

Status and Needs of Water Statistics in the ESCWA region

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ABSTRACT: The ESCWA region (13 countries of West Asia and Egypt) is characterized largely by arid land, and water scarcity where freshwater renewable resources represent only 0.4 percent of the global renewable water resources. Groundwater dependency for the ESCWA region exceeded 50 percent in 2000 except for Egypt, Iraq and Lebanon and Syria. Eight ESCWA member countries have per capita renewable water resources of under 500 cubic meters per year which indicates absolute water scarcity. Non-conventional water resources are mainly derived from seawater desalination in the Gulf countries and agricultural drainage re-use in Syria, Iraq, and Egypt. The weakness in providing reliable, timely, detailed and comparable official statistics on water quantity and quality is a source of major concern in the region given the increasing constraints on water resources. ESCWA is undertaking major efforts at the policy level in the region for a sustainable and integrated management of water resources. At the statistics level UNSD, ESCWA UNEP/ROWA, are collaborating build capacity in the ESCWA region in environment statistics in general and water statistics in particular. Efforts need to be sustained and coordinated further with other UN and regional agencies concerned with water statistics to strengthen capacity of member countries in assessment of water resources, comparable sectoral consumption, addition of new areas of interest to the region such as water markets and water accounts.

1 Background on water resources and use in the ESCWA region

The ESCWA region, representing 13 countries of West Asia and Egypt, (Figure 1) is characterized largely by arid land with more than 70 per cent of the region being arid (UNEP/WHO, 1991) and scarcity and uneven availability of freshwater resources representing only 0.4 percent (170 million cubic meters in 2002 of the global renewable water resources although it accounts for 3 percent of the world's population.



Figure 1. Map of the ESCWA region

The average per capita renewable water resources in the ESCWA region was 965 cubic meters per year in 2001 compared to 7,000 for world average. Eight ESCWA member countries have per capita renewable water resources of under 500 cubic meters per year which indicates absolute water scarcity. Egypt, Oman and Lebanon have a slightly lower level of water stress (500-1000 cubic meters per capita per year and only Iraq and Syria exceed the chronic water scarcity limit (1000 cubic meters per capita per year) (Fig. 2) (Statistical Abstract of the ESCWA Region, 2004).

Groundwater resources

Groundwater resources represent 9 percent of the total renewable water in the ESCWA region and the ratio of groundwater to total renewable resources exceeds 75 percent in Bahrain, Kuwait, Palestine and Qatar, it varies between 25 and 75 percent for Jordan, Oman, Saudi Arabia, United Arab Emirates and Yemen. Due to the severe scarcity of renewable water resources the main source of water for most ESCWA member countries remains groundwater leading to a critical condition whereby volumes abstracted far exceed natural recharge (Statistical Abstract of the ESCWA Region, 2004).

Per capita renewable water resources and consumption in 2000 (m³/p/yr)

كل شخصاً نـمو قد ددجـها في ظل امـجـا نـمـي ووتـرلا دولـيا بـجـونـ 2000 بـعـنـم تـم
دقـلـل / وـنـ

- Per Capita Annual withdrawal of freshwater resources
- Per capita annual renewable freshwater resources

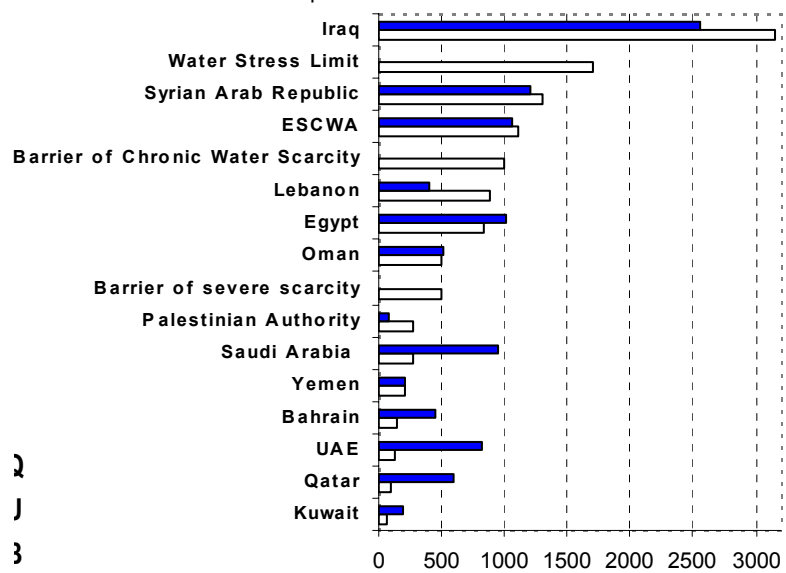


Figure 2. Per capita renewable water resources and consumption

Non-conventional water resources

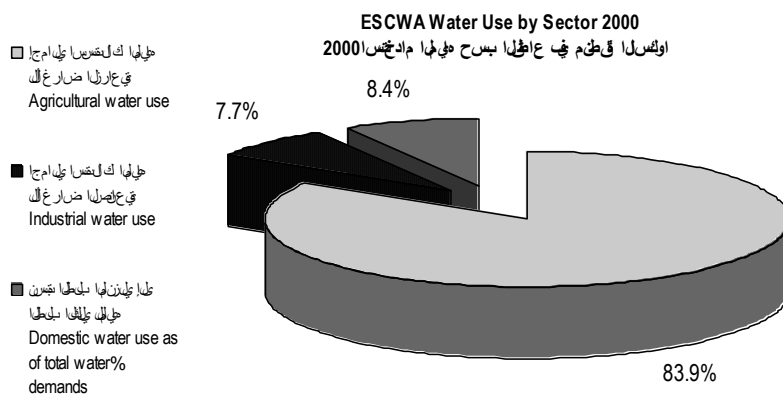
Non-conventional water resources in the ESCWA region amounted to approximately 16 million cubic meters in 2002 raising water resources per capita per year to 1,076 cubic meter. The ratio of non-conventional to total freshwater is above 60 percent for Kuwait, Qatar and United Arab Emirates. Agricultural drainage re-use amounts for have amounting for about 1500 million cubic meters in each of Syria and Iraq and 3800 million cubic meters in Egypt. Non-conventional water resources are mainly derived from seawater desalination which is practiced on a large scale in Saudi Arabia and the Gulf countries. Desalinated water production almost doubled in Kuwait, UAE, Oman and Egypt from 1990 to 2000 (Statistical Abstract of the ESCWA Region, 2004).

Water resources in the ESCWA region 2002

Figure 3. Freshwater resources by source in the ESCWA region

Freshwater Withdrawal

Population growth in the ESCWA region is a main issue affecting sustainable socio-economic development. The estimated ESCWA population in 1998 was at 160 million and grew by an average annual rate of 2.56 percent to reach above 181 million in 2003. The total water consumed for all purposes in the ESCWA region amounted to 179,000 million cubic meters in 2000 with average per capita use estimated at 1,067m³, making the total water use intensity an alarming 100 percent. The high population growth rate in the region exceeds by far the rate of water resource development; as a result, the annual per capita share of water resources is decreasing sharply. In fact, ESCWA member states are utilizing more than their internal renewable water resources either by overexploiting groundwater, or desalinating seawater or recycling wastewater. Water use intensity in Bahrain, Kuwait, Qatar, Saudi Arabia and United Arab Emirates is above 200 percent, and it is between 100 and 200 percent in Egypt, Jordan Syria and Yemen. Groundwater dependency for the ESCWA region reached 20 percent on average in 2000, and exceeded 50 percent except for Egypt, Iraq and Lebanon and Syria. It reaches 99% in Kuwait, United Arab Emirates and Qatar.



The agricultural sector accounts for 84 percent of total water use (compared to 67 percent in the European Union) followed by domestic water use 8 percent and industrial use 8 percent. At country levels, the agricultural sector accounted for more than 88 percent of total water consumption in Egypt, Iraq, Oman, Saudi Arabia, Syria and Yemen. However agriculture's share in total water use is expected to decline with the increased pressure from the domestic sector due to rising population, increasing urbanization and the rapidly growing industrial sector. This trend is already noticeable as most ESCWA member states decreased the share of agriculture in total water use except for Oman and United Arab Emirates over the last few years. Total agricultural land in the ESCWA region use is around 10 percent of the total available land, and only 36 percent of the agricultural area is irrigated.

2 Need for Water Statistics in the ESCWA region

Data availability and reliability are important tools for efficient water planning and policy making, at the national and regional level. Adequate data on water is generally not available in most countries of the ESCWA region, and if available, it is not reliable, comparable, or comprehensive. At the end of the 2004, the weakness in providing official statistics on water quantity and quality is a source of major concern in the region given that more constraints on water resources are expected to become more serious in the coming years, as population growth rates (average 2.5%) are expected to keep rising. Projection of per capita water resources for the year 2025 reveal an alarming situation whereby most ESCWA countries will have an annual rate of less than 500 cubic meters (except for Egypt, Iraq, Lebanon and Syria). As the gap between water availability and demand widens planning and integrated management of water resources is an absolute priority for the ESCWA region. The solution depends largely on providing governments and society with reliable and relevant information on water resources and the level of its scarcity, as well as its correspondence to international standards.

3 Problems in water statistics in the ESCWA region

Besides the problems on policy both at national and regional basis, such as policy harmonization within the country and the management of conflicts on trans-boundary rivers, the main problems encountered during the processes of collection and dissemination of reliable, timely and comparable statistics on water can be listed as follows:

1. Inadequate estimation of natural and potential water resources. Knowledge of the spatial and temporal distribution of water resources, not only their average values is important since those are controlled by a set of stochastic variables
2. Statistics on water use and water supply are not detailed or comprehensive. Sectoral water use is not classified according to International standards which impairs water management and accurate measures of efficiency in addition to inaccurate estimation of present and forecasted water demand
3. Data management is essential for making reliable prediction of water supplies to formulate allocation strategies. Data processing systems need to be installed, and training offered to concerned parties to allow timely dissemination of information. Absence of

developed accessible information system leads to mismanagement and the inefficient water use

4. An integrated information system is needed to regularly record and disseminate data on water resources. It would be a benefit for the region to an institutional framework for conventional remote-sensing data program and the use of geographic information system (GIS) technology should be established to set up the data base integrated water resources.
5. In some countries, like Lebanon, the Central Administration of Statistics does not deliver data on water resources because the law restricts information on water resources for security purposes even though the information is delivered by the Ministry of Energy and Water.
6. Many questionnaires on water statistics, some of them in English only, requesting detailed information, are sent by different organizations to different departments in ESCWA countries. Therefore, there is need to unify questionnaires and provide them in Arabic and English to NSO's who produce official statistics to facilitate the data collection process.
7. There is need for capacity building for human resources in ministries of water and NSO's through training workshops and manuals on water statistics

(Some of the problems have been reported by Hamdy and Liuzzi 2004)

4 UNESCWA and the water priorities in the region: at the policy level and at the statistics, indicators and database levels.

Integrated policies for efficient and sustainable management of water resources is a priority issue for UNESCWA in its role as regional commission to unify the policies of Member States with regard to priority sectors such as water and energy, technology, globalization and social policies. Therefore, Water and Environment Teams in ESCWA are active in helping countries improve water management based on integrated water resources management approach, environmental monitoring and environmental systems, GIS assessment of some water basins in the region. On the water statistics and indicators issue, the Sectoral Statistics team established in February 2004, has been collaborating with UNSD in the following activities:

- The UNSD questionnaire on environment including the water section has been translated totally into Arabic, the (guidance, definitions, tables and conversions) and distributed to ministries of environment and National Statistics Offices (NSO's) in ESCWA countries in April-June 2004 taking into account the UNEP/ROWA Regional Priority Environmental Indicators on Water, Energy, health and environment, Agriculture-Land, Biodiversity, Coastal and Marine. The water section included: 5 issues (Water demand, Water utilization, Water pollution, Water Management, Access to water) and a total of 27 parameters
- Workshop on environment statistics in April 2004 to train Officials from Ministries of environment and National Statistics Offices (E/ESCWA/SDPD/2004/5)
- Fellowship offered to central statistics offices to train one of their staff for one week in the CSO of one of three countries Turkey, Jordan and Bulgaria spring-summer 2004
- Follow-up on responses with member countries by ESCWA: Until June 2005, the Response rate from ESCWA countries is 3/13 (2.3%)
- An Assessment of the situation of Environment Statistics in the ESCWA countries was produced by DESA-UNSD (in prep).
- A project on strengthening statistical capacity of ESCWA and North African countries in environment statistics has been proposed.

Within ESCWA, interdisciplinary work among teams and divisions have been undertaken to collect water statistics and develop a database on water. ESCWA Water team has sent water questionnaires in Arabic that included 35 indicators to focal points of ESCWA's committee on water resources and has received replies from all ESCWA countries (Annex 1). A questionnaire with 20 water indicators, bilingual, on conventional, non-conventional water resources, water withdrawal, sectoral use, indicators, and sanitation and data shared from Water team was sent to ESCWA's NSOs to validate and complete the questionnaire. The response rate was 60% in a four months period. The data was completed from other national, UN and regional sources to be published in ESCWA Statistical Abstract 25th issues. Data and indicators on water were database for the ESCWA region (ESIS) including a module on water indicators was developed in collaboration with the Information and Communication Technology Division in ESCWA.

At the regional level, efforts must be intensified to gather fundamental water data, organize it into usable and accessible forms, and disseminate it to all who need them. Regional data collection and sharing is an important part of the rational management of any resource. Unless, nations share hydrological data, no satisfactory agreements on allocation, responses during shortages, flood management, or long-range planning can be reached

The need for reliable, timely and comparable water statistics and indicators, and for integrated environmental-economic water resources accounting in the ESCWA region urges for more closer collaboration among international and regional organizations and the member countries to identify the problems encountered with water statistics and that affect the response rate to questionnaires and data quality.

References

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Annex 2. Questionnaire by the Sectoral Statistics Team to NSO's in ESCWA countries 2004.

Sample of Questionnaire sent to Egypt

مؤشرات مصادر المياه							
Water Resources Indicators							
مؤشرات مصادر المياه (المصادر التقليدية)				مؤشرات مصادر المياه واستخداماتها (مصادر غير تقليدية)			
Water Resources (conventional sources)				Water Resources (non-conventional sources)			
الأمطار الهائلة	إجمالي المياه السطحية	المعدل السنوي لتغذية المياه الجوفية	إجمالي المياه المتجددة	إنتاج المياه المحلاة	إعادة استخدام مياه الصرف الصحي المعالجة	إعادة استخدام مياه الصرف الزراعي	إجمالي المياه غير التقليدية
Precipitation	Total surface water	Ground recharge	Total renewable water resources	Desalination production	Treated wastewater reuse	Agricultural drainage reuse	Total non-conventional water
مليون متر مكعب/سنة	مليون متر مكعب/سنة	مليون متر مكعب/سنة	مليون متر مكعب/سنة	مليون متر مكعب/سنة	مليون متر مكعب/سنة	مليون متر مكعب/سنة	مليون متر مكعب/سنة
million m ³ /yr	million m ³ /yr	million m ³ /yr	million m ³ /yr	million m ³ /yr	million m ³ /yr	million m ³ /yr	million m ³ /yr
51,370			58,300				
	55,000	1,384	56,800	1,800	1,400	7,500	10,700
مؤشرات الطلب على المياه حسب القطاع							
Sectoral Water Use Indicators							
إجمالي استخراج المياه			الطلب على المياه حسب القطاع				
Total Water Withdrawal			Sectoral Water Use				
إجمالي المياه الجوفية المستعملة	إجمالي استخراج المياه العذبة	إجمالي استهلاك المياه للأغراض المنزلية (المنزلية)	إجمالي استهلاك المياه للأغراض الزراعية	إجمالي استهلاك المياه للأغراض الصناعية	قطاعات أخرى (تجاري، حكومي، فاند...)	إجمالي استهلاك المياه	
Total groundwater withdrawal	Total freshwater withdrawal	Domestic water use	Agricultural water use	Industrial water use	Other uses (commercial, government, loss..)	Total water demands	
مليون متر مكعب/سنة		مليون متر مكعب/سنة	مليون متر مكعب/سنة	مليون متر مكعب/سنة	مليون متر مكعب/سنة	مليون متر مكعب/سنة	
million m ³ /yr	million m ³ /yr	million m ³ /yr	million m ³ /yr	million m ³ /yr	million m ³ /yr	million m ³ /yr	
	53,100						
	55,100						
	53,700						
		4,700	57,800	7,500		71,300	
7,022	54,300	5,230	53,850	9,570		68,650	
	السكان اللذين يحصلون على مياه شرب آمنة (الحضر)	السكان اللذين يحصلون على مياه شرب آمنة (الريف)	السكان اللذين يحصلون على صرف صحي ملائم (الحضر)	السكان اللذين يحصلون على صرف صحي ملائم (الريف)			
	Access to improved drinking water sources (urban)	Access to improved drinking water sources (rural)	Access to improved sanitation (urban)	Access to improved sanitation (rural)			
السنة							
Year	%	%	%	%			
1990	97	91	96	80			
2000	99	96	100	96			

Annex 3. Sample table from Chapter 6 in ESCWA Statistical Abstract 25th issue, Chapter 6, 6 Tables on conventional, non-conventional water resources, water

Water Resources in the ESCWA region									
اولئسلا قطنم فب ءسكلمها قهالما دراومها يلدامجا									
	Total surface water	Groundwater recharge	Total renewable water resources	Total (renewable and non-conventional resources)	Groundwater resources/total renewable resources	Groundwater depletion**	Water availability^		
	million m ³ /yr	million m ³ /yr	million m ³ /yr	million m ³ /yr	%	million m ³ /yr	million m ³ /yr		
	مليونا يلدامجا قسطنمها	مليونا قنئلمها لءءمها قسطنمها	مليونا يلدامجا قسطنمها	مليونا يلدامجا قسطنمها ريءس م نم قسطنمها قسطنمها	درامها يلدامجا قسطنمها قسطنمها ريءس م نم قسطنمها قسطنمها	%	مليونا قسطنمها	مليونا قسطنمها	
	بءم نم بءم/قطن	بءم نم بءم/قطن	بءم نم بءم/قطن	بءم نم بءم/قطن	%	بءم نم بءم/قطن	بءم نم بءم/قطن		
Bahrain									ليرءمها قطنم
1996			100.2						1996
1997	4	112	116	208	97%				1997
2000	0.2	100	100.2	206	100%	-95	-94		2000
Egypt									قيرءمها بءم قروءم
1997	56,000	1,300	58,300	65,502 *	2%		-5,798		1997
2000	55,000	1,384	56,800	65,766	2%	-5,638	-2,884		2000
Iraq									قارءمها قروءم
1997	74,220	1,200	75,420		2%				1997
2000	70,370	2,000	73,370	75,190	3%		15,890		2000
2001	74,880	2,000	76,880	78,700	3%	1,000			2001
Jordan									قطنمها قنءرلها قطنمها
1990	555	277	832	832	33%		122		1990
1997	600	500	880	934	57%		143		1997
2000	423	102	525	607	19%		-210		2000
2001		164							2001
2002	874*	370	1,244	1,316	30%		513		2002
2003	1124*	406	1,530	1,602	27%	-114	800		2003
Kuwait									مليونا قوء
1996			20						
1997	0	160	160	579	100%		39		1997
2000	0.1	160	160	611	100%	-245	161		2000
2002				654			202		2002
Lebanon									قطنمها قروءم
1990	1,650	500	2,150	2,150	23%		939		1990
1997	3,707	685	4,407	4,407	16%		3,122		1997
2000	2,500	600	3,100	3,122	19%		1,822		2000
2003	2,200	400	2,700	2,700	15%	160	1,150		2003
Oman									نامء قطنم
1990	1,470	564	2,034	2,034	28%		762		1990
1997	930	955	1,885	1,952	51%		307		1997
2000	918	1,645	1,299	1,378	127%		-24		2000
2002	694*	600	1,294	1,380	46%	-716	163		2002
Palestine									مليونا قطنم
1997	74	725	799		91%				1997
2000	30	740	770	770	96%				2000
2003	2	737	739	739	100%	534	456		2003
Qatar									مليونا قوء
1990	0	40	40		100%				1990
1997	1	50	53	200	94%				1997
2000	1.4	58	60	182	98%	-127	-165		2000
Saudi Arabia#									قروءمها قسطنمها قطنمها##
1990	3,200	2,240	5,440	5,440	41%		-10,860		1990
1997	2,200	2,200	4,400	5,503	50%				1997
2000	2,230	3,850	6,080	7,194	63%		-13,546		2000
2003	5,000	2,500	8,000	9,179	31%	-12,269	-13,301		2003
Syrian Arab Republic									قروءمها قسطنمها قروءمها
1990	22,688	3,000	25,035	25,035	12%		17,309		1990
1997	22,710	4,200	26,260	26,630	16%		15,249		1997
2000	16,375	5,100	21,475	26,475	24%		6,525		2000
2003	10,767	5,417	16,184	21,184	33%	-1,933	4,024		2003
United Arab Emirates									قطنمها قسطنمها قسطنمها قوء
1990	150	100	250	662	40%				1990
1997	150	120	270	762	44%		-1,348		1997
2000	185	130	315	828	41%		-1,482		2000
2002	190	129	319	1,520	40%	-2,097	-1,135		2002
Yemen									قطنمها قروءم
1990	3,500	1,400	3,900	3,900	36%		1,001		1990
1996	2,135	1,525	3,660	3,703	42%		477		1996
1997	4,000	1,300	4,100	4,143	32%				1997
2000	2,250	1,400	3,650	3,688	38%		228		2000
2001	1,500	1,000	2,500	2,538	40%		-1,303		2001
2003			2,000	2,038			-1,900		2003
ESCWA									اولئسلا قطنم
2000/03	151,137	14,858	167,011	186,052	9%	-22,473	6,693		2000/03