5th World Water Forum
Topic 6.4 - Data for all

Developing Water Accounts for the Arab-ESCWA Region
United Nations Economic and Social Commission for Western Asia
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The ESCWA region strongly depend on their natural and non-renewable resources to support their economic growth and thus face numerous constraints in their efforts to achieve sustainable development including fast growing populations, scarce water resources, land degradation, exploitation of oil and gas resources.

Main characteristics regarding water resources in the region are scarcity and uneven availability of freshwater resources, increasing gap between fresh water supply and demand, deteriorating water quality and dominating water use in agriculture (ESCWA, 2007a). Furthermore, existing wastewater treatment facilities in the region face difficulties in handling increasing volumes of wastewater generated by increased water consumption and urbanization where the regional wastewater treatment capacity in the ESCWA region was sufficient to handle only 40% of the domestic wastewater generated in 2000 (ESCWA, 2007a)

1-Frameworks, classifications and methods recommended

Environmental and integrated environmental and economic accounts are important to enhance economic and environmental policies. Economic policies are improved via integrated environmental and economic accounting (IEEA) by taking environmental assets (natural capital) as independent and important underlying resources in their own right. The conventional GDP indicator can be further disaggregated into net domestic product (NDP) which is simply GDP net of consumption of fixed capital and EDP or environmentally adjusted value added, which deducts the monetary values of natural asset depletion and degradation from NDP (UN, 2000). Furthermore, environmental accounts data can be used to factor the economic costs of natural asset depletion and degradation into economic policies, where comparisons between EDP and NDP over time can 'demonstrate the effectiveness of reformed economic policies in preserving the value of natural assets' (UN, 2000). Moreover, environmental accounts provide information that can be applied to environmental policies as well, through: (a) identifying environmental priorities; (b) tracing pressure points; (c) designing environmental policies; (d) evaluating policy effects; and (e) facilitating international environmental management (UN, 2000).

The United Nations, the Commission of the European Communities, the International Monetary Fund, the Organisation for Economic Cooperation and Development and the World Bank, developed in 2003 a handbook *Integrated Environmental and Economic Accounting* commonly referred to as SEEA-2003, which describes the interaction between the economy and the environment and covers the whole spectrum of natural resources and the environment (United Nations et al., 2003).

In SEAA, natural resources are classified as mineral and energy resources, soil resources, water resources and biological resources, in addition to land and surface water and ecosystems assets

Regarding the ESCWA region, water, energy and soil, resources and land and ecosystems sub-accounts are of the importance to sustainable development in the energy-rich yet water-scarce region. Other accounts, such as fisheries and forestry accounts can also be developed since fisheries are an important resource in coastal member countries and forests covers a significant part of the land in some member countries such as, Lebanon, Sudan and Syria.

On the other hand, given the unavailability of data to build a comprehensive SEEA in ESCWA member countries, priorities identified by countries pertained to physical flow accounts, assets accounts (physical stocks) and environmental protection expenditures (Table 2). Monetary flows can be probably developed in countries with advanced system for National Accounts such as Oman. Emissions accounts are difficult to compile given the insufficient environmental monitoring systems and lack of environmental reporting in most ESCWA countries.

Table 2–Natural resources by type of accounts of priority in the ESCWA region

	Water	Soil	Mineral and Energy	Ecosystems
Flow and pollution accounts Physical Flows (Hybrid accounts) Monetary flows Pollution (waste, emissions)	x	x	x	
Asset accounts Physical Stocks Monetary Stocks	x		x	
Economic information on the Environment Expenditures Revenues/Taxes etc	x		x	

Water Accounts: SEEAW

To this end, water accounts are vital and critical for the ESCWA region and this was further supported by a recommendation from the ESCWA Statistical Committee (UN-ESCWA, 2004).

The *System of Environmental-Economic Accounting for Water* (SEEAW) was set up to provide a conceptual framework for organizing the hydrological and economic information in a coherent and consistent manner (UNSD, 2007b). The SEEAW framework is an elaboration of the SEEA-2003, and both SEEAW and SEEA use 1993 SNA as basic framework. The SEEAW conceptual framework is complemented with a set of standard tables focusing on the following hydrological and economic information: (UNSD, 2007b).

(a) Stocks and flows of water resources within the environment;
(b) Pressures of the economy on the environment in terms of water abstraction and emissions added to wastewater and released to the environment or removed from wastewater;

(c) The supply of water and the use of water as input in the production process and by households;
(d) The reuse of water within the economy;
(e) The costs of collection, purification, distribution and treatment of water, as well as the service charges paid by the users;
(f) The financing of these costs, that is, who is paying for the water supply and sanitation services;
(g) The payments of permits for access to abstract water or to use it as sink for discharge of wastewater;
(h) The hydraulic stock in place, as well as investments in hydraulic infrastructure during the accounting period.
(i) Quality accounts, which describe water resources in terms of their quality

The SEEAW is also a useful tool in support of Integrated Water Resource Management (IWRM) by providing the information to decision makers on *providing a standardized information system which harmonizes information from different sources, allocating water resources efficiently* , *Improving water efficiency* , *understanding the impacts of water management on users,* the following (UNSD, 2007b):

Countries were encouraged to compile water accounts using harmonized concepts, definitions and classifications (UNSD, 2007b). Worldwide, 25 countries have insofar implemented parts of the water accounts. Seventeen of these countries are developed ones, while the remaining eight are developing (Botswana, Chile, Mexico, Namibia, Philippines, South Africa, Turkey and the Republic of Moldova) (Alfieri, 2006). Currently, 60 nations have requested the assistance of the UNSD in implementing their SEEAW, including all ESCWA countries (Vardon, 2008).

2- Organization, storage and management of data

The SEEAW framework

1. Assess data availability according to the list of variable required for Water Accounts Standard Tables (A list was prepared by UNSD and ESCWA in Arabic and English) (Att.1).
2. Develop central comprehensive database for the different units within concerned departments on water.
3. Follow the definitions and methodologies in IRWRS
4. Use the 2008 UNSD/UNEP Water Questionnaire for the variables to be collected
5. Data contains among others all the information required by SEEAW
6. Provide the metadata
7. Extract the data and Indicators related to SEEAW and share with NSO (same structure for the database can be used)
8. Prepare the Standard trables and the adaptations introduced for ESCWA countries (Att. 2)
9. The NSO coordinates with the National Accounts Units for consistency and evaluation
10. Provide the metadata
11. Repots should be produced and disseminated from the database.

3-Coordination among various organizations producing water data the future of integrated data analysis and presentation.

The Global Assessment of Water Statistics and Accounts has been undertaken by the UNSD under the auspices of the UNCEEA to (a) obtain an in-depth understanding of country practices in the compilation of water statistics and accounts; (b) assess compliance with the SEEAW; (c) contribute to the development of the International Recommendations of Water Statistics; and (d) assist with the development of targeted technical cooperation activities in these areas (http://unstats.un.org/unsd/envaccounting/ceea/surveyWAS.asp).

In this context, an "Expert Group Meeting on the International Recommendations for Water Statistics" was organized by UNSD in New York, 4-6 November 2008 to discuss with organizations and member countries the International Recommendations for Water Statistics (IRWS) related to concepts, definitions and classifications. The adopted IRWS is used as a guideline to compile water accounts in SEEAW. (Part I of the draft is published on the UNSD website http://unstats.un.org/unsd/envaccounting/irws/egm2008/AC170-4.PDF.)

In order to further assist member countries to better understand and apply the compilations process of water accounts, ESCWA had provided methodological document in Arabic such as the translation of the manual on the System of Environmental-Economic Accounting for Water (SEEAW) and the standard tables, in addition to the publication entitled "General and Specific Surveys to Compile data on Water Accounts in the Arab Countries (ESCWA 2008a).

ESCWA also benefited from information technology tools to publish a database, docubase, and an expertbase on environment information for ESCWA. within an integrated website "ESIAP" http://esiap.escwa.un.org/index.php to promote knowledge sharing on environmental statistics, indicator and accounts in the Arab region and among interested groups and experts.

In the same line, ESCWA organized in collaboration with UNSD, UNEP and MEDSTAT, training workshops (Amman, Jordan, 10-13 March 2008 and Beirut, Lebanon, 25-28 August 2008), technical assistance missions and study visits (Jordan, Oman, Lebanon, Syria) to familiarise and strengthen capacity of ESCWA member countries with respect to water accounting. The workshops provided training on the compilation and practical and operational use of the SEEAW, by drawing on experiences from around the world and by bringing together experts (water statisticians, water managers and/or accountants) from National Statistical Offices, Ministries of Environment and Water Authorities of the member countries (ESCWA, 2008b,c). Joint technical missions conducted to national statistical offices in member countries emphasised on presenting a work plan to assess existing information, identify gaps, bridge with corresponding data producers and users, set a national coordinating mechanism and present the advantages of water accounts and SEEAW to policy makers.

The outcomes of the trainings revealed the need for more cooperation among international organizations and institutions and provide further technical assistance to member countries, and to make documentation on environment and water statistics, indicators and accounts available in Arabic.

Important outcome also relate to the adaptation of the SEEAW standard tables in order to take into consideration the regional peculiarities of member states, i.e., to classify underground water resources into renewable and non-renewable; to divide the water supply and use into cooling water and mining water; to divide the industry's aggregates of the standard tables to show mining,

oil extraction manufacturing, oil refining, hotels and cafes, constructions, to divide the water received from other economic units into reuse waste water to sewerage, and distributed water, and to include desalinated water. Up till now, Jordan, Oman and Bahrain have undertaken practical steps to develop water accounts. Egypt and Lebanon are presently planning pilot water accounts in 2009.

Regional Agenda and Recommendations

Below is suggested Regional Agenda for the development of for Environmental Account Systems and in particular water accounting. It involves 5 phases, the first beginning in January 2009 and the third finishing in December 2009. The work plan can be repeated from phase I to phase V on for the development of a second subaccount such as pilot energy accounts in 2010.

The phases change according to the advancement of the country in environment statistics. Three groupings of ESCWA countries can be distinguished:

Group 1: Bahrain, Egypt, Jordan, Lebanon, Oman, Palestine. More advanced in Environment Statistics, Possibility of producing water accounts in one year according to the work plan below.
Group 2: Saudi Arabia, United Arab Emirates, Kuwait, Qatar. Need to establish environment statistics. Possibility of compiling water accounts in 2 years. Financial and human resources available.
Group 3: Iraq, Sudan, Syria, Yemen. Need to establish environment statistics. Financial and human resources not available. Possibility of compiling water accounts in 3 years

Phase I: Setting the ground (3 months)

Activities	**Stakeholders**	**Month**
1. **Awareness raising** on importance of environmental accounting at the Political and at the Public levels	National Authorities, NGOs UN organizations, Public	1 continuous
2. **Legal Framework**		
Update legal framework on environment statistics and accounts acts (	National Governments	1-3
Reinforce the legislation (continuous)	National Governments,Public	continuous

Phase II: Institutional Framework , Coordination (4 months)

Activities	**Stakeholders**	**Month**
1. **Establishment of High level steering committee** -Clarification of roles and responsibilities for data production and compilation of accounts -Allocation or resources. Need one person, ideally full time, to be responsible for the compilation of the accounts	National Authorities, Ministers and DGs	3
2. **Establishment of working group** for environment accounts and nomination of focal points within government agencies Define the objectives	NSO and concerned ministries, private	4

Draft functioning rules and responsibilities Examine data exchange procedures Agree on a timetable for regular transmissions	sector and NGOs Technical Staff in concerned departments	
3. **Data Exchange,** Detailed data quality assessment of existing data sources and identification of data gaps	Technical staff in concerned departmen	5-regular
4. **Information System** for environment statistics and accounts	IT experts in concerned departments	6-continous

Phase III. Technical Support (2 months-regular)

Activities	**Stakeholders**	**Month**
1. Identification of training needs	NSO with concerned departments and organizations	7-8
2. Training on the background documents on environmental accounting		7-8
3. **Environment surveys**		
Add environmental part of the industry questionnaire Add environmental survey of industries and services Add environmental survey of households	NSO with concerned departments	Depending on countries Periodic

Phase IV. Production of Pilot Sub-Accounts (3 months)

Activities	**Stakeholders**	**Month**
Sub-account 1: Water accounts		
1. Build Physical supply and use tables Identify available data sources and accessibility Find estimating methods for missing data Populate a first pilot table (SEEAW standard table I,II)	NSO with Water Authorities and concerned departments	9-11
2. Build Hybrid accounts	NSO with Central Bank and data producers on National Accounts	9-11
Identify available data sources and accessibility		
Enterprises reports		
3. Build Emissions tables Identify available data sources and accessibility	NSO with Water Authorities and concerned departments	9-11
4. Build Asset accounts Identify available data sources and accessibility		
5. Expenditure accounts	NSO with concerned departments	9-11

Phase V. Dissemination (one month)

Activities	**Stakeholders**	**Month**
Publication of pilot study and planning for on-going production of accounts Prepare a joint publication	NSO with concerned departments	12

Revise tables and analysis for publication Prepare publication for release Publish on the website Prepare promotional material and brief senior officials on water accounts Prepare plan for on-going production of accounts, including a cost-effective way to address data deficiencies and gaps		
After publication Monitor use of accounts Review use and implement plan for on-going production of water accounts	NSO with concerned departments, continuous	Feed-back Review Restart the cycle

5.2 Recommendations for Improvements in Water Statistics

ESCWA final reports for three meetings on water statistics in, 2006 and 2007, the UN DESA assessment report (2005), as well as technical assistance missions to ESCWA member Countries provided a comprehensive list of recommendations (which are further reiterated below) for improving water statistics in the ESCWA region.

The main recommendations target institutional and legal provisions, information accessibility, cooperation between the relevant environment-economic data agencies, human resources and training requirements, and information dissemination among others.

Institutionalization and legal provisions on official environment statistics and accounts:

The National Statistical Offices are the authorities to collect, compile and disseminate official statistics including statistics on environmental issues in most of the ESCWA Countries where activities in the field of environment statistics are based on a general statistical law, including environment statistics explicitly (Jordan and Palestine) or implicitly

Countries should update their legal provisions on statistics and put forward environment and water statistics and accounts acts and reinforce those acts to allow for the establishment of an environmental statistics and accounts programmes. Appropriate organizational structure where clear delineation of responsibilities of different governmental bodies involved in the compilation of environmental data should be determined, along with highlighting cooperation links and obtaining the allocation of financial resources (on a consistent basis) necessary to implement environmental statistics and accounts procedures.

Coordination with other important institutions producing water data:

The Ministry of Environment or Environment Protection Agency , the Ministry of Water the Ministry of Agriculture / Irrigation, , and the Ministry of Municipalities, and water supply and use industries play an important role in collecting data on environmental issues.
In some countries cooperation links between those governmental bodies and the National Statistical Office have been established in order to develop environment statistics at the national level (Jordan, Palestine, Lebanon, Syria and Bahrain). In many countries, however, internal regulations do not allow all relevant data to be made available to the Statistical Office. In some cases, duplication in data collection exists, which usually leads to incompatible data.

These institutions that are involved in environmental data collection and compilation on the other hand should be coordinated by established links between them in order to fully develop an efficient environment statistics system. This cooperation will not only reduce duplication in data production but also reduce costs and allow agreement on applied methods, standards, classifications, concepts, and definitions to ensure data comparability. The National Statistical Office is ideal to step up to this role and should therefore strive to play the leading role in the cooperation system. The creation of a statistical coordination committee is also recommended to support mutual coordination and agreement in statistical programming, organization of data collection, and data dissemination by all environmental bodies involved in the process.

Strengthening human and financial resources for environment statistics:

In six countries (Egypt, Jordan, Palestine, Syria, Bahrain and Yemen), a separate unit dealing with environment statistics has been created within the National Statistical Office. However, almost all of them consider the number of employees dedicated to environment statistics as insufficient. In addition, their work situation is affected by frequent transfers of personnel and limited capacity of equipment and logistic means to carry out data collection.

These National Statistical Offices would undoubtedly need professional staff and therefore appropriate training should be provided covering general statistical issues like sampling, non-response evaluation, as well as subject matter issues, to analyse environmental data and to calculate relevant environmental indicators.

Conduct environment and water surveys:

Sources of data on water and environment statistics and accounts can be obtained from conducting separate environment and water surveys as well as embedding sections on environment and water in existing censuses and surveys such as business surveys a agriculture censuses and others.

Find solutions to the main obstacles for improvements in environment statistics:

The following list represents the main difficulties impeding improvements in environment statistics in the region:

- The absence of a designated unit responsible for environment/water statistics in most of the National Statistical Offices in most ESCWA countries;
- Lack of qualified human resources and lack of expertise to conduct environmental/water surveys and to produce environment statistics;
- Lack of financial means and inadequate equipment and logistic to implement environmental surveys which are often costly and time consuming;
- Scattered information in different institutions and limited accessibility to the information;
- Lack of cooperation between the governmental institutions concerned;
- Lack of monitoring stations and other technical infrastructure;
- High sensitivity of environmental data in some countries which results in inaccessibility of available information;
- Insufficiently developed methodology for data collection in different institutions;
- Unavailability of relevant documents, manuals, and internationally accepted standards and concepts in Arabic.

Adoption of new classifications, methodologies, standards and coding systems:

In many cases (e.g. the Syrian Arab Republic, Lebanon, and Egypt), the National Statistical Office collects environmental/water data from government institutions. The National Statistical Office may use some of the available data for the calculation of indicators and aggregates in order to present the information in tables. However generally, statistical methodologies such as sampling design, the specification of the survey population, methods of data collection, methods of calculation, and statistical modelling to produce indicators, have not yet been applied to their full extent. Some countries (Jordan, Palestine, Saudi-Arabia, Syria and Lebanon) apply international classifications in specific fields. However, the most relevant classifications (e.g. International Standard of Industrial Classification – ISIC- classification for economic activities ver.4, or FAO land use classification) should be applied by all countries.

Filling data gaps:

Substantial data gaps in all ESCWA countries concern the following specific areas:

- Water quantity statistics: water supply, water demand, and water distribution;
- Water quality statistics: fresh water quality, drinking water quality, river water quality, lake and marine water quality, sewage and treated water quality;
- Air quality and air emissions;
- Municipal, industrial and hazardous waste, quantities generated by source, methods of disposal and composition;
- Land use and land degradation;
- Biodiversity.
- Data gaps in the countries often depend on the national priorities, which in turn depend on their respective needs, past experience and activities, as well as the available institutional and financial resources.

Dissemination:

With the exception of Jordan and Palestine, who produce regular specific reports on environment /water statistics, the statistical offices in Iraq published in 2006 "An Environmental Survey of Iraq for 2005" and the Central administration of Statistics in Lebanon published "A National Compendium of Environment Statistics in Lebanon". Usually countries include tables in the annual statistical report or in specific reports such as the health statistics report.

These procedures and output of basic environment statistics should be freely made available (along the Aarhus Convention for the Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters) in a well-organised and computerized system which will allow efficient data processing and efficient data exchange amongst the institutions involved in environment statistics production.

Carry regular activities in environment statistics:

Six ESCWA countries reported that they carry out regular environmental data collection through special statistical surveys (Jordan, Palestine, Saudi-Arabia, Iraq (recently), Yemen and Kuwait). An important part of environmental data is collected by the National Statistical Offices from secondary data sources. Secondary data sources are the ministry of environment, the ministry of agriculture, the ministry of water and special environmental protection agencies. A few countries add special questions on environmental issues to questionnaires of existing surveys (for example to the Economic Enterprise Survey or the Household Budget Survey). Egypt, Syria, Lebanon,

Jordan and Palestine participated in the Euro-Mediterranean statistical cooperation project MEDSTAT-Environment phase one and are at present involved in the MEDSTAT-Environment project phase two.

Tailor the assistance of ESCWA and other UN and regional organizations in the field:

ESCWA on the other hand could assist countries in the region to sensitizing countries on the importance of environment statistics and indicators and on related data collections, assist in organising training workshops with all countries on the main environmental areas, coordinate activities between countries (promoting teamwork and supporting exchange of experiences between experts in the region) and support close collaboration with UNEP, especially in view of common activities concerning the core indicator list and related data collections.
In specific, ESCWA could support the creation of a regional environmental statistical system including the development or adaptation of appropriate manuals, classifications, and guidelines for standardization, methodologies, as well as case studies from the ESCWA region and support countries in responding to the international data requests, such as UNSD/UNEP questionnaire.

Training activities should also be extended to the persons responsible for environmental data collection in other institutions (ministries, environment protection agencies or monitoring stations) in order to have more effective cooperation between the institutions.

Considering the heterogeneous levels in development of environment statistics in the ESCWA countries, technical assistance will need to be carefully organized and tailored to the specific needs of the countries through, possibly, organizing study tours to those countries, through providing regular training workshops in the institutions producing environment statistics (i.e. the technical assistance should comprise expert missions to assist in the initial phase of the work and to provide on-the-job-training), and consultancy missions that will provide countries (that have already begun work in certain environmental areas) with training on the production of statistical tables and on methods of estimating and filling data gaps.

Consequently, output manuals for environment statistics covering basic concepts and definitions, methods for data collection, tabulation of environmental data, and the calculation of environmental indicators, as well as the application of classification should be developed to enable a harmonized environmental information system to produce comparable and useful data in ESCWA countries.

The UN-ESCWA 2007 compendium of environmental statistics is a pilot publication that may serve as an example for other ESCWA countries to produce. The availability and the use of international classifications for the main themes used in environment statistics as well as international and suggested national standards (for example, for drinking water quality, treated sewage water quality, toxic residuals in food, and air quality) are indispensable to ensure comparability of environmental data at international level.

The main issues that should be covered in the compendium of environmental statistics (or national environment statistics programmes) in the ESCWA region are water statistics (e.g. rainfall, river inflow/outflow, quality, groundwater abstraction, desalination…), solid and liquid waste statistics (e.g. waste generation, collection, recycling rate, reuse, wastewater treatment, cost of treatment…), the atmosphere (e.g. GHG emissions, local air quality…), land statistics (e.g. land use, changes in land use, land degradation…), biodiversity, environmental and sustainable development indicators, and natural resource statistics.

Furthermore and in order to make the above environmental data category outputs effective for decision making in national policy and at international level, the data will need to be widely distributed. It is suggested that the environmental data be presented either in Statistical Yearbooks in separate chapters, or specific publications be prepared on environmental issues on a regular basis. The distribution of the data through the internet would substantially increase the use of the data.

The UNSD could support moreover the ESCWA countries in the above by leading international harmonisation of definitions, concepts and methods in environment statistics, in close collaboration with UNEP, FAO, Conventions and other international bodies involved, by providing (Arabic) guidelines for the development of environment statistics in countries, by providing data collection manuals for the main environmental areas such as water, waste and air, (also in Arabic) and by providing training material for the main environmental topics.

Finally, the agenda proposed and the recommendations set forth along with integrated strategic planning , resources allocation, sound management and monitoring and evaluation, ESCWA member countries can produce pilot environment accounts that can be used by policy-makers for sound decisions on environment protection and economic development.

Pilot Water Accounts in ESCWA Countries: Jordan Example

Jordan ranked is one of the world's poorest countries in terms of water availability. In the face of water scarcity and the few and expensive opportunities to increase supply, the government is trying to solve part of the problem through redistributing of the available water resources to different uses. The government's planning and future projects take into consideration alternative sources for water supply. Some of these projects depend on dams building, while others depend on the usage of non-traditional sources such as the reuse of treated water and desalinization.

The Department of Statistics (DOS) in Jordan undertook a pilot study on "Water Statistics and Accounts" in 2008 to respond to this priority issue. DOS was capable of gathering the basic information since it detains a programme of environment statistics and publishes regular statistical reports on environment. In addition, supplementary efforts from DOS staff and management, committed coordination among the different stakeholders and technical assistance from UNSD, ESCWA and MEDSTAT, the pilot study DOS still under revision.

The study included water sector challenges, data sources, water supply and demand analysis, and presented three standard tables of SEEAW: Physical supply, use and emission accounts tables. Hybrid accounts were not compiled due to non-availability or dispersion of data. DOS is planning to gather the information from new or existing surveys. The main results are shown in Attachment 3.

Data List
The following list prepared by UNSD (Michael Vardon) and ESCWA (Wafa Aboul Hosn) shows the types of data that may be available for your country and are needed for compiling water accounts. Few countries in the world have the data for all of the date items listed. However, every country will have at least some of the data. Stakeholders should agree on the availability of data and address data gaps.
List of data items are drawn from SEEAW.

For each data variable, stakeholders fill the information: Department or Ministry responsible, Information Available: Yes/No, If Yes, Describe coverage, Data can be shared Yes/No, Ways of sharing-database, Focal Point, If not available, Plan to collect: Yes/No, If Yes, When and How, If no, what are the constraints

Hydrological/meteorological:	**الهيدرولوجية / الارصاد الجوية:**
Precipitation (e.g. rainfall, snow)	الأمطار الهاطلة (الأمطار، الثلوج)
Evapo-transpiration (evaporation and transpiration)	التبخر
Run-off	الجريان
Outflows to sea	التدفق نحو البحر
Outflows to other territories	**التدفق الخارجي**
Volume of water stocks in:	**كمية مخزون المياه في :**
Surface water	المياه السطحية
Artificial Reservoirs	خزانات المياه الإصطناعية
Rivers	الأنهار
Lakes	البحيرات
Groundwater	المياه الجوفية
Soil water	مياه التربة
Volume of water abstracted from:	**كمية المياه المستخرجة من :**
Surface water	المياه السطحية
Artificial Reservoirs	خزانات المياه الإصطناعية
Rivers	الأنهار
Lakes	البحيرات
Groundwater	المياه الجوفية
Soil water	مياه التربة
Other sources	مصادر أخرى

Collection of precipitation	مياه الامطار المجمعة
Abstraction from the sea	استخراج المياه من البحر
Volume of water supplied by:	**كمية المياه المتوفرة من:**
The water supply industry (ISIC 36)	امدادات المياه
0ther industries	الصناعات الأخرى
Volume of water losses in distribution by water supplier from:	**حجم الخسائر في توزيع المياه عن طريق المورد :**
Leakage (e.g. from leaky or burst pipes)	التسرب
Evaporation (e.g. from open channels)	التبخر (من قناة مفتوحة)
Theft	السرقة
Volume of water used by:	**كمية المياه المستخدمة من :**
Agriculture (1)	الزراعة (1)
Mining and Quarrying (5-9)	التعدين والكسارات (5-9)
Manufacturing (10-33)	الصناعة التحويلية (10-33)
Electricity Industry (35)	الكهرباء (35)
Other industries	الصناعات الأخرى
Households	المساكن
Irrigation:	**الري**
Area irrigated by crop type	المنطقة المروية حسب نوع المحصول
Volume of water applied to irrigated area	كمية المياه المطبقة على المساحة المروية
Irrigation techniques or management practices	تقنيات الري أو الممارسات الادارية
Wastewater:	**المياه العادمة**
Volume collected by the sewerage industry	كمية المياه المجمعة في محطات التكرير

Volume treated by the sewerage industry	كمية المياه المكررة في محطات التكرير
Volume of wastewater reused	كمية المياه العادمة المعاد استخدامها
Volume discharged to inland waters	كمية المياه المصرفة الى المياه الداخلية
Volume discharged to sea	كمية المياه المصرفة الى البحر
Emissions to water:	**الإنبعاثات في المياه**
Total nitrogen (N)	مجموع النيتروجين
Total phosphorous (P)	مجموع الفسفور
Total Suspended Solids (TSS)	مجموع المادة الصلبه العالقة
Total Dissolved Solids (TDS)	مجموع المادة الصلبة الدائبة
Biochemical Oxygen Demand (BOD)	الطلب البيولوجي الكيميائي على الأكسجين
Chemical Oxygen Demand (COD)	الطلب الكيميائي على الأكسجين
Arsenic (Ar)	الزرنيخ
Heavy metals (e.g. Cd, Hg, Cu, Cr, N, Pb, etc)	المعادن الثقيلة
Water supply industry:	**صناعة امدادت المياه**
Sales of water	مبيعات المياه
Government subsidies	الدعم الحكومي
for operating costs	تكاليف التشغيل
for specific capital items	لرأس المال المحدد
Other revenue	ايرادات اخرى
Compensation of employees (e.g. wages)	تعويضات الموظفين (الاجور)

Other production costs (e.g. insurance, rent, fuel, electricity, chemicals, etc.)	تكاليف الانتاج الاخرى (مثل التأمين والايجار والوقود ، والكهرباء ، والمواد الكيميائية، الخ.)
Taxes	الضرائب
Capital expenditure	النفقات الراسمالية
Sewerage industry:	**محطات التكرير:**
Sales of sewerage services	مبيعات خدمات الصرف الصحي
Government subsidies	الدعم الحكومي
for operating costs	تكاليف التشغيل
for specific capital items	لرأس المال المحدد
Other revenue	ايرادات اخرى
Compensation of employees in (e.g. wages)	تعويضات الموظفين (الاجور)
Other production costs (e.g. insurance, rent, fuel, electricity, chemicals, etc.)	تكاليف الانتاج الاخرى (مثل التأمين والايجار والوقود ، والكهرباء ، والمواد الكيمياءيه ، الخ.)
Taxes	الضرائب
Capital expenditure	النفقات الراسمالية
Value of the water supply infrastructure (i.e. fixed capital):	**قيمة البنية الأساسية لامدادات المياه (أي رأس المال الثابت) :**
Water supply industry (e.g. dams, pipes, etc.)	امدادات المياه (السدود ، والانابيب ، الخ.)

Agriculture (e.g. wells, sprinklers and pump for irrigation)	الزراعة (مثل الآبار ، والرشاشات ومضخات للري)
Other industries – mining industry, manufacturing industry, etc	صناعات أخرى- صناعة التعدين ، والصناعة التحويليه ، الخ
Households (including rainwater tanks and wells)	المساكن (بما في ذلك خزانات مياه الامطار والآبار)
Value of the sewerage infrastructure (i.e. fixed capital):	**قيمة الصرف الصحي (أي رأس المال الثابت) :**
Sewerage industry (e.g. sewers, wastewater treatment plants, etc.)	مجاري الصرف الصحي (مثل المجاري ومحطات معالجة مياه الصرف ، الخ.)
Agriculture (e.g. drainage channels)	الزراعة (مثل قنوات الصرف)
Other industries (e.g. mining, manufacturing, etc)	صناعات أخرى (صناعة التعدين ، والصناعة التحويلية)
Households (including septic tanks)	المساكن (بما في ذلك خزانات الصرف الصحي)
Tariffs and charges	**التعاريف والرسوم**
Water tariffs and charges (price to users, industries and households)	تعرفة المياه والرسوم (السعر للمستخدمين ، والمصانع والمساكن)
Sewerage service tariffs and charges (price to users, industries and households)	تعرفة مجاري الصرف الصحي والرسوم (السعر للمستخدمين ، والمصانع والمساكن)

Cost of water used by:	**تكلفة المياه المستخدمة من:**
Agriculture	الزراعة
Mining industry	الصناعة التعدينية
Manufacturing industry	الصناعة التحويلية
Electricity industry	الكهرباء
Other industries	صناعات أخرى
Households	المساكن
Cost of sewerage services by:	**تكلفة خدمات الصرف الصحي عن طريق :**
Agriculture	الزراعة
Mining industry	الصناعة التعدينية
Manufacturing industry	الصناعة التحويلية
Electricity industry	الكهرباء
Other industries	صناعات أخرى
Households	المساكن

Attachment 3. Pilot Water Accounts in Jordan
Physical water use table in Jordan 2007 (Pilot study).

Physical units MCM

			Industries (by ISIC categories)								
		1 irrig.	1 stock	All except 1,35,36,37	35	36	37	Total	Households	Rest of the world	Total
From the environment	**U1 - Total abstraction (= a.1+a.2 = b.1+b.2):**	0.0	0.0	0.0	0.0	857.4	0.0	857.4	0.0		857.4
	a.1- Abstraction for own use	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0
	a.2- Abstraction for distribution	0.0	0.0	0.0	0.0	857.4	0.0	857.4	0.0		857.4
	b.1- From water resources:	0.0	0.0	0.0	0.0	857.4	0.0	857.4	0.0		857.4
	Surface water	0.0	0.0	0.0	0.0	351.4	0.0	351.4	0.0		351.4
	Groundwater	0.0	0.0	0.0	0.0	506.0	0.0	506.0	0.0		506.0
	Soil water	-	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0
	b.2- From other sources	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0
	Collection of precipitation	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0
	Abstraction from the sea	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0
Within the economy	U2 - Use of water received from other economic units	421.5	5.07	24.96	0	0	89.26	540.8	189.4		730.2
	of which: Reused water	0	0	0	0	0	89.26	89.26	0		89.3
	of which: Wastewater to sewerage										0.0
U=U1+U2 -	**Total use of water**	421.5	5.1	25.0	0.0	857.4	89.3	1398.2	189.4		1587.6

Physical water supply table in Jordan 2007 (Pilot study).

Physical units MCM

			Industries (by ISIC categories)								
		1 irrig.	1 stock	All except 1,35,36,37	35	36	37	Total	Households	Rest of the world	Total
Within the economy	S1 - Supply of water to other economic units	0.0	0.0	15.4	0.0	557.3	83.6	656.3	73.9		730.2
	of which: Reused water										
	Wastewater to sewerage	0	0	15.4	0	0	0	15.4	73.9		89.3
To the environment	S2 - Total returns (= d.1+d.2)	0	0	0	0	300.1	0	300.1	0		300.1
	d.1- To water resources	0	0	0	0	300.1	0	300.1	0		300.1
	Surface water	0	0	0	0	300.1	0	300.1	0		300.1
	Groundwater	0	0	0	0	0	0	0	0		0.0
	Soil water	0	0	0	0	0	0	0	0		0.0
	d.2- To other sources (e.g. Sea water)	0	0	0	0	0	0	0	0		0.0
S - **Total supply of water** (= S1+S2)		0.0	0.0	15.4	0.0	857.4	83.6	956.4	73.9	0.0	1030.3
Consumption (U - S)		**421.5**	**5.1**	**9.6**	**0.0**	**0.0**	**5.7**	**441.8**	**115.5**	**0.0**	**557.3**

Note: grey cells indicate zero entries by definition.
data is not available

Emission accounts to water in Jordan 2007 (Pilot study).

Physical units tons

Pollutant	Industries (by ISIC categories)							Households	Rest of the world	Total
	1 irrig.	1 stock	All except 1,35,36,37	35	36	37	Total			
Gross emissions (= a + b)	0.0	0.0	205436.0	0.0	0.0	0.0	205,436.0	985,559.2		1,190,995.2
a. Direct emissions to water (= a1 + a2 = b1 + b2)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0
a1. Without treatment	0.00	0.00	0.0	0	0	0.00	0.0	0		0.0
a2. After on-site treatment	0	0	0.0	0	0	0	0.0	0		0.0
b1. To water resources	0.00	0.00	0.0	0	0	0.00	0.0	0		0.0
b2. To the sea	0	0	0.0	0	0	0	0.0	0		0.0
b. To Sewerage (ISIC 37)	0.00	0.00	205436.0	0	0	0.00	205,436.0	985559.2		1,190,995.2
d. Reallocation of emission by ISIC 37	6.0	0.0	0.0	0.0	0.0	0.0	6.0	0.0		6.0
e. Net emissions (= a. + d.)	6.0	0.0	0.0	0.0	0.0	0.0	6.0	0.0		6.0

Water Summary Table in Jordan 2007 (Pilot study).

	Industries (by ISIC categories)							Households	Rest of the world	Total
	1 irrig.	1 stock	All except 1,35,36,37	35	36	37	Total			
1. Net supply of water to other economic units	0.0	0.0	15.4	0.0	557.32	83.6	656.3	73.9		730.2
2. Losses in distribution	0.0	0.0	0.0	0.0	300.1	0.0	300.1	73.9		
2.a Leakages	0	0	0	0	300.1	0	300.1	73.9		374.0
2.b other (evaporation)	0	0	0	0	0	0	0.0	0		0.0
3. Gross supply within the economy (1+2)	0.0	0.0	15.4	0.0	857.4	83.6	956.4	147.8	0.0	730.2

Prices of the total amount of water in specific sectors (000 JD) in 2005

Consumption cost	Losses	Materials sold without processin	Change in Stock	Purchase during the year	Stock	Sector
28135.4	0.0	0.2	0.0	28135.7	0.0	Industry
1198.1	0.0	0.0	0.0	1198.1	0.0	-electricity generation
4173.6	0.0	0.0	0.0	4173.6	0.0	Wholesaler and retailer
8711.7	0.0	0.0	0.9-	8710.8	0.0	*Services
2614.9	0.0	0.0	0.1-	2614.8	0.0	Construction
2790.1	0.0	0.0	0.0	2790.1	0.0	*Transportation and communicatio
79.0	0.0	0.0	0.0	79.0	-	Insurance