Methodology and Quality Report of Water Accounts

(system of environmental economic accounting)

V-3.1

Quality Management

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1. Contact

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2. Methodology and Quality Update

2.1.	Methodology and Quality last update	19/12/2024

3. Statistical Presentation

3.1. Data description

The water accounts present data on the environmental and economic aspects of water in Saudi Arabia.

Water Accounts is a statistical product whose data is collected mainly through administrative records data on the main characteristics as follows:

- Water supply by water source (physical and monetary)
- Water use by industrial activity and households (physical and monetary)

3.2. Classification system

The following classifications are applied in water accounts.

National classification of economic activities (ISIC4):

A statistical classification based on the International Standard of Industrial Classification of All Economic Activities (ISIC4). It is used to describe the productive activities of an establishment.

System of Environmental-Economic Accounting (SEEA):

The SEEA is a framework that integrates economic and environmental data to provide a more comprehensive and multipurpose view of the interrelationships between the economy and the environment and the stocks and changes in stocks of environmental assets, as they bring benefits to humanity. It contains the internationally agreed standard concepts, definitions, classifications, accounting rules and tables for producing internationally comparable statistics and accounts. The SEEA framework follows a similar accounting structure as the System of National Accounts (SNA). The framework uses concepts, definitions and classifications consistent with the SNA to facilitate the integration of environmental and economic statistics. The SEEA is a multi-purpose system that generates a wide range of statistics, accounts and indicators with many different potential analytical applications. It is a flexible system that can be adapted to countries' priorities and policy needs while at the same time providing a common framework, concepts, terms and definitions.

The water accounts are part of SEEA Central Framework and is available on the United Nations website: https://seea.un.org/content/seea-central-framework

The Central Framework covers measurement in three main areas:

- Environmental flows:

  The flows of natural inputs, products and residuals between the environment and the economy, and within the economy, both in physical and monetary terms. Click here for a diagram illustrating environmental flows.

- Stocks of environmental assets:

  The stocks of individual assets, such as water or energy assets, and how they change over an accounting period due to economic activity and natural processes, both in physical and monetary terms.

- Economic activity related to the environment:

Monetary flows associated with economic activities related to the environment, including spending on environmental protection and resource management, and the production of environmental goods and services:

- Water account follows same structure the SEEA Central Framework:

And has three main types of accounts to record the hydrological system and its links to the economy:

– Physical flow accounts:

These accounts record physical flows of water between the environment and the economy. They record the abstraction of water by the economy, how water flows within the economy and the return flows of water back to the environment. Water emission accounts can also be compiled in relation to these flows.

– Physical asset accounts:

These accounts describe the hydrological cycle over an accounting period. Water stocks and their depletion over the accounting period are presented, including links to the abstraction and consumption of water by the economy.

– Economic accounts:

This set of accounts presents, among others, flows related to water products, information on the costs associated with water use and supply, and information on water related financing.

3.3. Sector coverage

The Water Account covers the following main economic activities:

- Industrial.
- Agricultural.
- Services.
- Other economic activities.
- And households.

3.4. Statistical concepts and definitions

Terms and Concepts Related to Water Accounts Publication:

All terms and definitions are consistent with the SEEA Central Framework. The terms used in the Water Account are defined below. Where appropriate paragraph references have been included.

- Abstraction:

is the amount of water that is removed from any source, either permanently or temporarily, in a given period of time. (3.195).

- Asset:

a store of value representing a benefit or series of benefits accruing to an economic owner by holding or using the entity over a period of time. It is a means of carrying forward value from one accounting period to another. (5.32).

- Environmental assets:

are the naturally occurring living and non-living components of the Earth, together constituting the biophysical environment, which may provide benefits to humanity. (2.17).

- Final water use:

is equal to evaporation, transpiration and water incorporated into products. (3.222) (Also referred to in water statistics as "water consumption").

- Groundwater:

is water that collects in porous layers of underground formations known as aquifers. (5.479).

- Industry:

consists of a group of establishments engaged in the same, or similar, kinds of activity. (2.116).

- Inland water system:

comprises surface water (rivers, lakes, artificial reservoirs, snow, ice and glaciers), groundwater and soil water within the territory of reference. (3.187).

- Losses during distribution:

are losses that occur between a point of abstraction, extraction or supply and a point of use. (3.101).

- Natural resources:

include all natural biological resources (including timber and aquatic resources), mineral and energy resources, soil resources and water resources. (2.101, 5.18).

- Non-renewable groundwater:

aquifers and springs that are not recharged.

- Physical flows:

are reflected in the movement and use of materials, water and energy. (para., 2.88).

- Renewable groundwater:

water removed by economic units from aquifers and springs that are naturally recharged.

- Return flows of water:

comprise water that is returned to the environment. (3.210).

- Reused water:

is wastewater supplied to a user for further use with or without prior treatment, excluding the reuse (or recycling) of water within economic units. (3.207).

- Soil water:

consists of water suspended in the uppermost belt of soil, or in the zone of aeration near the ground surface. (5.480).

- Surface water:

comprises all water that flows over or is stored on the ground surface regardless of its salinity levels. Surface water includes water in artificial reservoirs, lakes, rivers and streams, snow and ice and glaciers. (5.477).

- Wastewater:

is discarded water that is no longer required by the owner or user. (3.86).

- Water consumption:

see Final water use.

- Water resources:

consist of fresh and brackish water in inland water bodies, including groundwater and soil water. (5.474).

- Water Supply:

Water distribution, including collection, treatment and storage, for use in a town, city or municipal area, which is generally used to meet domestic and industrial needs.

3.5. Statistical unit

Not applicable

3.6. Statistical population

Not applicable.

3.7. Reference area

The publication is a representative sample for Saudi Arabia.

3.8. Time coverage

Data is available for 2021, 2022, and 2023.

3.9. Base period

Not applicable.

4. Unit of measure

- Meters cubed (m^3).
- Million metres cubed (Mm^3).
- Saudi Riyals (SAR).
- Million Saudi Riyals (MSAR).

5. Reference period

The data from administrative records is based on the last day of each calendar year.

6. Confidentiality

6.1. Confidentiality - policy

According to the Royal Decree No. 23 dated 07-12-1397, data must always be kept confidential, and must be used by GASTAT only for statistical purposes.

Therefore, the data are protected in the data servers of the Authority.

6.2. Confidentiality - data treatment

Data are displayed in appropriate tables to facilitate its summarization, comprehension, results extraction. comparison with other data and coming up with statistical connotations for the study community. It is also easier to check tables without the need to see any sensitive or confidential data, which violates the confidentiality of statistical data.

7. Release policy

7.1. Release calendar

The water accounts results are bound by a release calendar.

7.2. Release calendar access

Available on the: https://www.stats.gov.sa/en/future-releases

7.3. User access

One of GASTAT's objectives is to better meet its clients' needs, so it immediately provides them with the publication's results once the water accounts Publication is published.

It also receives questions and inquiries from the clients about the Publication and its results through various communication channels, such as:

- GASTAT's official website: www.stats.gov.sa
- GASTAT's official e-mail address: info@stats.gov.sa
- Client Support's e-mail address: cs@stats.gov.sa
- Official visits to GASTAT's official head office in Riyadh or one of its branches in Saudi Arabia.
- Official letters.
- Statistical telephone (199009).

8. Frequency of dissemination

Every 2 years.

9. Accessibility and clarity

9.1. News release

The announcements of each publication are available on release calendar as mentioned in 7.2. Release calendar access. The news release can be viewed on the website of GASTAT through the following link:

https://www.stats.gov.sa/en/news

9.2. Publications

GASTAT issues water accounts publications and reports on a regular basis following a pre-prepared release calendar and available on GASTAT's website. GASTAT is keen to publish its publications in a manner that serves all users of different types, including publications in different formats that contain (publication tables, data graphs, indicators, Methodology and Quality Report, and used questionnaires) in both English and Arabic.

The water accounts publications are available on the link:

Publication results link

9.3. On-line database

Not available.

9.4. Micro-data access

Not available.

9.5. Other

Not available.

9.6. Documentation on methodology

The water accounts publication is based on the SEEA Central Framework available from the United Nations Statistical Division via the link:

https://seea.un.org/content/seea-central-framework

The concepts and definitions are based on the list of definitions SEEA Central Framework, augmented by the Internation Recommendations for Water Statistics available from the United Nations Statistical Division via the link:

https://seea.un.org/content/seea-water

9.7. Quality documentation

Quality documentation covers documentation on methods and standards for assessing, measuring, and monitoring the quality of statistical process and output. It is based on standard quality criteria such as relevance, accuracy and reliability, timeliness and punctuality, accessibility and clarity, comparability, and coherence.

10. Quality management

10.1. Quality assurance

GASTAT declares that it considers the following principles: impartiality, user orientated, quality of processes and output, effectiveness of statistical processes, reducing the workload for respondents.

Quality controls and validation of data are actions carried out throughout the process in different stages such as the data input and data collection and other final controls.

10.2. Quality assessment

GASTAT performs all statistical activities according to a national model (Generic Statistical Business Process Model - GSBPM). According to the GSBPM, the final phase of statistical activities is overall evaluation using information gathered in each phase or sub-process. This information is used to prepare the evaluation report which outlines all the quality issues related to the specific statistical activity and serves as input for improvement actions.

11. Relevance

11.1. User needs

Internal GASTAT's users, who make use of water accounts data, include:

- General Department of Economics Statistics
- Department of International Indicators.

External users who make significant use of (Statistical product name) data include, but is not limited to:

- The governmental entities.
- Regional and International Organizations.
- Research institutions.
- Media.
- Individual of researchers and students.

The disseminated key variables that mostly used by key users:

The United Nations Statistics Division (UNSD	Data on water supply by source and water use by industry and households.
Gulf Statistical Center	
Food and Agriculture Organization of the United Nations	Data on water supply by source and water use by agriculture.

11.2. User satisfaction

Not available.

11.3. Completeness

The data of the Water Accounts publication is based on the government entities' record data, statistical surveys and censuses data of the General Authority for Statistics.

Data Coverage:

SEEA Central Framework has four water accounts.

- Water supply and use (physical terms).
- Water supply and use (monetary terms).
- Water asset account.
- Water emissions (physical terms).

No data were available for the accounts for water assets or water emissions.

Water use data were only available for a limited number of industries.

12. Accuracy and reliability

12.1. Overall accuracy

- The data was compared with other data sources and correlation between variables and confirms consistency between different data series.
- The data is checked with previous years to identify any significant changes in the data.
- The internal consistency of the data is checked before it is finalized.

13. Timeliness and punctuality

13.1. Timeliness

The General Authority for Statistics is committed to applying internationally recognized standards in announcing and clarifying the publication time of statistics on the official website through the statistical calendar. In case of any delay, it will be updated accordingly.

13.2. Punctuality

Publication takes place in accordance with published release dates for water accounts in the GASTAT webpage. The data are available at the expected time, as scheduled the release calendar, If the publication delayed the reasons would be provided.

14. Coherence and comparability

14.1. Comparability - geographical

Data are geographically comparable.

14.2. Comparability - over time

This is the first edition of the Water Accounts Publication. The data are for 2021, 2022, and 2023 and are comparable over this time.

14.3. Coherence- cross domain

Not applicable.

14.3.1. Coherence - sub annual and annual statistics

Not applicable.

14.3.2. Coherence- National Accounts

The data are consistent with the national accounts.

14.4. Coherence - internal

Water accounts estimates have complete internal consistency, as they are all based on the same exact data set, and are calculated using the same estimation methods

15. Data revision

15.1. Data revision - policy

Not applicable, only final results will be published.

15.2. Data revision - practice

Not applicable, only final results will be published.

16. Statistical processing

16.1. Source data

The Water Accounts Publication relies on several sources for its data.

It includes statistics from sources from the General Authority for Statistics (censuses, and statistical surveys) and statistics from administrative record sources, from which data were obtained.

The following table shows the data sources in the Water Accounts Publication:

Government entities		
National Water Company	Saudi Water Authority	Ministry of Environment, Water and Agriculture
MODON	Marafiq Company	National Center for Meteorology
Saudi Water Partnership Company	-	-
Censuses and statistical surveys		
Agricultural census	National Accounts	General census of Population and Housing
Environment Household Survey	Waste and Water in Industry Survey	-

16.2. Frequency of data collection

Annual.

16.3. Data collection

Data collection from administrative records:
In coordination with GASTAT's departments related to the implementation of the survey and the data acquisition department, the water accounts publication data were obtained from the

Ministry of Environment, Water and Agriculture. Additional data were collected from the Saline Water Conversion Corporation, National Water Company, Modon, and Marfiq Company.

The data were saved on GASTAT's databases, data have been audited and reviewed according to the statistical method and recognized quality standards, in case of defect quality issues or errors in the data we refer back to data source.

16.4. Data validation

Data are reviewed and matched to ensure their accuracy and precision in a way that suits their nature with the aim of giving the presented statistics quality and accuracy.

The data of the publication's current year are compared with the data of the previous year to ensure their integrity and consistency in preparation for processing data and extracting and reviewing results.

In addition to the data processing and tabulation to check their accuracy, all the outputs are stored and uploaded to the database after being calculated by GASTAT to be reviewed and processed by specialists in water accounts through modern technologies and software designed for this purpose.

16.5. Data compilation

Data Editing:

Specialists of Environment Agriculture and Energy Statistics Department have processed and analyzed data in this stage, and this step was based on the following measures:

- Sort and arrange data in groups or different categories in a serial order.
- Summarize detailed data into main points or main data.
- Linking between many parts of data and make them connected.
- Process incomplete or missing data.
- Process illogical data.
- Converting data into statistically significant data.
- Organize, display and interpret data.

Compensation: For non-response or incomplete data sets:
Compensation for incomplete data is done by applying statistical methods to estimate the data and is detailed in the statistical equations section below.
The following are calculation and estimation methods used in the publication:

- The weighted expenditure use of water was calculated by distributing government expenditure on the water sector over economic activities and households, by calculating a coefficient for each activity and households as follows:

  - (How much economic activity spends on water use/total expenditure of economic activities and households) * Government expenditure
- The amount of water used in the industrial sector outside urban areas was distributed among economic activities (minerals and quarrying, manufacturing industries, construction, electricity, gas and steam supply) using a factor that was calculated from the monetary use tables and applied to distribute the physical water use as follows:
  - Example: monetary factor for minerals and quarrying = (monetary use of minerals and quarrying/Sum of monetary use of minerals and quarrying, manufacturing, construction, electricity, gas and steam supply).
  - Then, the distribution of physical used water for minerals and quarrying sector = monetary factor * total water used in the industrial sector.
- The amount of water consumption for each economic activity or sector was calculated from the supply and use tables as follows
  - Water consumption = water use - water supply
- Average weighted expenditure of used water was calculated by calculating the average expenditure of all economic activities and households used water as follows:
  - Example: Economic activity expenditure on used water = used water expenditure by economic activity/amount of water used in economic activity, then
  - The average weighted expenditure of used water = average expenditure values for all economic activities and households * percentage of physical used water for each economic activity
- Household's water consumption per capita = total quantity of consumed water in households/total number of population.

16.6. Adjustment

Not applicable, only final results will be published. Data is susceptible to future updates and revisions

17. Comment