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ESCWA ACHIEVEMENTS IN THE WATER SECTOR

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I. CURRENT SITUATION OF WATER RESOURCES IN THE ESCWA REGION

The Economic and Social Commission for Western Asia (ESCWA) is made up of thirteen member countries, namely: Bahrain, Egypt, Iraq, Jordan, Kuwait, Lebanon, Oman, Palestine, Qatar, Saudi Arabia, Syrian Arab Republic, United Arab Emirates and Yemen.

The region covered by the ESCWA member countries is about 4.75 million square kilometers and 97.7 per cent of this area is desert. Water is a valuable resource and its development and management require considerable investment. Climatic conditions, availability of water resources, socio-economic conditions, national borders, conflict of interest and politics play an important role in hindering development in many countries of the ESCWA region. Water resources issues are probably more significant in this region than in any other part of the world. When present and projected water requirements for all purposes are compared with the available ground- and surface-water resources, serious questions arise concerning the long-term economic and environmental sustainability of existing water-resources development and water-use patterns. Under existing patterns of water use, it is unlikely that the expansion of irrigated agriculture can proceed without water-shortage problems. Additionally, increasing water scarcity in the region is likely to impose significant constraints upon meeting growing domestic and industrial demand. Some of the member States of ESCWA have met demand by securing water supplies through desalination of sea and brackish ground-water, as well as reclaimed waste water.

In the Arabian Peninsula subregion, surface-water resources are limited and rely on irregular, sporadic and un-predictable flood occurrences. Ground-water and non-conventional water resources (desalinated water and treated sewage effluent) are the major components of the water supply in the subregion. The main producing aquifers are composed of: Paleozoic sands; Mesozoic sands and carbonate rocks; and Tertiary carbonate rocks and Quaternary alluvium. Ground-water quality generally deteriorates as one moves from the mountain ranges towards the inland basins or sea coasts.

The limited water resources of the subregion have not been able to meet the increased water demands. This situation led concerned authorities, particularly in the Gulf States, to initiate the production of additional water resources to meet their water demand through the desalination of sea and brackish ground water.

In the Northern and North-east subregion which encompasses Jordan, Lebanon, the Syrian Arab Republic, Iraq and Egypt, surface-water resources predominate, though ground-water resources do occur and are well developed in some member countries. Surface-water resources in the subregion are appreciable and are represented by the following main rivers: Nile, Euphrates, Tigris and tributaries, Yarmouk, Orontes, Barada, Litani, Hasbani, Jordan, and others. Efforts to regulate flood waters and develop surface-water resources have been remarkable in the subregion, as represented by Al-Tabaka Dam in the Syrian Arab Republic, Qaroun Lake in Lebanon, and other projects in Egypt, Iraq and Jordan. Ground-water resources occur in Paleozoic sandstones, Jurassic-Cretaceous-Palaeogenic carbonate rock aquifers, Tertiary volcanic rocks and Quaternary alluvium. The quality ranges from excellent to brackish.

It is possible to classify ESCWA countries into three groups. **Group I** countries are situated in arid zones and they lack sufficient natural water resources and fertile soil; in addition, they suffer from adverse climatic conditions. They have to desalinate sea water to obtain most of their fresh water needs and to reuse sewage effluents to meet the needs of their high rate of population growth and rapid development. All group I countries share the western coastline of the Arabian Gulf. Oman, the United Arab Emirates and Saudi Arabia have long coastlines on the Arabian and Red Seas.

Group II countries are situated in relatively arid zones and include Jordan, Palestine and Yemen. These countries have a better natural water potential than those in group I, but they all face imminent water shortages.

Group III countries are situated in semi-arid zones and include Egypt, Iraq, Lebanon and the Syrian Arab Republic. The most important water resources problem of this group is that they share among themselves and with neighbouring countries a substantial percentage of their surface water. The water resources of group III are adequate only for the coming decade and if they conserve, develop and manage these resources.

Studies have indicated that countries in this part of the world are now, or are expected to be by the year 2000, at a point where total demand for water will be about equal or exceed the estimated available resources. In some ESCWA countries, water shortages are already a reality. Some others have almost fully developed their fresh (renewable) water resources. Depletion of non-renewable water resources due to over-pumping from exploited aquifers is also a serious and common phenomenon. Consequently, degradation of water quality, due to increasing salinity is also common in a number of countries in the ESCWA region.

The largest user of water in the ESCWA region is agriculture, and many of the Western Asia countries follow subsidy and incentive policies in this sector. It is now proven that such policies hamper agriculture development on the long run by encouraging increased water application rates and subsequently depleting aquifers, diminishing streams flows, and causing water logging and soil salinity. Additionally, rapid urbanization, and improvement of the quality of life in terms of health, sanitation and social services, have resulted in sharp increase in water demand for municipal purposes. Together with industrial and agricultural uses, high demand for water has caused imbalance between water availability and water requirements for socio-economic development.

Major surface and groundwater resources in the region are shared between countries lying both within and beyond the region. The most significant river basins are those of the Jordan, Nile and Euphrates/Tigris, all of which are subject to continuous riparian issues. A significant agreement exists only in respect of the Nile, and then only between two countries (Egypt and Sudan). Large aquifers are shared by countries in the Arabian Peninsula, Iraq, Syria and Jordan. Though costly to develop, agreements on abstractions do not exist.

Lack of appropriate cooperation and coordination at regional and interregional levels in the field of shared water resources is a problem and a source of worry. This issue is highly affected by the prevailing political situation in the region, as well as within adjacent regions. Mutual cooperation and coordination in managing the shared surface and groundwater basins

would help achieve sustainable development within the region to ensure rational development, utilization and conservation of the water resources, taking into consideration a variety of related aspects under the socio-economic factors prevailing in the concerned countries.

The estimated available water resources, based on the various hydrological and hydrogeological investigations carried out in the ESCWA region, may be summarized as follows:

	1990	2000
Available	154 BCM	166 BCM
Demand	143 BCM	179 BCM
Balance	11 BCM	- 13 BCM

Table I provides an idea of the importance of the close relation that exists between water resources availability and present and future water demands. Many member States in the ESCWA region will reach their development limits by the year 2000, owing to the acute water shortages which are even now a reality in the GCC member countries, Jordan and Yemen. In other cases, the estimated demand for agricultural water will not be met at all, preventing some countries from achieving food self-sufficiency, if present regional water-use practices continue.

It is worth mentioning here that the available surface-water resource figures shown in table I for both the Syrian Arab Republic and Iraq, and to a certain extent for Egypt and Jordan, may not apply in future, owing to the water-resources development activities which are being practiced in the neighbouring upstream countries sharing the same water sources and to the absence of registered riparian rights.

The volumes of the available groundwater resources shown in table I are based mostly on reconnaissance investigations. Groundwater over-exploitation due to excessive and uncontrolled pumping, as well as deterioration in water quality, are common features observed in many regional basins such as those in Jordan, the Syrian Arab Republic, Saudi Arabia and Yemen. Groundwater quality is deteriorating due to sea water intrusion into the coastal plains aquifers in Yemen, Oman, Bahrain, the United Arab Emirates and Qatar. All these factors have resulted in a progressive reduction in available groundwater resources in the ESCWA region, to the extent that sustainable agricultural development may be hindered in the future. Expensive non-conventional water resources are being produced in desalination plants to meet the increasing water demands in the region, particularly in the GCC member States. Surface water resources are increasingly vulnerable to pollution from different sources.

Great efforts are being made in the ESCWA region to develop additional water resources. In all large river basins, major storage reservoirs have been built or are under construction (the Euphrates, the Nile and the Tigris) in other parts of the region (the Syrian Arab Republic, Jordan and Saudi Arabia) a number of smaller dams are at different stages of planning or execution. In addition to the large river basins shared by several countries which form the main water resources for these countries, there are 37 groundwater basins considered as shared basins.

II. THE NEED FOR WATER RESOURCES PLANNING AND POLICY REFORM

BACKGROUND

As presented earlier, adequacy of water resources is a critical issue in the ESCWA region due to the need to meet water demands imposed by the vastly expanding population and development activities. Natural water scarcity, increasing water demand in various sectors and degradation of water quality are other dimensions that contribute to water supply limitations. The magnitude of renewable water sources remains the same, therefore, the imbalance between supply and demand is being bridged mainly through the mining of non-renewable, and non-conventional sources. The water situation is further complicated by the fact that substantial volumes of available surface and groundwater are being withdrawn from rivers and aquifers, some of which are shared among countries within and outside the ESCWA region.

Future solutions involve proper management of water resources, both on the country and regional levels, through improvement of the state of knowledge of water resources, reliability in the assessment and prediction of water requirements, strengthening of both institutional arrangements and capacity building, as well as the enhancement of regional cooperation in the water sector. Some aspects of the problem can be addressed through the formulation of policies and strategies as components of long-term water plans, and the enacting of regulations and legislative procedures to enforce efficient management of water resources. In order to achieve a balance between water availability and the growing water requirements for the socio-economic development, a rational management and conservation of the water resources are needed. It is against this background that most of the ESCWA countries have taken initiative towards improving the state of knowledge on their regional water resources, and augmented water supplies through desalination and reuse of renovated water in order to meet rising requirements. Demand management measures are being realized as a viable option to reduce requirements.

Many member countries have recognized the need for concurrent development, conservation and management of their vital water resources. Water assessment and planning to determine the most appropriate resources allocation to various water users, as well as to formulate medium- and long-term policies and guidelines for the exploitation, utilization and subsequent management of the water resources, were the objectives and targets considered during the last decade in many member countries of the ESCWA region.

Recently, significant efforts have been made by many of the ESCWA countries to formulate, implement and update their water plans. However, plan goals and objectives are still oriented towards providing safe and adequate water supplies for domestic purposes, as well as irrigation, in order to promote self-sufficiency in food production. Future development calls for a fundamental change in the water planning process to establish long-term, flexible plans that focus on an integrated approach towards development and management of water resources, in order to promote optimum utilization. Integrated development and management of water sources call for increasing efforts in supply management through augmentation of natural sources. These non-conventional sources have become major supply components, especially in the countries of the southern ESCWA region. Supply augmentation provides a

viable alternative to bridging the gap between supply and demand. However, additional efforts are needed to reduce the cost of production, treatment and assessment of environmental consequences.

The management of water resources also requires improvement in institutional arrangements in water and water related sectors. Some of the countries in the region have taken steps to unify and centralize their national institutions and establish central water bodies responsible for planning, environmental preservation and water conservation. These efforts, however, are still far from the establishment of effective institutional arrangements which mandate optimum development and utilization of water resources. In addition, past water legislation governing the development, utilization and protection of water resources requires further updating and modification to accommodate requirements of integrated water resource development and management.

Significant efforts have been made by some countries to inventory administer and manage their available and potential water resources. However, despite all the work so far carried out, the countries are far from achieving integrated management of their total water resources. Some countries of the region have taken steps to unify and centralize their national water institutional arrangements, while in the other member States, various independent water-related institutions still exist. As regards institutional arrangements, it is worth-mentioning that most of ESCWA countries have now specialized ministries or departments for environment. Their functions are extended to influence positively on water institutions to achieve environmentally-sound sustainable development.

Water legislation in the region is generally complex and outdated vis-a-vis modern water management practices and techniques, and has resulted in the fragmentation of administrative responsibilities. Provisions which regulate water resources development and management are often contained in different laws and regulations, or have originated from traditional and customary uses which relate to the prevailing social structure of some member countries. With growing scarcity, coherent legislation will become increasingly necessary if the high cost of ad hoc approaches to water allocation and control are to be avoided. Administrative weaknesses will inevitably constrain the effectiveness of legislation. Even so, enforcement of rights and standards will remain critical to resources management and the need to strengthen administrative efficiency cannot be avoided.

Human resource development in the water sector, through continuous training, education and research development, must be given due attention, focused on the management of water sources, from a local to the decision-making level. Capacity building should be geared towards all levels, as well as the application of modern techniques, for proper supply and demand management.

The significant efforts of countries within the ESCWA region have resulted in good progress in the assessment and development of water resources, despite the limited financial resources, and social setting. However, with increasing demand for water, further efforts are still needed to focus on integrated water resources development and management schemes, comprehensive long-term planning, and strengthening of both capacity building and institutional arrangements.

TABLE 1. ESTIMATED WATER RESOURCES SUPPLY, DEMAND AND BALANCES IN THE ESCWA REGION
((IN MILLION CUBIC METERS))

COUNTRY	Estimated		Non-conventional water resources		Total available water resources		9 (7.2)	10 (8.3)
	Water use (1990)	Water demand (2000)	1990	2000	1990	2000		
Bahrain	100.20	400.00	71.00	186.00	16525.70	16321.70		
Egypt	56150.00	70000.00	7000.00	7500.00	63150.00	63650.00		
Iraq	62480.00	53830.00		7.40	62480.00	62487.40		
Jordan	835.00	1548.00	37.00	87.00	572.00	1032.00		
Kuwait	180.10	675.00	356.00	547.00	546.10	707.10		
Lebanon	2800.00	2300.00		3.70	2800.00	2803.70		
Oman	1468.00	1526.00	66.00	86.00	1534.00	1554.00		
Palestine (PLO)	215.00	520.00			215.00	215.00		
Qatar	51.40	286.00	198.00	274.00	249.40	533.40		
Saudi Arabia	6080.00	14627.00	1160.00	1534.00	7240.00	7614.00		
Syrian Arab Republic	19775.00	26152.00	177.00	1273.00	19952.00	21048.00		
United Arab Emirate	340.00	2170.00	402.00	513.00	312.00	823.00		
Yemen	3525.00	3371.00	9.00	12.00	3534.00	3537.00		
TOTAL	154049.70	143192.00	9476.60	12023.10	163525.70	166072.80	20333.70	-12530.20

Sources: Economic and Social Commission for Western Asia. "Progress achieved in the Implementation of the Mar del Plata Action Plan in the ESCWA Region" (E/ESCWA/ENR/1992), updated; National papers submitted to the Fifth Meeting of the Permanent Arab Committee on the International Hydrological Programme (IHP), Cairo, 9-11 November, 1992; country reports presented at the Agenda 21 meeting, Amman, 2-5 October 1995; and direct consultation with the government authorities during missions undertaken to ESCWA member States.

Notes: Brackish groundwater predominates in the Arabian Peninsula. The flows of the Tigris and Euphrates rivers will be reduced by upstream abstraction in Turkey. Some figures on water resources and water demand are not confirmed, but are based on reconnaissance surveys.

III. ESCWA MAIN ACTIVITIES IN THE WATER SECTOR IN THE REGION

GENERAL

ESCWA activities related to water resources management in the member countries aim at enhancing the technical know-how through information exchange, execution of joint studies of shared water resources and introduction of appropriate technologies. Particular attention is given to the study of groundwater resources of subregional extent which are essential sources of water for domestic supply and irrigation, in particular in the dry zones of the region. These activities were supplemented with meetings and studies as well as participation in a number of water meetings organized by sister organizations. Related activities in 1996 included preparation for convening the **First Session of the Committee on Water Resources** during the first quarter of 1997 to discuss with the representatives of ESCWA member States current and planned water and planned water programmes as per ESCWA resolution No. 205 (XVIII), Annex III. Other activities consisted of contribution to the **Survey of Economic and Social Development in the ESCWA Region** which cover recent development in this field, which usually includes issues and activities of main concern to member countries.

An **Expert Group Meeting on Water Legislation** was convened in Amman (November 1996) to review the existing and/or planned efforts to formulate water laws, regulations and ordinances and their enforcement in relation to the development, utilization, protection and management of water resources in the ESCWA region. The meeting provided a platform for government-designated officials and representatives of international organizations involved in legal issues relating to the status of water legislation at the national level to exchange views on the establishment of mechanisms for the effective enforcement of such legislation to achieve rational utilization and integrated management of water resources in the region. A publication on the subject will be issued soon. ESCWA secretariat is expected to prepare a project document on training in this important field.

Another **EGM on Development of Non-conventional Water Resources** is planned to take place in Bahrain, 27-30 October, 1997. The meeting will discuss various aspects pertaining to desalination, reuse and water harvesting. Economic of non-conventional water resources will be discussed as well as their role in augmenting the conventional water resources ones.

The objectives of regional studies of water resources in extensive aquifer systems, being conducted by ESCWA are:

- to establish an information base of the aquifer system and to provide related regional information to the member countries;
- to promote cooperation between ESCWA countries in the field of groundwater management;
- to formulate recommendations for technical measures for rational aquifer management in selected areas.

The most salient activities of ESCWA in this connection which aim at promoting regional cooperation for integrated water resources management are the following:

A. Operational activities

1. An investigation of the regional basalt aquifer system in Jordan and Syria;
 2. A regional project entitled "Assessment of water resources in the ESCWA region using remote sensing and GIS techniques;
 3. A regional study of carbonate aquifers of the Lower Tertiary in the ESCWA region;
 4. Convening of water training courses.
- B. Regional water meetings and workshops.
- C. Advisory services for ESCWA member States in the water sector.
- D. Establishment of a Committee on Water.
- E. ESCWA future work programmes.

Expected technical publications to be published in 1997 are:

(i) **Development of non-conventional water resources**

The publication will include recent developments in the fields of brackish and sea water desalination, reuse and water harvesting. It will contain recommendations and action plans in the utilization and management of non-conventional water resources.

(ii) **Water legislation in the ESCWA region**

The technical publication includes a study on status of water legislation in many ESCWA member countries. It also contains a summary of the views and reflections of experts participated in the EGM on water legislation which was held in November 1996. Recommendations on enforcement of water legislation adopted by participants are included.

(iii) **Transboundary Water Resources In The ESCWA Region:"Utilization, Management and Cooperation"**

The implementation of the activity has been initiated in late 1996. Direct consultations with the concerned government officials and review and evaluate the available literature pertaining to the ongoing and future plans to develop, manage and conserve water resources at national, subregional and regional levels were undertaken. The major regional surface and groundwater sheds in the region were identified. A brief account on the regional water agreements and practices in these water sheds, trends of water strategies and policy reform in member countries sharing water resources as well as a conceptual framework for cooperation among riparians was drafted.

(iv) **Review of the impact of pricing policies on water demand**

A study is being prepared to evaluate the impact of water pricing and privatization in water sector as one of the demand management measures. The study will involve assessment of water demand in the domestic, industrial and agricultural sector, estimated cost of water production from different water sources, and current water tariffs being practiced in the region. In addition, concept

of privatization and its current trends in selected countries will be reviewed and documented. The water pricing, social acceptability and its influence on decreasing water consumption on the hypothetical and practical aspects will constitute also part of this study. The outcome of the study is expected to provide information on the perception of water pricing mechanism as a demand management tool to achieve optimal development and utilization of limited water resources.

(v) **Water pollution in selected urban areas in the ESCWA region” Case studies**

In light of heavy concentration of urbanization in many metropolitan cities in the ESCWA region, many water pollution problems arised with various environmental impact in these cities. The technical publication will include analysis of water resources situation and related water pollution problems in three main cities in the ESCWA region, namely: Damascus, Jeddah and Gaza Strip. Recommendations and suggestions will be directed towards the improvement of water quality used in metropolitan cities.

In addition to the above, a technical publication including the **Proceedings of the EGM, on the Implications of Agenda 21 for Integrated Water Management in the ESCWA Region**, was issued. Another publication on **Training Workshop on Remote Sensing and GIS Techniques** will be issued in the current year.

It is worthmentioning that plenty of publications were issued in the last fifteen years which are included in Annexes I and II.

A. OPERATIONAL ACTIVITIES

1. Investivation of Basalt Aquifer system shared by Jordan and Syria

A potential shared basalt aquifer occurs between Jordan and the Syrian Arab Republic. Intensive water withdrawal is taking place in Jordan as it furnishes one of the main water supply sources for the Greater Amman, as well as in southern Syria, affecting the water quality and quantity. Both Jordan and Syria are currently engaged individually in further studying this aquifer, aiming at increasing the respective country's water supply and further groundwater extraction's may worsen the situation. The basalt flows contain groundwater resources of regional extent and, in some areas, local perched groundwater occurrences.

The Energy, Natural Resources and Environment division (ENRED) of ESCWA has initiated a study on this subregional Basalt Aquifer System, extending over an area of about 25,000 km² and shared by Jordan and the Syrian Arab Republic (SAR), as part of its activities during the biennium 1994/1995. the study was implemented in cooperation with competent authorities in both countries, namely the Water Authority (WAJ) of the Ministry of Irrigation of the SAR. The study was

conducted within the context of ESCWA-ENRED/BGR (Federal Institute for Geosciences and Natural Resources of Germany) Technical Cooperation Project entitled "Advice to ESCWA member countries in the field of water resources", through the provision of advice in the fields of: hydrogeology, hydrochemistry, remote sensing, isotope hydrology, preparation of digitized thematic maps and the overall assessment of the potential water resources in the Basalt Aquifer System. Subregional cooperation was proved to be substantive during the course of the investigation to such an extent that made this study possible.

The immediate objectives of the study are: (i) to establish an information base on the hydrogeological conditions of the Basalt aquifer region, which is needed for sustainable management of the groundwater resources; (ii) to formulate proposals for further studies and technical measures for water resources development, management and conservation in specific areas; and (iii) to introduce appropriate methods such as remote sensing and isotope hydrology for groundwater exploration and management in the Basalt aquifer area.

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The long-term objective of the Project is to achieve an optimized sustainable management of the available water resources in the Basalt aquifer area.

2. Assessment of water resources in the ESCWA region using remote sensing and GIS techniques

As per the Commission mandate, ESCWA continued its role in promoting regional and subregional cooperation in water resources development and management among its member States. A regional project was executed during the biennium 1994/1995 and completed in early 1996. the project aimed towards improvement of the state of knowledge of water resources in the ESCWA region through application of modern techniques of remote sensing the Geographical Information System (GIS). The project was executed by ESCWA and financed by the United Nations Environment Programme (UNEP) and the Islamic Development Bank (IDB) with the contribution in the amount of US\$ 175,000 and US\$ 200,000 respectively. The project activities include regional assessment of surface and groundwater and formulation of water strategies with emphasis on shared water resources through interpretation and analysis of hydrological, hydrogeological and remotely sensed data. Advanced remote sensing and GIS techniques were applied to define key features on: major watersheds physiography and surface water bodies, regional hydrogeology and land uses within the ESCWA region.

Application of remote sensing techniques have contributed toward further refinements on the delineation of geomorphological characteristics of twenty major drainage basins, geological lineaments, aquifers areal extent, natural vegetation cover, and irrigated areas. The use of remote sensing in combination with GIS techniques, also strengthened the integration of hydrological and hydrogeological information leading to further refined assessments of the surface runoff and flow of

rivers, groundwater hydraulics characteristic, recharge, and development activities as well as suggestions on development and management of both surface and groundwater resources of the ESCWA region.

The maps have been prepared using information from existing maps and reports and evaluations of images of NOAA meteorological satellites and Landsat Multispectral Scanner images.

3. Regional study on Carbonate aquifers of the Lower Tertiary(Paleogene) in the ESCWA region.

Mesozoic to Tertiary carbonate rocks extend over wide parts of the geological province of the Arabian Shelf. The carbonate sequence, comprising predominantly limestones, dolomites, chalks, marly limestones and marls, was deposited during a long period of submersion of the Arabian Shelf under the sea, which lasted from the Middle Cretaceous until the Eocene. The carbonate sequence includes two important aquifer complexes:

Cretaceous limestones and dolomites with major outcrops in the sub-humid northwestern part of the ESCWA region;

Paleogene deposits comprising prevailingly limestones and chalky limestones, which extend over:

- wide parts of the steppe (Badiyah) and the Hamad areas in Syria, Jordan, Iraq and northwestern Saudi Arabia;
- parts of eastern Saudi Arabia, the gulf region, southwestern Oman and southeastern Yemen;
- parts of the semi-arid to sub-humid region in Syria, Lebanon and Palestine;

The Paleogene aquiferous formations are denominated in different countries: Eocene (Middle to Upper Eocene, Lutetian), Rijam and Sallala limestone, Umm er Radhuma and Dammam, Umm er Radhuma and Jeza.

A study of groundwater resources in Paleogene aquifers of the ESCWA region is included in the work programme of the ESCWA-BGR cooperation project 1996/1997 within the general scope of ESCWA activities to promote cooperation between member countries in the field of management of water resources and to provide governments with the required information and capabilities for the management of shared water resources.

4. Convening of regional water training courses

As a complementary activity to the project "Assessment of water resources in the ESCWA region using remote sensing techniques" a two-week training workshop was held at the Royal Jordanian Geographic Center, Amman, 2-13 December 1995 on "Using Remote Sensing Data and GIS Techniques in Hydrology, and Hydrogeology". Twenty trainees from member States of ESCWA have attended the course. ESCWA is presently in the process of issuing the proceedings of the training course as a technical publication.

The main objective of the training course was to strengthen the technical capabilities of water specialists from ESCWA member States through the application of remote sensing technology and GIS software for optimal assessment, monitoring and management of water resources in the ESCWA region. The purpose was also to heighten awareness of the many benefits resulting from the application of these techniques in water studies.

Several topics were covered during the course including: the fundamentals and applications of remote sensing, sensors and platforms, digital processing, GIS software, integration of remote sensing, GIS and hydrological data, and conventional hydrological and hydrogeological tools. Particular emphasis was placed on water sources shared among some of the member States.

A two-month training course on "Farm water management" was organized during 11 May-27 June 1996, at the Water Training Centre of the Ministry of Public Works and Water Resources of Egypt. ESCWA has financially supported the attendance of three trainees from its member States, namely: the Syrian Arab Republic, Palestine and Yemen.

B. REGIONAL WATER MEETINGS AND WORKSHOPS

In addition to the previously mentioned activities, ESCWA has convened several regional water meetings, symposia and workshops for the purpose of exchanging views and experiences, reviewing institutional and legislative arrangements, identifying means of co-operation and coordination among member States, assessing methodologies and techniques used in the region for water policy-making, planning, management, and conservation of water resources and recommendations for the consideration of the competent authorities in member States. Among these gatherings are the first and second regional water meetings held in Baghdad (1976) and Riyadh (1979), respectively.

In 1989, ESCWA organized an ad hoc expert group meeting on water security in the ESCWA region, Damascus, Syria. The meeting issued what is called "The Damascus Plea". As per this Plea, the experts urged the countries of the region to manage the scarce water resources through the formulation of a **Regional Water Council** under the auspices of ESCWA. Several papers about the water resources situation, development, management and conservation in ESCWA member States were discussed in the meeting.

An expert group meeting on manpower training needs was held in Amman-Jordan, in 1989. The objectives of the meeting were to : (i) identify the educational and training needs to improve the skilled manpower capabilities in the field of water resources development; and (ii) to discuss ways and means to strengthen the education and training institutes and programmes on water related topics. The meeting recommended the establishment of a regional training network to harmonize curricula, fields of specialization, education and training facilities within the region.

Within the context of promoting regional and international cooperation in the water sector, ESCWA has organized a regional symposium on water use and conservation held in Amman, in December 1993. The symposium primarily aimed at examining ways of facing the growing demand for water resulting from rapid socio-economic developments, as well as problems aggravated by the limited water resources in the region.. Forty papers were presented at the symposium and for a

proper categorized under the themes: water utilization and efficiency; water resources planning and management; and regional cooperation and coordination in the water sector.

The expert group meeting on implications of Agenda 21 for integrated water management in the ESCWA region was held in Amman-Jordan in October 1995. The meeting was attended by government-designated experts in the fields of water and environment. Representatives of the regional and international organizations were also in attendance. The expert group meeting reviewed the efforts made in the ESCWA member countries in implementing the activities identified in Chapter 18 of Agenda 21.

The EGM acknowledged that, in spite of the progress so far achieved by ESCWA member countries, intensive efforts are still needed for fulfilling the objectives of Agenda 21 for integrated management of water resources. It was also recognized that water situation in the ESCWA region is becoming more and more serious. Views expressed by the participants indicated that the region is now in urgent need for long-term vision considering future prospects within the framework of overall socio-economic development and closer subregional, regional and international cooperation. It was also admitted that in many ESCWA countries substantial technical and financial assistance is required implementation of Agenda 21.

C. ADVISORY SERVICES FOR ESCWA MEMBER STATES IN THE WATER SECTOR

To assist member States in their national efforts to develop and manage their water resources, ESCWA has provided technical advisory services in response to requests from the governments in the region. These services include advisory missions on an individual or joint multi-disciplinary basis and the recruitment of short-term consultants to address specific water resources issues or problems. Advisory services also included contribution to national and regional training activities.

Within the framework of the ESCWA/BGR technical cooperation project entitled "Advice to ESCWA member countries in the field of water resources", the project contributed to specific regional water studies dealing with: evaluation of groundwater quality in the ESCWA region; assessment of the applicability of isotope hydrologic methods in Western Asia; and model simulation of groundwater recharge through Wadi Ham dam, Fujairah (UAE). Also advisory services to different ESCWA member States have been rendered upon requests. These services provided technical advices to:

- The Ministry of Agriculture and Fisheries of the UAE on problems of ground water use in the northern Emirates;
 - The Kuwait Institute for Scientific Research on ground water contamination problems;
 - The Arab Centre for the Studies of Arid Zones and Dry Lands, Damascus, on the planning of project "Ground water protection in the Arab region".
- Advice to the Ministry of Agriculture and fisheries, Dubai, was provided in particular for studies aiming at the development of a strategy for safe groundwater exploitation and control

of salt water intrusion in the eastern coastal plain of the UAE. The advice included mathematical model simulations of groundwater recharge through a dam in Wadi Ham and of groundwater flow in the Fujairah coastal plain. The model simulations are intended to provide a basis for the introduction of a groundwater management scheme, through which available groundwater resources are utilized rationally and problems of aquifer depletion and water quality deterioration are avoided.

- A field investigation upon the request of the Ministry of Electricity and Hydraulic Resources of Lebanon was recently carried out (May 1996). The activity involved the formulation of a work plan to delineate and quantify the submarine spring freshwater flows into the Mediterranean near Chacka area in Lebanon. The work plan drawn was submitted to the competent authorities in Lebanon for their consideration. The plan includes geophysical prospecting, test drilling, well logging, isotope investigation, hydrogeologic and hydrochemical assessment and the possibility of groundwater flow simulation modelling.

In addition to the preceding services, ESCWA has provided technical advisory services upon the request of member countries and were mainly as follows:

- (a) **Bahrain**: Water resource management for sustainable agricultural development in Bahrain; and preparation by a group of experts of a report on the role of water resources management in controlling decertification in Bahrain, as well as review and update existing water legislation;
- (b) **Jordan**: Preparation of a study on the building of small, low-cost dams in the Walah and Mujib; formulation of a drinking-water strategy to the year 2005; and investigating the role of hydrodynamics, mainly the role of groundwater flow in the transfer and accumulations of hydrocarbons in Jordan; and participation in the formulation of Jordan national water policy and strategy.
- (c) **Oman**: Participation in the preparation of a National Plan of Action to Combat Decertification in the Sultanate of Oman and study of the role of effective, integrated water resource management in controlling decertification; and formulation of a programme for the operation and maintenance of drinking-water supply well fields for the city of Masqat;
- (d) **Syrian Arab Republic**: Preparation of a study on the prospects for developing and regulating the flow of groundwater in the Barada River source and using it for drinking water for the city of Damascus; preparation, for the Ministry of Irrigation, of a project document for the establishment of the Water Research Centre waste water reuse project, and, establishment of an outline for the preparation of the National Water Plan;
- (e) **United Arab Emirates**: Participation in the preparation of a report on the role of water resource management in controlling decertification; advisory services on dams design, construction, maintenance and aquifer recharge; assessment of the potentiality for development of the water falls base flow at Wadi Waria; and proposing practical guidelines for water legislation in the UAE, with emphasis on groundwater resources;
- (f) **Qatar**: Issues pertaining to water resources development and management; reviewing currently used techniques for water balance computation; simulation modelling techniques for

designing well-spacing and management of well fields; strategy for rural water supply; review and update the existing water legislation and measures for the present protection of quality control of drinking water supplies in Qatar.

D. ESTABLISHMENT OF A COMMITTEE ON WATER RESOURCES

As regards regional cooperation, ESCWA has pursued extensive efforts to achieve active involvement of concerned authorities of ESCWA member States in the planning and development of the secretariat's programmes in the field of water resources. ESCWA efforts in this respect have culminated in the establishment of a **Committee on Water Resources** which was established during the Commission's eighteenth session held in Lebanon as per ESCWA resolution 205 (XVIII), in May 1995. The Committee on Water Resources is supposed to be made up of representatives from the member States who are specialized in the field of water resources. The Committee will undertake:

- (a) Participation in the establishment and formulation of priorities for programmes of work and medium-term plans in the field of water resources;
- (b) Monitoring of developments in the field of water resources in the ESCWA member States;
- (c) Monitoring of the progress achieved in the activities of the ESCWA secretariat in the field of water resources;
- (d) Follow-up on international and regional conferences, participation of member States in them and coordination of member States' efforts in connection with the implementation of resolutions and recommendations.

ESCWA anticipate the active participation on the part of concerned authorities in the region in all aspects of the water resources programmes.

E. ESCWA FUTURE WORK PROGRAMME

As per the approved ESCWA programme of work and priorities for the biennium 1996/1997, the activities to be carried out by ESCWA will continue to be oriented towards the promotion of subregional and regional cooperation in the field of water resources development and management. The main thrust would focus on the following:

- Assessment of national efforts for optimal utilization of shared water resources in the region; Completion of the ongoing study of the regional carbonate aquifer system (Paleogene) in the region;
- Study on the impact of pricing policies on water demand;
- Case studies on water pollution problems in selected areas in the region;
- Follow-up on the establishment of a **Regional Water Training Network** and the **Committee on Water Resources**.

The proposed work programme of ESCWA during the forthcoming biennium 1998/1999 will be oriented towards the refinement of assessment of water resources, promotion of a regional centre of excellence in the water sector, integrated water and land resource development, and the harmonization of common standards in the water sector. The following activities were suggested in 1998/1999:

- Updating of the assessment of water resources in the ESCWA region;
- Establishing a baseline for environmental standards within the water sector;
Environmentally-sound management of groundwater resources in selected areas of the ESCWA region;
- Capacity-building development in the ESCWA region;
Follow-up on the implementation of Chapter 18 of Agenda 21, with emphasis on water for sustainable food production;
Use of non-conventional energy technologies for the production of fresh water resources in rural areas.

1. Updating the Assessment of Water Resources in the ESCWA Member States

A comprehensive study is planned for publication during the 1998-1999 biennium which will address the status of water resources in the ESCWA region, future demand, and feasible management options to enhance water use efficiency and optimal allocation of water resources. The study will evaluate various water assessment and projection techniques. Supply and demand management measures will be assessed with regard to their potential in bridging the gap between supply and demand. The study will also include water assessment on regional, country and local levels, based on information from the ESCWA member states, as well as country papers to be presented at the planned expert group meeting on the subject.

2. Harmonization of Environmental Standards in the Water Sector in the ESCWA Member States

A study on all aspects of existing standards related to the water sectors, and discussion of the means to harmonize them, will be contained in a technical publication to be issued in 1998. Harmonization of standards will include water quality, water legislation, as well as other standards related to water issues. The publication will also contain comments and recommendations of the ESCWA states, regional and international organizations, and experts, which will be presented at a planned expert group meeting.

3. Development of Freshwater Resources in the Rural Areas by using Non-conventional Techniques

A study will be conducted on the use of water desalination, treated wastewater reuse, marginal water, and water harvesting in rural areas. It will also contain the possibilities of using new renewable energy in the production of fresh water. Comparative advantages and economics of using certain non-conventional techniques in the production of fresh water through non-conventional energy (solar and wind energy) will be included. The study will focus on presenting case studies in selected ESCWA member states.

4. Current Water Policies and Practices in Selected ESCWA Countries

This technical publication evaluates the current and proposed water policies with regard to short and long term objectives for meeting water requirements. Other aspects of the publication include demand and supply management options, including the use of water saving techniques appropriate for the concerned country.

Another activity has been designated to evaluate the progress achieved in the Implementation of Chapter 18 of Agenda 21 with Emphasis on sustainable Agricultural Production.

Case studies will be undertaken to assess water consumption in the agricultural sector, as well as the long term impacts on supply availability.

5. Paleogene Aquifer Study

The activities of the ESCWA/BGR cooperation project in 1996-1997 include a first phase study of Paleogene aquifers in the ESCWA countries. The study for uses on the evaluation of available information and presentation of hydrological features in thematic digitized maps and reports. This activity began in 1996 with the establishment of an information data base to be utilized for planning and management purposes.

First drafts of digitized base maps are being prepared, mainly showing topography, outcrops, and the extent of Paleogene formations. These base maps are being reviewed and modified. They can serve as background information for the compilation of various thematic maps at scales ranging from 1:500,000 to 1:5 million. Various hand drafts extracting hydrogeological features from existing maps have been prepared, which will be used for the compilation of digital thematic maps.

In addition, the ESCWA committee on Water Resources will convene its second session to review and evaluate future program activities in the Energy, Natural Resources and Environmental Division, particular the water sector. The committee will review ESCWA's medium-range plans for the period 2002-2005.

Rendering Advisory Services

ESCWA will assist the member states in their national efforts to develop and manage their water resources through providing technical advisory services in response to requests from the governments of some of these states. These services include advisory missions on an individual or joint multi-disciplinary basis, and the recruitment of short-term consultants to address specific water resources issues or problems. Advisory services also include contributions to national and regional training activities.

ANNEX 1

F. TECHNICAL PUBLICATIONS ON VARIOUS WATER-RELATED ISSUES

A good number of water-related publications have been issued by ESCWA . A list of selected publications issued during 1980-1996 is shown in the annex 2. In what follows are brief notes on the main technical publications issued by ESCWA, or under preparation, tackling various aspects of the water sector. These publications together with the reference document number may be grouped under the following main topics:

(a) Water Resources Assessment and Management:

A regional water resources assessment (E/ESCWA/NR/81/L/1) - English, has been conducted in 1981 to evaluate inter alia the available and potential water resources, the prevailing hydrological and hydrogeological conditions, prospects of developing the natural resources at national and subregional levels and the environmental parameters of different water sources with special emphasis on resources protection from contamination and pollution and safeguarding water quality.

Identification and assessment of shared groundwater potential in two basins within the ESCWA region has been implemented in 1989, using remote sensing techniques. These watersheds are Wadi Sirhan (Jordan and Saudi Arabia), and Wadi Bana (Yemen Republic) - E/ESCWA/NR/1990/2 (English).

In addition, ESCWA is presently finalizing the issuance of two reports on the regional assessment studies described earlier, namely "Investigation of the Basalt Aquifer System (Jordan and Syria)", and "Assessment of water resources in the ESCWA region using remote sensing and GIS techniques".

(b) Water Resources Development:

To overcome potential water resources shortages, many countries of the region have been engaged in active water resources development projects over the last decade. There are schemes to construct dams in most ESCWA countries for groundwater recharge, surface water impoundment and/or flood control purposes. In this context, ESCWA secretariat conducted a technical study (E/ESCWA/NR/1993/19) on "Operation and Maintenance of Dams in Selected ESCWA Countries". The main objectives of this study are to:

- survey major dams and reservoirs in ESCWA member States;
- identify problems encountered in dam operation, maintenance and safety;
- evaluate the benefits gained compared with those originally planned for, and outline the socio-economic impact of different dam projects after operation.

401 The study includes a description of the general hydrology, hydrogeology and geology of the ESCWA region, and results of dam construction in the northern semi-arid and southern arid parts of the ESCWA region.

There is an increasing evidence that sea-water desalination has provided a reliable water supply, cheaper and more environmentally friendly than building new dams or canals, particularly in the GCC countries. They have always been world leaders in using desalination for municipal water supply. Two thirds of world installed capacity of desalination plants exist in these countries. Their accumulated experience in building and operating desalination plants over the last three decades are very valuable to all countries. A technical paper on this subject was prepared by ESCWA secretariat (E/ESCWA/NR/1993/WG.1/WP.10). The purpose of this paper is to assess available desalination technologies and its cost and then summarizes the experience of GCC countries in this field. This is followed by a brief assessment of other non-conventional water resources and a discussion of future trends in this field, in these countries.

ESCWA secretariat has carried out a study on waste water reuse and its applications in Western Asia (E/ESCWA/NR/84/4/Rev.1)- English. The objectives of the study were to: (i) assess the augmentation of current water supplies through utilization of treated waste waters from municipal, agricultural and industrial sources; (ii) outline the minimum acceptable standards and the required treatment to reach those standards for agricultural and industrial applications of the treated effluents; and (iii) indicate the required precautions and safeguards against misuse and environmental hazards.

Another study on desalination of brackish water has been conducted in order to augment fresh water supplies for domestic and agricultural uses in rural areas in the region (E/ESCWA/NR/87/12)- English. The study was intended to propose ways and means to improve water quality and, hence, the living conditions as well as to maintain water supply for sustainable agricultural production and rural development.

A study on potential and existing treated waste water reuse in selected ESCWA countries has been conducted in 1993 (E/ESCWA/NR/1993/WG.1/WP.8)- English. The purpose of this study is to identify potential uses of reclaimed water, to review the types of wastewater reuse applications, treatment processes and its appropriateness for present and future reuse. The study also discussed in detail the regulations and guidelines for wastewater reuse in ESCWA countries. It also covers the economical and social aspects for wastewater reuse in the region.

(c) Water Resources Protection and Conservation:

In view of the shortage of water resources in the region, and since irrigation schemes are the main users of these resources, ESCWA has conducted a study to: (i) appraise different methods of improving the control of water in terms of irrigation efficiency and water losses prevention measures; (ii) assess cases of efficient irrigation schemes in selected countries; (iii) introduce recent scientific advances in water management for agricultural uses in the region, with emphasis on systems analysis approach; and (iv) formulate recommendations on prevention

measures to minimize water losses in agricultural uses and to achieve efficient water utilization for sustainable agricultural production in selected ESCWA countries (E/ESCWA/NR/85/19)-English.

The document (E/ESCWA/NR/1993/21) was prepared to highlight the main issues tackled and discussed at the Regional Symposium on Water Use and Conservation (Amman, 28 November - 2 December 1993). It describes methodologies employed in water sector planning and management in the region. The pattern for such planning are outlined. Water resources availability, use and demand management in addition to the role of non-conventional water resources in the region are presented. Integrated basin-wide management is reviewed in brief together with notes on water resources utilization and planning in selected ESCWA member States are contained in the document. Finally, it concludes with key findings and recommendations based on the Symposium papers and discussions.

(d) Water Resources Quality and Control:

A regional study on "Groundwater quality control in the ESCWA region" (E/ESCWA/ENR/1995/WG.1/5) was conducted in 1995 to present a discussion of the main processes which control the groundwater quality and the main sources of groundwater salinity and groundwater quality deterioration. The paper also contains an outline on requirements of an possible measures for conservation of water quality in exploited and exploitable aquifers with particular consideration of:

- protection against intrusion of brackish and saline waters;
- protection of drinking water sources and of fresh water aquifers against contamination;
- investigations related to groundwater quality protection;
- groundwater quality monitoring.

A recent technical publication entitled "Assessment of quality in the ESCWA region" (E/ESCWA/ENR/1995/14) manifested the current status and practices related to water quality in the region. The study focused on water quality issues and control, whence it considered the question of water quality monitoring, the reality of this pivotal activity in the countries of the region, and the requirements for a monitoring programme. The study presented also an overview of water remediation and water pollution prevention, two of the most needed activities in the region. The current problem of management of water quality were delineated. In conclusion, the study proposed possible paths to be followed in search of solutions for water quality problems in the region. Details may be worked out in light of some of the results reached in the text, and others that can be obtained from in-depth surveys and field studies. Recommendations of the study were oriented towards the adaptation of proper measures to ensure better water quality norms according to the requirements for the sustainable socio-economic development of the countries of the ESCWA region.

(e) Isotope Hydrology:

A technical paper was issued in 1995 on "Assessment of the applicability of isotope hydrologic methods in Western Asia" (E/ESCWA/ENR/1995/WG.1/8). The paper outlines the applications of isotope hydrologic methods when integrated into hydrogeologic investigations for the assessment of groundwater resources and the determination of the prevailing hydrogeologic features and obtaining information, in particular on:

- recharge conditions and recharge areas;
- regional groundwater movement;
- sources and processes of groundwater salinization;
- origin and age of groundwater;
- Paleo-hydrologic conditions.

In addition, the paper gives an outline of the main results obtained from isotope hydrologic studies carried out in the ESCWA region and the potential applications of isotope hydrologic methods for particular problems of groundwater management.

(f) Capacity Building:

Integrated water resources management to maintain sustainable development necessitates the development of appropriate institutional arrangements, establishment of a comprehensive database, training of human resources and enhancement of public awareness as well as the community participation. In this context, ESCWA secretariat has conducted relevant studies on:

(i) Assessment of water resources management in the ESCWA region. The assessment reflects the progress achieved and constraints with regard to the water resources assessment and management, policy formulation, planning, institutional arrangements and water legislation (E/ESCWA/NR/87/16)- Arabic;

(ii) Establishment of water resources database in the ESCWA region (E/ESCWA/ENR/1992/6)- English. One of the main requirements for efficient water resources planning, management and allocation in harmony with environmental conservation is the availability of long-term, adequate and accurate water data. ESCWA has initiated the practice of collecting, sorting and presentation of water data with the intention to establish a comprehensive water database so as to minimize waste and depressed efforts in searching for, obtaining checking the availability, reliability and adequacy of water data; to maintain an easy operational mechanism for dissemination and exchange of information to improve, update and monitor the available water data, and to enhance and facilitate research, efficient planning and management of water resources.

A follow-up activity has been carried out during the biennium 1992/1993 (E/ESCWA/NR/1993/20)- English. This activity dealt with the following:

- designing the structure and modules of appropriate water database for the ESCWA region;
- specialized study on the application of appropriate computer format and programmes to establish the water database for the region.

(iii) As regards human resources development, education and training in the field of water resources, ESCWA convened three meetings on the issue. During these meetings relevant working documents were discussed. Among them are: Development of Manpower, Education and Training Needs in the Water Sector in Western Asia (E/ESCWA/NR/85/14), report on the Establishment of a Regional Water Training Network in the ESCWA Region" (E/ESCWA/NR/1993/WG.1/5)- English, and working paper on the establishment of a regional training network in the water sector in the ESCWA region (E/ESCWA/ENR/1995/WG.2/3)- English.

ANNEX 2

Selected Publications issued by ESCWA in the water sector (1980 - 1995)

1. Report of the Expert Group Meeting on the Establishment of a Regional Training Network in the Water Sector in the ESCWA Region, (E/ESCWA/ENR/1995/WG.2/4) Amman, 15-16 November, 1995.
2. Assessment of Water Quality in the ESCWA Region, (E/ESCWA/ENR/1995/14).
3. Final Report on Regional Symposium on water use and conservation, (E/ESCWA/NR/1994/6).
4. Contribution to the Design of the Proposed Dam of Wadi Munayi, (E/ESCWA/NR/1994/3).
5. Water Resources Planning, Management, Use and Conservation in the ESCWA Region, (E/ESCWA/NR/1993/21), English.
6. Planning and Design of an ESCWA Water Resources Data base, (E/ESCWA/NR/1993/20), English.
7. Operation and Maintenance of Dams in Selected Member Countries in the ESCWA Region, (E/ESCWA/NR/1993/19), English.
8. Water Desalination: The Experience of GCC Countries (E/ESCWA/NR/WG.1/WP.11/1993).
9. Potential and Existing Treated Waste Water Reuse in Selected ESCWA Countries, (E/ESCWA/NR/1993/WG.8), English.
10. Report on the Establishment of a Regional Water Training Network in the ESCWA Region, (E/ESCWA/NR/1993/WG.1.WP.5) English.
11. Water Resources Data base in the ESCWA Region, (E/ESCWA/NR/1992/6), English.
12. Progress Achieved in the Implementation of the Mar del Plata Action Plan in the ESCWA Region, (E/ESCWA/ENR/1992/5).
13. Proceedings of the Ad Hoc Expert Group Meeting on Water Security in the ESCWA Region, (E/ESCWA/NR/1990/3).

14. Identification and Assessment of Shared Groundwater Potential in two Basins within the ESCWA Region, (E/ESCWA/NR/1990/2),English.
15. Planning of Development and Conservation of Water Resources for Urban and Rural Water Supply in Selected ESCWA Countries, (E/ESCWA/NR/87/16),Arabic.
16. Desalination of Brackish Water for Production of Fresh Water for Domestic and Agricultural Water Supplies in Selected Countries of the ESCWA Region. (E/ESCWA/NR/87/12),English.
17. Activities of Governments and International Agencies in the Field of Water Resources within the ESCWA Region, (E/ESCWA/NR/86/4),English.
18. Development of Guidelines for the Economic Use of Water in the ESCWA Region. (E/ESCWA/NR/85/19),English.
19. Development of Manpower, Education and Training in the Water Sector in Western Asia, (E/ESCWA/NR/85/14),English.
20. Waste Water Reuse and its Applications in Western Asia, (E/ESCWA/NR/84/4/Rev.1), English.
21. The International Drinking Water Supply and Sanitation Decade Activities in the ESCWA Region, (1983), English.
22. Assessment of Water Resources Situation in the ESCWA Region, (E/ECWA/NR/L/1/Rev.1),1981, English.

ANNEX 3

205(XVIII). ESTABLISHMENT OF A COMMITTEE ON WATER RESOURCES IN THE ECONOMIC AND SOCIAL COMMISSION FOR WESTERN ASIA

The Economic and Social Commission for Western Asia,

Conscious of the importance of water security in view of the scarcity of water resources in the ESCWA member States,

Conscious also of the importance of developing water resources and rationalizing their use in the member States,

Taking into account the need to monitor scientific and technological developments in the use of both traditional and non-traditional water sources,

Aware of the importance of the participation of the competent authorities of the ESCWA member States in the planning, development and monitoring of the secretariat's programmes in the field of water resources,

1. *Decides* to establish a committee on water resources, made up of representatives of the member States who are specialized in the field of water resources, to undertake the following tasks:

(a) Participation in the establishment and formulation of priorities for programmes of work and medium-term plans in the field of water resources;

(b) Monitoring of developments in the field of water resources in the ESCWA member States;

(c) Monitoring of the progress achieved in the activities of the ESCWA secretariat in the field of water resources;

(d) Follow-up of international and regional conferences, participation of member States in them and coordination of member States' efforts in connection with the implementation of resolutions and recommendations;

2. *Decides also* that, starting in 1996, the committee on water resources shall hold its meetings every two years;

3. *Requests* the Executive Secretary to follow up the implementation of the present resolution and report thereon to the Commission at its eighteenth session.