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**UNESCO'S RESPONSE TO AGENDA 21  
WITH EMPHASIS ON FRESHWATER RELATED ISSUES**

by

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# UNESCO'S RESPONSE TO AGENDA 21 WITH EMPHASIS ON FRESHWATER RELATED ISSUES

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## 1. INTRODUCTION

The main results of the United Nations Conference on Environment and Development (UNCED), which took place in Rio de Janeiro in June 1992, were the followings:

- *Rio Declaration*
- *Agenda 21*
- *Convention on Biological Diversity*
- *Framework Convention on Climate Change*
- *Statement of Forest Principles*

Although successful follow-up to these results depends first and foremost on national action, international cooperation is essential to support and supplement national efforts. Because of its broad mandate- and long experience, UNESCO is involved in many aspects of UNCED follow-up, with particular emphasis on Agenda 21 and the conventions on biological diversity and climate change.

Even beyond Rio conference, most of UNESCO's existing programmes were coincidentally already in support of UNCED objectives. Environment and development problems have been a major focus of UNESCO's work for the past 40 years. Beginning with the Arid Zone Programme in 1951, numerous UNESCO programmes have been launched to address research, education, training and policy needs related to specific environment and development issues (e.g. water resources management, conservation of biological diversity) and ecological systems (e.g. islands, tropical forests, mountains and arid lands).

Since the Rio Conference, UNESCO has given "priority importance to activities concerned with the implementation of the relevant chapters of Agenda 21 and of other UNCED results, within the competence of the organization, both in the present biennium and in planning programmes for 1994 - 1995 and beyond..."

(Executive Board, 141st Session, Decision 7.2.1). UNESCO is addressing UNCED follow-up primarily by reorienting its existing programmes.

## 2. *FOCUS ON AGENDA 21*

Agenda 21 is widely adopted as the international programme of action for global sustainable development into the 21st century. It reflects a new political commitment to sustainable development at the highest level. However, it is a complex document with many chapters, broken into one or more programme areas, each of which contains a wide range of activities to be undertaken by governments, international organizations, non-governmental organizations, and/or the private sector. Science, education and capacity-building activities are listed not only in the "cross-cutting" chapters, but also in the "topical" chapters, such as those concerning biological diversity and oceans.

In contributing to the implementation of Agenda 21, UNESCO's primary goal "to combat Poverty, create equitable social and economic conditions, address issues related to population dynamics and ensure a healthy environment and sustainable use of resources for the benefit of present and future generations", is considered. Due to its broad cross-cutting mandate, UNESCO contributes to a greater or lesser extent to almost all of the 40 chapters of Agenda 21. (see appendix)

In addressing these overriding concerns, however, priority has been given to seven areas where UNESCO is expected to be among the UN agencies making the most substantial contribution:

- *Education, public awareness and training (chs. 36 and 25)*
- *Science (chs. 35 and 31)*
- *Capacity-building in developing countries and transfer of environmentally sound technology (chs. 37 and 34)*
- *Oceans, coastal areas and small islands (ch. 17)*
- *Biological diversity (ch. 15)*
- *Freshwater resources (ch. 18)*
- *Land ecosystems and resources, including combating desertification (chs. 10, 11, 12,13)*

Of particular importance are Chapters 35 (science) and 36 (education, public awareness and training), for which UNESCO will play lead role as "task leader" for facilitating coordination within the UN system.

UNESCO also contributes, to a lesser extent, to the implementation of other chapters, such as those on the atmosphere, hazardous waste management, and biotechnology, as well as those dealing with the social and economic dimensions of environment and development issues, such as human health and human settlements.

In this presentation, however, the author will concentrate only on issues directly related to UNCED freshwater recommendations, with emphasis on UNESCO's International Hydrological Programme (IHP) and its response to these recommendations.

### **3. AGENDA 21 AND FRESHWATER RESOURCES**

#### **3.1. AGENDA 21 FRESHWATER RESOURCES (ch.18)**

The main components of chapter 18 are the followings:

- Support the assessment of national water resources and the establishment of water management guidelines, taking into account the impact of human activities on the hydrological cycle.
- Co-ordinate research to improve the understanding of processes within the hydrological component of the climate system and the impacts of possible climate change on water resources.
- Study the impacts of social transformations (e.g. population growth and urbanization) on water quality and quantity
- Support hydrological observation programmes within the Global Terrestrial Observing System
- Promote participation by developing countries in research and observation programmes related to the hydrological cycle by strengthening technical support, post-graduate training for specialists and a lectureship scheme.
- Strengthen information for decision makers, education and public awareness programmes about freshwater issues.

However, Agenda 21 has also addressed many issues directly related to freshwater resources within the following frameworks:

- Land ecosystems and resources (ch.10, 11, 12, 13)
- Oceans, coastal areas and small islands (ch. 17)
- Convention on biological diversity.
- Framework convention on climate change.

The great resemblance of these requirements to UNESCO's environmental programmes, especially its freshwater programme, can easily be detected from the

following brief review of the components of the international hydrological programme (IHP).

#### **4. UNESCO INTERNATIONAL HYDROLOGICAL PROGRAMME (IHP)**

##### **4.1. GOALS AND OBJECTIVES:**

UNESCO international scientific cooperative programmes in water resources (IHP, and earlier IHD) were established because both the international scientific community and governments have realized that water resources are often one of the primary limiting factors for sustainable socio-economic developments in many regions and countries of the world, and therefore require an internationally co-ordinated programme for their rational management. Thus, the general objective of the IHD, and later the IHP, were set to improve the scientific and technological basis for the development of principal methods and techniques as well as providing the human resources base necessary for the rational development and management of water resources. The pursuit of this objective has been fundamental to the search for solutions to basic problems related to, among others, lack of reliable water supplies and sanitation, shortage of food and fiber, inadequate supplies of electrical energy, pollution of surface and ground waters, erosion and sedimentation, floods, drought and navigation.

Since the inception of the IHD in 1965, and later the IHP in 1975, great progress has been achieved regarding methodologies for water resources and management as well as in capacity building in the water sector. Notwithstanding the attained achievements, the general objectives, unfortunately remain valid, but perhaps with some changes in emphasis. The main components of these changes include the current emphasis given to water resources management for sustainable development and the adaptation of hydrological sciences to cope with the anticipated climate change and the preservation of the environment.

##### **4.2 IHP Structure and Implementation**

The IHP is planned, executed, coordinated and monitored at global, regional, sub-regional and national levels. This is accomplished through National IHP Committees, the Intergovernmental Council (IC) of the IHP and its Bureau, committees, working groups, rapporteurs and regional hydrologists. IHP programmes are generally executed in close co-operation and great harmony with related UNESCO environmental programmes (MAB, IGCP, IOC...etc.), other United Nations specialized organizations (WMO, FAO, WHO, UNEP, IAEA, ESCWA, .. etc.), Regional Organizations (ACSAD, ALECSO, .. etc.), non governmental scientific organization (IAHS, IAH, IAHR, IWRA, ...etc.) and research and academic circles. It remains to be mentioned that the finances of the IHP projects are provided through both the regular UNESCO budget, country's own resources as well as extra-budgetary sources obtained from various funding agencies (UNDP, WB, UNEP, ... etc.).

#### **4.3. Relevance to Agenda 21 Requirements.**

Noting the above objectives and implementation method, all of the previous IHP cycles (I, II, III, IV and IHD) were very successful in achieving appreciable progress in almost all of chapter 18 requirements.

IHP-IV (1990 - 1995), in particular, have dealt with the general theme "Hydrology and Water Resources for Sustainable Development in Changing Environment" which is well within the requirements of chapter 18 and related chapters of Agenda 21. It has addressed that theme through three main sub-programmes, namely:

- ***Hydrological research in changing environment***
- ***Management of water resources for sustainable development***
- ***Education, training, the transfer of knowledge and information***

In response to clear directive from UNESCO executive board all of the projects implemented within the biennium 1994/95 have given great consideration to Agenda 21 requirements. Such considerations have greatly influenced the shaping of IHP-V (1996 - 2001) programme. More detail about this programme will be presented in the following section.

### **5. THE PROPOSED IHP-V: HYDROLOGY AND WATER RESOURCES DEVELOPMENT IN A VUNERABLE ENVIRONMENT (1996 - 2001)**

#### **5.1 Point Of Departure From Previous IHPs**

During the preparation for the United Nations Conference on Environment and Development (UNCED) a number of international meetings, which were either directly or indirectly related to hydrological water resources, were held in many places of the world. The International Conference on Water and Environment (ICWE), held in Dublin from 26-31 January 1992, provided the major input on freshwater problems to UNCED calling attention to the serious problems of optimizing the use of freshwater resources in the years ahead. Its statement, principles and recommendations have been world-widely accepted as the main agenda on water issues.

Freshwater issues also came up at the International Conference on an "Agenda of Science for Environment and Development into the 21st Century (ASCEND)" which was convened by ICSU in Vienna in November 1991 in order to make a contribution to the formulation of the future directions of world science as well as to the preparation of UNCED. Water scarcity was pinpointed amongst the major problems that affect the environment and hinder sustainable development, and are to be of the highest scientific priority.

The recommendations of the above mentioned major international conferences, together with the Freshwater Chapter of the UNCED Agenda 21 formed the basis

for preparing the documents of IHP-V. The concept paper of this document points out that if future water resources development and management schemes are to be sustainable, they will have to deal effectively with the following four major issues:

- *Environmental and social consequences*
- *Land-water linkages*
- *Allocation of water among competing uses-and users*
- *Achieving effective implementation*

## **5.2 Framework And General Outline Of IHP-V**

In general, IHP-V plans to stimulate a stronger interrelation between scientific research, application and education. The emphasis should be on environmentally sound integrated water resources planning and management supported by scientifically proven methodologies.

Within these major issues eight themes, given below, have been identified as a support structure for the whole Programme. They cut across different hydrological scales and different climatic regions, but have integrated water management in a vulnerable environment as a common issue. The proposed themes are seen as cornerstones within which projects could be flexibly implemented. Due to the special importance of water problems in the humid tropics and the arid/semi-arid zones as well as in urban areas, these regions should gain increased attention.

***The eight proposed themes are:***

- Global hydrological and biochemical processes
- Ecohydrological processes in the surficial zone
- Groundwater resources at risk
- Strategies for water resources management in emergency and conflicting situations
- Integrated water resources management in arid and semi-arid zones
- Humid tropics hydrology and water management
- Integrated urban water management
- Transfer of knowledge, Information and Technology (KIT)

To avoid a purely hierarchical structure of the IHP-V programme any theme should emphasize both methodological aspects as well as a process for knowledge transfer. All must include interactions in the biotic and abiotic environments as well as in decision-making. This may call for a different organization of the Programme.

The products should be considered as the outcome of the world-wide efforts of member states, regional and international organizations. UNESCO, while conducting a large number of activities itself, will co-ordinate all IHP-related activities through the Intergovernmental Council of IHP regardless of the method of implementation.

## **6. IHP IN THE ARAB REGION**

Many reports and regional meetings have, more or less, agreed on the followings as priority areas in the Arab Region:

- Integrated sustainable water resources management under arid & semi-arid conditions (with special emphasis on resource assessment, demand management, augmentation of supply, conservation, quality deterioration, environmental assesment, conflict resolution & management, legislation and regulatory frameworks,... etc.)
- Capacity building and institutional developments;
- Database and information systems;
- Technology adaptation and transfer;
- Public awareness & participation;
- Research and development.

These areas have also been identified, and actions for solving them have been recommended, by many international meetings and programmes including; the Mar Del Plata Action Plan(1977), the Delft Declaration (1991), the Dublin statement (1992) and in agenda 21 of the UNCED (I 992) as well as in many other regional and national inputs. These topics have also kept, in a way or another, regular appearance in all of the IHD/IHP programmes of UNESCO since 1965 and are currently being considered in its forthcoming medium term IHP-V plans(1996-2001).

Unfortunately, little or no progress at all has been achieved, in most Arab countries, in these directions which are vital for coping with the indigenous water scarcity in a sustainable manner. To reach positive impact in these areas, genuine regional programmes and action plans are urgently needed through a well coordinated project where national, regional and international professionals and financial resources are well tapped and efficiently utilized. The themes suggested in the forthcoming UNESCO-IHP-V could provide an excellent framework for dealing with almost all of these problems if such a regional setup is materialized.

### **6.1 UNESCO/ROSTAS Activities In Hydrology**

ROSTAS programmes in Hydrology is closely coordinated with IHP themes and implementation strategies. Hence, many benefits have been made from UNESCO's IHP training programmes and publications for the last thirty years. The current



activities for the biennial 1994-1995 have been planned and implemented through three classes of involvements;

- Regular programme activities
- Priority areas pursued through extra-budgetary sources
- Participation projects
- Participation in regional activities organized by other organizations.

#### ***6.1.1 Regular programme activities***

Activities in this category are divided into two types: Theme(s) selected for high concentration of ROSTAS efforts and routine regular activities. The themes currently selected for high concentration include "Groundwater Protection" and "Rainfall Water Management", while the regular activities include support to regional training courses, strengthening national IHP committees, regional meetings of IHP committees, special thematic sessions in International Conferences, .. etc. Two active working groups have been established in the concentration areas where two state-of-the-art reports have been published together with a package of identified priority topics that have been consolidated in project documents prepared for extra-budgetary funding sources.

ROSTAS's involvement in IHP-V will cover almost seven of the eight themes (except for humid tropics) but due to budgetary limit it may concentrate into 3 to 4 themes from its regular budget. Hopefully the other areas which are very important to the Arab Region, can be tackled through other forms of funding.

#### ***6.1.2 Priority areas pursued through extra-budgetary sources***

ROSTAS identified many priority themes of regional nature that cannot be financed from ROSTAS modest regular budget. It has prepared outlines, preliminary concept papers or project documents for some of these themes and is actively seeking financial support from funding agencies. Its current individual and joint efforts, in this direction include:

- Water resources assessment project including the updating and restructuring of the document "Water Resources Assessment in the Arab Region"; jointly with ACSAD and possibly ESCWA.
- A comprehensive project on "Groundwater Protection".
- A comprehensive project on "Rain Water Management", jointly with ACSAD.
- Support to translation of important IHP publications into Arabic language.

- Development of hydrological softwares using multimedia techniques (including CD-ROMS), jointly with ACSAD.
- Training and capacity building activity in the water sector, jointly with ACSAD.
- Sustainable development and management of resources.

UNESCO/ROSTAS welcomes co-operation with any regional or international organization in any or all of these activities.

### ***6.1.3 Participation projects***

These are projects, outside the regular work plan, financed by UNESCO as a result of direct requests from the countries of the Arab region. It is unfortunate that, up to now, very few countries of the region have made significant use of this facility in the areas of water resources. Special effort is being made to establish active national IHP Committees to make a better use of this facility, perhaps through a co-ordinated regional project.

### ***6.1.4 Cooperation with other organizations***

ROSTAS is responding, whenever possible, positively to requests for co-operation and participation in regional activities organized by other regional and international water agencies. It believes that there is a need for closer interagency co-operation in planning and implementing joint priority programmes perhaps through a joint regional project.

## ***7. THE INTERDISCIPLINARY CHALLENGE***

The diversity of UNESCO's programmes in environment and sustainable development provides an important opportunity to promote UNCED's interdisciplinary and intersectorial approaches and activities. At the same time, the establishment of a "Bureau for the Coordination of Environmental Programmes" will ensure a coherent overall policy and foster inter-programme and inter-agency cooperation. Four intersectorial initiatives have already been launched to chart new directions across established programme lines. A committee of outside experts has been appointed by the Director-General to stimulate these initiatives.

In line with that approach, ROSTAS has formed a team of competent researchers and professionals to develop & promote a workable model for environmentally sound sustainable development concept. The Oasis of Al-Kharga, in Southern Egypt, was selected as a pilot site for this exercise, being well kept, from external negative developmental influences and considered so far, by many, as a place with little or no man-made pollution impacts. For this exercise to proceed as intersectorial and interdisciplinary work, technical and financial resources from many

UNESCO's environmental programmes (i.e. MAB, IHP, SC/ENV, IGCP, EPD ... ) as well as relevant national (Universities, Research Institutes... etc.) and international (UNICEF, CEDARE... etc.) institutes & programmes have been sought and rationally integrated and utilized. The social as well as the community participation dimensions have been given great importance in this approach.

The work of the team has been physically linked and integrated with the work of Wadi Allaqi's MAB research team which approaches sustainable development using UNESCO/MAB approach and taking Wadi Allaqi Biosphere Reserve, which includes Lake Nasser in Southern Egypt, as a model site. More pilot schemes in few selected Arab countries are planned to be established as part of ROSTAS/ECO programme for the medium term plan (1996 - 2001). Results from these integrated schemes shall be: widely disseminated to relevant recipients in the Arab World, as possible applicable models of sustainable development; and then compiled and prepared as education and training packages, which shall be regularly evaluated, improved and presented to selective priority target groups in the Arab Region.

## **8. CONCLUDING REMARKS**

- Though chapter 18 is considered as the freshwater resources avenue of Agenda 21, it is very clear that many aspects related to water resources are considered in other chapters, especially chapters 10, 11, 12, 13 and 17 as well as the related conventions on climate change and biodiversity.
- UNESCO's programme in water resources (IHD/IHP) and its related other environmental programmes (IOC, MAB, EPD...) meet many of the requirements of Agenda 21 in water resources. Its forthcoming IHP-V programme, in particular, represents a good framework for building up a regional project that achieves many of Agenda 21 objective in the Arab Region.
- The most outstanding water resources priority areas in the region have been identified and ROSTAS's current and future involvements towards contributing to these areas have been outlined. The necessity for regional co-operation has been stressed, if effective impacts are to be achieved.
- The interdisciplinary challenge is an important dimension of Agenda 21. UNESCO and ROSTAS efforts in that direction have been indicated.

## 9. LIST OF REFERENCES

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## *Appendix I*

### **UNESCO AND AGENDA 21**

#### ***SOCIAL AND ECONOMIC DIMENSION***

- Chapter 1.** Preamble
2. International cooperation to accelerate sustainable development in developing countries ... (international trade issues)
  - ⇒ 3. COMBATING POVERTY
  4. Changing consumption patterns
  - ⇒ 5. DEMOGRAPHIC DYNAMICS AND SUSTAINABILITY
  6. Protecting and promoting human health
  7. Sustainable human settlement development
  8. Integrating environment and development in decision-making

#### ***CONSERVATION AND MANAGEMENT OF RESOURCES FOR DEVELOPMENT'***

9. Protection of the atmosphere
- ⇒ 10. INTEGRATED .. PLANNING AND MANAGEMENT OF LAND RESOURCES
- ⇒ 11. COMBATING DEFORESTATION
- ⇒ 12. COMBATING DESERTIFICATION AND DROUGHT
- ⇒ 13. SUSTAINABLE MOUNTAIN DEVELOPMENT
14. Promoting sustainable agriculture ...
- ⇒ 15. CONSERVATION OF BIOLOGICAL DIVERSITY
16. Environmentally sound management of biotechnology
- ⇒ 17. OCEANS ... COASTAL AREAS AND SMALL ISLANDS
- ⇒ 18. PROTECTION OF THE QUALITY AND SUPPLY OF FRESHWATER RESOURCES
19. Environmentally sound management of toxic chemicals
20. Environmentally sound management of hazardous wastes...
21. Environmentally sound management of solid wastes and sewage-related issues
22. Safe and environmentally sound management of radioactive wastes

#### ***STRENGTHENING THE ROLE OF MAJOR GROUPS***

23. Preamble
- ⇒ 24. WOMEN...
- ⇒ 25. CHILDREN AND YOUTH...
26. Indigenous people...

- 27. Non-governmental organizations...
- 28. Local authorities' initiatives...
- 29. Workers and their trade unions
- 30. Business and industry
- ⇒31. SCIENTIFIC AND TECHNOLOGICAL COMMUNITY
- 32. Farmers

### ***MEANS OF IMPLEMENTATION***

- 33. Financial Resources And Mechanisms
- ⇒34. TRANSFER OF ENVIRONMENTALLY SOUND TECHNOLOGY...
- ⇒35\*. SCIENCE FOR SUSTAINABLE DEVELOPMENT
- ⇒36\*. PROMOTING EDUCATION, PUBLIC AWARENESS AND TRAINING
- ⇒37. CAPACITY-BUILDING IN DEVELOPING COUNTRIES
- 38. International institutional arrangements
- 39. International legal instruments and mechanisms
- 40. Information for decision-making

**NOTE:** Due to its broad, cross-cutting mandate, UNESCO contributes to a greater or lesser extent to almost ALL of the 40 chapters of Agenda 21.

⇒AREA WHERE UNESCO HAS PARTICULARLY SUBSTANTIAL PROGRAMMES AND THUS PLAYS A PROMINENT ROLE AMONG UN AGENCIES FOR THE IMPLEMENTATION OF THE CHAPTER.

\*UNESCO serves as "task leader" within the UN system for implementation of the chapter.

