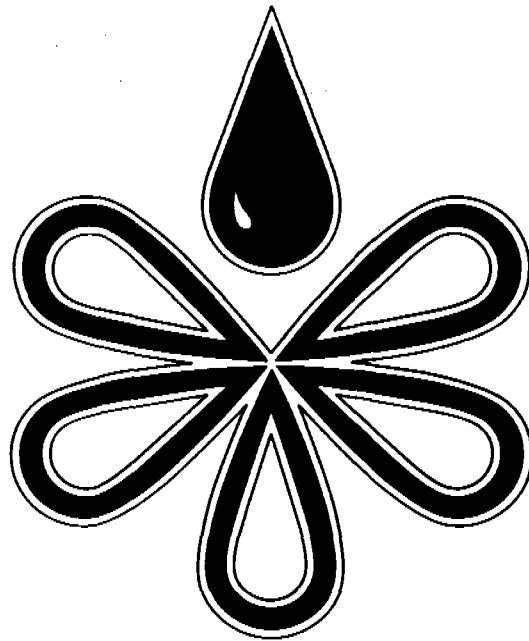


WATER MANAGEMENT



International Conference on Water and the Environment

**WATER MANAGEMENT SINCE THE ADOPTION
OF THE MAR DEL PLATA ACTION PLAN:
LESSONS FOR THE 1990'S**

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Introduction

The recommendations and resolutions adopted by the United Nations Water Resources Conference collectively known as the Mar del Plata Action Plan cover all aspects of the use and administration of water resources. The plan forms the most comprehensive normative statement that has been made on water resources policy. The intent behind its adoption was to provide an exhaustive set of guidelines to governments for "the accelerated development and orderly administration of water resources" and considerable stress was placed on the central role of the state in the management of water. The Mar del Plata Action Plan was very much a product of its time.

The recommendations on policy, planning and management contained in the Action Plan placed considerable emphasis on "the integrated planning of water management," "multi-purpose water resources development" and "national water policy" (Table 1). These recommendations were adopted, however, within a context of weak public water management institutions in most countries and of a global tendency for decisions on the development of water resources to be dominated by single-purpose large projects. The reality of water resource administration in the late 1970's was far removed from the normative contents of the Action Plan.

Over the 13 years since the United Nations Water Conference, the policies applied to the administration of water resources have

Table 1

MAR DEL PLATA ACTION PLAN: RECOMMENDATIONS ON POLICY,
PLANNING AND MANAGEMENT

1. EACH COUNTRY SHOULD FORMULATE AND KEEP UNDER REVIEW A GENERAL STATEMENT OF POLICY IN RELATION TO THE USE, MANAGEMENT AND CONSERVATION OF WATER, AS A FRAMEWORK FOR PLANNING AND IMPLEMENTING SPECIFIC PROGRAMMES AND MEASURES FOR EFFICIENT OPERATION OF SCHEMES. NATIONAL DEVELOPMENT PLANS AND POLICIES SHOULD SPECIFY THE MAIN OBJECTIVES OF WATER-USE POLICY, WHICH SHOULD IN TURN BE TRANSLATED INTO GUIDELINES AND STRATEGIES, SUBDIVIDED, AS FAR AS POSSIBLE, INTO PROGRAMMES FOR THE INTEGRATED MANAGEMENT OF THE RESOURCE.
 2. INSTITUTIONAL ARRANGEMENTS ADOPTED BY EACH COUNTRY SHOULD ENSURE THAT THE DEVELOPMENT AND MANAGEMENT OF WATER RESOURCES TAKE PLACE IN THE CONTEXT OF NATIONAL PLANNING AND THAT THERE IS REAL CO-ORDINATION AMONG ALL BODIES RESPONSIBLE FOR THE INVESTIGATION, DEVELOPMENT AND MANAGEMENT OF WATER RESOURCES. THE PROBLEM OF CREATING AN ADEQUATE INSTITUTIONAL INFRASTRUCTURE SHOULD BE KEPT CONSTANTLY UNDER REVIEW AND CONSIDERATION SHOULD BE GIVEN TO THE ESTABLISHMENT OF EFFICIENT WATER AUTHORITIES TO PROVIDE FOR PROPER CO-ORDINATION.
 3. EACH COUNTRY SHOULD EXAMINE AND KEEP UNDER REVIEW EXISTING LEGISLATIVE AND ADMINISTRATIVE STRUCTURES CONCERNING WATER MANAGEMENT AND, IN THE LIGHT OF SHARED EXPERIENCE, SHOULD ENACT, WHERE APPROPRIATE, COMPREHENSIVE LEGISLATION FOR A CO-ORDINATED APPROACH TO WATER PLANNING. IT MAY BE DESIRABLE THAT PROVISIONS CONCERNING WATER RESOURCES MANAGEMENT, CONSERVATION AND PROTECTION AGAINST POLLUTION, BE COMBINED IN A UNITARY LEGAL INSTRUMENT, IF THE CONSTITUTIONAL FRAMEWORK OF THE COUNTRY PERMITS. LEGISLATION SHOULD DEFINE THE RULES OF PUBLIC OWNERSHIP OF WATER AND OF LARGE WATER ENGINEERING WORKS, AS WELL AS THE PROVISIONS COVERING LAND OWNERSHIP PROBLEMS AND ANY LITIGATION THAT MAY RESULT THEREFROM. IT SHOULD BE FLEXIBLE ENOUGH TO ACCOMMODATE FUTURE CHANGES IN PRIORITIES AND PERSPECTIVES.
 4. COUNTRIES SHOULD MAKE NECESSARY EFFORTS TO ADOPT MEASURES FOR OBTAINING EFFECTIVE PARTICIPATION IN THE PLANNING AND DECISION-MAKING PROCESS INVOLVING USERS AND PUBLIC AUTHORITIES. SUCH PARTICIPATION CAN CONSTRUCTIVELY INFLUENCE THE CHOICE BETWEEN ALTERNATIVE PLANS AND POLICIES. IF NECESSARY, LEGISLATION SHOULD PROVIDE FOR SUCH PARTICIPATION AS AN INTEGRAL PART OF THE PLANNING, PROGRAMMING, IMPLEMENTATION AND EVALUATION PROCESS.
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Source: United Nations, Report of the United Nations Water Conference, Mar del Plata, 14-25 March, 1977, E/CONF.70/29, United Nations, New York, 1977.

undergone considerable modification in most countries. Until very recently, however, it was difficult to see any general trends in these policy changes. It cannot be claimed that, in most countries, the recommendations and resolutions adopted at the United Nations Water Conference have had any clearly discernible influence on the direction of the policies adopted towards water administration. More recently, a global tendency can be distinguished towards a decentralization of water management responsibilities away from central government. This tendency, somewhat contradictory to some aspects of the Action Plan, may create, at last, an opportunity for the application of some of the basic precepts for water resource administration enunciated at the United Nations Water Conference.

Water Management in the 1980's

1. The Global Perspective

The overall economic and social climate of the 1980's was not the most appropriate for innovation and change in water resource management. For many countries, the dominant economic climate was one of recession and decline. The years since the Mar del Plata Conference divide into two very markedly different periods. The first period, which ended in 1982, was marked by high rates of economic growth in all regions. It was followed, however, by eight years of much more mixed economic fortunes. Some countries continued to grow at relatively high rates, particularly in the Asia and the Pacific region. Others faced very adverse circumstances. In Latin America and the Caribbean, the main

contributing factor was the external debt crisis; in Africa, the difficulties arising from the external debt were aggravated in many countries by drought; and in West Asia the decline in world oil prices created its own problems. Only in the Asia and Pacific region was there a generally positive economic and social climate.

The last decade has also witnessed a considerable, if not revolutionary, change in the conventional perception of the role of the state in economic management in general and of the role and action of the public sector, in particular. In many countries, there has been a considerable reduction in the size of the public sector and the consequent transfer of economic development projects of all kinds to private management.

Such large scale changes in the management of the economy can be expected to have significant, even determinate consequences for water management. It is not clear, however, that the extent of the change has yet been reflected in the conventional wisdom on optimum water policies. There remains, in more recent statements, an underlying assumption of the dominant state role in water resource development and use. For example, the recent report by the "Panel of Experts on the Formulation of a Strategy for the Implementation of the Mar del Plata Action Plan in the 1990's," makes no reference to the role of the private sector in the development and use of the water resource nor does it emphasize the overriding significance of efficiency in the use of the water resource for the achievement of the objectives of social and economic development.

Uneven development among countries of the institutions and

policies for water management existed before the United Nations Water Conference and remains the situation now. Countries in all regions of the world had well developed administrative systems for water resource development and use in 1977 and others did not. In general, this remains the case, although innovation and change can be observed in policy, planning and management systems in many countries in all parts of the world.

2. Regional Circumstances

The basis of this report is a series of regional evaluations that have been prepared under the auspices of the Department of Technical Cooperation for Development and the United Nations Development Programme on the current state of water management and of its evolution since the United Nations Water Conference. The findings of these reports have been interpreted and presented for each region in an attempt both to preserve regional identities and to show the differences that exist in the nature of the current issues that confront water management and in the experience in attempts to follow the recommendations contained in the Mar del Plata Action Plan.

a. Africa *

The years since the adoption of the Mar del Plata Action Plan have been a difficult period for the countries of Africa south of the

* This section is based on: United Nations, Department of Technical Co-operation for Development and Department of International Economic and Social Affairs, Progress with Implementation of the Mar del Plata Action Plan, Institutional and Legal Infrastructures for Planning and Management of Water Resources, African Region, a report by Nii Boi Ayibotele, consultant, August, 1990.

Sahara. In many countries there were serious economic difficulties with an overall fall in per capita GDP between 1981 and 1987. In addition, from 1981 to 1984 many countries suffered a severe drought which accentuated their economic difficulties and also produced a considerable degradation of the environment.

In general, the countries of Africa lacked institutional infrastructure for water management in 1977. Historically, there had been relatively little exploitation of the resource and a lack of modern infrastructure for water use. There has been improvement in the legal and administrative infrastructure during the last 13 years, particularly in water supply and sanitation, but also in overall management of the resource.

The regional survey classifies the countries of Africa into four groups according to their present institutional and legal infrastructure. The infrastructure in each of the four groups of countries has the following characteristics:

- i) countries with fragmented policy-making systems for water resources, e.g. Ghana and Sierra Leone,
- ii) countries with an overall water policy body in the form of a Water Resources Commission or Board, with other public agencies subordinate to this body, e.g. Ethiopia,
- iii) countries with an overall policy body within a ministry with wider responsibilities, e.g. Gambia, Uganda, Zambia and Malawi,
- iv) countries with a specific water resources ministry, e.g. Burkina Faso, Kenya and Nigeria.

There are, however, common features among the water management issues facing all the countries of the region despite the existence of differences in institutional organization. The effectiveness of institutional arrangements in any country appears to depend more on the strength and qualifications of the planning staff than on the specific institutional form. Countries with central coordinating institutions do tend, however, to have less serious problems with overlapping and duplication of responsibilities and activities, as in Malawi. In many countries, as for example in Ghana, where nearly all water institutions are autonomous, and the Sudan, the relationship between the controlling boards of autonomous agencies and their respective ministries are not well defined. Similarly, in other policy areas, success depends more on the ability and willingness to apply policies than on the particular institutional form, for example in Ethiopia the Water Resources Commission, the Water Resources Development Authority and the Water Supply and Sewerage Authority have ample powers to regulate water demand and use, but these have not been exercised. This is generally true in such areas as the recovery of costs through tariffs, the formulation and implementation of development programmes and the management of specific water uses.

The most significant current difficulties in water resource management being faced by the countries of Africa are in part a reflection of the precarious economic situation found in many of them. The solution of these difficulties does not lie, therefore, only in the adoption of new policies for water policy and planning.

There are, however, other problems specific to water resources management. The most widespread of these can be summarized as follows:

- i) Lack of appreciation of and commitment to planning, or to great a reliance on external assistance, a tendency reinforced by the policies of many donor agencies,
- ii) A general absence of the skills required to manage complex water management systems,
- iii) A failure to develop and apply adequate tariff systems for water-based services and a generally inadequate management of such services,
- iv) The need to decentralize operational functions to the appropriate local level.

The continued existence of obstacles to the optimum use of the water resource in the countries of Africa does not mean that advances have not been made since 1977. Egypt, for example, has made considerable gains in agricultural productivity from irrigated lands despite the absence of charges for water. The advances that have been made, however, have not been sufficient to overcome the many inefficiencies existing in water management in the region. For example, since the mid-1970's, most countries have been forced to revise their cost recovery policies. The general trend in tariff policy for water supply and sanitation is for the recover of all costs in large cities, to recover all costs excepts capital costs in other urban areas and to recover operation and maintenance costs in rural areas. Nevertheless, many tariffs do not reflect

real costs, the beneficiaries do not always pay and many institutions still have not adopted clear financial objectives. Similar problems can be observed with tariff policies in irrigation and even for electricity generated from hydropower where generally agencies are expected to operate on commercial lines. There is often conflicts between financial and other goals. In the Ivory Coast, the government adopted a policy self-financing for water supply and sanitation at the beginning of the IDWSSD, but the policy had not been fully applied in 1990 due to conflicts with other political objectives such as providing water to the poor without charge.

Moreover, some innovations instituted in the last decade have not always achieved the results anticipated. In Kenya, efforts to promote multipurpose water development have been hampered by the lack of experience and expertise and the problems of reconciling river basin planning with administrative boundaries. The result has been that multipurpose development depends on the interest of the ministry initiating development of the particular water body. In general it can be said that in the countries of the African region there remains much room for improvement and reconsideration of the direction of overall water management policies, in the revision of legislation and its more thorough application and in efforts to train staff and retain them once trained. A summary of the situation in 1990 in the countries of the region is given in table 2.

Table 2
AFRICA, STATE OF WATER MANAGEMENT, BY COUNTRY

Country	Water policy statement	Water legislation	National plan	Central Coordination	Cost recovery
Benin	...	Inadequate	...	...	...
Burkina Faso	No	Adequate	No	Yes	...
Cameroon	...	Inadequate	...	...	Partial Irr.
Congo	...	Inadequate	...	No	...
Egypt	Yes	Adequate	No	Yes	Partial
Ethiopia	Yes	Inadequate	No	Yes	Partial
Gambia	...	Inadequate	...	...	...
Ghana	No	Inadequate	No	No	Partial
Guinea	...	Inadequate	...	...	...
Ivory Coast	Yes	Adequate	...	Yes	Full
Kenya	Yes	Adequate	No	Yes	Partial
Liberia	No	Inadequate	No	No	...
Malawi	Yes	Adequate	Yes	Yes	Partial
Mali	Yes	Adequate	Yes	No	Partial Irr.
Morocco	No	Inadequate	No	No	Partial
Niger	Yes	Adequate	Yes	Yes	Partial Irr.
Nigeria	No	Inadequate	No	Yes	...
Senegal	No	Inadequate	No	Yes	Partial
Sierra Leone	No	Inadequate	No	No	...
Sudan	No	Inadequate	No	No	Full
Tanzania	Yes	Adequate	...	Yes	...
Togo	...	Inadequate	...	...	...
Uganda	...	...	No	Yes	...
Zaire	...	...	...	No	...
Zambia	...	...	...	Yes	...

Source: United Nations, Department of Technical Cooperation for Development and Department of International Economic and Social Affairs, Progress with Implementation of the Mar del Plata Action Plan, Institutional and Legal Infrastructures for Planning and Management of Water Resources, African Region, a report by Nii Boi Ayibotele, consultant, August, 1990;
 United Nations, Department of Technical Cooperation for Development, Assessment of Progress in the Implementation of the Mar del Plata Action Plan, Technical Report on Mali, Niger and Burkina Faso, prepared by Oscar L.J. Radelet, February, 1990;
 United Nations, Department of Technical Cooperation for Development, Water Quality Assessment in Western and Central Africa, report by Martial Dray, April, 1990;
 United Nations, Department of Technical Cooperation for Development, Report on the Water Quality Issues in the Nile Basin and East African countries, prepared by Hassan El Ghobary, June, 1990.

c3.b. Asia and the Pacific *

The countries of the Asia and Pacific region have, in general, prospered in the period since the Water Conference. This relative economic well being has been accompanied by an increasing intensity of water use and a consequent growing complexity of the issues challenging water management. Fortunately, many countries had developed relatively sophisticated water management institutions by the 1970's and were, therefore, prepared for the new challenges which have arisen to water management over the last decade.

A number of the countries of the region have formulated national water policies which include the development of master water plans, although such policies have been modified in recent years to give greater emphasis to economic efficiency. In most countries of the region, these statements of national water policies are supported by legislation regulating the ownership, use and protection of the water resource. In many countries, for example the Republic of China, India and the Philippines, water is defined as public property and in these countries and others national water policies emphasize the multipurpose use of water and provide for the coordination of the development of water resources. The Philippine Water Code of 1976 provides that the utilization, development, conservation and protection of the water resources will be subject to the control and regulation of the

* This section is based on: United Nations, Economic and Social Commission for Asia and the Pacific, Regional Assessment of Progress on Water Management Issues in Asia and the Pacific, March, 1990.

National Water Resources Board. Except for domestic or household use in which only registration is required, no person may appropriate water without permission of the Board. Centralized institutional mechanisms for water planning and for the coordination of policy are commonly found in the region. Some countries still have to establish such mechanisms and most comment that there are serious weaknesses in the existing coordination systems. About half the countries of the region, including Afghanistan, the Republic of China, Malaysia, Pakistan, the Philippines, Sri Lanka, Thailand and Vietnam Nam, have prepared national water plans incorporating the concept of integrated water management. In India and the Republic of China plans are prepared at both the national and provincial levels. In most cases planning is done by more than one agency. This requires coordination among the different agencies involved. Such coordination is done through periodic meetings, as in India, and by correspondence as in Thailand, the Philippines and the Republic of China. Fifteen countries have established a central coordinating mechanism. There are many types of mechanisms in some a special council has been established such as the National Water Resources Council in India while in others one ministry is responsible for example the Ministry of Irrigation in Afghanistan.

The increasing urbanization and industrialization in many countries has led to growing pollution of many water bodies. For example in southwestern China acidification of water bodies from acid rain is of increasing concern. In Malaysia a number of rivers

are seriously polluted with organic matter mainly from untreated human sewage. In Australia nutrient inputs to water bodies have been rising rapidly and eutrophication of lakes is prevalent in China. Bacteria and organic pollution of rivers is a major problem in Nepal, Vietnam. Organic pollution is most serious, however, in Sri Lanka, the Republic of Korea and the Philippines. In contrast in Singapore the level of control and monitoring of water quality is such that there are no serious problems. It is generally accepted by the governments of the countries of the region that the need to control pollution is the most pressing of the major issues confronting water management in the Asian and Pacific region.

The wider environmental effects of exploitation of the water resource are also becoming recognized, for example, in the Philippines a number of projects are underway to improve water quality and the environmental impact statement (EIS) procedure has become a major planning tool. The EIS procedure has been in formal use in the Philippines since 1977, but only came into its own in the 1980's. Between 1981 and 1989 a total of 55 Environmental Impact Statements were prepared for major development projects.

All the governments of the region report that water uses are consulted in one way or another. In irrigation water user organizations are to be found in various countries. In Pakistan, water user cooperatives were formed during the 1980's to reconstruct, improve and maintain water systems and these are working satisfactorily. Such associations if they meet certain basic conditions may be registered as a body corporate with power

to hold property, enter into contracts, institute and defend suits and other legal proceedings and do all acts necessary for the purpose of carrying out its functions. Means to permit user participation are also found in India, the Philippines, the Republic of China and Thailand.

Despite the relatively successful advances that have been made in the countries of Asia and the Pacific, a number of issues still remain to be resolved. The current state of water management is summarized country by country in table 3.

The most significant issues facing the countries in the 1990's have been identified as those following,

- i) the need for the revision of existing water legislation to better reflect current challenges to water management, especially in respect of water pollution,
- ii) the need for more effective water quality management,
- ii) the improvement of existing central coordinating and planning mechanisms,
- iv) the necessity to make further advances in the recovery of the costs of provision of water and water-based services,
- v) greater public participation.

In comparative terms, water management in the Asia and Pacific region has made considerable strides in the effectiveness of its institutional structure and in the efficiency of its operations since the United Nations Water Conference. The problems confronting water management have been recognized, technical

Table 3
ASIA AND THE PACIFIC, STATE OF WATER MANAGEMENT, BY COUNTRY

Country	Water policy statement	Water legislation	National plan	Central Coordination	Cost recovery
Afghanistan	Yes	Adequate	Yes	Yes	Partial Urban
Australia	Yes	...	No	Yes	Full
Bangladesh	...	Inadequate	...	...	...
China	Yes	...	Yes	No	Partial
Fiji	Yes	Inadequate	No	No	Partial
Guam	Yes	Adequate	Yes	No	Partial
Hong Kong	Yes	Adequate	Yes	Yes	Partial
India	No	Inadequate	No	Yes	Partial
Indonesia	Yes	Adequate	No	No	Full Urban
Japan	No	Adequate	No	...	Full
Malaysia	No	Inadequate	Yes	No	Partial
Myanmar	...	Inadequate	...	...	...
New Zealand	Yes	Adequate	No	Yes	Full
Niue	Yes	Inadequate	No	Yes	Partial Irr.
Pakistan	Yes	Inadequate	Yes	Yes	Partial Irr.
Papua New Guinea	Yes	Adequate	No	Yes	Full Urban
Philippines	Yes	Adequate	Yes	Yes	Full
Republic of Korea	Yes	Adequate	Yes	Yes	Partial
Samoa	Yes	Inadequate	No	...	...
Singapore	Yes	Adequate	Yes	No	Full
Sri Lanka	No	Inadequate	Yes	No	Full
Thailand	Yes	Inadequate	Yes	...	Partial
Tonga	Yes	Inadequate	Yes	Yes	Partial
Trust Territory of the Pacific Islands	No	Inadequate	No	Yes	Partial Urban
Vanuatu	No	Inadequate	No	No	Full
Viet Nam	Yes	...	Yes	Yes	...

Source: United Nations, Economic and Social Commission for Asia and the Pacific, Regional Assessment of Progress on Water Management Issues in Asia and the Pacific, March, 1990.

solutions identified and in many cases are being applied. There is now a generally high level of effectiveness in water management within the countries of the region. Present levels of management efficiency and effectiveness can be improved, but a solid basis has been created in most countries from which to confront the challenges that can be expected to arise in the 1990's.

c3.c. Latin America and the Caribbean *

In general, it can still be said that in water management in Latin America and the Caribbean, there are few, if any, genuine examples of water management institutions charged with the responsibility to take an integrated viewpoint, the most basic notion in the Action Plan. There is evident, however, an increasing recognition of the need to centre public activities on the resource itself rather than on the uses to which it may be put.

Until very recently, with the change in the role of government in many countries of the region, it was possible to group the administrative systems of the countries of the region into three very broad classes,

- i) administrative systems characterized by the existence of many public and, in some cases, private institutions active in water management, with only weak central coordination,
- ii) administrative systems with a mechanism for the central coordination of policy, but with institutional dispersion of responsibilities for the administration of water use.
- iii) administrative systems characterized by complete centralization of authority.

The most common situation was the first. Argentina, Bolivia, Chile, Colombia, El Salvador, Guatemala, Honduras, Paraguay, and

* This section is based on: United Nations, Economic Commission for Latin America and the Caribbean, The Administration of Water Resources in Latin America and the Caribbean since the Mar del Plata Conference, July, 1990.

Table 4
LATIN AMERICA AND THE CARIBBEAN, STATE OF WATER MANAGEMENT, BY COUNTRY

Country	Water policy statement	Water legislation	National plan	Central Coordination	Cost recovery
Antigua and Barbuda	No	Adequate	No	Yes	Water supply
Argentina	No	Adequate	No	No	Partial
Bahamas	No	Adequate	No	Yes	Water supply
Barbados	No	Adequate	No	Yes	Partial
Bolivia	No	Inadequate	No	No	Partial
Brazil	No	Adequate	No	No	Full
Cayman Is.	Yes	Adequate	Yes	Yes	Full
Chile	No	Adequate	No	No	Full
Colombia	No	Adequate	No	Yes	Partial
Costa Rica	No	Adequate	No	No	Partial
Cuba	Yes	Adequate	Yes	Yes	No
Dominica	No	Adequate	No	Yes	Full
Dominican Republic	No	Adequate	No	Yes	Partial
Ecuador	No	Adequate	Yes	No	Partial
El Salvador	Yes	Inadequate	Yes	Yes	Partial
Grenada	No	Adequate	No	Yes	Full
Guatemala	No	Inadequate	No	No	Partial
Haiti	No	Inadequate	No	No	No
Honduras	No	Inadequate	No	No	Partial
Jamaica	Yes	Adequate	No	Yes	Partial
Mexico	Yes	Adequate	Yes	Yes	Partial
Montserrat	No	Adequate	No	Yes	Full
Nicaragua	No	Inadequate	No	No	No
Panama	No	Adequate	No	Yes	Partial
Paraguay	No	Adequate	No	No	Partial
Peru	Yes	Inadequate	Yes	Yes	Partial
St. Kitts and Nevis	Yes	Adequate	No	Yes	Full
St. Lucia	No	Adequate	No	Yes	Full
St. Vincent and the Grenadines	No	Adequate	No	No	Partial
Trinidad and Tobago	No	Adequate	No	No	Full
Uruguay	No	Inadequate	No	No	Partial
Venezuela	Yes	Adequate	Yes	Yes	Partial

Source: United Nations, Economic Commission for Latin America and the Caribbean, The Administration of Water Resources in Latin America and the Caribbean since the Mar del Plata Conference, July, 1990.

Uruguay all fell within this category. Coordination of activities between institutions or across sectors is of obvious importance in such an open system of management and, although generally ineffective, has been attempted in a great variety of ways. There are inter-ministerial councils, specific coordination agencies, national planning offices, ad hoc arrangements for the carrying out of specific projects to name only a few examples.

The second category, characterized by somewhat stronger central coordination, was found in Costa Rica, Panama, Peru and at both the federal and state levels of government in Brazil. In these countries coordination of policies has been achieved through the existence of formal mechanisms at the inter-ministerial level. The existence of such coordination mechanisms in the countries of Latin America and the Caribbean predates, however, the specific recommendations made in the Action Plan. There is no example of any country adopting such an institutional structure in the 1980's.

In four countries, Cuba, Ecuador, Mexico and Venezuela responsibility for the administration of water resources has been centralized in a single institution. There are variations in the specific form of the institutional system among these countries, but the important feature is the consolidation of authority over the resource and its use in one central institution.

In general, the degree of public intervention has been considerable in all countries, although it tended to increase from countries in the first category to those in the third category, culminating with Cuba. Conversely, the private sector has had a

more active participation in water administration and economic incentives have been given a greater role as an administrative tool in countries within the first category than in those countries falling into the other two categories.

It has taken a major economic and social crisis in the region to change the perception of the public role in water management to one where the idea of resource-oriented, multi-purpose management can be given serious consideration. Previously, these ideas have had only very limited acceptance. There is currently a very fluid situation in water management in Latin America and the Caribbean as there is in most traditional public sector activities.

Of all the countries of the region, it is in Brazil, Chile and Mexico that the most interesting specific innovations have occurred in water management policies in recent years. Innovations which are, in themselves, very different, but which point to the possible future creation of water management systems applying such concepts as integrated and coordinated water resource management with a clear distinction between the responsibility to manage the resource and the responsibility for the management of its use. In all three countries, the policy initiative has come from the top down as part of the efforts to generally redefine the role of government. In Brazil, the proposal for the reorganization of water management is still only a proposal, although a reorganization of the federal bureaucracy is already in place. In Chile, a system of water administration has been created which distinguishes between the public responsibility for the resource and the users responsibility

to manage its use. While in Mexico the Comisión Nacional del Agua (CNA), which has replaced the Secretaría de Recursos Hidráulicas, is charged with the institutional responsibility for integrated water management within a more decentralized administrative system.

c3.d. West Asia *

The countries of West Asia are characterized by arid and semi-arid climates with scarce or very limited water resources. In some, for example, Kuwait, there is no surface water and all supply comes from wells and desalination plants. In general there is increasing use of desalinated water and the reuse of agricultural and wastewater drainage. In most countries of the region, the present and projected water requirements when compared with the availability of supply pose serious questions as to the long-term sustainability of existing patterns of water development and use. In consequence, many countries of the region have recognized the need to conserve and manage their water resources through the formulation of medium and long-term policies for their utilization. At the same time, however, the private sector continues to play a major role, especially in irrigated agriculture, even in centrally planned economies like Syria.

The last decade has been marked by increasing efforts in the countries of the region to establish capable water institutions. Some countries have made serious efforts to establish or improve meteorological and hydrological networks as well as to improve

* This section is based on: United Nations, Economic and Social Commission for West Asia, Implementation of the Mar del Plata Action Plan in the ESCWA Region, May, 1990.

water administration. There has been a movement away from ad hoc purely engineering solutions to problems of water supply and demand towards a seeking of solutions which take into account broader social and environmental considerations. In general, however, the countries of the region are far from achieving integrated management of their water resources.

Some countries have taken measures to establish more unified and centralized institutional arrangements capable of applying modern techniques and methodologies to water management, for example, in Jordan, and Lebanon have established national water authorities responsible for the central management, planning and administration of water resources. The Jordan Ministry of Water and Irrigation was formed in 1987 by the amalgamation of the Water Authority of Jordan, responsible for water supply, sewerage and water resources, with the Jordan Valley Authority, responsible for irrigation and development in the valley of the River Jordan. In Iraq, a Central Advisory Board for Water Management and Planning has been established to facilitate water resource development. In other countries, however, fragmented responsibilities for water management are still to be found within the public administration. Such fragmentation is still characteristic of Oman, Yemen and the United Arab Emirates among others. The dispersion of the administration has resulted in institutional conflicts and poor management as well as appreciable difficulties in water resource development.

Water legislation in general in the region is complex and

outdated. The regulation of water resource development is often contained in diverse laws or originates from traditional and customary practices. Many countries have critically reviewed their water legislation in an attempt to provide more rational systems in accordance with modern water management practices. For example water legislation was revised in Iraq in 1971, 1981, 1983, 1986 and again in 1988. In the Gulf States (Bahrain, Kuwait, Oman, Qatar, United Arab Emirates and Saudi Arabia), the Gulf Cooperation Council charter has given specific concern to water resources. In article (4) the countries are urged to undertake measures to enhance technical and scientific aspects in all fields of development including water resources. In this respect, the Ministers of Water and Electricity have formed specialized committees for:

- the optimum use of water and electricity,
- the unification of water and electricity specifications
- the exchange of information
- the standardization of maintenance and operation methodologies

National water plans have been prepared in various countries of the region. For example, in Jordan, the National Water Master Plan was completed as early as 1977. Kuwait, Egypt, Iraq, Saudi Arabia and Oman have all taken steps to prepare water plans and national water policy statements. In Egypt, the first phase of the plan covering the preparation of a development programme to increase water supply was completed in at the end of 1981. In a second phase undertaken between 1982 and 1986 develops in detail

a number of the projects identified earlier.

A number of countries have made efforts to ensure that environmental considerations are taken into account in the development and use of the water resource. For example, in Kuwait, all domestic wastes receive tertiary treatment and the treated effluents used in agriculture. In others, however, water quality is not monitored and the data needed to manage water quality and to safeguard the environment are not available. This is the case in Syria the Lebanon and Yemen. In contrast, in Jordan a National Environmental Strategy was planned for completion by the end of 1990. The strategy will encompass all aspects of the environment including surface and ground water resources.

The general situation of water management in the countries of the region is summarized in table 5.

Overall, good progress has been made in West Asia in institutional arrangements and legislation for water resources management. There remains a need for further improvement, particularly in such areas as the knowledge of the resource, better training of manpower, continuance of legislative reform, increased consideration of social aspects of water projects, the management of shared water resources, particularly the Euphrates River, and, finally, the application of new and non-conventional technology to many aspects of water management.

c1. Opportunities and challenge

The early 1980's mark a climax in the expansion of the managing of economic activities by the public sector. In water resources

Table 5
WEST ASIA, STATE OF WATER MANAGEMENT, BY COUNTRY

Country	Water policy statement	Water legislation	National plan	Central Coordination	Cost recovery
Bahrain	No	Adequate	No	Yes	...
Egypt	Yes	Adequate	Yes	Yes	...
Iraq	No	Adequate	No	Yes	...
Jordan	Yes	Adequate	Yes	Yes	Partial
Kuwait	Yes	Adequate	Yes	No	...
Lebanon	No	Inadequate	No	Yes	...
Oman	Yes	Adequate	Yes	Yes	...
Qatar	No	Adequate	No	No	...
Saudi Arabia	Yes	Adequate	Yes	No	...
Syria	No	Inadequate	No	No	...
UAE	No	Adequate	No	Yes	...
Yemen	No	Inadequate	No	No	...

Source: United Nations, Economic and Social Commission for West Asia, Implementation of the Mar del Plata Action Plan in the ESCWA Region, May, 1990.

management, this period was typified by the undertaking of a number of grandiose water-related public sector projects mainly for the generation of hydroelectricity, but also for irrigation and navigation. This dominance of public sector activities in water resources management is now being reversed. In recent years and in most countries, the role of the state in the economy is under serious reconsideration. The objective of this reconsideration is the achievement of both the reduction of state expenditures in conditions of fiscal austerity and an increase in the efficiency of provision of services by transferring responsibilities either to the private sector or, at least, to autonomous state companies charged with obtaining financial self-sufficiency.

One of the results has been an increase in participation by users in water management through the transfer of many water using activities to the private sector or to local governments leaving the central public administrations with responsibility for licensing of water-related projects, but not for their operation. The introduction of such policies, although very uneven among countries, is a general phenomenon and is the first major change in the direction of water administration policy in the last fifty years. The steady expansion of the state has been halted. The context in which water administration is being discussed has changed. The opportunity has possibly been created for the adoption of institutional arrangements based on the concept of the integrated management of the water resource. The removal of much of the responsibility for the management of water use from the

central public administration to local government, autonomous state companies or to the private sector will require a large effort in coordination if anarchy is not to result.

This raises the question of whether a new approach is required to water management? Much has been achieved since the adoption of the Mar del Plata Action Plan, but there remains a general lack of sound and effective water management. There are strong grounds for the adoption of a less normative prescription to face the challenge of the growing water demands of the 1990's and the increasing heterogeneity of the use of the water resource.

The regional reports clearly show the universality of the growth in the importance of water pollution caused by the uncontrolled dumping of human and industrial wastes from urban centres and by the increasing use of fertilizers and pesticides in agriculture. Few countries have the institutional means or the necessary policies to tackle pollution. Moreover, it is not clear that the experience of the developed countries can be easily transferred, dependent as it has been on technological solutions and high rates of capital investment.

The future role of the public sector in water management will probably be different from that characteristic until the 1980's. A general transfer of the management and operation of water using activities to the private sector can be expected. It is not likely that such a transfer will be complete or that some water using projects will not remain in the public sector. It is not to be anticipated either that the only means of ownership will be by

private entrepreneurs. Cooperatives and other forms of social ownership will also be used. The result could be, however, to better distinguish a public responsibility for the management of the resource from the responsibility for the management of its use. An opportunity will be created to ensure the adoption of resource-orientated management systems.

c1. Conclusions

Measuring progress in the following by countries of the normative statements on water management included in the Mar del Plata Action Plan is not possible in precise terms. There are no easily applied standards and it is not possible to stand in universal judgement. It can be claimed, although with some degree of uncertainty, that the resolutions adopted at the United Nations Water Conference have had little clearly discernible influence in countries in setting the direction of the policies adopted towards water administration. There are some exceptions, particularly in those countries, mainly in Africa, where international organizations have had a major role in determining policy. More recently, however, there are clear signs of both a general tendency toward the decentralization of water management responsibilities and an apparent consideration and even introduction of some of the basic precepts for water resource administration enunciated at the United Nations Water Conference.

The common problems of water management have changed little since 1977 and remain,

- i) a dominance of unregulated use of water resources,
- ii) inadequate and ineffective water resource management,
- iii) a high degree of inefficiency in many water related public utilities,
- iv) a failure to retain trained staff of all types,
- v) over centralization and bureaucratization of decision-making authority,
- vi) inappropriate and inadequate water legislation.

It is not certain that a simple reiteration, even in modified form, of the normative resolutions adopted at the United Nations Water Conference would be a particularly useful exercise. A new approach is needed which both recognizes the dependence of progress of water management in each country on the circumstances and conditions of that country and accepts that the fundamental importance of water lies in its use and in its character as a natural resource and an economic good.

Any new global statement on water management should recognize that water management institutions must be appropriate to local conditions and not centrally imposed according to a preconceived inflexible pattern. Moreover, institutional systems should reflect the overwhelming priority of local responsibility and of the need for local, not just central, coordination.

Equally it must be acknowledged that in water resource management, centralized national planning has failed as a tool for achieving optimum use of the water resource, as it has failed generally as a tool for achieving the goals of economic and social development. New emphasis should be placed on the need for achieving rational efficient use of water locally. The importance of the efficient management of water using utilities should be clearly emphasized and the role of the private sector in achieving increased efficiency be given due consideration.

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