESOURCES

10.1 Land is normally defined as a physical entity in terms of its topography and spatial nature; a broader integrative view also includes natural resources: the soils, minerals, water and biota that the land comprises. These components are organized in ecosystems which provide a variety of services essential to the maintenance of the integrity of life-support systems and the productive capacity of the environment. Land resources are used in ways that take advantage of all these characteristics. Land is a finite resource, while the natural resources it supports can vary over time and according to management conditions and uses. Expanding human requirements and economic activities are placing ever increasing pressures on land resources, creating competition and conflicts and resulting in suboptimal use of both land and land resources. If, in the future, human requirements are to be met in a sustainable manner, it is now essential to resolve these conflicts and move towards more effective and efficient use of land and its natural resources. Integrated physical and land-use planning and

management is an eminently practical way to achieve this. By examining all uses of land in an integrated manner, it makes it possible to minimize conflicts, to make the most efficient trade-offs and to link social and economic development with environmental protection and enhancement, thus helping to achieve the objectives of sustainable development. The essence of the integrated approach finds expression in the coordination of the sectoral planning and management activities concerned with the various aspects of land use and land resources.

10.3 Land resources are used for a variety of purposes which interact and may compete with one another; therefore, it is desirable to plan and manage all uses in an integrated manner. Integration should take place at two levels, considering, on the one hand, all environmental, social and economic factors (including, for example, impacts of the various economic and social sectors on the environment and natural resources) and, on the other, all environmental and resource components together (i.e., air, water, biota, land, geological and natural resources). Integrated consideration facilitates appropriate choices and trade-offs, thus maximizing sustainable productivity and use. Opportunities to allocate land to different uses arise in the course of major settlement or development projects or in a sequential fashion as lands become available on the market. This in turn provides opportunities to support traditional patterns of sustainable land management or to assign protected status for conservation of biological diversity or critical ecological services.

10.7 Governments at the appropriate level, with the support of regional and international organizations, should review and, if appropiate, revise planning and management systems to facilitate an integrated approach. To do this, they should:

(a) Adopt planning and management systems that facilitate the integration of environmental components such as air, water, land and other natural resources, using landscape ecological planning (LANDEP) or other approaches that focus on, for example, an ecosystem or a watershed;

Chapter 11

COMBATING DEFORESTATION

11.10 Forests world wide have been and are being threatened by uncontrolled degradation and conversion to other types of land uses, influenced by increasing human needs; agricultural expansion; and environmentally harmful mismanagement, including, for example, lack of adequate forest-fire control and anti-poaching measures, unsustainable commercial logging, overgrazing and unregulated browsing, harmful effects of airborne pollutants, economic incentives and other measures taken by other sectors of the economy. The impacts of loss and degradation of forests are in the form of soil erosion; loss of biological diversity, damage to wildlife habitats and degradation of watershed areas, deterioration of the quality of life and reduction of the options for development.

11.13 Governments should recognize the importance of categorizing forests, within the framework of long-term forest conservation and management policies, into different forest types and setting up sustainable units in every region/watershed with a view to securing the conservation of forests. Governments, with the participation of the private sector, non-governmental organizations, local community groups, indigenous people, women, local government units and the public at large, should act to maintain and expand the existing vegetative cover wherever ecologically, socially and economically feasible, through technical cooperation and other forms of support. Major activities to be considered include:

(a) Ensuring the sustainable management of all forest ecosystems and woodlands, through improved proper planning, management and timely implementation of silvicultural operations, including inventory and relevant research, as well as rehabilitation of degraded natural forests to restore productivity and environmental contributions, giving particular attention to human needs for economic and ecological services, wood-based energy, agroforestry, non-timber forest products and services, watershed and soil protection, wildlife management, and forest genetic resources;

Chapter 12

MANAGING FRAGILE ECOSYSTEMS: COMBATING DESERTIFICATION AND DROUGHT

12.4 The following programme areas are included in this chapter:

(a) Strengthening the knowledge base and developing information and monitoring systems for regions prone to desertification and drought, including the economic and social aspects of these ecosystems;

(d) Developing comprehensive anti-desertification programmes and integrating them into national development plans and national environmental planning;

(e) Developing comprehensive drought preparedness and drought-relief schemes, including self-help arrangements, for drought-prone areas and designing programmes to cope with environmental refugees;

(f) Encouraging and promoting popular participation and environmental education, focusing on desertification control and management of the effects of drought.

12.6 The objectives of this programme area are:

(a) To promote the establishment and/or strengthening of national environmental information coordination centres that will act as focal points within Governments for sectoral ministries and provide the necessary standardization and back-up services; to ensure also that national environmental information systems on desertification and drought are linked together through a network at subregional, regional and interregional levels;

12.8 Governments at the appropriate level, with the support of the relevant international and regional organizations, should:

(b) Review and study the interactions between the socio-economic impacts of climate, drought and desertification and utilize the results of these studies to secure concrete action.

12.9 Governments at the appropriate level, with the support of the relevant international and regional organizations, should:

(a) Support the integrated data collection and research work of programmes related to desertification and drought problems; (b)Support national, regional and global programmes for integrated data collection and research networks carrying out assessment of soil and land degradation;

(c) Strengthen national and regional meteorological and hydrological networks and monitoring systems to ensure adequate collection of basic information and communication among national, regional and international centres.

12.10 Governments at the appropriate level, with the support of the relevant international and regional organizations, should:

(a) Strengthen regional programmes and international cooperation, such as the Permanent Inter-State Committee on Drought Control in the Sahel (CILSS), the Intergovernmental Authority for Drought and Development (IGADD), the Southern African Development Coordination Conference (SADCC), the Arab Maghreb Union and other regional organizations, as well as such organizations as the Sahara and Sahel Observatory;

12.12 Governments at the appropriate level, with the support of the relevant international and regional organizations working on the issue of desertification and drought, should:

(a) Undertake and update existing inventories of natural resources, such as energy, water, soil, minerals, plant and animal access to food, as well as other resources, such as housing, employment, health, education and demographic distribution in time and space;

(c) International bodies should cooperate with national Governments to facilitate the acquisition and development of appropriate technology for monitoring and combating drought and desertification.

12.13 Governments at the appropriate level, with the support of the relevant international and regional organizations working on the issue of desertification and drought, should develop the technical and professional skills of people engaged in monitoring and assessing the issue of desertification and drought.

12.14 Governments at the appropriate level, with the support of the relevant international and regional organizations working on the issue of desertification and drought, should:

(a) Strengthen national and local institutions by providing adequate staff equipment and finance for assessing desertification;

(b) Promote the involvement of the local population, particularly women and youth, in the collection and utilization of environmental information through education and awareness-building.

12.16 An increasing vegetation cover would promote and stabilize the hydrological balance in the dryland areas and maintain land quality and land productivity. Prevention of not yet degraded land and application of corrective measures and rehabilitation of moderate and severely degraded drylands, including areas affected by sand dune movements, through the introduction of environmentally sound, socially acceptable, fair and economically feasible land-use systems. This will enhance the land carrying capacity and maintenance of biotic resources in fragile ecosystems.

12.17 The objectives of this programme area are:

(a) As regards areas not yet affected or only slightly affected by desertification, to ensure appropriate management of existing natural formations (including forests) for the conservation of biodiversity, watershed protection, sustainability of their production and agricultural development, and other purposes, with the full participation of indigenous people;

(b) To rehabilitate moderately to severely desertified drylands for productive utilization and sustain their productivity for agropastoral/agroforestry development through, *inter alia*, soil and water conservation;

(c) To increase the vegetation cover and support management of biotic resources in regions affected or prone to desertification and drought, notably through such activities as afforestation/reforestation, agroforestry, community forestry and vegetation retention schemes;

12.18 Governments at the appropriate level, and with the support of the relevant international and regional organizations, should:

(a) Implement urgent direct preventive measures in drylands that are vulnerable but not yet affected, or only slightly desertified drylands, by introducing (i) improved land-use policies and practices for more sustainable land productivity; (ii) appropriate, environmentally sound and economically feasible agricultural and pastoral technologies; and (iii) improved management of soil and water resources;

(d) Promote improved land/water/crop-management systems, making it possible to combat salinization in existing irrigated croplands; and to stabilize rainfed croplands and introduce improved soil/crop-management systems into land-use practice;

12.23 Governments at the appropriate level and local communities, with the support of the relevant international and regional organizations, should:

(a) Integrate indigenous knowledge related to forests, forest lands, rangeland and natural vegetation into research activities on desertification and drought;

(b) Promote integrated research programmes on the protection, restoration and conservation of water and land resources and land-use management based on traditional approaches, where feasible.

12.24 Governments at the appropriate level and local communities, with the support of the relevant international and regional organizations, should:

(b) Promote efficient extension-service facilities in areas prone to desertification and drought, particularly for training farmers and pastoralists in the improved management of land and water resources in drylands.

12.29 Governments at the appropriate level, with the support of the relevant international and regional organizations, should:

(b) Conduct inventory of natural resources (soil, water and vegetation) and their state of degradation, based primarily on the knowledge of the local population (e.g., rapid rural appraisal);

12.33 Governments at the appropriate level, with the support of the relevant international and regional organizations, should:

(a) Train members of rural organizations in management skills and train agropastoralists in such special techniques as soil and water conservation, water harvesting, agroforestry and small-scale irrigation;

12.45 Drought, in differing degrees of frequency and severity, is a recurring phenomenon throughout much of the developing world, especially Africa. Apart from the human toll - an estimated 3 million people died in the mid-1980s because of drought in sub-Saharan Africa - the economic costs of

drought-related disasters are also high in terms of lost production, misused inputs and diversion of development resources.

12.46 Early-warning systems to forecast drought will make possible the implementation of drought-preparedness schemes. Integrated packages at the farm and watershed level, such as alternative cropping strategies, soil and water conservation and promotion of water harvesting techniques, could enhance the capacity of land to cope with drought and provide basic necessities, thereby minimizing the number of environmental refugees and the need for emergency drought relief. At the same time, contingency arrangements for relief are needed for periods of acute scarcity.

12.47 The objectives of this programme area are:

(a) To develop national strategies for drought preparedness in both the short and long term, aimed at reducing the vulnerability of production systems to drought;

(b) To strengthen the flow of early-warning information to decision makers and land users to enable nations to implement strategies for drought intervention;

(c) To develop and integrate drought-relief schemes and means of coping with environmental refugees into national and regional development planning.

12.48 In drought-prone areas, Governments at the appropriate level, with the support of the relevant international and regional organizations, should:

(b) Improve national and regional capacity for agrometeorology and contingency crop planning. Agrometeorology links the frequency, content and regional coverage of weather forecasts with the requirements of crop planning and agricultural extension;

(c) Prepare rural projects for providing short-term rural employment to drought-affected households. The loss of income and entitlement to food is a common source of distress in times of drought. Rural works help to generate the income required to buy food for poor households;

(d) Establish contingency arrangements, where necessary, for food and fodder distribution and water supply;

(e) Establish budgetary mechanisms for providing, at short notice, resources for drought relief;

12.49 Governments of affected countries, at the appropriate level, with the support of the relevant international and regional organizations, should:

(a) Implement research on seasonal forecasts to improve contingency planning and relief operations and allow preventive measures to be taken at the farm level, such as the selection of appropriate varieties and farming practices, in times of drought;

(b) Support applied research on ways of reducing water loss from soils, on ways of increasing the water absorption capacities of soils and on water harvesting techniques in drought-prone areas;

(c) Strengthen national early-warning systems, with particular emphasis on the area of risk-mapping, remote-sensing, agrometeorological modelling, integrated multidisciplinary crop-forecasting techniques and computerized food supply/demand analysis.

12.50 Governments at the appropriate level, with the support of the relevant international and regional organizations, should:

(a) Establish a system of stand-by capacities in terms of foodstock, logistical support, personnel and finance for a speedy international response to drought-related emergencies;

(b) Support programmes of the World Meteorological Organization (WMO) on agrohydrology and agrometeorology, the Programme of the Regional Training Centre for Agrometeorology and Operational Hydrology and their Applications (AGRHYMET), drought-monitoring centres and the African Centre of Meteorological Applications for Development (ACMAD), as well as the efforts of the Permanent Inter-State Committee on Drought Control in the Sahel (CILSS) and the Intergovernmental Authority for Drought and Development (IGADD);

(d) Strengthen and expand the scope of existing regional programmes and the activities of appropriate United Nations organs and organizations, such as the World Food Programme (WFP), the Office of the United Nations Disaster Relief Coordinator (UNDRO) and the United Nations Sudano-Sahelian Office as well as of non-governmental organizations, aimed at mitigating the effects of drought and emergencies.

12.52 Governments at the appropriate level and drought-prone communities, with the support of the relevant international and regional organizations, should:

(b) Strengthen and develop national, regional and local interdisciplinary research and training capabilities for drought-prevention strategies.

12.54 Governments at the appropriate level, with the support of the relevant international and regional organizations, should:

(a) Improve and maintain mechanisms with adequate staff, equipment and finances for monitoring drought parameters to take preventive measures at regional, national and local levels;

(b) Establish interministerial linkages and coordinating units for drought monitoring, impact assessment and management of drought-relief schemes.

12.55 The experience to date on the successes and failures of programmes and projects points to the need for popular support to sustain activities related to desertification and drought control. But it is necessary to go beyond the theoretical ideal of popular participation and to focus on obtaining actual active popular involvement, rooted in the concept of partnership. This implies the sharing of responsibilities and the mutual involvement of all parties. In this context, this programme area should be considered an essential supporting component of all desertification-control and drought-related activities.

12.56 The objectives of this programme area are:

(a) To develop and increase public awareness and knowledge concerning desertification and drought, including the integration of environmental education in the curriculum of primary and secondary schools;

12.58 Governments at the appropriate level, with the support of the relevant international and regional organizations, should:

(c) Disseminate knowledge about applied research results on soil and water issues, appropriate species, agricultural techniques and technological know-how.

12.59 Governments at the appropriate level, and with the support of the relevant international and regional organizations, should:

(a) Develop programmes of support to regional organizations such as CILSS, IGADD, SADCC and the Arab Maghreb Union and other intergovernmental organizations in Africa and other parts of the world, to strengthen outreach programmes and increase the participation of non-governmental organizations together with rural populations;

Chapter 13

MANAGING FRAGILE ECOSYSTEMS: SUSTAINABLE MOUNTAIN DEVELOPMENT

13.1 Mountains are an important source of water, energy and biological diversity. Furthermore, they are a source of such key resources as minerals, forest products and agricultural products and of recreation. As a major ecosystem representing the complex and interrelated ecology of our planet, mountain environments are essential to the survival of the global ecosystem. Mountain ecosystems are, however, rapidly changing. They are susceptible to accelerated soil erosion, landslides and rapid loss of habitat and genetic diversity. On the human side, there is widespread poverty among mountain inhabitants and loss of indigenous knowledge. As a result, most global mountain areas are experiencing environmental degradation. Hence, the proper management of mountain resources and socio-economic development of the people deserves immediate action.

13.3 Two programme areas are included in this chapter to further elaborate the problem of fragile ecosystems with regard to all mountains of the world. These are:

(b) Promoting integrated watershed development and alternative livelihood opportunities.

13.5 The objectives of this programme area are:

(a) To undertake a survey of the different forms of soils, forest, water use, crop, plant and animal resources of mountain ecosystems, taking into account the work of existing international and regional organizations;

(c) To improve and build the existing land/water ecological knowledge base regarding technologies and agricultural and conservation practices in the mountain regions of the world, with the participation of local communities;

13.6 Governments at the appropriate level, with the support of the relevant international and regional organizations, should:

(a) Strengthen existing institutions or establish new ones at local, national and regional levels to generate a multidisciplinary land/water ecological knowledge base on mountain ecosystems;

13.7 Governments at the appropriate level, with the support of the relevant international and regional organizations, should:

(a) Maintain and establish meteorological, hydrological and physical monitoring analysis and capabilities that would encompass the climatic diversity as well as water distribution of various mountain regions of the world;

(b) Build an inventory of different forms of soils, forests, water use, and crop, plant and animal genetic resources, giving priority to those under threat of extinction. Genetic resources should be protected *in situ* by maintaining and establishing protected areas and improving traditional farming and animal husbandry activities and establishing programmes for evaluating the potential value of the resources;

(c) Identify hazardous areas that are most vulnerable to erosion, floods, landslides, earthquakes, snow avalanches and other natural hazards;

13.10 Governments at the appropriate level, with the support of the relevant international and regional organizations, should strengthen scientific research and technological development programmes, including diffusion through national and regional institutions, particularly in meteorology, hydrology, forestry, soil sciences and plant sciences.

13.13 Nearly half of the world's population is affected in various ways by mountain ecology and the degradation of watershed areas. About 10 per cent of the Earth's population lives in mountain areas with higher slopes, while about 40 per cent occupies the adjacent medium- and lower-watershed areas. There are serious problems of ecological deterioration in these watershed areas. For example, in the hillside areas of the Andean countries of South America a large portion of the farming population is now faced with a rapid deterioration of land resources. Similarly, the mountain and upland areas of the Himalayas, South-East Asia and East and Central Africa, which make vital contributions to agricultural production, are threatened by cultivation of marginal lands due to expanding population. In many areas this is accompanied by excessive livestock grazing, deforestation and loss of biomass cover.

13.14 Soil erosion can have a devastating impact on the vast numbers of rural people who depend on rainfed agriculture in the mountain and hillside areas. Poverty, unemployment, poor health and bad sanitation are widespread. Promoting integrated watershed development programmes through effective participation of local people is a key to preventing further ecological imbalance. An integrated approach is needed for conserving, upgrading and using the natural resource base of land, water, plant, animal and human resources. In addition, promoting alternative livelihood opportunities, particularly through development of employment schemes that increase the productive base, will have a significant role in improving the standard of living among the large rural population living in mountain ecosystems.

13.15 The objectives of this programme area are:

(a) By the year 2000, to develop appropriate land-use planning and management for both arable and non-arable land in mountain-fed watershed areas to prevent soil erosion, increase biomass production and maintain the ecological balance;

(b) To promote income-generating activities, such as sustainable tourism, fisheries and environmentally sound mining, and to improve infrastructure and social services, in particular to protect the livelihoods of local communities and indigenous people;

13.18 Governments at the appropriate level, with the support of the relevant international and regional organizations, should:

(a) Strengthen the role of appropriate international research and training institutes such as the Consultative Group on International Agricultural Research Centers (CGIAR) and the International Board for Soil Research and Management (IBSRAM), as well as regional research centres, such as the Woodland Mountain Institutes and the International Center for Integrated Mountain Development, in undertaking applied research relevant to watershed development;

(b) Promote regional cooperation and exchange of data and information among countries sharing the same mountain ranges and river basins, particularly those affected by mountain disasters and floods;

(c) Maintain and establish partnerships with non-governmental organizations and other private groups working in watershed development.

13.21 Governments at the appropriate level, with the support of the relevant international and regional organizations, should:

(b) Generate technologies for specific watershed and farm conditions through a participatory approach involving local men and women, researchers and extension agents who will carry out experiments and trials on farm conditions;

13.22 Governments at the appropriate level, with the support of the relevant international and regional organizations, should:

(a) Promote a multidisciplinary and cross-sectoral approach in training and the dissemination of knowledge to local people on a wide range of issues, such as household production systems, conservation and utilization of arable and non-arable land, treatment of drainage lines and recharging of groundwater, livestock management, fisheries, agroforestry and horticulture;

(c) Promote local awareness and preparedness for disaster prevention and mitigation, combined with the latest available technology for early warning and forecasting.

13.23 Governments at the appropriate level, with the support of the relevant international and regional organizations, should develop and strengthen national centres for watershed management to encourage a comprehensive approach to the environmental, socio-economic, technological, legislative, financial and administrative aspects and provide support to policy makers, administrators, field staff and farmers for watershed development.

13.24 The private sector and local communities, in cooperation with national Governments, should promote local infrastructure development, including communication networks, mini- or micro-hydro development to support cottage industries, and access to markets.

Chapter 14

PROMOTING SUSTAINABLE AGRICULTURE AND RURAL DEVELOPMENT

14.4 The following programme areas are included in this chapter:

(f) Water for sustainable food production and sustainable rural development;

14.53 This programme area is included in chapter 18 (Protection of the quality and supply of freshwater resources), programme area F.

Chapter 15

CONSERVATION OF BIOLOGICAL DIVERSITY

15.2 Our planet's essential goods and services depend on the variety and variability of genes, species, populations and ecosystems. Biological resources feed and clothe us and provide housing, medicines and spiritual nourishment. The natural ecosystems of forests, savannahs, pastures and rangelands, deserts, tundras, rivers, lakes and seas contain most of the Earth's biodiversity. Farmers' fields and gardens are also of great importance as repositories, while gene banks, botanical gardens, zoos and other germplasm repositories make a small but significant contribution. The current decline in biodiversity is largely the result of human activity and represents a serious threat to human development.

15.5 Governments at the appropriate levels, consistent with national policies and practices, with the cooperation of the relevant United Nations bodies and, as appropriate, intergovernmental organizations and, with the support of indigenous people and their communities, non-governmental organizations and other groups, including the business and scientific communities, and consistent with the requirements of international law, should, as appropriate:

(g) Take action where necessary for the conservation of biological diversity through the *in situ* conservation of ecosystems and natural habitats, as well as primitive cultivars and their wild relatives, and the maintenance and recovery of viable populations of species in their natural surroundings, and implement *ex situ* measures, preferably in the source country. *In situ* measures should include the reinforcement of terrestrial, marine and aquatic protected area systems and embrace, *inter alia*, vulnerable freshwater and other wetlands and coastal ecosystems, such as estuaries, coral reefs and mangroves;

Chapter 16

ENVIRONMENTALLY SOUND MANAGEMENT OF BIOTECHNOLOGY

16.1 Biotechnology is the integration of the new techniques emerging from modern biotechnology with the well-established approaches of traditional biotechnology. Biotechnology, an emerging knowledge-intensive field, is a set of enabling techniques for bringing about specific man-made changes in deoxyribonucleic acid (DNA), or genetic material, in plants, animals and microbial systems, leading to useful products and technologies. By itself, biotechnology cannot resolve all the fundamental problems of environment and development, so expectations need to be tempered by realism. Nevertheless, it promises to make a significant contribution in enabling the development of, for example, better health care, enhanced food security through sustainable agricultural practices, improved supplies of potable water, more efficient industrial development processes for transforming raw materials, support for sustainable methods of afforestation and reforestation, and detoxification of hazardous wastes. Biotechnology also offers new opportunities for global partnerships, especially between the countries rich in biological resources (which include genetic resources) but lacking the expertise and investments needed to apply such resources through biotechnology and the countries that have developed the technological expertise to transform biological resources so that they serve the needs of sustainable development. Biotechnology can assist in the conservation of those resources through, for example, *ex situ* techniques.

16.11 The improvement of human health is one of the most important objectives of development. The deterioration of environmental quality, notably air, water and soil pollution owing to toxic chemicals, hazardous wastes, radiation and other sources, is a matter of growing concern. This degradation of the environment resulting from inadequate or inappropriate development has a direct negative effect on human health. Malnutrition, poverty, poor human settlements, lack of good-quality potable water and inadequate sanitation facilities add to the problems of communicable and non-communicable diseases. As a consequence, the health and well-being of people are exposed to increasing pressures.

16.13 Governments at the appropriate level, with the assistance of international and regional organizations, academic and scientific institutions, and the pharmaceutical industry, should, taking into account appropriate safety and ethical considerations:

(d) Improve, systematically sample and evaluate drinking-water quality by introducing appropriate specific measures, including diagnosis of water-borne pathogens and pollutants;

16.20 Environmental protection is an integral component of sustainable development. The environment is threatened in all its biotic and abiotic components: animals, plants, microbes and ecosystems comprising biological diversity; water, soil and air, which form the physical components of habitats and ecosystems; and all the interactions between the components of biodiversity and their sustaining habitats and ecosystems. With the continued increase in the use of chemicals, energy and non-renewable resources by an expanding global population, associated environmental problems will also increase. Despite increasing efforts to prevent waste accumulation and to promote recycling, the amount of environmental damage caused by overconsumption, the quantities of waste generated and the degree of unsustainable land use appear likely to continue growing.

16.22 The aim of this programme is to prevent, halt and reverse environmental degradation through the appropriate use of biotechnology in conjunction with other technologies, while supporting safety procedures as an integral component of the programme. Specific objectives include the inauguration as soon as possible of specific programmes with specific targets:

(b) To promote the use of biotechnologies, with emphasis on bio-remediation of land and water, waste treatment, soil conservation, reforestation, afforestation and land rehabilitation;

16.23 Governments at the appropriate level, with the support of relevant international and regional organizations, the private sector, non-governmental organizations and academic and scientific institutions, should:

(k) Develop easily applicable technologies for the treatment of sewage and/organic waste;

Chapter 17

PROTECTION OF THE OCEANS, ALL KINDS OF SEAS, INCLUDING ENCLOSED AND SEMI-ENCLOSED SEAS, AND COASTAL AREAS AND THE PROTECTION, RATIONAL USE AND DEVELOPMENT OF THEIR LIVING RESOURCES

17.6 Each coastal State should consider establishing, or where necessary strengthening, appropriate coordinating mechanisms (such as a high-level policy planning body) for integrated management and sustainable development of coastal and marine areas and their resources, at both the local and national levels. Such mechanisms should include consultation, as appropriate, with the academic and private sectors, non-governmental organizations, local communities, resource user groups, and indigenous people. Such national coordinating mechanisms could provide, *inter alia*, for:

(a) Preparation and implementation of land and water use and siting policies;

(f) Improvement of coastal human settlements, especially in housing, drinking water and treatment and disposal of sewage, solid wastes and industrial effluents;

17.21 A precautionary and anticipatory rather than a reactive approach is necessary to prevent the degradation of the marine environment. This requires, *inter alia*, the adoption of precautionary measures, environmental impact assessments, clean production techniques, recycling, waste audits and minimization, construction and/or improvement of sewage treatment facilities, quality management criteria for the proper handling of hazardous substances, and a comprehensive approach to damaging impacts from air, land and water. Any management framework must include the improvement of coastal human settlements and the integrated management and development of coastal areas.

17.27 As concerns sewage, priority actions to be considered by States may include:

(a) Incorporating sewage concerns when formulating or reviewing coastal development plans, including human settlement plans;

(b) Building and maintaining sewage treatment facilities in accordance with national policies and capacities and international cooperation available;

(c) Locating coastal outfalls so as to maintain an acceptable level of environmental quality and to avoid exposing shell fisheries, water intakes and bathing areas to pathogens;

(d) Promoting environmentally sound co-treatments of domestic and compatible industrial effluents, with the introduction, where practicable, of controls on the entry of effluents that are not compatible with the system;

(e) Promoting primary treatment of municipal sewage discharged to rivers, estuaries and the sea, or other solutions appropriate to specific sites;

(f) Establishing and improving local, national, subregional and regional, as necessary, regulatory and monitoring programmes to control effluent discharge, using minimum sewage effluent guidelines and water quality criteria and giving due consideration to the characteristics of receiving bodies and the volume and type of pollutants.

17.28 As concerns other sources of pollution, priority actions to be considered by States may include:

(h) Cooperating in the development and implementation of environmentally sound land-use techniques and practices to reduce run-off to water-courses and estuaries which would cause pollution or degradation of the marine environment;

(j) Adopting new initiatives at national, subregional and regional levels for controlling the input of non-point source pollutants, which require broad changes in sewage and waste management, agricultural practices, mining, construction and transportation.

17.29 As concerns physical destruction of coastal and marine areas causing degradation of the marine environment, priority actions should include control and prevention of coastal erosion and siltation due to anthropogenic factors related to, *inter alia*, land-use and construction techniques and practices. Watershed management practices should be promoted so as to prevent, control and reduce degradation of the marine environment.

17.93 States, with the support of relevant intergovernmental organizations, as appropriate, should:

(d) Consider observing, as appropriate, the FAO/ICES Code of Practice for Consideration of Transfer and Introduction of Marine and Freshwater Organisms;

Chapter 18

PROTECTION OF THE QUALITY AND SUPPLY OF FRESHWATER RESOURCES: APPLICATION OF INTEGRATED APPROACHES TO THE DEVELOPMENT, MANAGEMENT AND USE OF WATER RESOURCES

INTRODUCTION

18.1 Freshwater resources are an essential component of the Earth's hydrosphere and an indispensable part of all terrestrial ecosystems. The freshwater environment is characterized by the hydrological cycle, including floods and droughts, which in some regions have become more extreme and dramatic in their consequences. Global climate change and atmospheric pollution could also have an impact on freshwater resources and their availability and, through sea-level rise, threaten low-lying coastal areas and small island ecosystems.

18.2 Water is needed in all aspects of life. The general objective is to make certain that adequate supplies of water of good quality are maintained for the entire population of this planet, while preserving the hydrological, biological and chemical functions of ecosystems, adapting human activities within the capacity limits of nature and combating vectors of water-related diseases. Innovative technologies, including the improvement of indigenous technologies, are needed to fully utilize limited water resources and to safeguard those resources against pollution.

18.3 The widespread scarcity, gradual destruction and aggravated pollution of freshwater resources in many world regions, along with the progressive encroachment of incompatible activities, demand integrated water resources planning and management. Such integration must cover all types of interrelated freshwater bodies, including both surface water and groundwater, and duly consider water quantity and quality aspects. The multisectoral nature of water resources development in the context of socio-economic development must be recognized, as well as the multi-interest utilization of water resources for water supply and sanitation, agriculture, industry, urban development, hydropower generation, inland fisheries, transportation, recreation, low and flat lands management and other activities. Rational water utilization schemes for the development of surface and underground water-supply sources and other potential sources have to be supported by concurrent water conservation and wastage minimization measures. Priority, however, must be accorded to flood prevention and control measures, as well as sedimentation control, where required.

18.4 Transboundary water resources and their use are of great importance to riparian States. In this connection, cooperation among those States may be desirable in conformity with existing agreements and/or other relevant arrangements, taking into account the interests of all riparian States concerned.

18.5 The following programme areas are proposed for the freshwater sector:

(a) Integrated water resources development and management;

(b) Water resources assessment;

(c) Protection of water resources, water quality and aquatic ecosystems;

(d) Drinking-water supply and sanitation;

(e) Water and sustainable urban development;

(f) Water for sustainable food production and rural development;

(g) Impacts of climate change on water resources.

PROGRAMME AREAS

A. Integrated water resources development and management

Basis for action

18.6 The extent to which water resources development contributes to economic productivity and social well-being is not usually appreciated, although all social and economic activities rely heavily on the supply and quality of freshwater. As populations and economic activities grow, many countries are rapidly reaching conditions of water scarcity or facing limits to economic development. Water demands are increasing rapidly, with 70-80 per cent required for irrigation, less than 20 per cent for industry and a mere 6 per cent for domestic consumption. The holistic management of freshwater as a finite and vulnerable resource, and the integration of sectoral water plans and programmes within the framework of national economic and social policy, are of paramount importance for action in the 1990s and beyond. The fragmentation of responsibilities for water resources development among sectoral agencies is proving, however, to be an even greater impediment to promoting integrated water management than had been anticipated. Effective implementation and coordination mechanisms are required.

Objectives

18.7 The overall objective is to satisfy the freshwater needs of all countries for their sustainable development.

18.8 Integrated water resources management is based on the perception of water as an integral part of the ecosystem, a natural resource and a social and economic good, whose quantity and quality determine the nature of its utilization. To this end, water resources have to be protected, taking into account the functioning of aquatic ecosystems and the perenniality of the resource, in order to satisfy and reconcile needs for water in human activities. In developing and using water resources, priority has to be given to the satisfaction of basic needs and the safeguarding of ecosystems. Beyond these requirements, however, water users should be charged appropriately.

18.9 Integrated water resources management, including the integration of land- and water-related aspects, should be carried out at the level of the catchment basin or sub-basin. Four principal objectives should be pursued, as follows:

(a) To promote a dynamic, interactive, iterative and multisectoral approach to water resources management, including the identification and protection of potential sources of freshwater supply, that integrates technological, socio-economic, environmental and human health considerations;

(b) To plan for the sustainable and rational utilization, protection, conservation and management of water resources based on community needs and priorities within the framework of national economic development policy;

(c) To design, implement and evaluate projects and programmes that are both economically efficient and socially appropriate within clearly defined strategies, based on an approach of full public participation, including that of women, youth, indigenous people and local communities in water management policy-making and decision-making;

(d) To identify and strengthen or develop, as required, in particular in developing countries, the appropriate institutional, legal and financial mechanisms to ensure that water policy and its implementation are a catalyst for sustainable social progress and economic growth.

18.10 In the case of transboundary water resources, there is a need for riparian States to formulate water resources strategies, prepare water resources action programmes and consider, where appropriate, the harmonization of those strategies and action programmes.

18.11 All States, according to their capacity and available resources, and through bilateral or multilateral cooperation, including the United Nations and other relevant organizations as appropriate, could set the following targets:

(a) By the year 2000:

(i) To have designed and initiated costed and targeted national action programmes, and to have put in place appropriate institutional structures and legal instruments;

(ii) To have established efficient water-use programmes to attain sustainable resource utilization patterns;

(b) By the year 2025:

(i) To have achieved subsectoral targets of all freshwater programme areas.

It is understood that the fulfilment of the targets quantified in (i) and (ii) above will depend upon new and additional financial resources that will be made available to developing countries in accordance with the relevant provisions of General Assembly resolution 44/228.

Activities

18.12 All States, according to their capacity and available resources, and through bilateral or multilateral cooperation, including the United Nations and other relevant organizations as appropriate, could implement the following activities to improve integrated water resources management:

(a) Formulation of costed and targeted national action plans and investment programmes;

(b) Integration of measures for the protection and conservation of potential sources of freshwater supply, including the inventorying of water resources, with land-use planning, forest resource utilization, protection of mountain slopes and riverbanks and other relevant development and conservation activities;

(c) Development of interactive databases, forecasting models, economic planning models and methods for water management and planning, including environmental impact assessment methods;

(d) Optimization of water resources allocation under physical and socio-economic constraints;

(e) Implementation of allocation decisions through demand management, pricing mechanisms and regulatory measures;

(f) Flood and drought management, including risk analysis and environmental and social impact assessment;

(g) Promotion of schemes for rational water use through public awareness-raising, educational programmes and levying of water tariffs and other economic instruments;

(h) Mobilization of water resources, particularly in arid and semi-arid areas;

(i) Promotion of international scientific research cooperation on freshwater resources;

(j) Development of new and alternative sources of water-supply such as sea-water desalination, artificial groundwater recharge, use of marginal-quality water, waste-water reuse and water recycling;

(k) Integration of water (including surface and underground water resources) quantity and quality management;

(l) Promotion of water conservation through improved water-use efficiency and wastage minimization schemes for all users, including the development of water-saving devices;

(m) Support to water-users groups to optimize local water resources management;

(n) Development of public participatory techniques and their implementation in decision-making, particularly the enhancement of the role of women in water resources planning and management;

(o) Development and strengthening, as appropriate, of cooperation, including mechanisms where appropriate, at all levels concerned, namely:

(i) At the lowest appropriate level, delegation of water resources management, generally, to such a level, in accordance with national legislation, including decentralization of government services to local authorities, private enterprises and communities;

(ii) At the national level, integrated water resources planning and management in the framework of the national planning process and, where appropriate, establishment of independent regulation and monitoring of freshwater, based on national legislation and economic measures;

(iii) At the regional level, consideration, where appropriate, of the harmonization of national strategies and action programmes;

(iv) At the global level, improved delineation of responsibilities, division of labour and coordination of international organizations and programmes, including facilitating discussions and sharing of experiences in areas related to water resources management;

(p) Dissemination of information, including operational guidelines, and promotion of education for water users, including the consideration by the United Nations of a World Water Day.

Means of implementation

(a) Financing and cost evaluation

18.13 The Conference secretariat has estimated the average total annual cost (1993-2000) of implementing the activities of this programme to be about $115 million from the international community on grant or concessional terms. These are indicative and order-of-magnitude estimates only and have not been reviewed by Governments. Actual costs and financial terms, including any that are non-concessional, will depend upon, *inter alia*, the specific strategies and programmes Governments decide upon for implementation.

(b) Scientific and technological means

18.14. The development of interactive databases, forecasting methods and economic planning models appropriate to the task of managing water resources in an efficient and sustainable manner will require the application of new techniques such as geographical information systems and expert systems to gather, assimilate, analyse and display multisectoral information and to optimize decision-making. In

addition, the development of new and alternative sources of water-supply and low-cost water technologies will require innovative applied research. This will involve the transfer, adaptation and diffusion of new techniques and technology among developing countries, as well as the development of endogenous capacity, for the purpose of being able to deal with the added dimension of integrating engineering, economic, environmental and social aspects of water resources management and predicting the effects in terms of human impact.

18.15 Pursuant to the recognition of water as a social and economic good, the various available options for charging water users (including domestic, urban, industrial and agricultural water-user groups) have to be further evaluated and field-tested. Further development is required for economic instruments that take into account opportunity costs and environmental externalities. Field studies on the willingness to pay should be conducted in rural and urban situations.

18.16 Water resources development and management should be planned in an integrated manner, taking into account long-term planning needs as well as those with narrower horizons, that is to say, they should incorporate environmental, economic and social considerations based on the principle of sustainability; include the requirements of all users as well as those relating to the prevention and mitigation of water-related hazards; and constitute an integral part of the socio-economic development planning process. A prerequisite for the sustainable management of water as a scarce vulnerable resource is the obligation to acknowledge in all planning and development its full costs. Planning considerations should reflect benefits investment, environmental protection and operation costs, as well as the opportunity costs reflecting the most valuable alternative use of water. Actual charging need not necessarily burden all beneficiaries with the consequences of those considerations. Charging mechanisms should, however, reflect as far as possible both the true cost of water when used as an economic good and the ability of the communities to pay.

18.17 The role of water as a social, economic and life-sustaining good should be reflected in demand management mechanisms and implemented through water conservation and reuse, resource assessment and financial instruments.

18.18 The setting afresh of priorities for private and public investment strategies should take into account (a) maximum utilization of existing projects, through maintenance, rehabilitation and optimal operation; (b) new or alternative clean technologies; and (c) environmentally and socially benign hydropower.

(c) Human resources development

18.19 The delegation of water resources management to the lowest appropriate level necessitates educating and training water management staff at all levels and ensuring that women participate equally in the education and training programmes. Particular emphasis has to be placed on the introduction of public participatory techniques, including enhancement of the role of women, youth, indigenous people and local communities. Skills related to various water management functions have to be developed by municipal government and water authorities, as well as in the private sector, local/national non-governmental organizations, cooperatives, corporations and other water-user groups. Education of the public regarding the importance of water and its proper management is also needed.

18.20 To implement these principles, communities need to have adequate capacities. Those who establish the framework for water development and management at any level, whether international, national or local, need to ensure that the means exist to build those capacities. The means will vary from case to case. They usually include:

(a) Awareness-creation programmes, including mobilizing commitment and support at all levels and initiating global and local action to promote such programmes;

(b) Training of water managers at all levels so that they have an appropriate understanding of all the elements necessary for their decision-making;

(c) Strengthening of training capacities in developing countries;

(d) Appropriate training of the necessary professionals, including extension workers;

(e) Improvement of career structures;

(f) Sharing of appropriate knowledge and technology, both for the collection of data and for the implementation of planned development including non-polluting technologies and the knowledge needed to extract the best performance from the existing investment system.

(d) Capacity-building

18.21 Institutional capacity for implementing integrated water management should be reviewed and developed when there is a clear demand. Existing administrative structures will often be quite capable of achieving local water resources management, but the need may arise for new institutions based upon the perspective, for example, of river catchment areas, district development councils and local community committees. Although water is managed at various levels in the socio-political system, demand-driven management requires the development of water-related institutions at appropriate levels, taking into account the need for integration with land-use management.

18.22 In creating the enabling environment for lowest-appropriate-level management, the role of Government includes mobilization of financial and human resources, legislation, standard-setting and other regulatory functions, monitoring and assessment of the use of water and land resources, and creating of opportunities for public participation. International agencies and donors have an important role to play in providing support to developing countries in creating the required enabling environment for integrated water resources management. This should include, as appropriate, donor support to local levels in developing countries, including community-based institutions, non-governmental organizations and women's groups.

B. Water resources assessment

Basis for action

18.23 Water resources assessment, including the identification of potential sources of freshwater supply, comprises the continuing determination of sources, extent, dependability and quality of water resources and of the human activities that affect those resources. Such assessment constitutes the practical basis for their sustainable management and a prerequisite for evaluation of the possibilities for their development. There is, however, growing concern that at a time when more precise and reliable information is needed about water resources, hydrologic services and related bodies are less able than before to provide this information, especially information on groundwater and water quality. Major impediments are the lack of financial resources for water resources assessment, the fragmented nature of hydrologic services and the insufficient numbers of qualified staff. At the same time, the advancing technology for data capture and management is increasingly difficult to access for developing countries. Establishment of national databases is, however, vital to water resources assessment and to mitigation of the effects of floods, droughts, desertification and pollution.

Objectives

18.24 Based upon the Mar del Plata Action Plan, this programme area has been extended into the 1990s and beyond with the overall objective of ensuring the assessment and forecasting of the quantity and quality of water resources, in order to estimate the total quantity of water resources available and their future supply potential, to determine their current quality status, to predict possible conflicts between supply and demand and to provide a scientific database for rational water resources utilization.

18.25 Five specific objectives have been set accordingly, as follows:

(a) To make available to all countries water resources assessment technology that is appropriate to their needs, irrespective of their level of development, including methods for the impact assessment of climate change on freshwaters;

(b) To have all countries, according to their financial means, allocate to water resources assessment financial resources in line with the economic and social needs for water resources data;

(c) To ensure that the assessment information is fully utilized in the development of water management policies;

(d) To have all countries establish the institutional arrangements needed to ensure the efficient collection, processing, storage, retrieval and dissemination to users of information about the quality and quantity of available water resources at the level of catchments and groundwater aquifers in an integrated manner;

(e) To have sufficient numbers of appropriately qualified and capable staff recruited and retained by water resources assessment agencies and provided with the training and retraining they will need to carry out their responsibilities successfully.

18.26 All States, according to their capacity and available resources, and through bilateral or multilateral cooperation, including cooperation with the United Nations and other relevant organizations, as appropriate, could set the following targets:

(a) By the year 2000, to have studied in detail the feasibility of installing water resources assessment services;

(b) As a long-term target, to have fully operational services available based upon high-density hydrometric networks.

Activities

18.27 All States, according to their capacity and available resources, and through bilateral or multilateral cooperation, including the United Nations and other relevant organizations as appropriate, could undertake the following activities:

(a) Institutional framework:

(i) Establish appropriate policy frameworks and national priorities;

(ii) Establish and strengthen the institutional capabilities of countries, including legislative and regulatory arrangements, that are required to ensure the adequate assessment of their water resources and the provision of flood and drought forecasting services;

(iii) Establish and maintain effective cooperation at the national level between the various agencies responsible for the collection, storage and analysis of hydrologic data;

(iv) Cooperate in the assessment of transboundary water resources, subject to the prior agreement of each riparian State concerned;

(b) Data systems:

(i) Review existing data-collection networks and assess their adequacy, including those that provide real-time data for flood and drought forecasting;

(ii) Improve networks to meet accepted guidelines for the provision of data on water quantity and quality for surface and groundwater, as well as relevant land-use data;

(iii) Apply standards and other means to ensure data compatibility;

(iv) Upgrade facilities and procedures used to store, process and analyse hydrologic data and make such data and the forecasts derived from them available to potential users;

(v) Establish databases on the availability of all types of hydrologic data at the national level;

(vi) Implement "data rescue" operations, for example, establishment of national archives of water resources;

(vii) Implement appropriate well-tried techniques for the processing of hydrologic data;

(viii) Derive area-related estimates from point hydrologic data;

(ix) Assimilate remotely sensed data and the use, where appropriate, of geographical information systems;

(c) Data dissemination:

(i) Identify the need for water resources data for various planning purposes;

(ii) Analyse and present data and information on water resources in the forms required for planning and management of countries' socio-economic development and for use in environmental protection strategies and in the design and operation of specific water-related projects;

(iii) Provide forecasts and warnings of flood and drought to the general public and civil defence;

(d) Research and development:

(i) Establish or strengthen research and development programmes at the national, subregional, regional and international levels in support of water resources assessment activities;

(ii) Monitor research and development activities to ensure that they make full use of local expertise and other local resources and that they are appropriate for the needs of the country or countries concerned.

Means of implementation

(a) Financing and cost evaluation

18.28 The Conference secretariat has estimated the everage total annual cost (1993-2000) of implementing the activities of this programme to be about $355 million, including about $145 million from the international community on grant or concessional terms. These are indicative and order-of-magnitude estimates only and have not been reviewed by Governments. Actual costs and financial terms, including any that are non-concessional will depend upon, *inter alia*, the specific strategies and programmes Governments decide upon for implementation.

(b) Scientific and technological means

18.29 Important research needs include (a) development of global hydrologic models in support of analysis of climate change impact and of macroscale water resources assessment; (b) closing of the gap between terrestrial hydrology and ecology at different scales, including the critical water-related processes behind loss of vegetation and land degradation and its restoration; and (c) study of the key processes in water-quality genesis, closing the gap between hydrologic flows and biogeochemical processes. The research models should build upon hydrologic balance studies and also include the consumptive use of water. This approach should also, when appropriate, be applied at the catchment level.

18.30 Water resources assessment necessitates the strengthening of existing systems for technology transfer, adaptation and diffusion, and the development of new technology for use under field conditions, as well as the development of endogenous capacity. Prior to inaugurating the above activities, it is necessary to prepare catalogues of the water resources information held by government

services, the private sector, educational institutes, consultants, local water-use organizations and others.

(c) Human resource development

18.31 Water resources assessment requires the establishment and maintenance of a body of well-trained and motivated staff sufficient in number to undertake the above activities. Education and training programmes designed to ensure an adequate supply of these trained personnel should be established or strengthened at the local, national, subregional or regional level. In addition, the provision of attractive terms of employment and career paths for professional and technical staff should be encouraged. Human resource needs should be monitored periodically, including all levels of employment. Plans have to be established to meet those needs through education and training opportunities and international programmes of courses and conferences.

18.32 Because well-trained people are particularly important to water resources assessment and hydrologic forecasting, personnel matters should receive special attention in this area. The aim should be to attract and retain personnel to work on water resources assessment who are sufficient in number and adequate in their level of education to ensure the effective implementation of the activities that are planned. Education may be called for at both the national and the international level, with adequate terms of employment being a national responsibility.

18.33 Recommended actions include:

(a) Identifying education and training needs geared to the specific requirements of countries;

(b) Establishing and strengthening education and training programmes on water-related topics, within an environmental and developmental context, for all categories of staff involved in water resources assessment activities, using advanced educational technology, where appropriate, and involving both men and women;

(c) Developing sound recruitment, personnel and pay policies for staff of national and local water agencies.

(d) Capacity-building

18.34 The conduct of water resources assessment on the basis of operational national hydrometric networks requires an enabling environment at all levels. The following national support action is necessary for enhanced national capacities:

(a) Review of the legislative and regulatory basis of water resources assessment;

(b) Facilitation of close collaboration among water sector agencies, particularly between information producers and users;

(c) Implementation of water management policies based upon realistic appraisals of water resources conditions and trends;

(d) Strengthening of the managerial capabilities of water-user groups, including women, youth, indigenous people and local communities, to improve water-use efficiency at the local level.

C. Protection of water resources, water quality and aquatic ecosystems

Basis for action

18.35 Freshwater is a unitary resource. Long-term development of global freshwater requires holistic management of resources and a recognition of the interconnectedness of the elements related to freshwater and freshwater quality. There are few regions of the world that are still exempt from problems of loss of potential sources of freshwater supply, degraded water quality and pollution of surface and groundwater sources. Major problems affecting the water quality of rivers and lakes arise, in variable order of importance according to different situations, from inadequately treated domestic sewage, inadequate controls on the discharges of industrial waste waters, loss and destruction of catchment areas, ill-considered siting of industrial plants, deforestation, uncontrolled shifting cultivation and poor agricultural practices. This gives rise to the leaching of nutrients and pesticides. Aquatic ecosystems are disturbed and living freshwater resources are threatened. Under certain circumstances, aquatic ecosystems are also affected by agricultural water resource development projects such as dams, river diversions, water installations and irrigation schemes. Erosion, sedimentation, deforestation and desertification have led to increased land degradation, and the creation of reservoirs has, in some cases, resulted in adverse effects on ecosystems. Many of these problems have arisen from a development model that is environmentally destructive and from a lack of public awareness and education about surface and groundwater resource protection. Ecological and human health effects are the measurable consequences, although the means to monitor them are inadequate or non-existent in many countries. There is a widespread lack of perception of the linkages between the development, management, use and treatment of water resources and aquatic ecosystems. A preventive approach, where appropriate, is crucial to the avoiding of costly subsequent measures to rehabilitate, treat and develop new water supplies.

Objectives

18.36 The complex interconnectedness of freshwater systems demands that freshwater management be holistic (taking a catchment management approach) and based on a balanced consideration of the needs of people and the environment. The Mar del Plata Action Plan has already recognized the intrinsic linkage between water resource development projects and their significant physical, chemical, biological, health and socio-economic repercussions. The overall environmental health objective was set as follows: "to evaluate the consequences which the various users of water have on the environment, to support measures aimed at controlling water-related diseases, and to protect ecosystems".

18.37 The extent and severity of contamination of unsaturated zones and aquifers have long been underestimated owing to the relative inaccessibility of aquifers and the lack of reliable information on aquifer systems. The protection of groundwater is therefore an essential element of water resource management.

18.38 Three objectives will have to be pursued concurrently to integrate water-quality elements into water resource management:

(a) Maintenance of ecosystem integrity, according to a management principle of preserving aquatic ecosystems, including living resources, and of effectively protecting them from any form of degradation on a drainage basin basis;

(b) Public health protection, a task requiring not only the provision of safe drinking-water but also the control of disease vectors in the aquatic environment;

(c) Human resources development, a key to capacity-building and a prerequisite for implementing water-quality management.

18.39 All States, according to their capacity and available resources, through bilateral or multilateral cooperation, including the United Nations and other relevant organizations as appropriate, could set the following targets:

(a) To identify the surface and groundwater resources that could be developed for use on a sustainable basis and other major developable water-dependent resources and, simultaneously, to initiate programmes for the protection, conservation and rational use of these resources on a sustainable basis;

(b) To identify all potential sources of water-supply and prepared outlines for their protection, conservation and rational use;

(c) To initiate effective water pollution prevention and control programmes, based on an appropriate mixture of pollution reduction-at-source strategies, environmental impact assessments and enforceable standards for major point-source discharges and high-risk non-point sources, commensurate with their socio-economic development;

(d) To participate, as far as appropriate, in international water-quality monitoring and management programmes such as the Global Water Quality Monitoring Programme (GEMS/WATER), the UNEP Environmentally Sound Management of Inland Waters (EMINWA), the FAO regional inland fishery bodies, and the Convention on Wetlands of International Importance Especially as Waterfowl Habitat (Ramsar Convention);

(e) To reduce the prevalence of water-associated diseases, starting with the eradication of dracunculiasis (guinea worm disease) and onchocerciasis (river blindness) by the year 2000;

(f) To establish, according to capacities and needs, biological, health, physical and chemical quality criteria for all water bodies (surface and groundwater), with a view to an ongoing improvement of water quality;

(g) To adopt an integrated approach to environmentally sustainable management of water resources, including the protection of aquatic ecosystems and freshwater living resources;

(h) To put in place strategies for the environmentally sound management of freshwaters and related coastal ecosystems, including consideration of fisheries, aquaculture, animal grazing, agricultural activities and biodiversity.

Activities

18.40 All States, according to their capacity and available resources, and through bilateral or multilateral cooperation, including United Nations and other relevant organizations as appropriate, could implement the following activities:

(a) Water resources protection and conservation:

(i) Establishment and strengthening of technical and institutional capacities to identify and protect potential sources of water-supply within all sectors of society;

(ii) Identification of potential sources of water-supply and preparation of national profiles;

(iii) Preparation of national plans for water resources protection and conservation;

(iv) Rehabilitation of important, but degraded, catchment areas, particularly on small islands;

(v) Strengthening of administrative and legislative measures to prevent encroachment on existing and potentially usable catchment areas;

(b) Water pollution prevention and control:

(i) Application of the "polluter pays" principle, where appropriate, to all kinds of sources, including on-site and off-site sanitation;

(ii) Promotion of the construction of treatment facilities for domestic sewage and industrial effluents and the development of appropriate technologies, taking into account sound traditional and indigenous practices;

(iii) Establishment of standards for the discharge of effluents and for the receiving waters;

(iv) Introduction of the precautionary approach in water-quality management, where appropriate, with a focus on pollution minimization and prevention through use of new technologies, product and process change, pollution reduction at source and effluent reuse, recycling and recovery, treatment and environmentally safe disposal;

(v) Mandatory environmental impact assessment of all major water resource development projects potentially impairing water quality and aquatic ecosystems, combined with the delineation of appropriate remedial measures and a strengthened control of new industrial installations, solid waste landfills and infrastructure development projects;

(vi) Use of risk assessment and risk management in reaching decisions in this area and ensuring compliance with those decisions;

(vii) Identification and application of best environmental practices at reasonable cost to avoid diffuse pollution, namely, through a limited, rational and planned use of nitrogenous fertilizers and other agrochemicals (pesticides, herbicides) in agricultural practices;

(viii) Encouragement and promotion of the use of adequately treated and purified waste waters in agriculture, aquaculture, industry and other sectors;

(c) Development and application of clean technology:

(i) Control of industrial waste discharges, including low-waste production technologies and water recirculation, in an integrated manner and through application of precautionary measures derived from a broad-based life-cycle analysis;

(ii) Treatment of municipal waste water for safe reuse in agriculture and aquaculture;

(iii) Development of biotechnology, *inter alia*, for waste treatment, production of biofertilizers and other activities;

(iv) Development of appropriate methods for water pollution control, taking into account sound traditional and indigenous practices;

(d) Groundwater protection:

(i) Development of agricultural practices that do not degrade groundwaters;

(ii) Application of the necessary measures to mitigate saline intrusion into aquifers of small islands and coastal plains as a consequence of sealevel rise or overexploitation of coastal aquifers;

(iii) Prevention of aquifer pollution through the regulation of toxic substances that permeate the ground and the establishment of protection zones in groundwater recharge and abstraction areas;

(iv) Design and management of landfills based upon sound hydrogeologic information and impact assessment, using the best practicable and best available technology;

(v) Promotion of measures to improve the safety and integrity of wells and well-head areas to reduce intrusion of biological pathogens and hazardous chemicals into aquifers at well sites;

(vi) Water-quality monitoring, as needed, of surface and groundwaters potentially affected by sites storing toxic and hazardous materials;

(e) Protection of aquatic ecosystems:

(i) Rehabilitation of polluted and degraded water bodies to restore aquatic habitats and ecosystems;

(ii) Rehabilitation programmes for agricultural lands and for other users, taking into account equivalent action for the protection and use of groundwater resources important for agricultural productivity and for the biodiversity of the tropics;

(iii) Conservation and protection of wetlands (owing to their ecological and habitat importance for many species), taking into account social and economic factors;

(iv) Control of noxious aquatic species that may destroy some other water species;

(f) Protection of freshwater living resources:

(i) Control and monitoring of water quality to allow for the sustainable development of inland fisheries;

(ii) Protection of ecosystems from pollution and degradation for the development of freshwater aquaculture projects;

(g) Monitoring and surveillance of water resources and waters receiving wastes:

(i) Establishment of networks for the monitoring and continuous surveillance of waters receiving wastes and of point and diffuse sources of pollution;

(ii) Promotion and extension of the application of environmental impact assessments of geographical information systems;

(iii) Surveillance of pollution sources to improve compliance with standards and regulations and to regulate the issue of discharge permits;

(iv) Monitoring of the utilization of chemicals in agriculture that may have an adverse environmental effect;

(v) Rational land use to prevent land degradation, erosion and siltation of lakes and other water bodies;

(h) Development of national and international legal instruments that may be required to protect the quality of water resources, as appropriate, particularly for:

(i) Monitoring and control of pollution and its effects in national and transboundary waters;

(ii) Control of long-range atmospheric transport of pollutants;

(iii) Control of accidental and/or deliberate spills in national and/or transboundary water bodies;

(iv) Environmental impact assessment.

Means of implementation

(a) Financing and cost evaluation

18.41 The Conference secretariat has estimated the average total cost (1993-2000) of implementing the activities of this programme to be about $1 billion, including about $340 million from the international community on grant or concessional terms. These are indicative and order-of-magnitude estimates only and have not been reviewed by Governments. Actual costs and financial terms, including any that are non-concessional, will depend upon, *inter alia*, the specific strategies and programmes Governments decide upon for implementation.

(b) Scientific and technological means

18.42 States should undertake cooperative research projects to develop solutions to technical problems that are appropriate for the conditions in each watershed or country. States should consider strengthening and developing national research centres linked through networks and supported by regional water research institutes. The North-South twinning of research centres and field studies by

international water research institutions should be actively promoted. It is important that a minimum percentage of funds for water resource development projects is allocated to research and development, particularly in externally funded projects.

18.43 Monitoring and assessment of complex aquatic systems often require multidisciplinary studies involving several institutions and scientists in a joint programme. International water-quality programmes, such as GEMS/WATER, should be oriented towards the water-quality of developing countries. User-friendly software and Geographical Information Systems (GIS) and Global Resource Information Database (GRID) methods should be developed for the handling, analysis and interpretation of monitoring data and for the preparation of management strategies.

(c) Human resource development

18.44 Innovative approaches should be adopted for professional and managerial staff training in order to cope with changing needs and challenges. Flexibility and adaptability regarding emerging water pollution issues should be developed. Training activities should be undertaken periodically at all levels within the organizations responsible for water-quality management and innovative teaching techniques adopted for specific aspects of water-quality monitoring and control, including development of training skills, in-service training, problem-solving workshops and refresher training courses.

18.45 Suitable approaches include the strengthening and improvement of the human resource capabilities of local Governments in managing water protection, treatment and use, particularly in urban areas, and the establishment of national and regional technical and engineering courses on the subjects of water-quality protection and control at existing schools and education/training courses on water resources protection and conservation for laboratory and field technicians, women and other water-user groups.

(d) Capacity-building

18.46 The effective protection of water resources and ecosystems from pollution requires considerable upgrading of most countries' present capacities. Water-quality management programmes require a certain minimum infrastructure and staff to identify and implement technical solutions and to enforce regulatory action. One of the key problems today and for the future is the sustained operation and maintenance of these facilities. In order not to allow resources gained from previous investments to deteriorate further, immediate action is required in a number of areas.

D. Drinking-water supply and sanitation

Basis for action

18.47 Safe water-supplies and environmental sanitation are vital for protecting the environment, improving health and alleviating poverty. Safe water is also crucial to many traditional and cultural activities. An estimated 80 per cent of all diseases and over one third of deaths in developing countries are caused by the consumption of contaminated water, and on average as much as one tenth of each person's productive time is sacrificed to water-related diseases. Concerted efforts during the 1980s brought water and sanitation services to hundreds of millions of the world's poorest people. The most outstanding of these efforts was the launching in 1981 of the International Drinking Water Supply and Sanitation Decade, which resulted from the Mar del Plata Action Plan adopted by the United Nations Water Conference in 1977. The commonly agreed premise was that "all peoples, whatever their stage of development and their social and economic conditions, have the right to have access to drinking water in quantities and of a quality equal to their basic needs". The target of the Decade was to provide safe drinking-water and sanitation to underserved urban and rural areas by 1990, but even the unprecedented progress achieved during the Decade was not enough. One in three people in the developing world still lacks these two most basic requirements for health and dignity. It is also recognized that human excreta and sewage are important causes of the deterioration of water-quality

in developing countries, and the introduction of available technologies, including appropriate technologies, and the construction of sewage treatment facilities could bring significant improvement.

Objectives

18.48 The New Delhi Statement (adopted at the Global Consultation on Safe Water and Sanitation for the 1990s, which was held in New Delhi from 10 to 14 September 1990) formalized the need to provide, on a sustainable basis, access to safe water in sufficient quantities and proper sanitation for all, emphasizing the "some for all rather than more for some" approach. Four guiding principles provide for the programme objectives:

(a) Protection of the environment and safeguarding of health through the integrated management of water resources and liquid and solid wastes;

(b) Institutional reforms promoting an integrated approach and including changes in procedures, attitudes and behaviour, and the full participation of women at all levels in sector institutions;

(c) Community management of services, backed by measures to strengthen local institutions in implementing and sustaining water and sanitation programmes;

(d) Sound financial practices, achieved through better management of existing assets, and widespread use of appropriate technologies.

18.49 Past experience has shown that specific targets should be set by each individual country. At the World Summit for Children, in September 1990, heads of State or Government called for both universal access to water-supply and sanitation and the eradication of guinea worm disease by 1995. Even for the more realistic target of achieving full coverage in water-supply by 2025, it is estimated that annual investments must reach double the current levels. One realistic strategy to meet present and future needs, therefore, is to develop lower-cost but adequate services that can be implemented and sustained at the community level.

Activities

18.50 All States, according to their capacity and available resources, and through bilateral or multilateral cooperation, including the United Nations and other relevant organizations as appropriate, could implement the following activities:

(a) Environment and health:

(i) Establishment of protected areas for sources of drinking-water supply;
(ii) Sanitary disposal of excreta and sewage, using appropriate systems to treat waste waters in urban and rural areas;
(iii) Expansion of urban and rural water-supply and development and expansion of rainwater catchment systems, particularly on small islands, in addition to the reticulated water-supply system; (iv) Building and expansion, where appropriate, of sewage treatment facilities and drainage systems;
(v) Treatment and safe reuse of domestic and industrial waste waters in urban and rural areas;
(vi) Control of water-associated diseases;

(b) People and institutions:

(i) Strengthening of the functioning of Governments in water resources management and, at the same time, giving of full recognition to the role of local authorities;

(ii) Encouragement of water development and management based on a participatory approach, involving users, planners and policy makers at all levels;

(iii) Application of the principle that decisions are to be taken at the lowest appropriate level, with public consultation and involvement of users in the planning and implementation of water projects;

(iv) Human resource development at all levels, including special programmes for women;

(v) Broad-based education programmes, with particular emphasis on hygiene, local management and risk reduction;

(vi) International support mechanisms for programme funding, implementation and follow-up;

(c) National and community management:

(i) Support and assistance to communities in managing their own systems on a sustainable basis;

(ii) Encouragement of the local population, especially women, youth, indigenous people and local communities, in water management;

(iii) Linkages between national water plans and community management of local waters;

(iv) Integration of community management of water within the context of overall planning;

(v) Promotion of primary health and environmental care at the local level, including training for local communities in appropriate water management techniques and primary health care;

(vi) Assistance to service agencies in becoming more cost-effective and responsive to consumer needs;

(vii) Providing of more attention to underserved rural and low-income periurban areas;

(viii) Rehabilitation of defective systems, reduction of wastage and safe reuse of water and waste water;

(ix) Programmes for rational water use and ensured operation and maintenance;

(x) Research and development of appropriate technical solutions;

(xi) Substantially increase urban treatment capacity commensurate with increasing loads;

(d) Awareness creation and public information/participation:

(i) Strengthening of sector monitoring and information management at subnational and national levels;

(ii) Annual processing, analysis and publication of monitoring results at national and local levels as a sector management and advocacy/awareness creation tool;

(iii) Use of limited sector indicators at regional and global levels to promote the sector and raise funds;

(iv) Improvement of sector coordination, planning and implementation, with the assistance of improved monitoring and information management, to increase the sector's absorptive capacity, particularly in community-based self-help projects.

Means of implementation

(a) Financing and cost evaluation

18.51 The Conference secretariat has estimated the average total annual cost (1993-2000) of implementing the activities of this programme to be about $20 billion, including about $7.4 billion from the international community on grant or concessional terms. These are indicative and order-of-magnitude estimates only and have not been reviewed by Governments. Actual costs and

financial terms, including any that are non-concessional, will depend upon, *inter alia*, the specific strategies and programmes Governments decide upon for implementation.

(b) Scientific and technological means

18.52 To ensure the feasibility, acceptability and sustainability of planned water-supply services, adopted technologies should be responsive to the needs and constraints imposed by the conditions of the community concerned. Thus, design criteria will involve technical, health, social, economic, provincial, institutional and environmental factors that determine the characteristics, magnitude and cost of the planned system. Relevant international support programmes should address the developing countries concerning, *inter alia*:

(a) Pursuit of low-cost scientific and technological means, as far as practicable;

(b) Utilization of traditional and indigenous practices, as far as practicable, to maximize and sustain local involvement;

(c) Assistance to country-level technical/scientific institutes to facilitate curricula development to support fields critical to the water and sanitation sector.

(c) Human resource development

18.53 To effectively plan and manage water-supply and sanitation at the national, provincial, district and community level, and to utilize funds most effectively, trained professional and technical staff must be developed within each country in sufficient numbers. To do this, countries must establish manpower development plans, taking into consideration present requirements and planned developments. Subsequently, the development and performance of country-level training institutions should be enhanced so that they can play a pivotal role in capacity-building. It is also important that countries provide adequate training for women in the sustainable maintenance of equipment, water resources management and environmental sanitation.

(d) Capacity-building

18.54 The implementation of water-supply and sanitation programmes is a national responsibility. To varying degrees, responsibility for the implementation of projects and the operating of systems should be delegated to all administrative levels down to the community and individual served. This also means that national authorities, together with the agencies and bodies of the United Nations system and other external support agencies providing support to national programmes, should develop mechanisms and procedures to collaborate at all levels. This is particularly important if full advantage is to be taken of community-based approaches and self-reliance as tools for sustainability. This will entail a high degree of community participation, involving women, in the conception, planning, decision-making, implementation and evaluation connected with projects for domestic water-supply and sanitation.

18.55 Overall national capacity-building at all administrative levels, involving institutional development, coordination, human resources, community participation, health and hygiene education and literacy, has to be developed according to its fundamental connection both with any efforts to improve health and socio-economic development through water-supply and sanitation and with their impact on the human environment. Capacity-building should therefore be one of the underlying keys in implementation strategies. Institutional capacity-building should be considered to have an importance equal to that of the sector supplies and equipment component so that funds can be directed to both. This can be undertaken at the planning or programme/project formulation stage, accompanied by a clear definition of objectives and targets. In this regard, technical cooperation among developing countries owing to their available wealth of information and experience and the need to avoid "reinventing the wheel", is crucial. Such a course has proved cost-effective in many country projects already.

E. Water and sustainable urban development

Basis for action

18.56 Early in the next century, more than half of the world's population will be living in urban areas. By the year 2025, that proportion will have risen to 60 per cent, comprising some 5 billion people. Rapid urban population growth and industrialization are putting severe strains on the water resources and environmental protection capabilities of many cities. Special attention needs to be given to the growing effects of urbanization on water demands and usage and to the critical role played by local and municipal authorities in managing the supply, use and overall treatment of water, particularly in developing countries for which special support is needed. Scarcity of freshwater resources and the escalating costs of developing new resources have a considerable impact on national industrial, agricultural and human settlement development and economic growth. Better management of urban water resources, including the elimination of unsustainable consumption patterns, can make a substantial contribution to the alleviation of poverty and improvement of the health and quality of life of the urban and rural poor. A high proportion of large urban agglomerations are located around estuaries and in coastal zones. Such an arrangement leads to pollution from municipal and industrial discharges combined with overexploitation of available water resources and threatens the marine environment and the supply of freshwater resources.

Objectives

18.57 The development objective of this programme is to support local and central Governments' efforts and capacities to sustain national development and productivity through environmentally sound management of water resources for urban use. Supporting this objective is the identification and implementation of strategies and actions to ensure the continued supply of affordable water for present and future needs and to reverse current trends of resource degradation and depletion.

18.58 All States, according to their capacity and available resources, and through bilateral or multilateral cooperation, including the United Nations and other relevant organizations as appropriate, could set the following targets:

(a) By the year 2000, to have ensured that all urban residents have access to at least 40 litres per capita per day of safe water and that 75 per cent of the urban population are provided with on-site or community facilities for sanitation;

(b) By the year 2000, to have established and applied quantitative and qualitative discharge standards for municipal and industrial effluents;

(c) By the year 2000, to have ensured that 75 per cent of solid waste generated in urban areas are collected and recycled or disposed of in an environmentally safe way.

Activities

18.59 All States, according to their capacity and available resources, and through bilateral or multilateral cooperation, including the United Nations and other relevant organizations as appropriate, could implement the following activities:

(a) Protection of water resources from depletion, pollution and degradation:

(i) Introduction of sanitary waste disposal facilities based on environmentally sound low-cost and upgradable technologies;
(ii) Implementation of urban storm-water run-off and drainage programmes;
(iii) Promotion of recycling and reuse of waste water and solid wastes;
(iv) Control of industrial pollution sources to protect water resources;

(v) Protection of watersheds with respect to depletion and degradation of their forest cover and from harmful upstream activities;

(vi) Promotion of research into the contribution of forests to sustainable water resources development;

(vii) Encouragement of the best management practices for the use of agrochemicals with a view to minimizing their impact on water resources;

(b) Efficient and equitable allocation of water resources:

(i) Reconciliation of city development planning with the availability and sustainability of water resources;

(ii) Satisfaction of the basic water needs of the urban population;

(iii) Introduction of water tariffs, taking into account the circumstances in each country and where affordable, that reflect the marginal and opportunity cost of water, especially for productive activities;

(c) Institutional/legal/management reforms:

(i) Adoption of a city-wide approach to the management of water resources;

(ii) Promotion at the national and local level of the elaboration of land-use plans that give due consideration to water resources development;

(iii) Utilization of the skills and potential of non-governmental organizations, the private sector and local people, taking into account the public's and strategic interests in water resources;

(d) Promotion of public participation:

(i) Initiation of public-awareness campaigns to encourage the public's move towards rational water utilization;

(ii) Sensitization of the public to the issue of protecting water quality within the urban environment;

(iii) Promotion of public participation in the collection, recycling and elimination of wastes;

(e) Support to local capacity-building:

(i) Development of legislation and policies to promote investments in urban water and waste management, reflecting the major contribution of cities to national economic development;

(ii) Provision of seed money and technical support to the local handling of materials supply and services;

(iii) Encouragement, to the extent possible, of autonomy and financial viability of city water, solid waste and sewerage utilities;

(iv) Creation and maintenance of a cadre of professionals and semi-professionals, for water, waste-water and solid waste management;

(f) Provision of enhanced access to sanitary services:

(i) Implementation of water, sanitation and waste management programmes focused on the urban poor;

(ii) Making available of low-cost water-supply and sanitation technology choices;

(iii) Basing of choice of technology and service levels on user preferences and willingness to pay;

(iv) Mobilization and facilitation of the active involvement of women in water management teams;

(v) Encouragement and equipment of local water associations and water committees to manage community water-supply systems and communal latrines, with technical back-up available when required;

(vi) Consideration of the merits and practicality of rehabilitating existing malfunctioning systems and of correcting operation and maintenance inadequacies.

Means of implementation

(a) Financing and cost evaluation

18.60 The Conference secretariat has estimated the average total annual cost (1993-2000) of implementing the activities of this programme to be about $20 billion, including about $4.5 billion from the international community on grant or concessional terms. These are indicative and order-of-magnitude estimates only and have not been reviewed by Governments. Actual costs and financial terms, including any that are non-concessional, will depend upon, *inter alia*, the specific strategies and programmes Governments decide upon for implementation.

(b) Scientific and technological means

18.61 The 1980s saw considerable progress in the development and application of low-cost water-supply and sanitation technologies. The programme envisages continuation of this work, with particular emphasis on development of appropriate sanitation and waste disposal technologies for low-income high-density urban settlements. There should also be international information exchange, to ensure a widespread recognition among sector professionals of the availability and benefits of appropriate low-cost technologies. The public-awareness campaigns will also include components to overcome user resistance to second-class services by emphasizing the benefits of reliability and sustainability.

(c) Human resource development

18.62 Implicit in virtually all elements of this programme is the need for progressive enhancement of the training and career development of personnel at all levels in sector institutions. Specific programme activities will involve the training and retention of staff with skills in community involvement, low-cost technology, financial management, and integrated planning of urban water resources management. Special provision should be made for mobilizing and facilitating the active participation of women, youth, indigenous people and local communities in water management teams and for supporting the development of water associations and water committees, with appropriate training of such personnel as treasurers, secretaries and caretakers. Special education and training programmes for women should be launched with regard to the protection of water resources and water-quality within urban areas.

(d) Capacity-building

18.63 In combination with human resource development, strengthening of institutional, legislative and management structures are key elements of the programme. A prerequisite for progress in enhancing access to water and sanitation services is the establishment of an institutional framework that ensures that the real needs and potential contributions of currently unserved populations are reflected in urban development planning. The multisectoral approach, which is a vital part of urban water resources management, requires institutional linkages at the national and city levels, and the programme includes proposals for establishing intersectoral planning groups. Proposals for greater pollution control and prevention depend for their success on the right combination of economic and regulatory mechanisms, backed by adequate monitoring and surveillance and supported by enhanced capacity to address environmental issues on the part of local Governments.

18.64 Establishment of appropriate design standards, water-quality objectives and discharge consents is therefore among the proposed activities. The programme also includes support for

strengthening the capability of water and sewerage agencies and for developing their autonomy and financial viability. Operation and maintenance of existing water and sanitation facilities have been recognized as entailing a serious shortcoming in many countries. Technical and financial support are needed to help countries correct present inadequacies and build up the capacity to operate and maintain rehabilitated and new systems.

F. Water for sustainable food production and rural development

Basis for action

18.65 Sustainability of food production increasingly depends on sound and efficient water use and conservation practices consisting primarily of irrigation development and management, including water management with respect to rain-fed areas, livestock water-supply, inland fisheries and agro-forestry. Achieving food security is a high priority in many countries, and agriculture must not only provide food for rising populations, but also save water for other uses. The challenge is to develop and apply water-saving technology and management methods and, through capacity-building, enable communities to introduce institutions and incentives for the rural population to adopt new approaches, for both rain-fed and irrigated agriculture. The rural population must also have better access to a potable water-supply and to sanitation services. It is an immense task but not an impossible one, provided appropriate policies and programmes are adopted at all levels - local, national and international. While significant expansion of the area under rain-fed agriculture has been achieved during the past decade, the productivity response and sustainability of irrigation systems have been constrained by problems of waterlogging and salinization. Financial and market constraints are also a common problem. Soil erosion, mismanagement and overexploitation of natural resources and acute competition for water have all influenced the extent of poverty, hunger and famine in the developing countries. Soil erosion caused by overgrazing of livestock is also often responsible for the siltation of lakes. Most often, the development of irrigation schemes is supported neither by environmental impact assessments identifying hydrologic consequences within watersheds of interbasin transfers, nor by the assessment of social impacts on peoples in river valleys.

18.66 The non-availability of water-supplies of suitable quality is a significant limiting factor to livestock production in many countries, and improper disposal of animal wastes can in certain circumstances result in pollution of water-supplies for both humans and animals. The drinking-water requirements of livestock vary according to species and the environment in which they are kept. It is estimated that the current global livestock drinking-water requirement is about 60 billion litres per day and based on livestock population growth estimates, this daily requirement is predicted to increase by 0.4 billion litres per annum in the foreseeable future.

18.67 Freshwater fisheries in lakes and streams are an important source of food and protein. Fisheries of inland waters should be so managed as to maximize the yield of aquatic food organisms in an environmentally sound manner. This requires the conservation of water-quality and quantity, as well as of the functional morphology of the aquatic environment. On the other hand, fishing and aquaculture may themselves damage the aquatic ecosystem; hence their development should conform to guidelines for impact limitation. Present levels of production from inland fisheries, from both fresh and brackish water, are about 7 million tons per year and could increase to 16 million tons per year by the year 2000; however, any increase in environmental stress could jeopardize this rise.

Objectives

18.68 The key strategic principles for holistic and integrated environmentally sound management of water resources in the rural context may be set forth as follows:

(a) Water should be regarded as a finite resource having an economic value with significant social and economic implications reflecting the importance of meeting basic needs;

(b) Local communities must participate in all phases of water management, ensuring the full involvement of women in view of their crucial role in the practical day-to-day supply, management and use of water;

(c) Water resource management must be developed within a comprehensive set of policies for (i) human health; (ii) food production, preservation and distribution; (iii) disaster mitigation plans; (iv) environmental protection and conservation of the natural resource base;

(d) It is necessary to recognize and actively support the role of rural populations, with particular emphasis on women.

18.69 An International Action Programme on Water and Sustainable Agricultural Development (IAP-WASAD) has been initiated by FAO in cooperation with other international organizations. The main objective of the Action Programme is to assist developing countries in planning, developing and managing water resources on an integrated basis to meet present and future needs for agricultural production, taking into account environmental considerations.

18.70 The Action Programme has developed a framework for sustainable water use in the agricultural sector and identified priority areas for action at national, regional and global levels. Quantitative targets for new irrigation development, improvement of existing irrigation schemes and reclamation of waterlogged and salinized lands through drainage for 130 developing countries are estimated on the basis of food requirements, agro-climatic zones and availability of water and land.

18.71 FAO global projections for irrigation, drainage and small-scale water programmes by the year 2000 for 130 developing countries are as follows: (a) 15.2 million hectares of new irrigation development; (b) 12 million hectares of improvement/modernization of existing schemes; (c) 7 million hectares installed with drainage and water control facilities; and (d) 10 million hectares of small-scale water programmes and conservation.

18.72 The development of new irrigation areas at the above-mentioned level may give rise to environmental concerns in so far as it implies the destruction of wetlands, water pollution, increased sedimentation and a reduction in biodiversity. Therefore, new irrigation schemes should be accompanied by an environmental impact assessment, depending upon the scale of the scheme, in case significant negative environmental impacts are expected. When considering proposals for new irrigation schemes, consideration should also be given to a more rational exploitation, and an increase in the efficiency or productivity, of any existing schemes capable of serving the same localities. Technologies for new irrigation schemes should be thoroughly evaluated, including their potential conflicts with other land uses. The active involvement of water-users groups is a supporting objective.

18.73 It should be ensured that rural communities of all countries, according to their capacities and available resources and taking advantage of international cooperation as appropriate, will have access to safe water in sufficient quantities and adequate sanitation to meet their health needs and maintain the essential qualities of their local environments.

18.74 The objectives with regard to water management for inland fisheries and aquaculture include conservation of water-quality and water-quantity requirements for optimum production and prevention of water pollution by aquacultural activities. The Action Programme seeks to assist member countries in managing the fisheries of inland waters through the promotion of sustainable management of capture fisheries as well as the development of environmentally sound approaches to intensification of aquaculture.

18.75 The objectives with regard to water management for livestock supply are twofold: provision of adequate amounts of drinking-water and safeguarding of drinking-water quality in accordance with the specific needs of different animal species. This entails maximum salinity tolerance levels and the absence of pathogenic organisms. No global targets can be set owing to large regional and intra-country variations.

Activities

18.76 All States, according to their capacity and available resources, and through bilateral or multilateral cooperation, including the United Nations and other relevant organizations as appropriate, could implement the following activities:

(a) Water-supply and sanitation for the unserved rural poor:

(i) Establish national policies and budget priorities with regard to increasing service coverage;

(ii) Promote appropriate technologies;

(iii) Introduce suitable cost-recovery mechanisms, taking into account efficiency and equity through demand management mechanisms;

(iv) Promote community ownership and rights to water-supply and sanitation facilities;

(v) Establish monitoring and evaluation systems;

(vi) Strengthen the rural water-supply and sanitation sector with emphasis on institutional development, efficient management and an appropriate framework for financing of services;

(vii) Increase hygiene education and eliminate disease transmission foci;

(viii) Adopt appropriate technologies for water treatment;

(ix) Adopt wide-scale environmental management measures to control disease vectors;

(b) Water-use efficiency:

(i) Increase of efficiency and productivity in agricultural water use for better utilization of limited water resources;

(ii) Strengthen water and soil management research under irrigation and rain-fed conditions;

(iii) Monitor and evaluate irrigation project performance to ensure, *inter alia*, the optimal utilization and proper maintenance of the project;

(iv) Support water-users groups with a view to improving management performance at the local level;

(v) Support the appropriate use of relatively brackish water for irrigation;

(c) Waterlogging, salinity control and drainage:

(i) Introduce surface drainage in rain-fed agriculture to prevent temporary waterlogging and flooding of lowlands;

(ii) Introduce artificial drainage in irrigated and rain-fed agriculture;

(iii) Encourage conjunctive use of surface and groundwaters, including monitoring and water-balance studies;

(iv) Practise drainage in irrigated areas of arid and semi-arid regions;

(d) Water-quality management:

(i) Establish and operate cost-effective water-quality monitoring systems for agricultural water uses;

(ii) Prevent adverse effects of agricultural activities on water-quality for other social and economic activities and on wetlands, *inter alia*, through optimal use of on-farm input and the minimization of the use of external input in agricultural activities;

(iii) Establish biological, physical and chemical water-quality criteria for agricultural water-users and for marine and riverine ecosystems;

(iv) Minimize soil run-off and sedimentation;

(v) Dispose properly of sewage from human settlements and of manure produced by intensive livestock breeding;

(vi) Minimize adverse effects from agricultural chemicals by use of integrated pest management;

(vii) Educate communities about the pollution-related impacts of the use of fertilizers and chemicals on water-quality, food safety and human health;

(e) Water resources development programmes:

(i) Develop small-scale irrigation and water-supply for humans and livestock and for water and soil conservation;

(ii) Formulate large-scale and long-term irrigation development programmes, taking into account their effects on the local level, the economy and the environment;

(iii) Promote local initiatives for the integrated development and management of water resources;

(iv) Provide adequate technical advice and support and enhancement of institutional collaboration at the local community level;

(v) Promote a farming approach for land and water management that takes account of the level of education, the capacity to mobilize local communities and the ecosystem requirements of arid and semi-arid regions;

(vi) Plan and develop multi-purpose hydroelectric power schemes, making sure that environmental concerns are duly taken into account;

(f) Scarce water resources management:

(i) Develop long-term strategies and practical implementation programmes for agricultural water use under scarcity conditions with competing demands for water;

(ii) Recognize water as a social, economic and strategic good in irrigation planning and management;

(iii) Formulate specialized programmes focused on drought preparedness, with emphasis on food scarcity and environmental safeguards;

(iv) Promote and enhance waste-water reuse in agriculture;

(g) Water-supply for livestock:

(i) Improve quality of water available to livestock, taking into account their tolerance limits;

(ii) Increase the quantity of water sources available to livestock, in particular those in extensive grazing systems, in order to both reduce the distance needed to travel for water and to prevent overgrazing around water sources;

(iii) Prevent contamination of water sources with animal excrement in order to prevent the spread of diseases, in particular zoonosis;

(iv) Encourage multiple use of water-supplies through promotion of integrated agro-livestock-fishery systems;

(v) Encourage water spreading schemes for increasing water retention of extensive grasslands to stimulate forage production and prevent run-off;

(h) Inland fisheries:

(i) Develop the sustainable management of fisheries as part of national water resources planning;

(ii) Study specific aspects of the hydrobiology and environmental requirements of key inland fish species in relation to varying water regimes;

(iii) Prevent or mitigate modification of aquatic environments by other users or rehabilitate environments subjected to such modification on behalf of the sustainable use and conservation of biological diversity of living aquatic resources;

(iv) Develop and disseminate environmentally sound water resources development and management methodologies for the intensification of fish yield from inland waters;

(v) Establish and maintain adequate systems for the collection and interpretation of data on water quality and quantity and channel morphology related to the state and management of living aquatic resources, including fisheries;

(i) Aquaculture development:

(i) Develop environmentally sound aquaculture technologies that are compatible with local, regional and national water resources management plans and take into consideration social factors;

(ii) Introduce appropriate aquaculture techniques and related water development and management practices in countries not yet experienced in aquaculture;

(iii) Assess environmental impacts of aquaculture with specific reference to commercialized culture units and potential water pollution from processing centres;

(iv) Evaluate economic feasibility of aquaculture in relation to alternative use of water, taking into consideration the use of marginal-quality water and investment and operational requirements.

Means of implementation

(a) Financing and cost evaluation

18.77 The Conference secretariat has estimated the average total annual cost (1993-2000) of implementing the activities of this programme to be about $13.2 billion, including about $4.5 billion from the international community on grant or concessional terms. These are indicative and order-of-magnitude estimates only and have not been reviewed by Governments. Actual costs and financial terms, including any that are non-concessional, will depend upon, *inter alia*, the specific strategies and programmes Governments decide upon for implementation.

(b) Scientific and technological means

18.78 There is an urgent need for countries to monitor water resources and water-quality, water and land use and crop production; compile inventories of type and extent of agricultural water development and of present and future contributions to sustainable agricultural development; evaluate the potential for fisheries and aquaculture development; and improve the availability and dissemination of data to planners, technicians, farmers and fishermen. Priority requirements for research are as follows:

(a) Identification of critical areas for water-related adaptive research;

(b) Strengthening of the adaptive research capacities of institutions in developing countries;

(c) Enhancement of translation of water-related farming and fishing systems research results into practical and accessible technologies and provision of the support needed for their rapid adoption at the field level.

18.79 Transfer of technology, both horizontal and vertical, needs to be strengthened. Mechanisms to provide credit, input supplies, markets, appropriate pricing and transportation must be developed jointly by countries and external support agencies. Integrated rural water-supply infrastructure, including facilities for water-related education and training and support services for agriculture, should be expanded for multiple uses and should assist in developing the rural economy.

(c) Human resource development

18.80 Education and training of human resources should be actively pursued at the national level through: (a) assessment of current and long-term human resources management and training needs;

(b) establishment of a national policy for human resources development; and (c) initiation and implementation of training programmes for staff at all levels as well as for farmers. The necessary actions are as follows:

(a) Assess training needs for agricultural water management;

(b) Increase formal and informal training activities;

(c) Develop practical training courses for improving the ability of extension services to disseminate technologies and strengthen farmers' capabilities, with special reference to small-scale producers;

(d) Train staff at all levels, including farmers, fishermen and members of local communities, with particular reference to women;

(e) Increase the opportunities for career development to enhance the capabilities of administrators and officers at all levels involved in land- and water-management programmes.

(d) Capacity-building

18.81 The importance of a functional and coherent institutional framework at the national level to promote water and sustainable agricultural development has generally been fully recognized at present. In addition, an adequate legal framework of rules and regulations should be in place to facilitate actions on agricultural water-use, drainage, water-quality management, small-scale water programmes and the functioning of water-users' and fishermen's associations. Legislation specific to the needs of the agricultural water sector should be consistent with, and stem from, general legislation for the management of water resources. Actions should be pursued in the following areas:

(a) Improvement of water-use policies related to agriculture, fisheries and rural development and of legal frameworks for implementing such policies;

(b) Review, strengthening and restructuring, if required, of existing institutions in order to enhance their capacities in water-related activities, while recognizing the need to manage water resources at the lowest appropriate level;

(c) Review and strengthening, where necessary, of organizational structure, functional relationships and linkages among ministries and departments within a given ministry;

(d) Provision of specific measures that require support for institutional strengthening, *inter alia*, through long-term programme budgeting, staff training, incentives, mobility, equipment and coordination mechanisms;

(e) Enhancement of involvement of the private sector, where appropriate, in human resource development and provision of infrastructure;

(f) Transfer of existing and new water-use technologies by creating mechanisms for cooperation and information exchange among national and regional institutions.

G. Impacts of climate change on water resources

Basis for action

18.82 There is uncertainty with respect to the prediction of climate change at the global level. Although the uncertainties increase greatly at the regional, national and local levels, it is at the national level that the most important decisions would need to be made. Higher temperatures and decreased

precipitation would lead to decreased water-supplies and increased water demands; they might cause deterioration in the quality of freshwater bodies, putting strains on the already fragile balance between supply and demand in many countries. Even where precipitation might increase, there is no guarantee that it would occur at the time of year when it could be used; in addition, there might be a likelihood of increased flooding. Any rise in sealevel will often cause the intrusion of salt water into estuaries, small islands and coastal aquifers and the flooding of low-lying coastal areas; this puts low-lying countries at great risk.

18.83 The Ministerial Declaration of the Second World Climate Conference states that "the potential impact of such climate change could pose an environmental threat of an up to now unknown magnitude ... and could even threaten survival in some small island States and in low-lying coastal, arid and semi-arid areas". The Conference recognized that among the most important impacts of climate change were its effects on the hydrologic cycle and on water management systems and, through these, on socio-economic systems. Increase in incidence of extremes, such as floods and droughts, would cause increased frequency and severity of disasters. The Conference therefore called for a strengthening of the necessary research and monitoring programmes and the exchange of relevant data and information, these actions to be undertaken at the national, regional and international levels.

Objectives

18.84 The very nature of this topic calls first and foremost for more information about and greater understanding of the threat being faced. This topic may be translated into the following objectives, consistent with the United Nations Framework Convention on Climate Change:

(a) To understand and quantify the threat of the impact of climate change on freshwater resources;

(b) To facilitate the implementation of effective national countermeasures, as and when the threatening impact is seen as sufficiently confirmed to justify such action;

(c) To study the potential impacts of climate change on areas prone to droughts and floods.

Activities

18.85 All States, according to their capacity and available resources, and through bilateral or multilateral cooperation, including the United Nations and other relevant organizations as appropriate, could implement the following activities:

(a) Monitor the hydrologic regime, including soil moisture, groundwater balance, penetration and transpiration of water-quality, and related climate factors, especially in the regions and countries most likely to suffer from the adverse effects of climate change and where the localities vulnerable to these effects should therefore be defined;

(b) Develop and apply techniques and methodologies for assessing the potential adverse effects of climate change, through changes in temperature, precipitation and sealevel rise, on freshwater resources and the flood risk;

(c) Initiate case-studies to establish whether there are linkages between climate changes and the current occurrences of droughts and floods in certain regions;

(d) Assess the resulting social, economic and environmental impacts;

(e) Develop and initiate response strategies to counter the adverse effects that are identified, including changing groundwater levels and to mitigate saline intrusion into aquifers;

(f) Develop agricultural activities based on brackish-water use;

(g) Contribute to the research activities under way within the framework of current international programmes.

Means of implementation

(a) Financing and cost evaluation

18.86 The Conference secretariat has estimated the average total annual cost (1993-2000) of implementing the activities of this programme to be about $100 million, including about $40 million from the international community on grant or concessional terms. These are indicative and order-of-magnitude estimates only and have not been reviewed by Governments. Actual costs and financial terms, including any that are non-concessional, will depend upon, *inter alia*, the specific strategies and programmes Governments decide upon for implementation.

(b) Scientific and technological means

18.87 Monitoring of climate change and its impact on freshwater bodies must be closely integrated with national and international programmes for monitoring the environment, in particular those concerned with the atmosphere, as discussed under other sections of Agenda 21, and the hydrosphere, as discussed under programme area B above. The analysis of data for indication of climate change as a basis for developing remedial measures is a complex task. Extensive research is necessary in this area and due account has to be taken of the work of the Intergovernmental Panel on Climate Change (IPCC), the World Climate Programme, the International Geosphere-Biosphere Programme (IGBP) and other relevant international programmes.

18.88 The development and implementation of response strategies requires innovative use of technological means and engineering solutions, including the installation of flood and drought warning systems and the construction of new water resource development projects such as dams, aqueducts, well fields, waste-water treatment plants, desalination works, levees, banks and drainage channels. There is also a need for coordinated research networks such as the International Geosphere-Biosphere Programme/Global Change System for Analysis, Research and Training (IGBP/START) network.

(c) Human resource development

18.89 The developmental work and innovation depend for their success on good academic training and staff motivation. International projects can help by enumerating alternatives, but each country needs to establish and implement the necessary policies and to develop its own expertise in the scientific and engineering challenges to be faced, as well as a body of dedicated individuals who are able to interpret the complex issues concerned for those required to make policy decisions. Such specialized personnel need to be trained, hired and retained in service, so that they may serve their countries in these tasks.

(d) Capacity-building

18.90 There is a need, however, to build a capacity at the national level to develop, review and implement response strategies. Construction of major engineering works and installation of forecasting systems will require significant strengthening of the agencies responsible, whether in the public or the private sector. Most critical is the requirement for a socio-economic mechanism that can review predictions of the impact of climate change and possible response strategies and make the necessary judgements and decisions.

Chapter 19

ENVIRONMENTALLY SOUND MANAGEMENT OF TOXIC CHEMICALS, INCLUDING PREVENTION OF ILLEGAL INTERNATIONAL TRAFFIC IN TOXIC AND DANGEROUS PRODUCTS

19.44 There are often alternatives to toxic chemicals currently in use. Thus, risk reduction can sometimes be achieved by using other chemicals or even non-chemical technologies. The classic example of risk reduction is the substitution of harmless or less harmful substances for harmful ones. Establishment of pollution prevention procedures and setting standards for chemicals in each environmental medium, including food and water, and in consumer goods, constitute another example of risk reduction. In a wider context, risk reduction involves broad-based approaches to reducing the risks of toxic chemicals, taking into account the entire life cycle of the chemicals. Such approaches could encompass both regulatory and non-regulatory measures, such as promotion of the use of cleaner products and technologies, pollution prevention procedures and programmes, emission inventories, product labelling, use limitations, economic incentives, procedures for safe handling and exposure regulations, and the phasing out or banning of chemicals that pose unreasonable and otherwise unmanageable risks to human health and the environment and of those that are toxic, persistent and bio-accumulative and whose use cannot be adequately controlled.

Chapter 21

ENVIRONMENTALLY SOUND MANAGEMENT OF SOLID WASTES AND SEWAGE-RELATED ISSUES

21.20 Information and research is required to identify promising socially acceptable and cost-effective forms of waste reuse and recycling relevant to each country. For example, supporting activities undertaken by national and local governments in collaboration with the United Nations and other international organizations could include:

(c) Increasing funding for research pilot programmes to test various options for reuse and recycling, including the use of small-scale, cottage-based recycling industries; compost production; treated waste-water irrigation; and energy recovery from wastes;

21.25 Training will be required to reorient current waste management practices to include waste reuse and recycling. Governments, in collaboration with United Nations international and regional organizations, should undertake the following indicative list of actions:

(b) Expanding training programmes on water supply and sanitation to incorporate techniques and policies for waste reuse and recycling;

21.29 Governments, according to their capacities and available resources and with the cooperation of the United Nations and other relevant organizations, as appropriate, should:

(c) By the year 1995, in industrialized countries, and by the year 2005, in developing countries, ensure that at least 50 per cent of all sewage, waste waters and solid wastes are treated or disposed of in conformity with national or international environmental and health quality guidelines;

(d) By the year 2025, dispose of all sewage, waste waters and solid wastes in conformity with national or international environmental quality guidelines.

21.35 Scientific guidelines and research on various aspects of waste-related pollution control will be crucial for achieving the objectives of this programme. Governments, municipalities and local authorities, with appropriate international cooperation, should:

(b) Undertake research on critical subjects such as low-cost, low-maintenance waste-water treatment systems; safe sludge disposal options; industrial waste treatment; and low-technology, ecologically safe waste disposal options;

(f) Ensure the investment and provision of waste collection facilities with the concomitant provision of water services and with an equal and parallel investment and provision of waste treatment facilities.

21.38 By the end of the century, over 2.0 billion people will be without access to basic sanitation, and an estimated half of the urban population in developing countries will be without adequate solid waste disposal services. As many as 5.2 million people, including 4 million children under five years of age, die each year from waste-related diseases. The health impacts are particularly severe for the urban poor. The health and environmental impacts of inadequate waste management, however, go beyond the unserved settlements themselves and result in water, land and air contamination and pollution over a wider area. Extending and improving waste collection and safe disposal services are crucial to gaining control over this form of pollution.

21.39 The overall objective of this programme is to provide health-protecting, environmentally safe waste collection and disposal services to all people. Governments, according to their capacities and available resources and with the cooperation of the United Nations and other relevant organizations, as appropriate, should:

(c) By the year 2025, ensure that full urban waste service coverage is maintained and sanitation coverage achieved in all rural areas.

21.42 Many United Nations and bilateral programmes exist that seek to provide water supply and sanitation services to the unserved. The Water and Sanitation Collaborative Council, a global forum, currently acts to coordinate development and encourage cooperation. Even so, given the ever-increasing numbers of unserved urban poor populations and the need to address, in addition, the problem of solid waste disposal, additional mechanisms are essential to ensure accelerated coverage of urban waste disposal services. The international community in general and selected United Nations organizations in particular should:

21.45 Policy changes at the national and local levels could enhance the rate of waste service coverage extension. These changes should include the following:

(c) Integrating the provision and maintenance of waste management services with other basic services such as water-supply and storm-water drainage.

SECTION III STRENGTHENING THE ROLE OF MAJOR GROUPS

Chapter 24

GLOBAL ACTION FOR WOMEN TOWARDS SUSTAINABLE AND EQUITABLE DEVELOPMENT

24.3 Governments should take active steps to implement the following:

(d) Programmes to promote the reduction of the heavy workload of women and girl children at home and outside through the establishment of more and affordable nurseries and kindergartens by Governments, local authorities, employers and other relevant organizations and the sharing of household tasks by men and women on an equal basis, and to promote the provision of environmentally sound technologies which have been designed, developed and improved in consultation with women, accessible and clean water, an efficient fuel supply and adequate sanitation facilities;

24.6 Countries should take urgent measures to avert the ongoing rapid environmental and economic degradation in developing countries that generally affects the lives of women and children in rural areas suffering drought, desertification and deforestation, armed hostilities, natural disasters, toxic waste and the aftermath of the use of unsuitable agro-chemical products.

24.8 Countries should develop gender-sensitive databases, information systems and participatory action-oriented research and policy analyses with the collaboration of academic institutions and local women researchers on the following:

(c) The impact on women of environmental degradation, particularly drought, desertification, toxic chemicals and armed hostilities;

Chapter 32

STRENGTHENING THE ROLE OF FARMERS

32.7 National Governments should:

(a) Ensure the implementation of the programmes on sustainable livelihoods, agriculture and rural development, managing fragile ecosystems, water use in agriculture, and integrated management of natural resources;

32.9 Governments and farmers' organizations should:

(b) Establish networks for the exchange of experiences with regard to farming that help to conserve land, water and forest resources, minimize the use of chemicals and reduce or reutilize farm wastes;

32.13 Governments and appropriate international organizations, in collaboration with national research organizations and non-governmental organizations should, as appropriate:

(a) Develop environmentally sound farming technologies that enhance crop yields, maintain land quality, recycle nutrients, conserve water and energy and control pests and weeds;

Chapter 35

SCIENCE FOR SUSTAINABLE DEVELOPMENT

35.2 Scientists are improving their understanding in areas such as climatic change, growth in rates of resource consumption, demographic trends, and environmental degradation. Changes in those and other areas need to be taken into account in working out long-term strategies for development. A first step towards improving the scientific basis for these strategies is a better understanding of land, oceans, atmosphere and their interlocking water, nutrient and biogeochemical cycles and energy flows which all form part of the Earth system. This is essential if a more accurate estimate is to be provided of the carrying capacity of the planet Earth and of its resilience under the many stresses placed upon it by human activities. The sciences can provide this understanding through increased research into the underlying ecological processes and through the application of modern, effective and efficient tools that are now available, such as remote-sensing devices, robotic monitoring instruments and computing and modelling capabilities. The sciences are playing an important role in linking the fundamental significance of the Earth system as life support to appropriate strategies for development which build on its continued functioning. The sciences should continue to play an increasing role in providing for an improvement in the efficiency of resource utilization and in finding new development practices, resources, and alternatives. There is a need for the sciences constantly to reassess and promote less intensive trends in resource utilization, including less intensive utilization of energy in industry, agriculture, and transportation. Thus, the sciences are increasingly being understood as an essential component in the search for feasible pathways towards sustainable development.

35.10 In order to promote sustainable development, more extensive knowledge is required of the Earth's carrying capacity, including the processes that could either impair or enhance its ability to support life. The global environment is changing more rapidly than at any time in recent centuries; as a result, surprises may be expected, and the next century could see significant environmental changes. At the same time, the human consumption of energy, water and non-renewable resources is increasing, on both a total and a per capita basis, and shortages may ensue in many parts of the world even if environmental conditions were to remain unchanged. Social processes are subject to multiple variations across time and space, regions and culture. They both affect and are influenced by changing environmental conditions. Human factors are key driving forces in these intricate sets of relationships and exert their influence directly on global change. Therefore, study of the human dimensions of the causes and consequences of environmental change and of more sustainable development paths is essential.

35.11 One key objective is to improve and increase the fundamental understanding of the linkages between human and natural environmental systems and improve the analytical and predictive tools required to better understand the environmental impacts of development options by:

(a) Carrying out research programmes in order better to understand the carrying capacity of the Earth as conditioned by its natural systems, such as the biogeochemical cycles, the atmosphere hydrosphere lithosphere cryosphere system, the biosphere and biodiversity, the agro-ecosystem and other terrestrial and aquatic ecosystems;

35.12 The following activities should be undertaken:

(a) Support development of an expanded monitoring network to describe cycles (for example, global, biogeochemical and hydrological cycles) and test hypotheses regarding their behaviour, and improve research into the interactions among the various global cycles and their

consequences at national, subregional, regional and global levels as guides to tolerance and vulnerability;

(e) Develop the capacity for predicting the responses of terrestrial, freshwater, coastal and marine ecosystems and biodiversity to short- and long-term perturbations of the environment, and develop further restoration ecology;

(g) Initiate a global observing system of parameters needed for the rational management of coastal and mountain zones and significantly expand freshwater quantity quality monitoring systems, particularly in developing countries;

(h) In order to understand the Earth as a system, develop Earth observation systems from space which will provide integrated, continuous and long-term measurements of the interactions of the atmosphere, hydrosphere and lithosphere, and develop a distribution system for data which will facilitate the utilization of data obtained through observation;

Chapter 36

PROMOTING EDUCATION, PUBLIC AWARENESS AND TRAINING

36.5 Recognizing that countries and regional and international organizations will develop their own priorities and schedules for implementation in accordance with their needs, policies and programmes, the following activities are proposed:

(e) Relevant authorities should ensure that every school is assisted in designing environmental activity work plans, with the participation of students and staff. Schools should involve schoolchildren in local and regional studies on environmental health, including safe drinking water, sanitation and food and ecosystems and in relevant activities, linking these studies with services and research in national parks, wildlife reserves, ecological heritage sites etc.;

Chapter 38

INTERNATIONAL INSTITUTIONAL ARRANGEMENTS

38.27 The role of the United Nations Sudano-Sahelian Office (UNSO), with added resources that may become available, operating under the umbrella of UNDP and with the support of UNEP, should be strengthened so that it can assume an appropriate major advisory role and participate effectively in the implementation of Agenda 21 provisions related to combating drought and desertification and to land resource management. In this context, the experience gained could be used by all other countries affected by drought and desertification, in particular those in Africa, with special attention to countries most affected or classified as least developed countries.

38.34 Regional and subregional organizations should play a major role in the implementation of the provisions of Agenda 21 related to combating drought and desertification. UNEP, UNDP and UNSO should assist and cooperate with those relevant organizations.

Chapter 40

INFORMATION FOR DECISION-MAKING

40.8 Countries and, upon request, international organizations should carry out inventories of environmental, resource and developmental data, based on national global priorities for the management of sustainable development. They should determine the gaps and organize activities to fill those gaps. Within the organs and organizations of the United Nations system and relevant international organizations, data-collection activities, including those of Earthwatch and World Weather Watch, need to be strengthened, especially in the areas of urban air, freshwater, land resources (including forests and rangelands), desertification, other habitats, soil degradation, biodiversity, the high seas and the upper atmosphere. Countries and international organizations should make use of new techniques of data collection, including satellite-based remote sensing. In addition to the strengthening of existing development-related data collection, special attention needs to be paid to such areas as demographic factors, urbanization, poverty, health and rights of access to resources, as well as special groups, including women, indigenous peoples, youth, children and the disabled, and their relationships with environment issues.

ROUND TABLE

on Water and Health *in underprivileged urban areas*

THE SOPHIA ANTIPOLIS RECOMMENDATIONS

February 21st-23rd, 1994

SOPHIA ANTIPOLIS, FRANCE

THE SOPHIA ANTIPOLIS RECOMMENDATIONS

Given the rapid increase of underprivileged populations in the periphery of large urban settlements in the developing countries and the countries in transition, the question of access to wholesome water requires high priority in view of its impact on the health, and often even the survival, of these populations, particularly the children.

Examining this issue in light of concrete experiences presented by some one hundred participants from all regions of the world, the Round Table has emphasized the following principles and the annexed conclusions of the four workshops. These principles should serve to guide the actions of the responsible authorities at all levels, as well as of donor agencies, and should be examined by those institutions in charge of the implementation of the environmental and sustainable development programmes following the guidelines of Agenda 21 adopted at the Earth Summit (Rio 1992), in particular by the Ministerial Conference in Noordwijk and the United Nations Commission on Sustainable Development.

1◆ ALL HUMAN BEINGS, REGARDLESS OF THEIR LIVING CONDITIONS OR RESOURCES, HAVE AN INALIENABLE RIGHT TO DRINK WHOLESOME WATER.

2◆ The satisfaction of the fundamental needs of the populations of underprivileged urban areas, for drinking water and sanitation must be integrated with the public health and urban development policies implemented by the public authorities.

3◆ Only the determined commitment of Governments and the active participation of citizens can help solving these urgent issues. To achieve this, a major communication and awareness-building effort must be undertaken very soon.

4◆ In order to combat exclusion, access to drinking water and sanitation needs to be underwritten by legal rights and duties to guarantee both a fair distribution of this scarce resource, of the benefit of the investments and of the burdan of their financing and the proper maintenance of the installations.

5◆ The economic value of water must take into account value in use. The lasting nature of investments in the water and sanitation sector requires that the beneficiaries should meet the corresponding costs. Redistribution mechanisms between the different strata of urban populations are needed. Some degree of subsidy may however be required.

6◆ In order to maximize the achievement of health goals, water supply and sanitation must be part of an approach, which is integrated, realistic and participatory.

7◆ Services offered must cover basic needs while ensuring satisfactory health protection.

8◆ Solutions to the issues discussed must take into account an evolutionary context, characterized by greater decentralization and increased responsibilities for the local agents : municipalities, service providers, public and private firms, both large and small, community leaders, both men and women, as well as NGOs. This new sharing of tasks must not relieve the state of its general and regulatory responsibilities.

9◆ Partnerships linking these agents constitute an essential instrument for equitable access to wholesome water and to sanitation for all components of the population of underprivileged urban areas. The relationship between them and the definition of their respective functions must be clarified and organized, so possibly in the form of agreements, as to take into account the social and cultural context of each region.

10◆ Technical solutions should not be considered as a starting point but as the result of a process integrating other social, environmental, cultural, economic and institutional dimensions involving all the agents.

11◆ Coordination, training and information must accompany the identification and implementation of adaptable technologies.

12◆ Signifiant efforts are needed, involving a truly participatory approach, in the fields of evaluation, research and the production and dissemination of qualitatively satisfactory basic data, particularly in Southern countries.

13◆ The current tendency of donor agencies to give priority to the financing of heavy equipment in the center of cities must be rebalanced in favor of peripheral areas and smaller towns. Supplementary financing in significant amounts has to be mobilized in order to meet the needs of the poorest and to generate sustainable development.

14◆ As far as concerns the forms which international cooperation can take, it is helpful to encourage more partnerships between local authorities, professional organizations and non-governmental organizations. These partnerships complement intergovernmental cooperation and give it a dimension which is extremely close to the concerns of the citizens of the communities of the South and East.

TRANSLATION FINALIZED BY THE MINISTRY OF FOREIGN AFFAIRS.

Ministerial Conference
on Drinking Water
and Environmental Sanitation

March / March
22nd / 23rd

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IMPLEMENTING INFRA SERVICES

Ministerial Conference

on Drinking Water and Environmental Sanitation

Implementing UNCED Agenda 21

22 and 23 March 1994,

Noordwijk, The Netherlands

Political Statement

Action Programme

MINISTERIAL CONFERENCE ON DRINKING WATER AND ENVIRONMENTAL SANITATION - Implementing UNCED Agenda 21

22 and 23 March 1994, Noordwijk, the Netherlands

We, the Ministers[1], meeting at Noordwijk, the Netherlands, on 22 and 23 March 1994, for the Ministerial Conference on Drinking Water and Environmental Sanitation, having reviewed and discussed the issue, on the basis of the documentation for the Conference as listed in Annex 2,

1. REAFFIRM THAT:

Our task is to find ways to help our governments to implement Chapter 18 of Agenda 21.

1.1 In that context, we stress the need for integrated water resources management. Chapter 18 calls for:

- holistic management of freshwater as a finite and vulnerable resource and integration of sectoral water plans and programmes within the framework of national economic and social policy; and
- perception of water as an integral part of the ecosystem, a natural resource and a social and economic good, whose quantity and quality determine the nature of its utilization.

1.2 In the particular context of drinking water and environmental sanitation, we draw attention to Chapter 18's affirmation of the need, identified at the Global Consultation on Safe Water and Sanitation for the 1990's, in New Delhi in 1990, to provide, on a sustainable basis, access to safe water in sufficient quantities and proper sanitation, emphasizing the approach of "some for all rather than more for some". Chapter 18 commits governments to New Delhi's four guiding principles:

- protection of the environment and safeguarding of health through the integrated management of water resources and liquid and solid wastes;
- institutional reforms promoting an integrated approach and including changes in procedures, attitudes and behaviour, and the full participation of women at all levels in sector institutions;
- community management of services, backed by measures to strengthen local institutions in implementing and sustaining water and sanitation programmes;
- sound financial practices, achieved through better management of existing assets, and widespread use of appropriate technologies.

[1] For the list of countries and organisations represented at the Conference see Annex 1.

1.3 As mechanisms to implement programmes based on these principles, Chapter 18 stresses the need to:

- build capacities, at all administrative levels, involving institutional development, co-ordination, human resources, community participation, health and hygiene education and literacy, which is one of the underlying keys in implementing strategies;
- identify means of financing the substantial costs involved;
- adopt technologies that are responsive to the needs, and constraints imposed by conditions of, the community concerned.

2. RECOGNIZE THAT:

Many countries face a water crisis

2.1 Explosive growth of urban centres, unsustainable exploitation of natural resources, uncontrolled industrialization, increasing water demand for food production, and expanding populations lacking proper environmental sanitation have led to progressive depletion and degradation of freshwater resources. Many current patterns of water use are not sustainable. Rising costs of developing ever-more-distant freshwater resources threaten economic development, while both the visible and the less visible effects of reckless waste disposal and inadequate environmental sanitation spread squalor, disease and death. Water scarcity, and the tensions which it engenders, especially in competing claims to transboundary resources, are a potential threat to peace.

2.2 The rapid deterioration of water quality and the reduced availability of fresh water is directly affected by natural processes and human activities. To safeguard the sustainable supply of safe drinking water and entire watersheds, concerted action is needed on all fronts, including agriculture, forestry, transport, industry, urban and spatial planning, population planning and electricity generation. Although cities are increasingly recognized as places of social progress and economic growth, millions of urban residents lack access to safe water and adequate sanitation. There is an acute need to extend sustainable water and sanitation coverage to the urban poor. Many countries also have large rural populations and efforts to extend service to the rural poor should be continued.

To satisfy, at least basic needs for water and sanitation, the crisis can and must be resolved.

2.3 The commitments made by Governments in Chapter 18 of Agenda 21 offer new hope to the many millions of their citizens who suffer intolerable levels of disease, squalor and indignity because they lack access to a safe supply of drinking water and adequate means of sanitation. The average global death toll of six thousand children every day due to lack of safe water and environmental sanitation is a tragic reminder of the urgent need to turn the Rio and World Summit for Children commitments of Heads of States into positive and concerted action.

2.4 The long-term objective continues to be 'safe drinking water supply and sanitation for all'. Access to adequate water and sanitation is a basic need which has to be met. It needs to be accompanied by an obligation to use water efficiently and to dispose of wastes in an environmentally sound manner for the benefit of future generations.
This is a precondition for substantial progress towards the common targets of health for all, poverty alleviation, environmental conservation and economic and human development. To achieve these goals, water and environmental sanitation programmes need to be tailored to the ability of the local environment to support them, to local socio-economic and cultural conditions and needs, and to the availability of resources. Differences in the needs, work and influence of, and benefits for, men and women need to be taken into account.

Change is needed; business as usual is not enough.

2.5 The International Drinking Water Supply and Sanitation Decade (1981-1990) resulted in a proportional increase in coverage, but made only a marginal impact in reducing the total number of unserved people. The main reasons have been identified as: population growth, lack of political support, inadequate community involvement, limited mobilization of resources for infrastructure projects particularly in urban areas, poor operation and maintenance of installed systems, and, in a number of cases, inadequate attention to small-scale, low-cost approaches where these would have been more appropriate than large infrastructure projects. In many countries, sanitation, communication and hygiene education, necessary to achieve the behavioural changes needed to obtain optimum benefits from improved water supplies, remained low priorities.
The Decade taught all those involved that water and environmental sanitation programmes need to be based on partnerships involving all stakeholders (users - especially women, community associations, local, regional and central government, public and private sector agencies, non-governmental organisations). Government's role is to establish the regulatory and support framework. This includes the determination and enforcement of drinking water and effluent standards, and the support needed, at appropriate levels, to enable local partnerships to deliver local services in accordance with the expressed needs and willingness to pay of all users, and facilitate a balanced distribution of contributions, influence and benefits. A key role of domestic financial institutions and external support agencies is to support strategies to assist the underprivileged. These strategies should be cost-effective, based on the real needs of communities, and designed to protect critical aquatic ecosystems and water source catchment areas.

We need to use our resources - people, water and finance - more efficiently.

2.6 Lessons learned from the International Drinking Water Supply and Sanitation Decade give cause for confidence that, on the basis of the Rio commitments, the right changes can be made, sufficient resources can be mobilized and action programmes can be initiated to bring more effective, appropriate and sustainable progress towards national goals of water and sanitation for all..

Bridging the gap between needs and available funds means change. Six changes will go far towards reaching these targets.

- directing investments towards affordable and environmentally sound approaches to serve the unserved;
- increased efficiency in the use of available funds and mobilizing additional funds from existing and new sources including government and external support agencies, the private sector and consumers;
- mobilizing local communities for self-help;
- pricing water and sanitation services realistically for all users, according to capacity to pay;
- cutting down on the high levels of water wasted in many cities and in agricultural and industrial use; and
- promoting water conservation through recycling and reuse of water, recognising that treated wastewater is a potentially valuable water resource, and combating industrial pollution.

It is also essential that international bodies and governments attach higher priorities to research and development activities directed towards achieving breakthroughs in finding more appropriate water and environmental sanitation technologies.

2.7 Ineffective delivery of water and sanitation services to households and the urgent water scarcity and contamination problems around the world demand an immediate response. Though water supply and sanitation problems vary in their exact nature and manifest themselves primarily at the local and regional levels, they are issues of global concern. Hence, a concerted and coordinated international response is needed to make the most effective use of water and financial resources.

3. ACCORDINGLY, TRANSLATING THESE VIEWS INTO ACTION IN OUR OWN COUNTRIES, OR THROUGH INTERNATIONAL COOPERATION, WE:

3.1 re-emphasise the commitment to implementation of Chapter 18 of Agenda 21, and the crucial role that improved water supply and sanitation programmes will play in health improvement, the protection of freshwater resources and the achievement of sustainable development; urge that water resources management in general, and drinking water and environmental sanitation and education aimed at achieving behavioural change in particular, be given the financial support needed, as vital components in achieving the mutual and multiple benefits of reducing disease, preserving the environment, and stimulating economic and human development; address the issue that although international funding resources in support of feasible water and environmental sanitation projects have increased, there are still factors impeding the flow of resources to the developing countries, and these issues need to be addressed, along with others, in the framework of general discussions on international cooperation;

3.2 encourage the development and implementation of strategies for drinking water and environmental sanitation, at all appropriate levels, including the international level;

develop these sector strategies in the context of broader strategies for sustainable water resources management and environmental protection and ensure that they are coordinated at national and local level with activities in health, education, agriculture, forestry, industry, energy, urban and rural development, and other relevant sectors, to safeguard the quality and quantity of water resources worldwide;

3.3 stress that behavioural change, development of the knowledge base, education of experts, partnership of stakeholders, full commitment of all partners, and capacity building, are essential for success; seek to accelerate moves to develop enabling, supporting and regulatory frameworks which facilitate the maximum involvement of local agencies and individuals in programmes to improve the living environment; seek enhanced priority for institutional strengthening and human resource development programmes which will create organizational and management capacity for local delivery and upkeep of water and environmental sanitation services;

3.4 advocate the application of sound economic principles to the allocation and pricing of water, based on the principle that water is a social and economic good, while recognizing that it is a basic human need; seek to make more effective use of available water and financial resources by directing these resources towards projects that best meet the objectives of sustainable development i.e. which are technologically appropriate, economically feasible, environmentally sound and socially acceptable; enable water providers to set equitable tariffs for agricultural, industrial and domestic water, to encourage conservation and efficient use; seek ways in which local communities can be given improved access to financial resources and encouraged to undertake community management of water and environmental sanitation services; encourage potential private sector involvement in financing, constructing, operating and maintaining water and sanitation services; encourage external support agencies, including multilateral and regional development banks, to adopt water and environmental sanitation sector investment guidelines which are consistent with the policy guidance of Chapter 18 of Agenda 21;

3.5 to avoid costly future remedial actions, adopt programmes for waste reduction and pollution prevention at the source and for protection of catchment areas to safeguard water supply sources, water quality, aquatic ecosystems, and fisheries and for reducing wastage of water to conserve future resources; implement tariff structures which reduce wastage, increase cost recovery, and prevent pollution, such as progressive block rate fees, sewage and wastewater treatment fees, and fines for non-compliance; supply water to meet new demands by environmentally sound methods, including water conservation, demand management and reuse, particularly in the irrigation sector.

4. WE, THE MINISTERS, THEREFORE:

4.1 ENDORSE FOR RAPID EXECUTION THE ATTACHED ACTION PROGRAMME as a further step towards sustainable development of drinking water and environmental sanitation services.

This programme learns from the experience of the International Drinking Water and Sanitation Decade and puts into practice Chapter 18 of Agenda 21. The main lessons are that capacity-building is the key and that we must:

a. generate public and political awareness of the importance of the imminent water crisis;
b. set realistic targets on the route to the overall goal of safe water and adequate sanitation for all; have relevant target dates set by governments to execute the Action Programme;
c. establish more efficient and effective systems for drinking water and environmental sanitation in all our countries;
d. mobilize the available resources within each country, from users and the private and public sectors and through the "polluter pays" approach, within self-sustaining systems of finance for water supply and sanitation services;
e. enhance the mobilisation of international financial resources and the transfer of technology to complement and support domestic resources.

The programme also incorporates the new approaches brought about by Agenda 21. We must give special attention to:

a. the integrated management of water, taking into account all the implications that water has for health, for the environment, for social and economic policy and for spatial planning;
b. creating partnerships among all stakeholders, which reflect the different needs of men, women and youth and involve all sections of society in resolving the problems that affect them;
c. modifying patterns of behaviour towards clean water and hygiene, and changing the role of governments, to make the best use of available resources, to enable the integrated management of water at the lowest appropriate level and to move to a system of demand-driven management;
d. putting into practice the management of water resources as a social and economic good;
e. searching for innovations, technological and non-technological, to protect our finite and vulnerable water resources and to bridge the gap between the physical, human and financial resources and the escalating demand for water and need for sanitation brought about especially by urbanization and industrialization in the developing world.

IN ADDITION WE:

4.2 Note that a meeting of experts on water and health in underprivileged urban areas held in Sophia-Antipolis, France, from 21 to 23 February 1994, has adopted recommendations to be submitted by the participants to the Commission on Sustainable Development at its 2nd session in May, 1994.

4.3 Transmit, in view of the special problems of the small island states this Statement and Action Programme for consideration at the United Nations Conference on the Sustainable Development of Small Island Developing States to be held in Barbados from 24 April to 6 May 1994.

4.4 Recommend that, in order to prevent a water crisis, there is an urgent need to mobilize, within the framework established by Chapter 33 of Agenda 21, adequate financial resources, through using all available sources and mechanisms and maximizing the availability and smooth flow of additional resources to execute this Action Programme.

4.5 Recommend in view of the need to coordinate, concentrate and consolidate the many international activities relevant to drinking water and environmental sanitation, within the context of integrated water resources management:

a. consideration of steps to enhance this process, particularly by the Commission on Sustainable Development;

b. the strengthening of existing institutions and organizations which are contributing to this goal, in accordance with the Action Programme.

4.6 Recommend that this Action Programme be considered for adoption by the Commission on Sustainable Development at its 2nd session in May 1994.

1. WATER AND PEOPLE - bringing about partnership and behavioural change

As Agenda 21 states, for sustainable development, collaboration is necessary among all partners. The approach to collaboration has to start with an understanding of the real needs of users. Better collaboration will help to improve performance, to resolve conflict and to foster integration.

To enable and support this partnership approach, water supply and sanitation decisions must be based on a dialogue about the attitudes and needs of people in rural and urban communities, and on what they can manage, maintain and pay for. Behaviour at political and governmental level, as well as in the water supply and sanitation sectors, must change as required.

Accordingly, at the appropriate level, governments should:

1. generate public awareness and social mobilization towards drinking water and environmental sanitation by:
   (a) stimulating mutual understanding by government, local authorities, utility operators, consumers, especially women, youth and other stakeholders of the water problems and the vulnerability of water resources and the aquatic environment;
   (b) raising awareness among all stakeholders of the fact that water resources are becoming increasingly scarce and that it is necessary to use them in a rational economical way, to instal or improve wastewater treatment systems to prevent pollution of water resources and to adopt appropriate sanitation habits which prevent microbiological pollution;
   (c) ensuring a basic knowledge about the conservation and use of water, giving priority to health issues;
   (d) enhancing realisation that water is a social and economic good and has an economic value to which an appropriate pricing policy needs to be applied, including the use of economic instruments;
   (e) formulating and implementing participatory communication and education programmes aimed at bringing about changes in behaviour patterns, in planning, design, construction, operation and maintenance processes and revenue collection;
   (f) providing training programmes according to regulated standards for all levels of personnel responsible for management of drinking water, sanitation and waste water treatment in all relevant authorities, reflecting new approaches and principles;

2. improve partnership and participation; therefore taking the following priority actions:
   (a) encouraging the policy makers, owners, contractors and operators of water supply and environmental sanitation systems to involve local communities, user organisations, women and non-governmental organisations in the planning of, and decision-making procedures about those systems, so as to make use of local knowledge, special skills and different viewpoints;
   (b) developing the legal and institutional framework to support such participation and partnership;
   (c) developing plans to build up the capacity of all stakeholders, including the empowerment of communities, in particular the women, through proper training and education at community level, representation of users on Utility Boards, the establishment of Consumer Councils and the development of consultation mechanisms with stakeholders;
   (d) providing access to information on projects, programmes and policies, recognizing the rights and responsibilities of citizens and communities, and providing accountable, transparent decision-making processes and water quality standards with opportunities for appeal and independent review;

At the regional and international level:

1. develop programmes on the exchange of information and experience, especially on training, education, research, technology and modalities of project design and implementation;
2. seek to ensure that external support agencies support public education and capacity building programmes, implement transparent and accountable decision-making mechanisms within their institutions, and promote public participation in all levels of project design, implementation and management;
3, develop programmes, both at national and international levels, presenting priorities for the water and environmental sanitation sector and develop coordinated action programmes to advocate for the sector at all levels - political, public, technical, and financial;
4. strengthen regional collaboration, especially among oountries with comparable problems such as transboundary water resources, or a comparable situation such as that of the small island states;
5. develop concerted programmes at national and international levels in support of sustainable water resources development and environmental sanitation in small island states.

2. WATER, HEALTH AND THE ENVIRONMENT - integrating water policy

As Agenda 21 states, the planning and implementation of drinking water and environmental sanitation programmes should be carried out in the context of an holistic water resources development framework, taking an ecosystem approach to water resources development and management, including the health dimension.

Accordingly, at the appropriate level, governments should:

1. undertake a water resources assessment in order to produce an inventory of the current situation and to identify problems and constraints in providing water supply and environmental sanitation services;

2. develop, review or revise, in the context of a national sustainable development strategy consistent with Agenda 21, measures for water resource management, environmental protection, including drinking water and environmental sanitation, aimed at:
   (a) a recognition that access to adequate water and environmental sanitation services is a basic human need;
   (b) the need for conservation and protection of the quantity and quality of water resources, taking into account water quantity and quality requirements for the functioning of ecosystems:
   (c) an obligation to use water efficiently, taking into account the re-use and recycling of effluents, and disposal of waste in a manner which conserves the environment for the benefit of future generations;
   (d) a framework for a rational allocation of water among competing uses, including drinking water, industry, agriculture and hydro-power;
   (e) bringing national water consumption into line with the available resources;
   (f) supportive policies and policy instruments to support the best possible water use and sustainable management of freshwater resources;
   (g) recognition of health-related objectives in water supply and sanitation planning.

3. develop, review or revise by 1997 and implement, in the context of a national sustainable development strategy consistent with Agenda 21, measures for drinking water and environmental sanitation, taking into account the goals set by the World Summit for Children, with a view to achieving rational and effective provision and use of drinking water and environmental sanitation; these measures should include:
   (a) strategies to serve the poor and unserved;
   (b) investment strategies, including strategies to serve the poor according to their special needs in rural and peri-urban areas;
   (c) a planning strategy based on an understanding of effective demand and integration of water supply and sewage plans and programmes;
   (d) a planning strategy for more effective hygiene education;
   (e) establishing realistic quality standards and criteria for drinking water, for sewage effluent and for recycled water;

(f) the protection and enhancement of human health through giving priority to populations at greatest risks.

4. involve in the implementation of strategies all stakeholders, such as consumers, non-governmental organisations, scientists, women's organisations, local entrepreneurs, professionals and professional associations;

5. establish, where it does not yet exist, a nation-wide drinking water and environmental sanitation monitoring system to monitor the efforts on this Action Programme as well as other major objectives, making full use of available open-ended monitoring and information support systems being developed by the existing WHO/UNICEF Water Supply and Sanitation Monitoring Programmes;

6. establish pricing policies aimed at promoting the efficient use of water, according to the following criteria:
   (a) affordability at all levels, taking into account health impact considerations;
   (b) resource conservation through demand management;
   (c) utilization of the polluter pays principle;

7. reduce the proportion of water put into the distribution system that is lost and does not serve an end-use, and assess institutional, management, organisational and operational aspects of water agencies to identify the factors affecting the existing levels of unaccounted-for water;

8. promote the design and use of water-saving and re-use technologies in order to decrease the consumptive uses of water by industries, agriculture and households;

9. preserve the natural quality of both surface and groundwater, if feasible by a water basin approach, including:
   (a) maintaining effective watershed management and establishing water protection and sanitary zones adjacent to the sources of drinking water supply with regulations governing special natural resources use and conservation practices to minimize the input of problem substances and other impacts from industry, agriculture and households;
   (b) preventing nutrient input into groundwater and other water bodies by using the land in accordance with sustainable agricultural practice;
   (c) applying pesticides properly and in accordance with provisions of legislation; continuously looking for the least harmful pesticides and eliminating those proven to be harmful to surface and ground water; promoting and implementing sustainable agricultural techniques;
   (d) establishing wastewater treatment plants and the use of recycled water within an environmentally sound system, their planning to be accompanied, where appropriate, by environmental impact assessment;

10. promote the appropriate development and use of non-conventional sources of water supply, such as the safe re-use of effluents, rainwater harvesting, desalination of sea water and brackish groundwater and conservation of traditional sources;

11. strengthen health-data collection and analysis to assist in prioritizing and targeting water and sanitation;

12. promote, where they do not exist, the adoption of appropriate country-specific standards or guidelines on drinking water quality, taking into account the WHO's drinking water guidelines.

At the regional and international level:

1. enhance cooperation in river basin management, transboundary water-resources development and pollution control;

2. promote the transfer of technology, in particular on a regional basis, in the field of loss-reduction strategies, water-saving and re-use technologies;

3. agree on indicators for the state of water resources in relation to their functions and uses.

3. WATER AND INSTITUTIONS - organising service provision

As Agenda 21 states, capacity-building is a fundamental activity to create competent institutions, to provide adequate numbers of qualified staff, to equip all the stakeholders and to enable communities to become full partners in the development of the sector.

Accordingly, at the appropriate level governments should:

1. change the emphasis of the role of governments, as appropriate, as related to water and environmental sanitation services to an enabler and a regulator of other stakeholders by:
   (a) taking responsibility for organizing monitoring, establishing nation-wide information systems, preparing national drinking water assessments and setting policies and sector guidance;
   (b) strengthening the role of the government in developing legal frameworks and as a regulator, ensuring effective enforcement of water laws and regulations;
   (c) taking the responsibility for adequate performance monitoring of activities of all service providers and other stakeholders as appropriate;
   (d) considering the possibilities of private sector participation (particularly in the operational parts) of water supply and sanitation, with the proviso that, among others, quality, effectiveness, availability at fair prices and the recognition of social concerns are safeguarded by appropriate regulations to protect the users;

2. establish coordinating mechanisms, at the appropriate level, to enhance cross-sectoral collaboration, establish uniform policy, improve planning and foster the sharing of sector relevant information;

3. increase investments in capacity building programmes necessary to create organisational and management capacity at all levels, including institutional strengthening and human resources development with specific attention to gender;

4. identify, support and provide necessary incentives for institutions to become more people-oriented: ownership, decision-making and responsibility for planning and implementation should be brought to the lowest appropriate level nearest to the user;

5. create utilities for water supply and environmental sanitation that can operate autonomously, in particular with respect to financial management, overall management and research, ensuring the sustainability and effectiveness of the services which can progressively attain cost recovery;

6. improve the overall and financial performance of utilities which are more accountable and more transparent to the public, including providing access to information and quality data, and allow for appeal procedures by the public in connection with their decisions;

7. develop or strengthen incentives to ensure the availability of skilled personnel needed for the planning, management and operation of water supply and environmental sanitation systems to:
   (a) encourage professional and technical education and training;
   (b) establish career planning and appropriate salary levels to retain technical and professional staff;
   (c) ensure the publication of the technical material needed to support professional expertise, the efficient management of utilities and the participation of non-governmental organisations;
   (d) enhance, based on a proper gender analysis, the role of women in planning, management and operation and increase the active involvement of women in decision-making about water and environmental sanitation issues at the micro and macro level;

8. encourage the establishment of multidisciplinary professional associations as major aids to networking, particularly to participate in formulating national standards and to organize the dissemination of know-how on a national basis and to join the international professional associations and profit from their support;

9. stimulate by 1998 the development of key indicators, other than coverage, such as indicators relating to health, environmental impact and behaviour of users;

10. establish or strengthen domestic resource centres, including domestic institutions for information collection and dissemination, applied research and technical support for monitoring;

11. strengthen the appropriate health institutions which, in coordination with water and sanitation authorities, implement hygiene education and support community involvement;

At the regional and international level:

1. promote information exchange and networking among sector professionals, professional associations and non-governmental organisations, including twinning arrangements;

2. promote effective collaboration with neighbouring countries in the management of transboundary water resources;

3. promote regional exchange of experience on institutional reform;

4. strengthen regional cooperation that enhances non-governmental organisations capacity and involvement in drinking water and environmental sanitation, in order to improve programme planning, management and implementation.

4. WATER AND MOBILIZING FINANCIAL RESOURCES - building assets for the future

As Agenda 21 states, in order to enable drinking water supply and environmental sanitation facilities to operate on an economically sound basis, it is crucial to aim for the most efficient and effective use of the available funds, particularly in view of the increasing global demand for drinking water and environmental sanitation and the trend towards decreasing availability of external funds for the sector.

Accordingly, at the appropriate level, governments should:

1. ensure equitable and efficient financial management of water supply and environmental sanitation systems by:
   (a) progressively devolving decision-making and management down to the lowest appropriate level, having sufficient qualified staff;
   (b) as soon as possible, organizing a tariff system in such a way (cross-subsidization), or setting prices at such a level, that water supply and environmental sanitation organisations can operate autonomously in financial terms without this impacting adversely on the basic supply to the most needy;
   (c) in the light of the potential impacts on the poor, enabling them to benefit from the changes envisaged;

2. develop detailed guidelines for investments in the drinking water and environmental sanitation sector in order to rationalise resource generation and use, aimed at, amongst other things:
   (a) ongoing provision of water and environmental sanitation for domestic use to all sectors of society;
   (b) minimizing subsidies, but taking into account special needs of the most needy to assure their access to safe water;
   (c) encouraging mutually beneficial investments, whereby money is saved, the position of the user is improved and the environment is protected;
   (d) targeting investment priorities at cost-effective, affordable and appropriate technology;
   (e) phasing out inappropriate technology;
   (f) rehabilitation and maintenance of existing water supply and environmental sanitation systems;
   (g) giving priority to more and sufficient investments in water supply and environmental sanitation, particularly in urban and peri-urban areas, including both physical facilities and education to promote better personal/family hygiene and the best use of water supply and environmental sanitation;

3. explore and develop new, innovative financing mechanisms, including private funding and harnessing of local resources to the maximum extent possible;

4. stimulate integrated approaches including income-improving activities for the peri- and semi-urban and rural poor, through mechanisms for access to credit, land distribution and security of land tenure, so as to reduce the need for subsidies;

5. encourage tariff systems, in different socio-economic settings, in different service demand settings and through different collection mechanisms, with a view to introducing cost recovery into water supply and environmental sanitation programmes and in particular with a view to charging the user for the costs of environmental sanitation (either by incorporating this factor into drinking water prices or in some other way);

6. study and promote more efficient use and re-use of water by means of economic incentives and including environmental costs into prices for drinking water and water used for other purposes;

7. study the possibilities of re-using treated waste water for agriculture or as a supplementary water resource;

8. accept temporary variations in the level of service provided in different areas so as to achieve the greatest possible coverage as early as possible, and then improve those levels to a uniform level as resources permit;

9. emphasize the importance of operational and maintenance considerations being incorporated into the design of projects.

At the international level it is urged that:

1. the external support agencies, including the World Bank and regional banks, give priority, as appropriate, to projects aimed at more extensive coverage, both in drinking water supply and in environmental sanitation and to projects which tend to at least maintain the existing coverage, with economic and appropriate technology considerations;

2. consideration is given to debt swap as a mechanism to generate funds to the sectors;

3. discussion is encouraged on the 20/20 approach, as initially proposed by UNDP and UNICEF, by which 20 percent of official development assistance (ODA) and 20% of domestic budgetary resources are devoted to social development, including drinking water and sanitation.

5. WATER AND THE WORLD - promoting international support

In order to facilitate the implementation of national activities, the international community is urged to:

1. support country-level collaboration as an essential tool for the successful preparation of sector strategies and social mobilisation initiatives;

2. give special consideration to assisting countries that have developed or are developing national strategies for water resources management that incorporate the views of stakeholders and fully consider the ecosystems and socio-economic structures;

3. focus on needy areas, recognizing that special attention should be given to Africa;

4. stress the role and importance of international organizations and bilateral cooperation in supporting capacity building programmes in developing countries and request the Executive Board of UNDP to consider in the context of UNDP Capacity 21 Programme, a water and sanitation component;

5. request the UN Commission on Sustainable Development to consider how existing institutions can provide regional clearing-houses for the exchange of data and information and how to strengthen the role of development cooperation and other support funds for drinking water and environmental sanitation;

6. renew collaborative mechanisms towards support of increasing regional initiatives like SAARC, OAU, ASEAN, LAC, and promote joint collaboration in achieving goals;

7. promote and stimulate the role of, and the interest shown by, UN Regional Commissions in the field of water and environmental sanitation, without prejudging the outcome of the ongoing decentralization process under the responsibility of the Secretary-General;

8. promote and support national actions:
   - aimed at bringing about changes in behaviour patterns; and
   - regarding roles of communities, government and other stakeholders.

Furthermore it is recommended that:

9. future international conferences, such as the World Summit for Social Development, the Conference on Population and Development, the Fourth World Women's Conference, HABITAT II and others, address relevant water resources development and management issues, and in particular those related to water supply and environmental sanitation and the health dimension of water quality;

10. the UN Commission on Sustainable Development, at its 1997 review, should assess progress in the implementation of the recommendations of Agenda 21 concerning drinking water and environmental sanitation;

11. the UN system continues to undertake a scientific global water resource assessment including projections of water needs and availability;

12. recognizing the positive contribution of the Water Supply and Sanitation Collaborative Council as a global forum and a partnership among professionals from countries and from external support agencies, non-governmental organisations, professional associations and information, research and academic institutions, assistance is provided for strengthening the Council and enhancing its advocacy role;

13. in order to prevent a water crisis, there is an urgent need to mobilize, within the framework established by Chapter 33 of Agenda 21, adequate financial resources, through using all available sources and mechanisms and maximizing the availability and smooth flow of additional resources to execute this Action Programme;

14. the UN Commission on Sustainable Development, at its second session, considers the need to strengthen the existing mechanism for the coordination of activities of the UN system in the field of water resources with a view to help implementing the Action Programme adopted by this Conference, taking into account the primary responsibility of the Secretary-General for interagency coordination; and that the Commission on Sustainable Development recommends ECOSOC to consider this issue at its coordination segment in 1995;

15. international professional associations such as IWSA and IAWQ stimulate the establishment and development of national professional associations;

International support agencies are invited to:

16. assess the degree to which their programmes effectively facilitate:
    (a) the integrated management of water resources,
    (b) the strengthening of national institutions;

17. develop programme delivery and loan mechanisms which need to take into account the water supply and environmental sanitation crisis;

18. encourage the Water Supply and Sanitation Collaborative Council, in association with interested public bodies and non-governmental organisations concerned, to undertake necessary studies toward strengthening its activities and when appropriate, to take necessary steps for expanding its activities or establishing itself as a more comprehensive world water forum or Council involving the various aspects of water sector, and also encourage the Council to submit its report to its members by April 1995 on any progress achieved on this issue.