

Water Statistics in the State of Qatar 2023





Water Statistics

In the State of Qatar
2023

November 2024



H H Sheikh Tamim Bin Hamad Al Thani
Emir of the State of Qatar

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Preface



Allah the Exalted said in Holy Quran: “We made from water every living thing”*. **Hence, water is life!**

The conservation of Qatar's natural freshwater resources is therefore a critical aspect of the National Development Strategy.

Qatar relies on seawater desalination as the primary source of drinking water and on groundwater abstraction for agricultural purposes. The reuse of treated wastewater has emerged as a significant alternative source for irrigation in agriculture and landscaping.

Qatar's water policies have yielded significant successes, including the provision of safe drinking water for all population, minimum water loss, high-level treatment of urban wastewater and re-use of substantial amounts of treated wastewater. Statistics show that water use efficiency has increased in most economic sectors.

However, freshwater reserves continue to be overexploited, leading to lower groundwater levels and higher salinity. This, in turn, makes it difficult to use groundwater for irrigation and potable water purposes in the future.

According to available statistics, there is still potential for increased reuse of treated wastewater, which would further enhance water efficiency across domestic and economic activities while reducing water losses.

Collectively, these measures will contribute to achieving water security, food security and sustainable development, in alignment with the Qatar National Vision 2030. The Qatar Water Statistics Report provides a comprehensive overview on water sources and usages. Publishing these statistics is a crucial step to support knowledge-based decision-making in the water sector.

Dr. Abdulaziz bin Nasser bin Mubarak Al Khalifa
Secretary-General of the National Planning Council

(*) Sura Al-Anbiyaa– Verse 30

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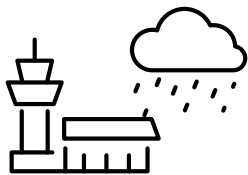


INFOGRAPHIC OF WATER STATISTIC IN QATAR 2023



RENEWABLE FRESHWATER RESOURCES

◆ Precipitation (Million m3 per year)



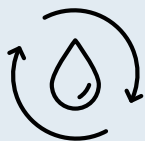
145.5

DOHA INTERNATIONAL AIRPORT



87.4

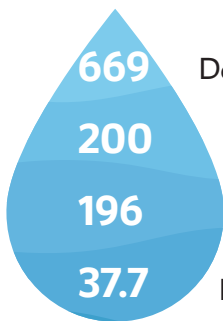
Long-term annual average rainfall (1962-2021)



150.5 (Million m3 per year)

Renewable freshwater resources

◆ Water production (water available for use) (Million m3 per year)



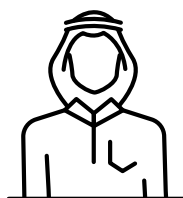
Desalination of sea water

Fresh groundwater

Reuse of treated wastewater

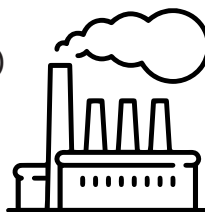
Real Losses

WATER SUPPLY INDUSTRY (ISIC 36)



214 (Thousand m3 per year)

Average water per capita consumption based on authorized consumption of system input volume, net of losses



669 (Million m3 per year)

Gross water supplied by water supply industry (ISIC 36)

Water uses by sector

(Million m3 per year)

Industry

35

Government

204

Commercial

94

Domestic

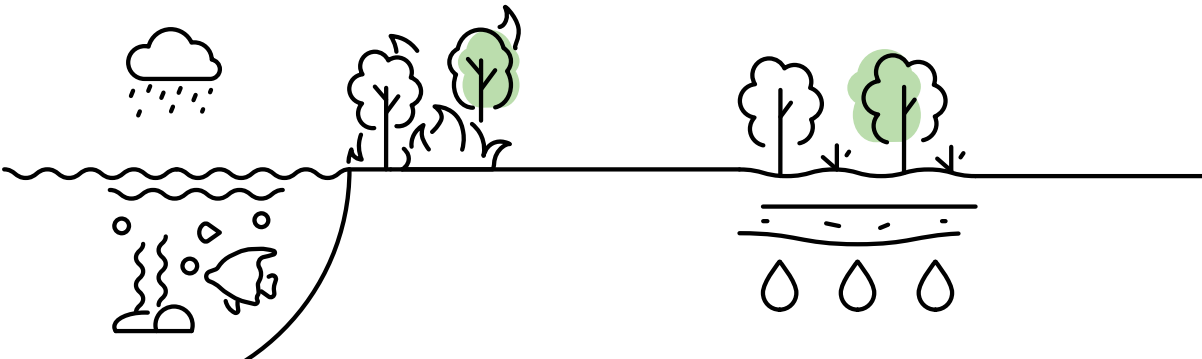
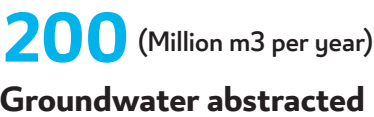
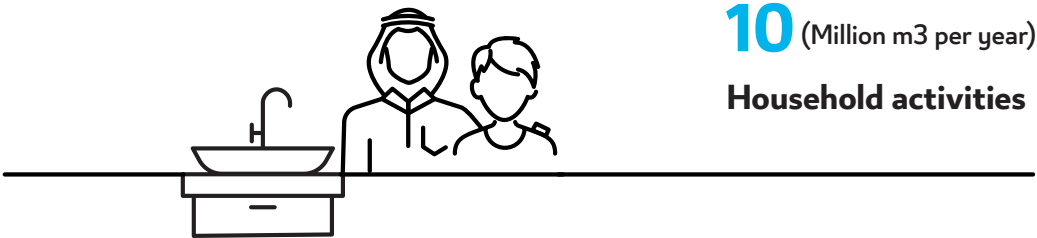
299

Agriculture

255



FRESHWATER ABSTRACTION AND USE



WASTEWATER GENERATION AND TREATMENT

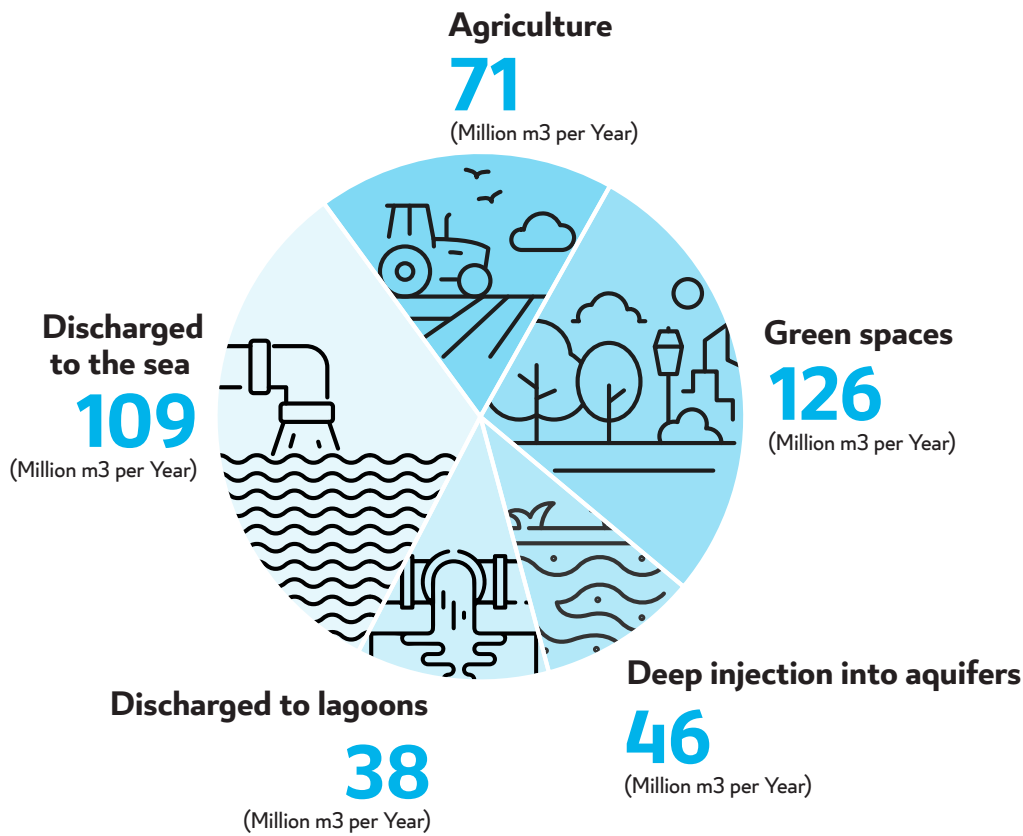
283 (Million m3 per year)
Volume of wastewater collected

0.63 (Million m3 per year)
Amount of wastewater not collected at sewage plant and is discharged into lakes

282 (Million m3 per year)
Volume of wastewater treated

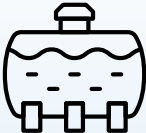
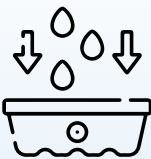
248 (1000 Ton)
Sewage sludge production

WASTEWATER TREATED USES

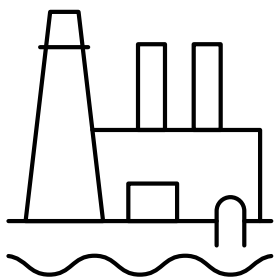


WATER INFRASTRUCTURE

Water stations and design capacity of stations (Thousand m3 per Day)

					
	Desalination stations	Multi-Stage Flash Distillation (MSF)	Reservoirs	Reverse Osmose (RO)	Multiple Effect Distillation(MED)
Numbers	9	25	145	35	10
Capacity	2444	1446	11	712	286

WWTP stations



22
Numbers

1,053
Design Capacity (Thousand m3 per Day)



WATER RESOURCES

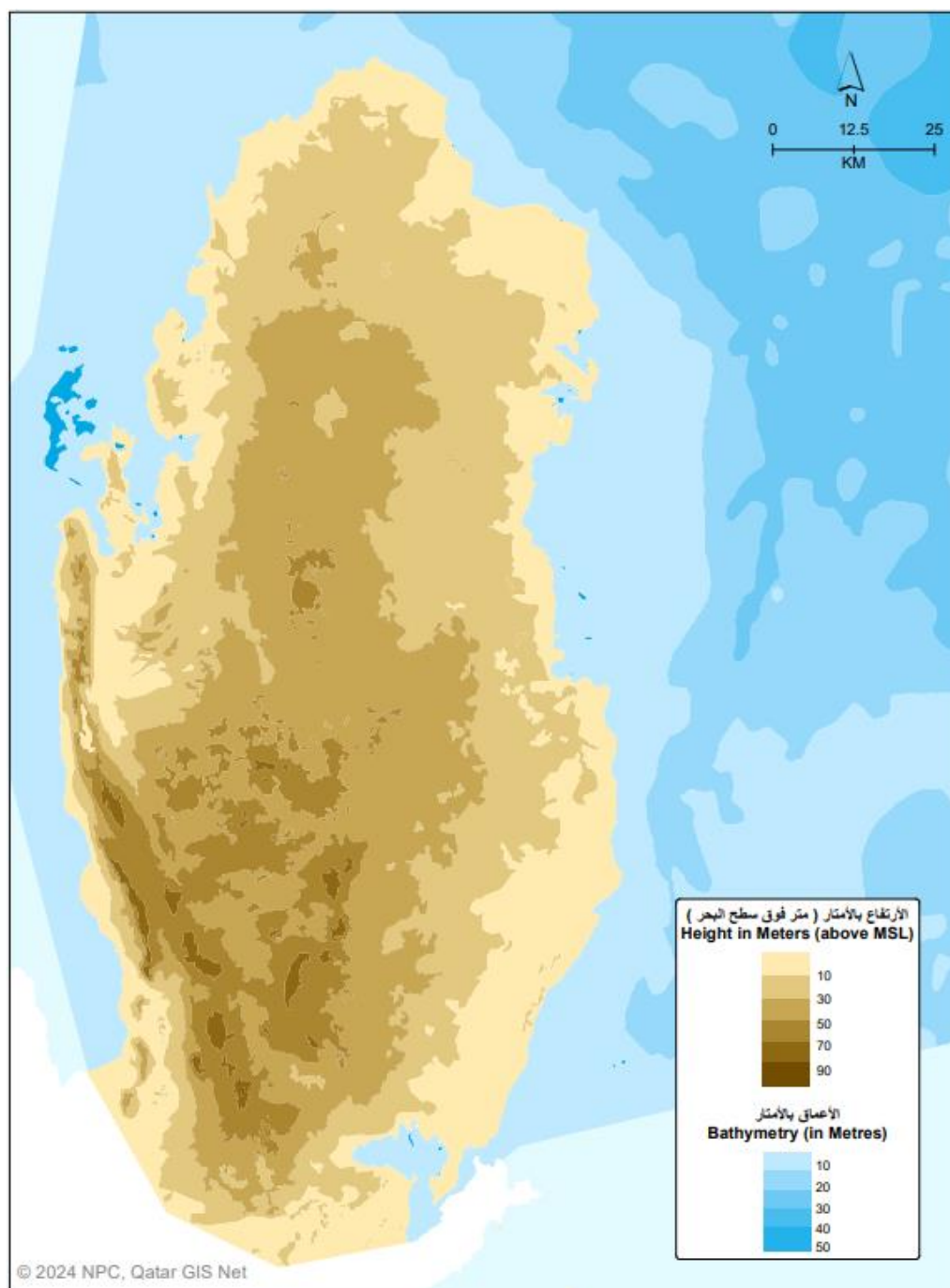
1. General Information

Qatar is situated midway along the western coast of the Arabian Gulf, between latitudes 24.27°-26.10° North and longitudes 50.45° – 51.40° East. Covering an area of 11,587 km², the country includes several small islands in the Arabian Gulf such as Halul, Shira'who, Ashat and Al-Bishiria.

The peninsula spans approximately 185 km in length and 85 km in width. Surrounded by the Arabian Gulf on most sides, Qatar shares its only land border of about 60 km with the Kingdom of Saudi Arabia. The United Arab Emirates lies to the east and Bahrain to the northwest of the country.

Qatar generally consists of flat rocky surfaces, though it does feature some hills that reach an altitude of 100 meters above sea level. Most of the country's terrain consists of a sandy desert interspersed with scrub vegetation and loose gravel. Moving sand dunes, averaging about 40 meters in height, are found in the southern part and along the northeastern coast near Ras Laffan. The northern part of Qatar is relatively low-lying, gradually rising toward the west and southwest. (See Map 1.1).

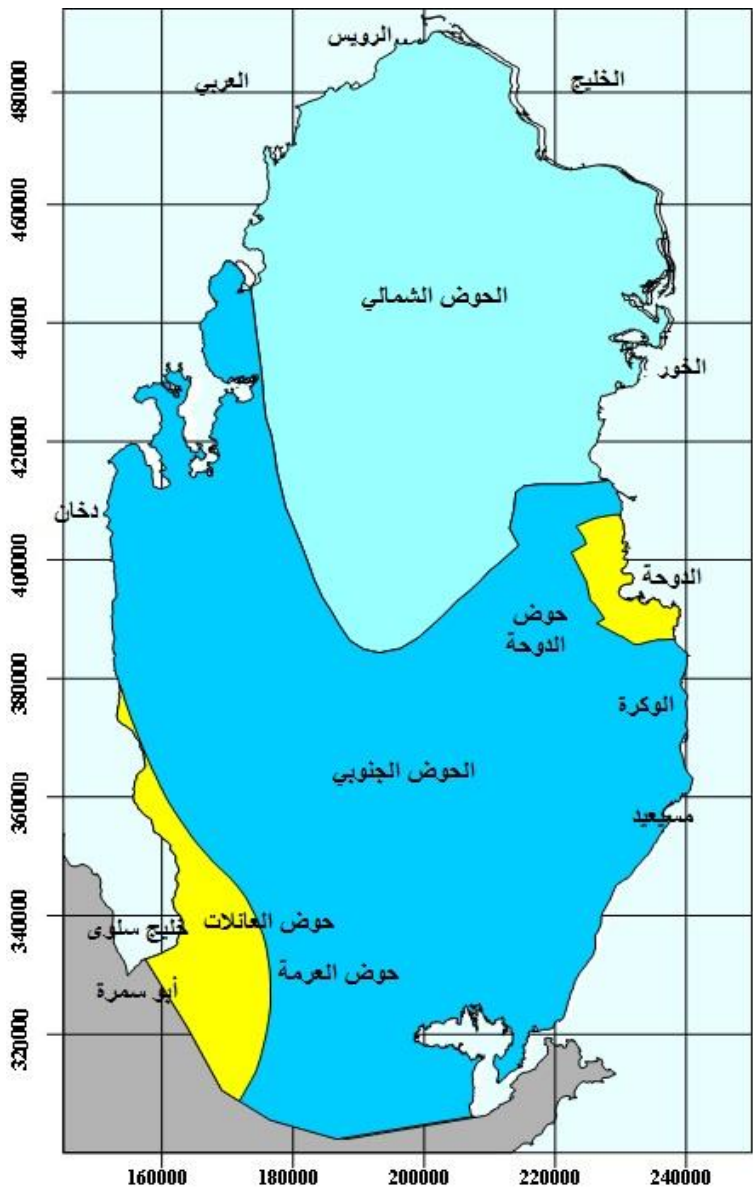
Map 1.1: Relief Map of Qatar



Source: National Planning Council

Qatar’s main groundwater basins include the Northern Basin, Southern Basin, Doha basin and the Allat Basin. (See **Error! Reference source not found.**).

Map 1.2: Groundwater Basins in the State of Qatar



Source: Ministry of Environment and Climate Change



WATER RESOURCES

2. Water Indicators in 2030 SDGs

Table 2.1: Water Indicators in Sustainable Development (2018-2023)

SDG	Purpose	Indicator	Indicator Name	2018	2019	2020	2021	2022	2023
3	3.9	3.9.2	Mortality rate attributed to unsafe water, unsafe sanitation and lack of hygiene (exposure to unsafe Water, Sanitation and Hygiene for All (WASH) services).	0	0	0	0	0	0
3	3.9	3.9.2	Unclean water	0	0	0	0	0	0
3	3.9	3.9.2	Unsafe sanitation	0	0	0	0	0	0
3	3.9	3.9.2	Lack of hygiene materials	0	0	0	0	0	0
6	6.1	6.1.1	Proportion of population using safely managed drinking-water services (%)	100%	100%	100%	100%	100%	100%
6	6.2	6.2.1	Proportion of population using safely managed sanitation services, including a hand-washing facility with soap and water (%)	100%	100%	100%	100%	100%	100%
6	6.3	6.3.1	Proportion of wastewater safely treated (%)	99.4%	99.6%	99.7%	99.7%	99.7%	99.7%
6	6.3	6.3.2	Proportion of bodies of water with good ambient water quality	...	...	...	...	...	...
6	6.4	6.4.1	Change in water use efficiency over time (CWUE)	Water Efficiency in the Agricultural, Industrial and Commercial Sector (QR/L)					

SDG	Purpose	Indicator	Indicator Name	2018	2019	2020	2021	2022	2023
			Value added of agricultural activities (at constant prices 2018) (QR)/ amount of water used in the agricultural sector (liters)	0.005	0.005	0.005	0.006	...	...
			Value added of industrial activities (at constant prices 2018) (QR)/ amount of water used in the industrial sector (liters)	16.8	33.9	15.6	11.6	13.2	12.8
			Value added of commercial activities (at constant prices 2018) (QR)/ amount of water used in the commercial sector (liters)	0.9	3.2	7.2	2.3	2.0	2.3
6	6.4	6.4.2	Level of water stress: freshwater withdrawal as a proportion of available freshwater resources (%)	229%	247%	247%	280%	396%	236%
6	6.5	6.5.1	Degree of integrated water resources management implementation (0-100%)	80%	82%	82%	81%	90.5	9.7
6	6.b	6.b.1	Proportion of local administrative units with established and operational policies and procedures for participation of local communities in water and sanitation management (%)	100%	100%	100%	100%	100%	100%

...: Unavailable from the source

Source: Qatar Sustainable Development Goals Report 2018 –2023



WATER RESOURCES

3. Water Resources

3-1 Rationale

Qatar's only natural freshwater resources are rainfall and groundwater. The conservation of the quality and quantity of the country's groundwater resources is one of the targets of Qatar's National Development Strategy.

Table 3.1 shows the long-term natural water balance (1998-2023) of Qatar's groundwater basins. The safe yield of groundwater amounted to 49.6 million m³ per year. The rate of groundwater withdrawal during the period (1998-2022) was about 250 million m³ per year, causing the depletion of aquifers, low groundwater levels and increased salinity. In 2023, groundwater abstraction amounted to about 180 million m³ per year, with the abstracted volume changing due to the Regional Groundwater Modeling Project in Qatar (Kahramaa Project).

Several projects are also in place to raise the rate of artificial recharge of groundwater basins (e.g. through recharge wells) and the artificial injection of treated wastewater and distilled water. The return of irrigation water plays an important role in the overall water balance.

Table 3.1: Natural Water Balance in Qatar's Aquifers
(Average Annual Values for 1998-2023)

No.	Water Balance	Mm ³ /year	Data Source
1	Recharge of aquifers from rainfall	74.7	Kahramaa (Long-term annual average 1998-2023)
2	Total renewable water resources (*)	74.7	
3	Groundwater outflows into sea and deep saline groundwater (**)	25.1	Kahramaa (Long-term annual average 1998-2023)
4	Annual rate of water balance (groundwater safe yield) (***)	49.6	Subtraction result (2-3)

(*): FAO Aquastat, OECD, UNSD and Eurostat.

(**): Variation of long-term annual average data (1998-2023) of groundwater flow to the sea and deep saline aquifers from the source

(***): Without the yields from irrigation.

Source: Qatar General Electricity and Water Corporation (KAHRAMAA)

3-2 Key messages

- A) In 2018-2023, the total rainfall at Doha International Airport was higher than the long-term average (1962-2023). In 2023, the total rainfall at the Doha International Airport station was 166% of the long-term average.
- B) Water abstraction from fresh groundwater is mainly for agricultural purposes (about 180 million m³ per year in 2023; i.e. 90% of total abstracted groundwater).
- C) The annual water deficit (mainly caused by groundwater withdrawal) ranges from 3 million m³ to 49 million m³ for the years (2018 and 2023).
- D) Artificial recharge of groundwater aquifers by TSE injection, recharge wells and recharge from irrigation are the main source for the national groundwater reserve (55% of the annual additions to groundwater reserves from irrigation water, 13% from artificial recharge and 32% from rainfall).

3-3 Statistics and Indicators

3-3-1 Precipitation

Compared to the long-term average rainfall (1962-2023), the year 2023 is relatively rainy. The total rainfall at Doha International Airport Station was 145.5 mm: i.e. 166% of the long-term average rainfall. In 2023, Doha International Airport Station reported the highest rainfall among all monitoring stations, whereas the lowest rainfall was recorded at the Karaana Station (71.8 mm). (See Table 3.2).

Table 3.2: Annual rainfall rates (mm) at selected monitoring stations in Qatar 2018 - 2023

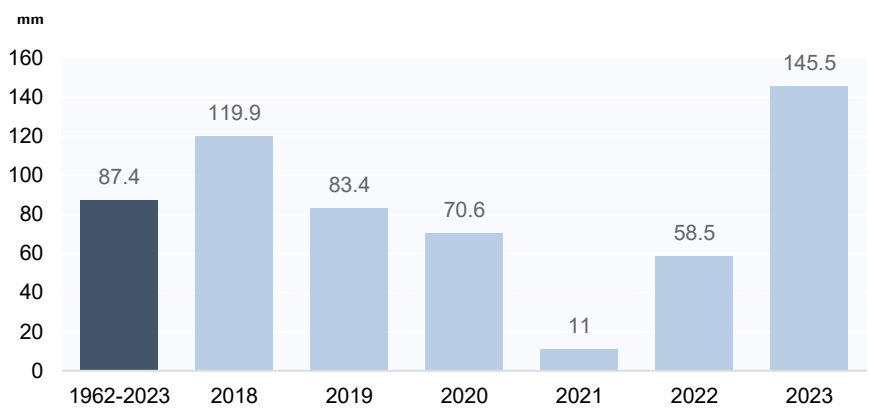
Selected Monitoring Stations	2018	2019	2020	2021	2022	2023
Mesaieed	42.7	101.4	34.6	10.4	21.9	134.1
Al-Ruwais	67.3	64.5	69.8	25.8	50.3	86.8
Dukhan	53.1	57.2	34.3	1.1	61.8	115.9
Doha International Airport	119.9	83.4	70.6	11.0	58.5	145.5
Al-Karaana	47.1	43.3	42.9	7.9	15.4	71.8

Source: Qatar Civil Aviation Authority (QCAA) – Department of Meteorology.

Figure 3.1 shows that the average annual rainfall for 2018 and 2023 was higher than the long-term average annual rainfall (1962- 2023), with 2023's rainfall

reaching 166% of the long-term annual average. In contrast, the average annual rainfall for the years (2019-2022) was either within or below the long-term annual average rainfall (1962-2023).

Figure 3.1: Average annual rainfall at Doha International Airport Station 2018–2023 compared to long-term annual average rainfall (1962-2023)

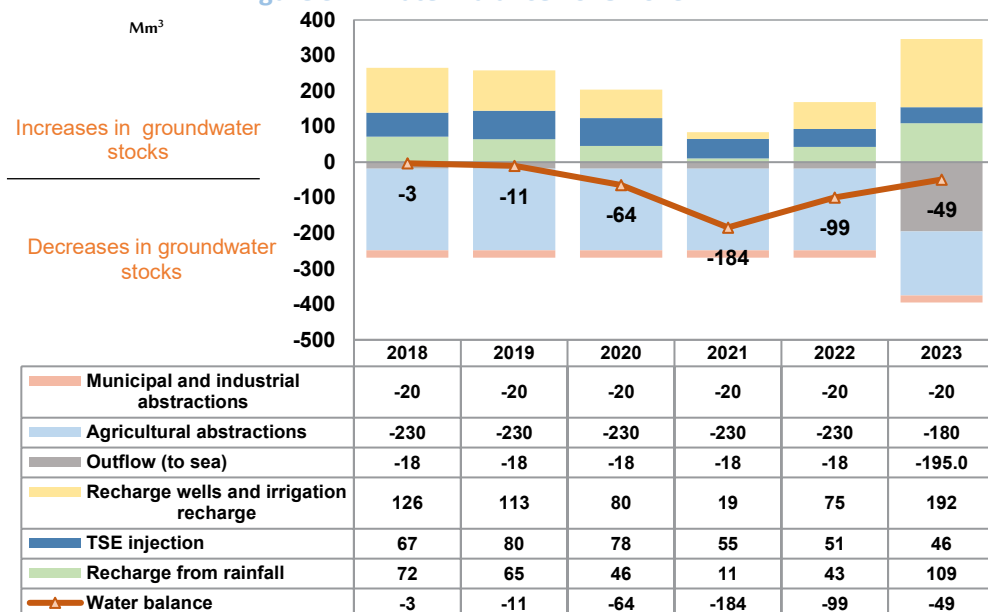


Source: Qatar Civil Aviation Authority (QCAA) – Department of Meteorology.

3-3-2 Groundwater Balance

Figure 3.2 presents the groundwater balance during the period from 2018 to 2023. The total increase in groundwater stocks—comprising rainfall recharge, artificial recharge, and irrigation returns—rose from 265 million m³ in 2018 to 347 million m³ in 2023. However, the decrease in underground stocks (which include municipal and industrial withdrawals, agricultural withdrawals and flow to the sea) was relatively stable at about 269 million m³ per year during the period (2018-2022,) while it reached 395 million m³ in 2023. This resulted in an annual groundwater deficit ranging between 3 million m³ and 49 million m³ for the years (2018 and 2023).

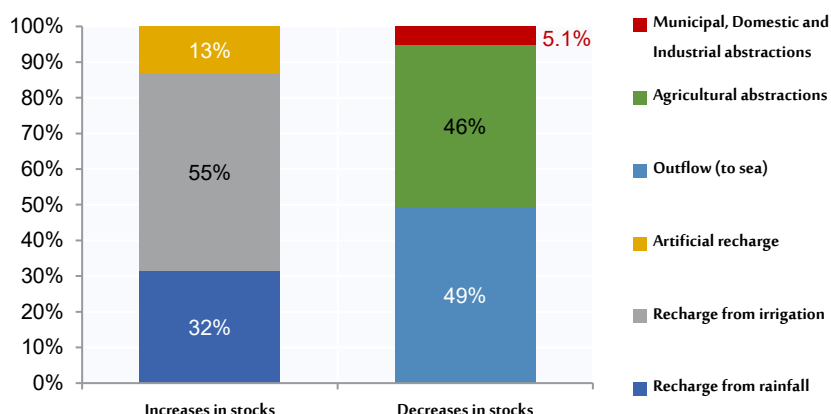
Figure 3.2: Water Balance 2018-2023



Source: Public Works Authority, Qatar General Electricity and Water Corporation, computations by NPC.

The artificial recharge wells and irrigation recharge represent the largest source of additions to groundwater reserves, while most of the decline in groundwater reserves is due to agricultural water withdrawal. Figure 3.3 shows the proportions of increase and decrease in groundwater stock for 2023.

Figure 3.3: Increase and decrease in groundwater stock as a percentage of total water in 2023



Source: Public Works Authority, Qatar General Electricity and Water Corporation, NPC calculations.



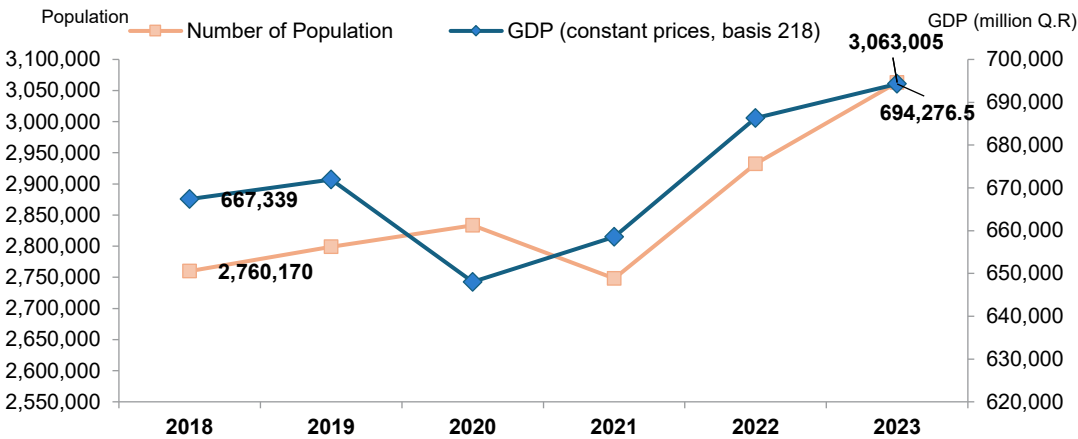
WATER RESOURCES

4. Water Production, Abstraction and Use

4-1 Rationale

Qatar is experiencing a rapid economic growth coupled with a continuous population growth. As shown in Figure 4.1, the population grew from 2.8 million to 3.0 million between 2018 and 2023, reflecting a growth rate of 2.1%. Over the same period, the annual Gross Domestic Product (GDP) increased from QAR 667 billion to QAR 694 billion (marking a growth rate of 0.8%). The measures taken to meet the water needs of this growing economy include boosting water production, enhancing water reuse, and improving water use efficiency.

Figure 4.1: Population growth and GDP (constant 2018)
2018-2023



Source: National Planning Council.

* Previous data changed from source

Water available for use originates from the following sources:

1. Abstraction of fresh and saline groundwater.
2. Distillation of seawater.
3. Reuse of treated wastewater.

The potential future water sources include water generated by the GTL process, which is currently recycled in industries, where excess water is discharged without use. Currently, there is no available data regarding the volume of freshwater produced from the GTL process.

4-2 Key messages

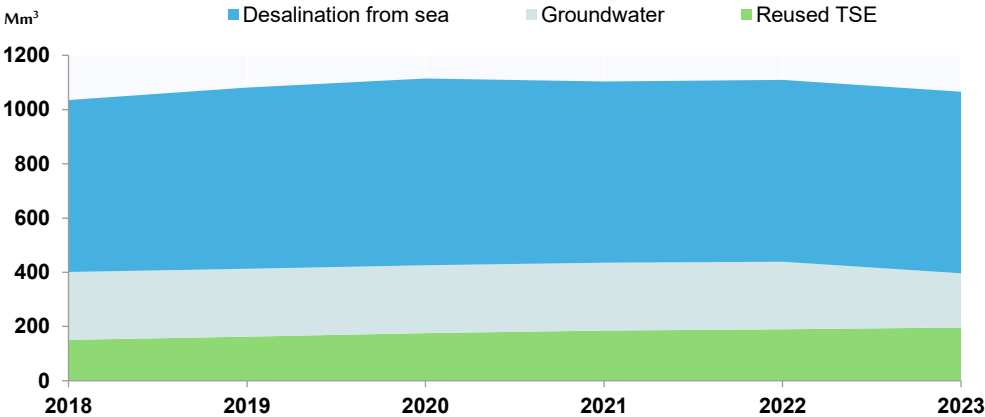
- A) The amount of water production (which includes desalinated water + fresh groundwater abstraction + reuse of TSE) increased from 1038 million m³ in 2018 to 1065 million m³ in 2023.
- B) Water demand has been accompanied by economic and population growth.
- C) The percentage of real water losses increased from 4% in 2018 to 6% in 2023.
- D) During the years 2018 and 2019, the productivity of water used in all economic activities increased. It also increased during 2022 and 2023, except for the domestic sector, which witnessed a slight decline.

4-3 Statistics and Indicators

4-3-1 Water Production and Reuse

As shown in Figure 4.2, in 2018, Qatar relied on groundwater abstraction (24%) and seawater desalination (61%), which are the only source of water. In 2018, the percentage of treated wastewater used for agriculture and green spaces irrigation purposes accounted for 15% and increased to 18% in 2023. Notably, in 2023, the main source of total water production was seawater desalination (63%), followed by groundwater abstraction (19%), then by reuse of treated wastewater (18%).

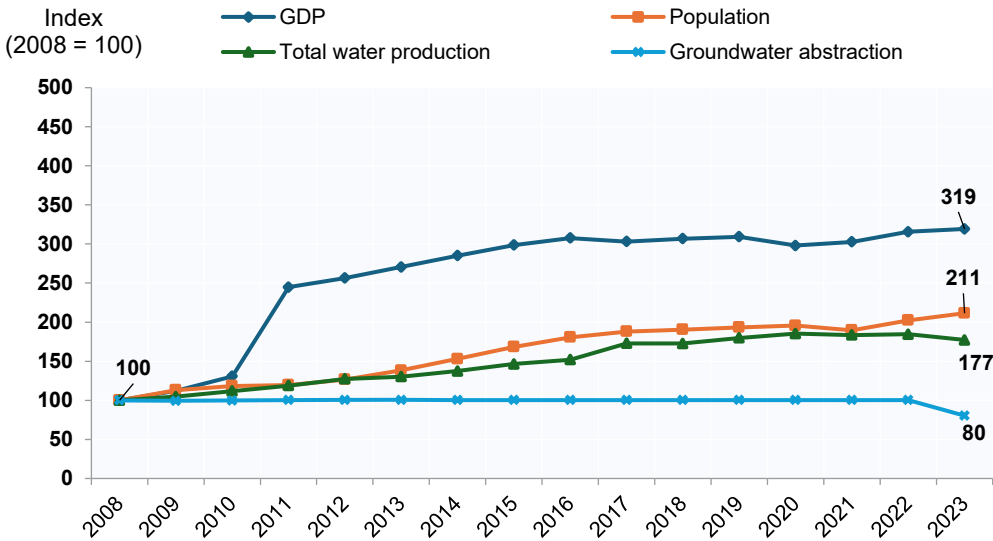
Figure 4.2: Total water production and reuse by water source (Mm³)
2018-2023



Source: Public Works Authority (Ashghal) and Qatar General Electricity and Water Corporation (KAHRAMAA)
* Data for previous years changed from source

Error! Reference source not found. below shows that the total water production is closely related to economic and population growth. There is a clear divergence between the GDP growth rate curve and the growth rate of total water production (which includes groundwater abstraction + seawater desalination + wastewater reuse).

Figure 4.3: GDP growth rates, population, total water production and groundwater abstraction (indicator base year 2008=100)
2008-2023

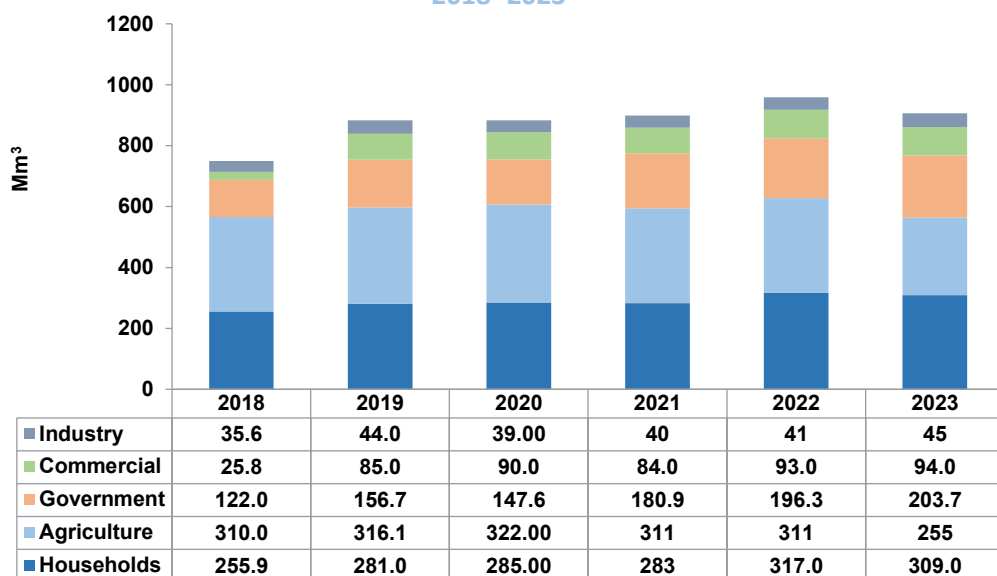


Source: NPC, Ashghal, KAHRAMAA, and NPC calculations.

4-3-2 Water Uses by Economic Activity

Statistics reveal an increase in the volume of used water (net water, free of waste / after deducting water loss) from 749.3 to 906.4 million m³ per year in 2018 and 2023. Figure 4.4 shows that the largest portion of water usage is attributed to agricultural and domestic activities. The highest annual growth rates for water use were in commercial activity (30%), followed by government activity (11%), whereas annual growth rate of water use in agricultural activity was (-4%) (see Figure 4.5).

**Figure 4.4: Water Used by Economic Activity (Mm³) (excluding losses)
2018 -2023**

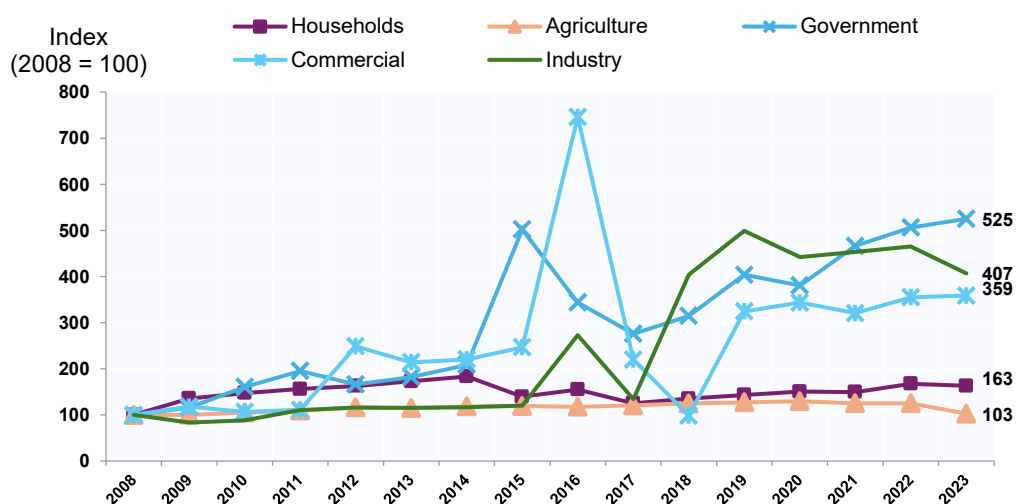


* Industry includes Kahramaa water and industrial wells.

*: There are some variations in household water usage compared to previous years due to the difference in the method of calculation from the source

Source: Ashghal, KAHRAMAA, and NPC calculations.

**Figure 4.5: Annual Growth Rates of Water Used by Economic Activity (2008-2023)
(Index base year 2008=100)**



*: There are some variations in household water usage compared to previous years due to the difference in the method of calculation from the source

Source: Ashghal, KAHRAMAA, and NPC calculations.

As for the per-capita water use across different sectors (household, industrial, commercial, and governmental) except for agricultural activity, it is noted that there has been a decrease in the per capita share of total water production. In 2023, the per capita water usage was 217 cubic meters annually.

Table 4.1: Annual per capita water consumption for various uses (m³/year/per capita)
2018 - 2023

Year	Per capita total water production	Per capita total water transported to the network (including water loss)	Per capita consumption of water transported to the network (excluding real loss)
2018	231	223	214
2019	242	234	224
2020	246	240	226
2021	249	245	230
2022	250	246	232
2023	217	214	202

Source: Qatar General Electricity and Water Corporation (KAHRAMAA)

4-3-3 Water Loss

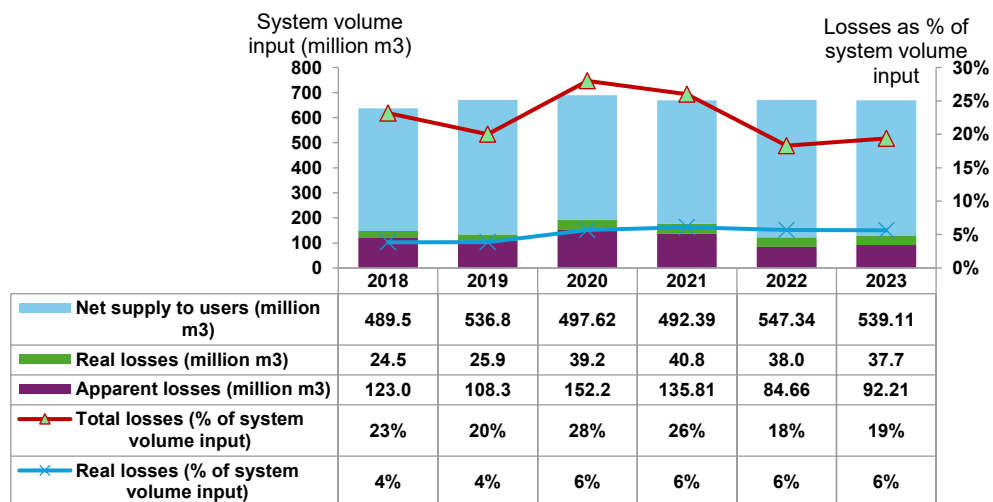
Water loss occurs during the transportation of drinking water, in wastewater sewers, within septic tanks or during evacuation and transport of septic tanks' wastewater. As for desalinated water, Kahramaa has statistics for the so-called apparent loss and real loss (according to the classification of the International Water Association (IWA)). Apparent loss and real loss are defined by IWA as follows:

- **Apparent loss** consists of unauthorized consumption (theft or illegal use), and all types of inaccuracies associated with production metering and customer metering. Under-registration of production meters or over-registration of customer meters leads to under-estimation of real losses. Over-registration of production meters and under-registration of customer meters lead to over-estimation of real loss.
- **Real loss** is physical water loss from the pressurized system, up to the point of customer metering. The volume lost through all types of leaks, bursts and overflows depends on frequencies, flow rates, and average durations of individual leaks.
- **Total loss** is the sum of apparent loss and real loss.

With respect to analysis and indicators, it is extremely important to be explicitly clear which losses (total, apparent, or real) which are currently under discussion. Figure 4.6 illustrates the distribution of water losses, showing the development of real and total

losses during the period 2018-2023. The total water loss decreased from 23 % to 19%, and real water losses increased from 4% to 6%. The figure also shows that the total volume of net supplies to users increased from 637 million m³ in 2018 to 669 million m³ in 2023.

Figure 4.6: Loss of drinking water distribution, 2018-2023



Source: Qatar General Electricity and Water Corporation (KAHRAMAA)

Currently, there are no statistics on loss in wastewater sewers in Qatar; however, only estimates are available. In terms of water volume, the issue of groundwater leakage into the sewer system is of greater concern than the actual water loss. Leakage into the sewer mains may be responsible for the relatively high salinity of TSE of around 1,000 mg/L measured at Doha wastewater treatment plants (see Ashghal & Schlumberger study, 2013).

4-3-4 Water Use in Agricultural Activity

For simplicity (and in line with data availability), economic activity "Agriculture, Forestry, and Fishing" has been categorized as "Agricultural Activity".

Groundwater and treated wastewater are the primary sources of water for agricultural activity. Statistics from Table 4.2 indicate that the volume of treated wastewater used in agriculture decreased from 79.7 million m³ in 2018 to 70.7 million m³ in 2023, with treated wastewater accounting for 27.8% of the total water used in agricultural activity. According to the study carried out by Ashghal and Schlumberger (2013), the water salinity at Doha wastewater treatment plants reached 1,000 mg/L, which posed a major concern for water re-use in agriculture. The table also notes that the GDP generated from agricultural activity grew from QAR 1,457 million in 2018 to QAR 2,026 million in 2023.

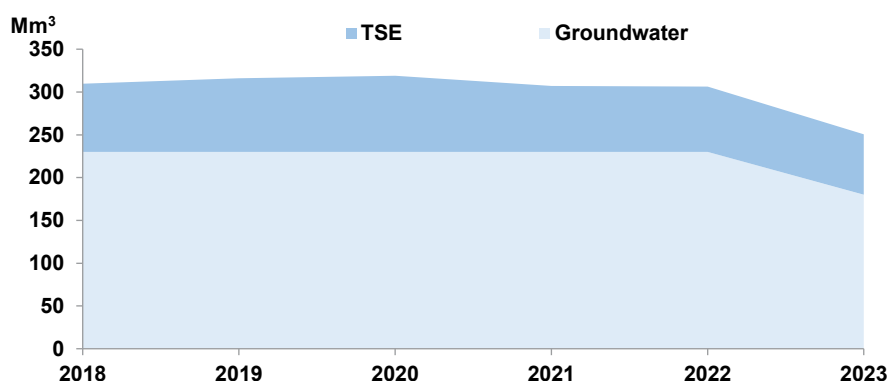
Table 4.2: Water used in agricultural activity by water source and GDP of agriculture (at constant prices of 2018) 2018 - 2023

Year	Abstracted groundwater (million m3)	Productive farms (million m3)	TSE (million m3)	Total (million m3)	GDP (million QR, constant prices of 2018)
2018	230	0.3	79.67	309.97	1,457
2019	230	0.2	86.06	316.06	1,700
2020	230	3	88.96	321.96	1,777
2021	230	4	77.16	311.16	1,785
2022	230	5	76.13	311.13	1,923
2023	180	4	70.73	254.73	2,026

- The amount of groundwater abstracted for 2023 has changed due to the Regional Underground Modeling Project in the State of Qatar (KAHRAMAA Project)
 - GDP data for previous years changed from the source.
- Source: NPC, KAHRAMAA, Ashghal

Figure (4.7) illustrates a decline in the volume of water used for agricultural activities, dropping from 309.7 million m³ in 2018 to 254.7 million m³ in 2023. Notably, the amount of groundwater abstracted for agricultural purposes changed in 2023 (180 million m³ per year) due to the recently completed Regional Underground Modeling Project in the State of Qatar (Kahramaa Project).

Figure 4-7: Water used in agricultural activity by water source (Mm³) 2018-2023

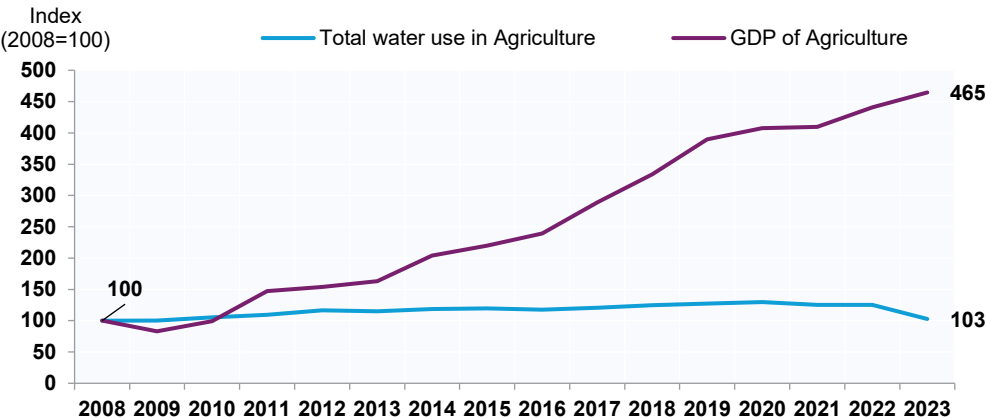


Source: Qatar General Electricity & Water Corporation (KAHRAMAA), Public Works Authority (Ashghal)

Figure (4.9) shows the **Water efficiency in agriculture**, as statistics in 2018 indicate that about (213) liters of water were needed to produce (1) Qatari riyals of GDP in agriculture, while this quantity decreased in 2023 to (126) liters. In terms of the **Water productivity in agriculture**, water productivity for 2023 showed a significant

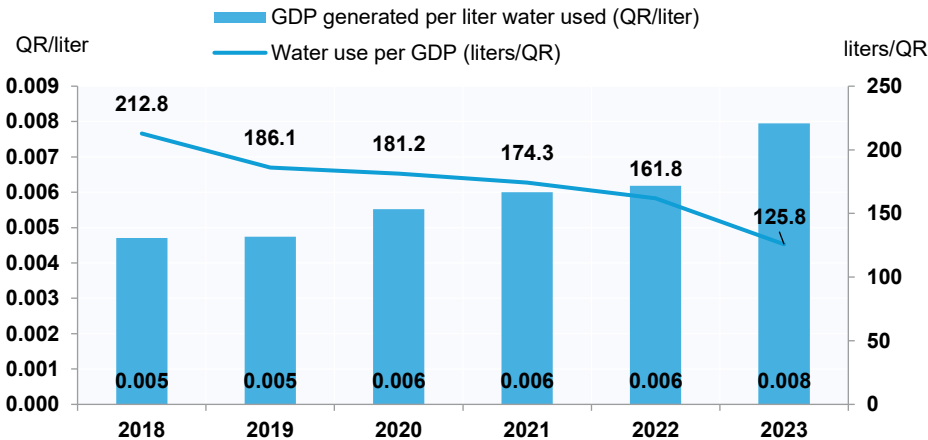
improvement compared to 2018, with one liter of water contributing to the production of QAR 0.008 of GDP in agriculture, compared to QAR 0.005 in 2018.

Figure 4.8: Growth rate of water used in agriculture and GDP of agriculture (at constant prices of 2018) (Index base year 2008=100) 2008-2023



Source: NPC, Ashghal, Kahramaa, and NPC calculations.

Figure 4-9: Water use efficiency (liter/QR of GDP) and water use productivity (GDP per liter of water used) in agriculture 2018-2023 (at constant prices for 2018)



Source: NPC, Ashghal, Kahramaa, and NPC calculations.

4-3-5 Water Use in Industrial Activity

For simplicity (and in line with the availability of data), the following economic activities have been aggregated under the category of "Industrial Activity":

- Mining and quarrying.
- Manufacturing.
- Electricity, gas, steam and air conditioning supply.
- Water supply, sewerage, waste management and remediation.
- Construction.

Industries in the State of Qatar depend on three sources of freshwater:

- 1- Water provided by Qatar General Electricity and Water Corporation "Kahramaa".
- 2- Groundwater for industrial purposes.
- 3- Seawater desalinated in industrial facilities. For this latter type (desalination), data is unavailable. Therefore, analysis can only be done for that part of water which originates from groundwater (self-abstraction by industries) and water supplied by Kahramaa.

Statistics from Table 4.3 indicate an increase in the annual amount of water used in industrial activity during 2018 and 2023, from 35.6 million m³ to 45.0 million m³. However, the GDP of industrial activity dropped from QAR 402.9 million in 2018 to QAR 394.9 million in 2023.

Table 4.3: Water Used in Industrial Activity by Water Source and GDP of Industry (at constant prices of 2018) 2018 - 2023

Year	Water supplied by Kahramaa (Mm ³)	Industrial groundwater wells (Mm ³)	Total water used (Mm ³)*	GDP (Million QAR at constant prices of 2018) **
2018	25.6	10	35.6	402,950
2019	34	10	44	396,641
2020	29	10	39	384,659
2021	30	10	40	387,217
2022	31	10	41	393,759
2023	35	10	45	394,993

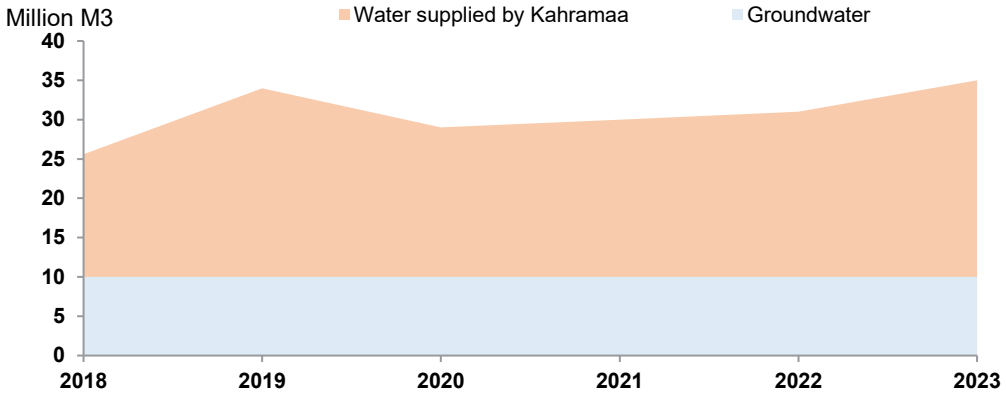
Previous years' data changed from source

* Excluding desalinated industrial water.

** Includes mining and quarrying (including oil and gas), manufacturing, electricity and water, building and construction.

Source: National Planning Council, Qatar General Electricity and Water Corporation (KAHRAMAA).

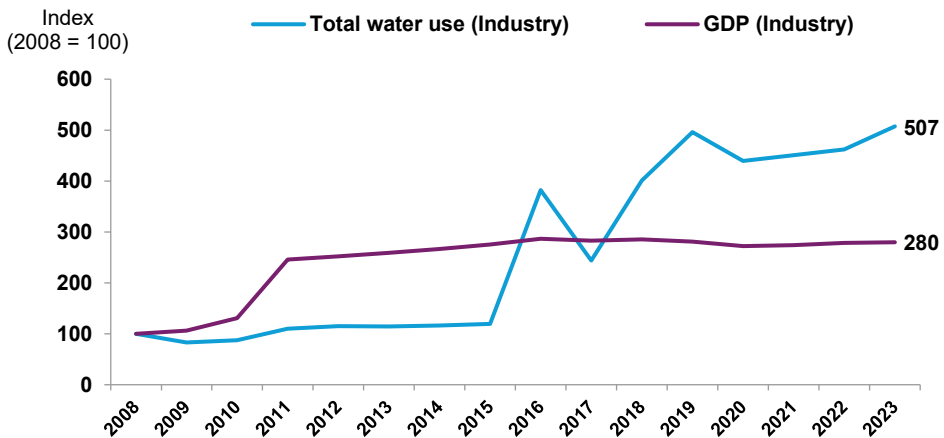
**Figure 4.10: Water used in industrial activity by water source (million cubic meters)
2018 - 2023**



Source: Qatar General Electricity and Water Corporation (KAHRAMAA)

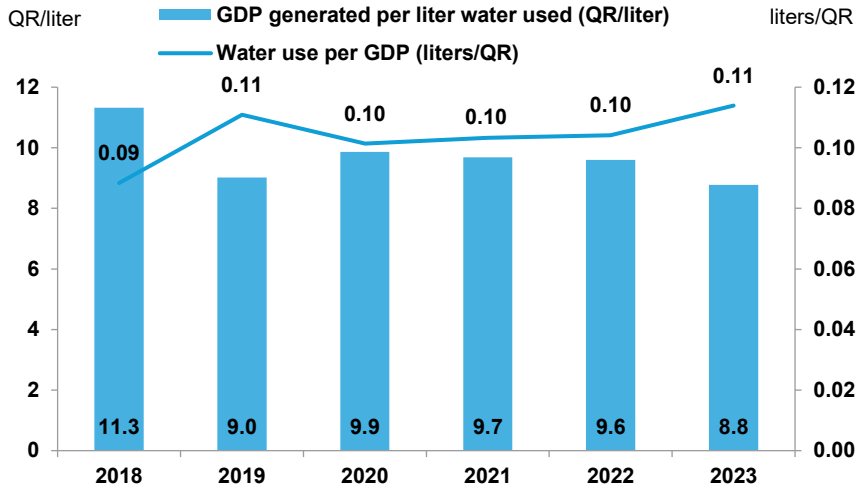
Figure 4.12 below demonstrates that the GDP growth rate in industrial activity is linked to the amount of water used, even with improvements in water use efficiency and productivity. In 2018, 0.09 liters of water were required to produce 1 Qatari Riyal of industrial GDP, whereas in 2023, 0.11 liters were needed to produce the same amount of industrial GDP. In other words, this means that the productivity of one liter of water was 11.3 Qatari Riyal of industrial GDP in 2018, while water productivity in 2023 decreased to 8.8 Qatari Riyal of industrial GDP per liter.

Figure 4.11: Growth rate of water used in industrial activity and GDP (constant prices 2018) (Base year 2008=100) 2008-2023



Source: KAHRAMAA, NPC calculations.

Figure 4.12: Water use efficiency (liter/QR of GDP) and water use productivity (GDP per liter of water used) in industrial activity (at constant prices 2018) 2018-2023



Source: KAHRAMAA, NPC calculations.

4-3-6 Water Use in Commercial Activity

For simplicity (and in line with data availability), the following economic activities have been aggregated under the “commercial sector” category:

- Wholesale and retail trade; repair of motor vehicles and motorcycles.
- Transportation and storage.
- Accommodation and food service activities.
- Information and communication.
- Financial and insurance activities.
- Real estate activities.
- Activities of households as employers of domestic personnel.

The water supplied by Qatar General Electricity and Water Corporation (KAHRAMAA) is the only known source of water for commercial activities. Statistics from Figure 4.13 reveal that the total amount of water used in commercial activity rose from 26 million m³ in 2018 to 94 million m³ in 2023.

Table 4.4: Quantity of water used in commercial activity and GDP in commercial activities

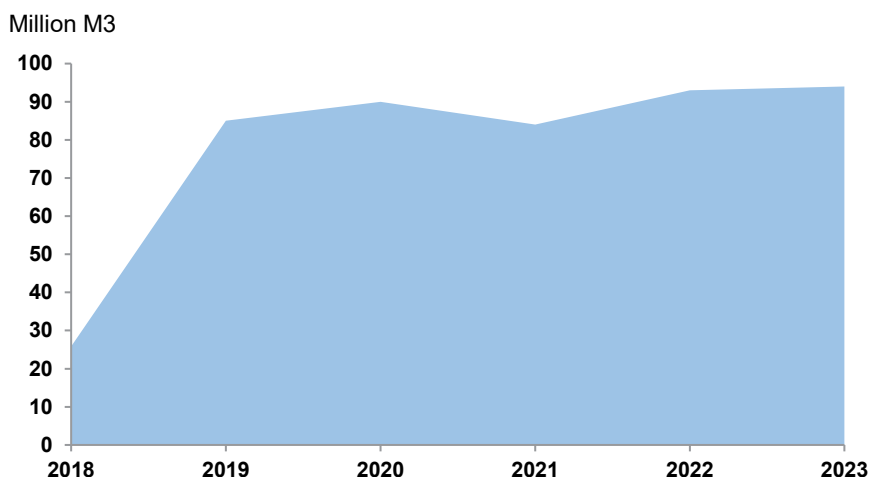
(Constant prices 2018) 2018 - 2023

Year	Amount of water used (water provided by KAHRAMAA) million m3	GDP (QAR million, at constant prices of 2018) *
2018	26	186,751
2019	85	190,149
2020	90	181,347
2021	84	190,808
2022	93	206,973
2023	94	209,569

* Trade, restaurants, hotels, transportation, storage, information and communication, money, insurance, real estate services, business and home services.

Source: National Planning Council, Qatar General Electricity and Water Corporation (KAHRAMAA)

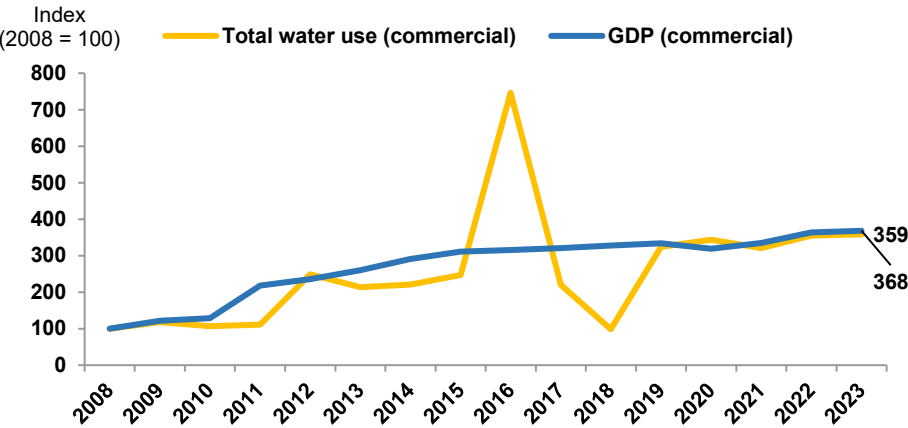
Figure 4.13: Quantity of water used in commercial activity (Mm³) 2018-2023



Source: Qatar General Electricity and Water Corporation (KAHRAMAA)

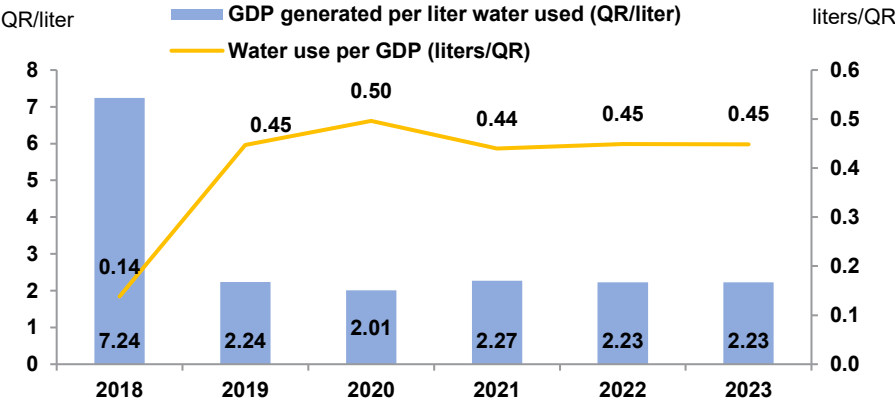
According to Figure 4.14 below, GDP growth rates in commercial activity since 2018 have been linked to the amount of water used. As shown in Figure 4.15, in 2018, 0.14 liters of water were required to generate 1 Qatari Riyal in commercial GDP, whereas only 0.45 liters of water were needed to reach the same GDP in 2023. In other words, one liter of water used in commercial activities in 2018 produced 7.24 Qatari Riyal of GDP, while a liter of water produced 2.23 Qatari Riyal of GDP in 2023.

Figure 4.14: Growth rate of water used in commercial activity and GDP of commercial activities (Base year 2008=100) 2008 - 2023



Source: NPC, KAHRAMAA, and NPC calculations.

Figure 4.15: Water use efficiency (liter/QR of GDP) and water use productivity (GDP per liter of water used) in commercial activities (constant prices 2018) 2018 – 2023



Source: NPC and KAHRAMAA

4-3-7 Water Use in Government Activity

For simplicity (and in line with data availability), the following economic activities have been grouped under the "government activity" category:

- Public administration and defense; compulsory social security.
- Education.
- Human health and social work activities.
- Arts, entertainment and recreation.

The water supplied by KAHRAMAA and the TSE reused for irrigating green spaces are the main sources of water in government activity. Statistics in Table 4.5 and Figure 4.16 show that the water used in government activity picked up from 122 million m³ in 2018 to about 203 million m³ in 2023. In 2023, water resulting from re-used TSE (used for the irrigation of green spaces) accounted for 62% of the water used by government activity.

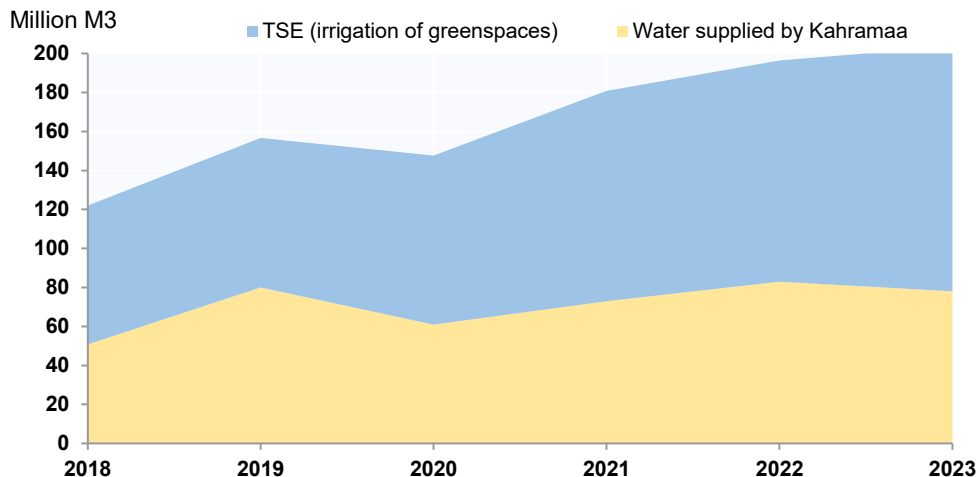
Since government activity is considered a consumer of goods and services, an analysis based on comparing GDP and water use in government activity (as done for agricultural, industrial and commercial activities) would not be useful, even though certain government services are included in the GDP computation.

**Table 4.5: Water Used in Government Activity by Water Source (Mm³ per Year)
2018 - 2023**

Year	Water supplied by KAHRAMAA	TSE (irrigation of green spaces)	Total water used
2018	50.80	71.21	122.01
2019	80.00	76.65	156.65
2020	61.00	86.57	147.60
2021	73.00	107.86	180.86
2022	83.00	113.34	196.34
2023	78.00	125.66	203.66

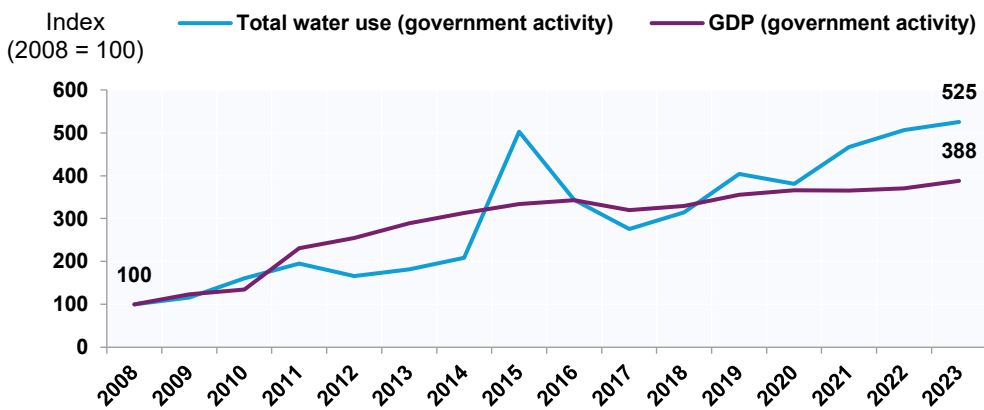
Source: Ashghal and KAHRAMAA

Figure 4.16: Amount of Water Used in Government Activity by Water Source (Mm³) 2018-2023



Source: Ashghal and KAHRAMAA

Figure 4-17: Growth rate of water used in government activity and GDP (Base year 2008) 2008-2023



Source: NPC and KAHRAMAA

4-3-8 Water Use in Household Activity

Households rely mainly on the water supplied by Kahramaa, although private wells are also used, primarily by individual households. Statistics on the water supplied by Kahramaa, as shown in Table 4.6 and Figure 4.18, indicate an increase in water used in households between 2018 and 2023. In 2018, households used 256 million m³ of water, while in 2023, this amount reached about 309 million m³.

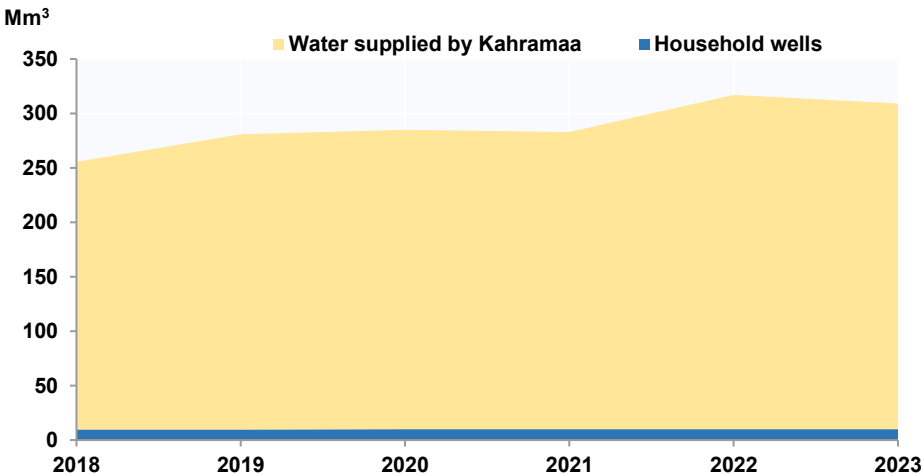
Table 4.6: Water Used in Household Activity by Water Source (Mm³ per Year)
2018 - 2023

Year	Water supplied by KAHRAMAA	Household wells	Total water used
2018	246	10	256
2019	271	10	281
2020	275	10	285
2021	273	10	283
2022	307	10	317
2023	299	10	309

* Data for previous years has been changed from the source due to a change in the calculation methodology.

Source: KAHRAMAA

Figure 4.18: Water Used in Household Activity by Water Source (Mm³) 2018-2023



Source: Qatar General Electricity and Water Corporation (KAHRAMAA)

4-3-9 Water Demand

It can be observed from the table that water demand in 2023 and 2022 remained stable and unchanged. However, the prevailing trend of water demand has shown an overall annual increase of an average of 2% since 2018. As for the number of subscribers, it increased from 329.800 subscribers in 2018 to 441.200 subscribers in 2023.

Table 4-7: Water Demand by Type, Number and Percentage of Growth of Subscribers in the Period (2018-2023)

Year	Average demand for distribution	Average demand for industrial activity	Average demand for residential activity	Number of subscribers	Annual growth in number of subscribers
2018	359	23	336	329,832	10%
2019	379	23	356	363,338	5%
2020	393	23	370	382,932	6%
2021	386	24	362	406,745	5%
2022	387	26	361	426,738	5 %
2023	387	26	361	441,202	3 %

Source: Qatar General Electricity and Water Corporation (KAHRAMAA)

4-3-10 Water Use Balance

The amount of water available for use in 2023 reached 1152.09 million m³, including desalinated water (prior to the loss computation), abstracted groundwater, and urban wastewater (treated and untreated).

The amount of water consumed by the end user (including agricultural, industrial, commercial, governmental and household activities) consists of water accessible and available for use, minus water loss and the wastewater discharged without reuse. Injection of TSE into aquifers serves as a method of compensating for overexploitation, rather than a final use. Thus, it appears separately in the aggregated water balance (see Table 4.9).

Table 4-8: Aggregate Water Use Balance (Mm³) 2023

Statement	Mm ³ per year
Water potentially available for use (A)	1152.09
Water loss (B)	129.91
Wastewater discharged without reuse (C)	85.7

Water injected into aquifers	45.62
Water used by the end consumer = (a - b - c)	882.46

Details of the water use balance are shown in Table 4.9 below.

Table 4.9: Details of water use balance (water balance in million M³) 2023

Statement	Water potentially available for use	Water use and loss	Remarks
Desalinated water	669		Water supplied by Kahramaa
Fresh groundwater abstraction	200		It includes data on agricultural wells, municipal wells, domestic and industrial wells.
TSE	282.09		Wastewater discharged by urban wastewater treatment plants
Untreated wastewater	1		Discharge of untreated wastewater into lagoons
Total water potentially available for use	1152.09		Water available before loss
Untreated wastewater		1	
Apparent distilled water loss		92.21	
Real desalinated water losses		37.7	Total water losses.
TSE discharged into lagoons		38.17	
TSE discharged into sea		1.95	
TSE injected into deep aquifers		45.62	
Water used in agriculture		311.156	Groundwater and TSE.
Water used in industries and commercial activities		139.00	Water supplied by KAHRAMAA, water supplied by industrial wells, including large industrial complexes and hotels.
Water used in household activity		309.00	Water supplied by KAHRAMAA and water supplied by household wells and municipal wells.
Water used in government activity		203.66	Water supplied by Kahramaa and TSE for irrigation of green spaces

Statement	Water potentially available for use	Water use and loss	Remarks
Undisclosed use or loss of desalinated water		29.05	These differences between incoming water inputs to the system and uses or losses from the source are not indicated.
Total water uses and loss		1152.09	



WATER RESOURCES

5. Urban Wastewater Production, Collection, Treatment and Discharge

5-1 Rationale

In the State of Qatar, the collection and treatment of urban wastewater is an important measure for its reuse for irrigation, cooling and groundwater recharge and for protecting the environment from the adverse impact of waterborne pollution. Furthermore, this infrastructure is essential to provide appropriate sanitation services for all individuals across the country.

Since rainfall in Qatar is one of the world's lowest, and with the country's focus on integrated water resources management, treated wastewater represents an important alternative to desalinated seawater and the abstraction of fresh groundwater from Qatar's limited resources. Its use is a crucial step toward achieving greater sustainability in water consumption.

5-2 Key messages

- A) The design capacity of wastewater treatment plants increased from 965 m³ per day in 2018 to 1,053 m³ per day in 2023.
- B) In terms of type of treatment, all wastewater treatment plants in Qatar are equipped with at least secondary level of treatment.
- C) Urban wastewater treatment plants remove more than 99% of organic pollution.
- D) In 2023, 99% of urban wastewater was treated in treatment plants.
- E) In 2023, 24% of TSE was used for irrigation purposes in agricultural activity and 43% for landscaping.

5-3 Statistics and Indicators

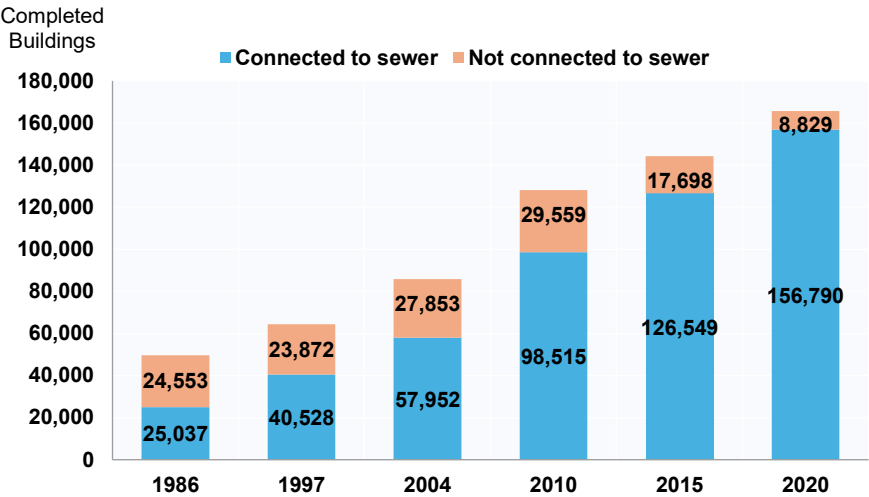
5-3-1 Urban Wastewater Collection and Treatment Infrastructure

According to data available from the Population, Housing and Establishments Censuses (1986-2020), the number of completed buildings connected to the sewage network increased from 127,000 (87.7% of total completed buildings) in 2015 to 157,000 (94.7% of total completed buildings) in 2020 (see Figure 5.1).

Buildings not connected to the sewage network are serviced by tankers that transport wastewater to treatment plants and sewage lagoons

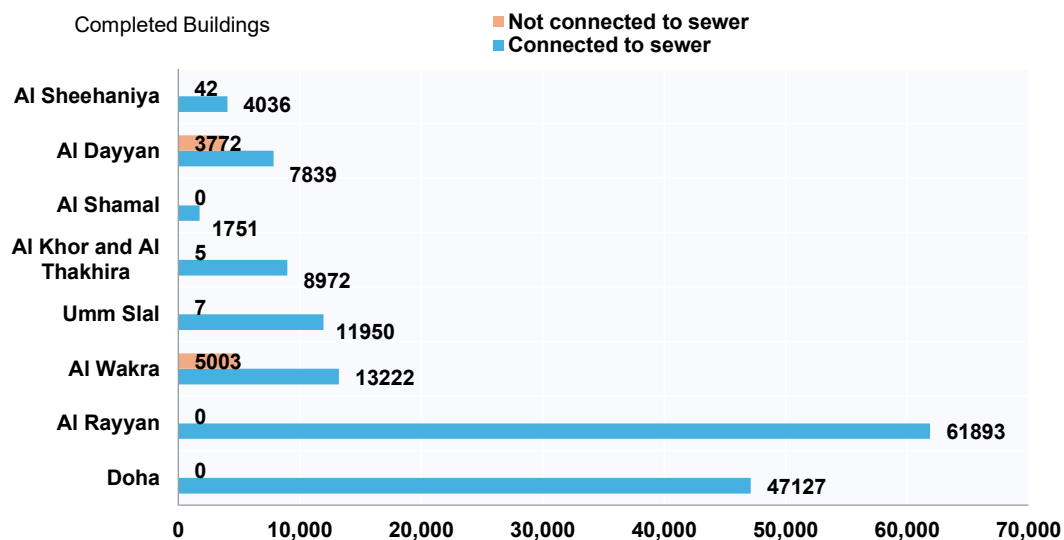
Figure 5.2 presents data from the 2020 Census on the connection of buildings to the sewage network by municipality. The highest percentage of buildings connected to the sewage network was in Al-Rayyan, Doha, and Al Shamal, with a 100% connection rate. In contrast, Al Daayen had the lowest connection rate, at 67.5%.

Figure 5.1: Number of Completed Buildings by Connection to the Sewer Network
Censuses 1986 - 2020



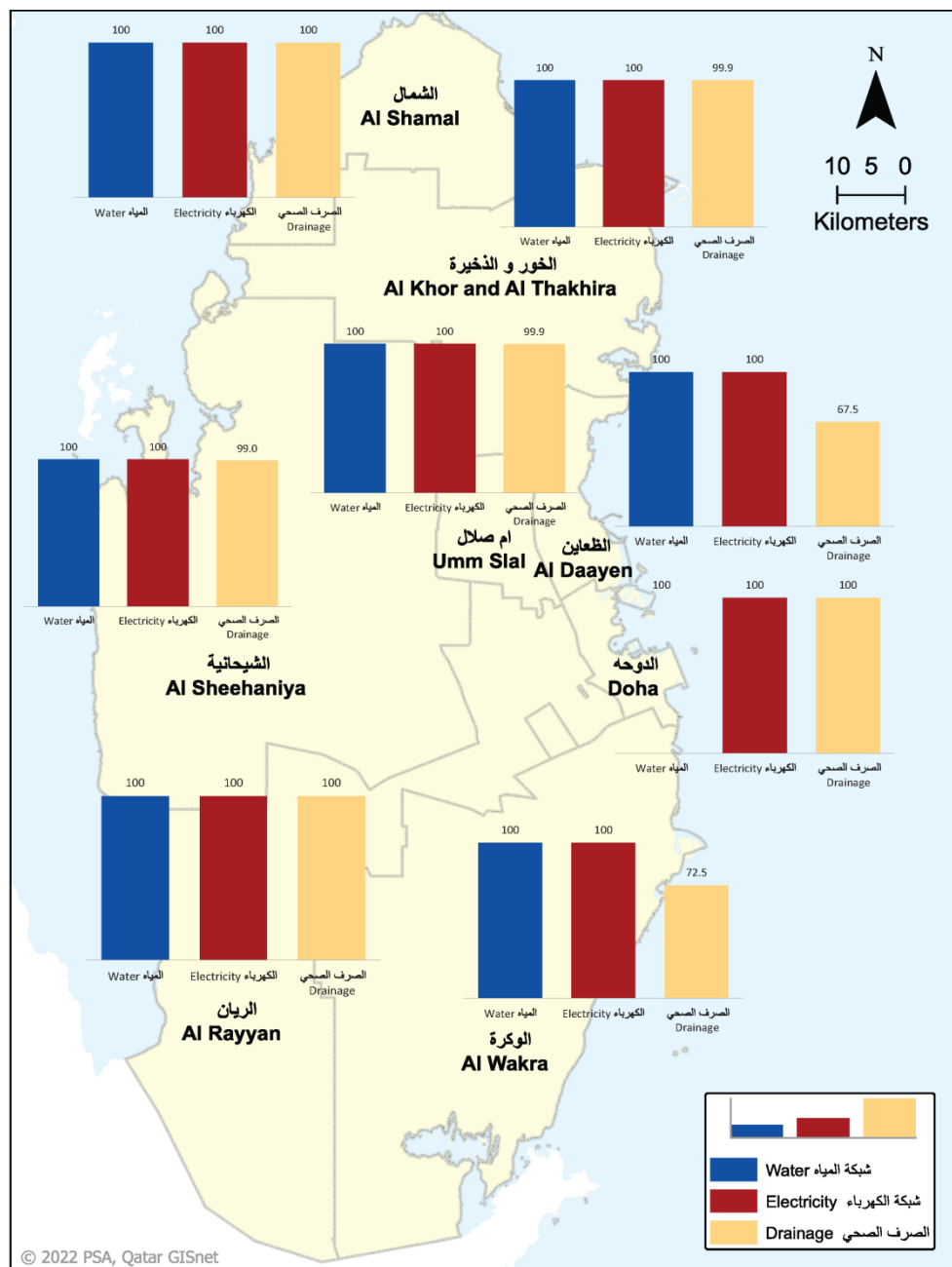
Source: National Planning Council.

Figure 5.2: Number of completed buildings by connection to public sewage and municipality, Census, 2020 census



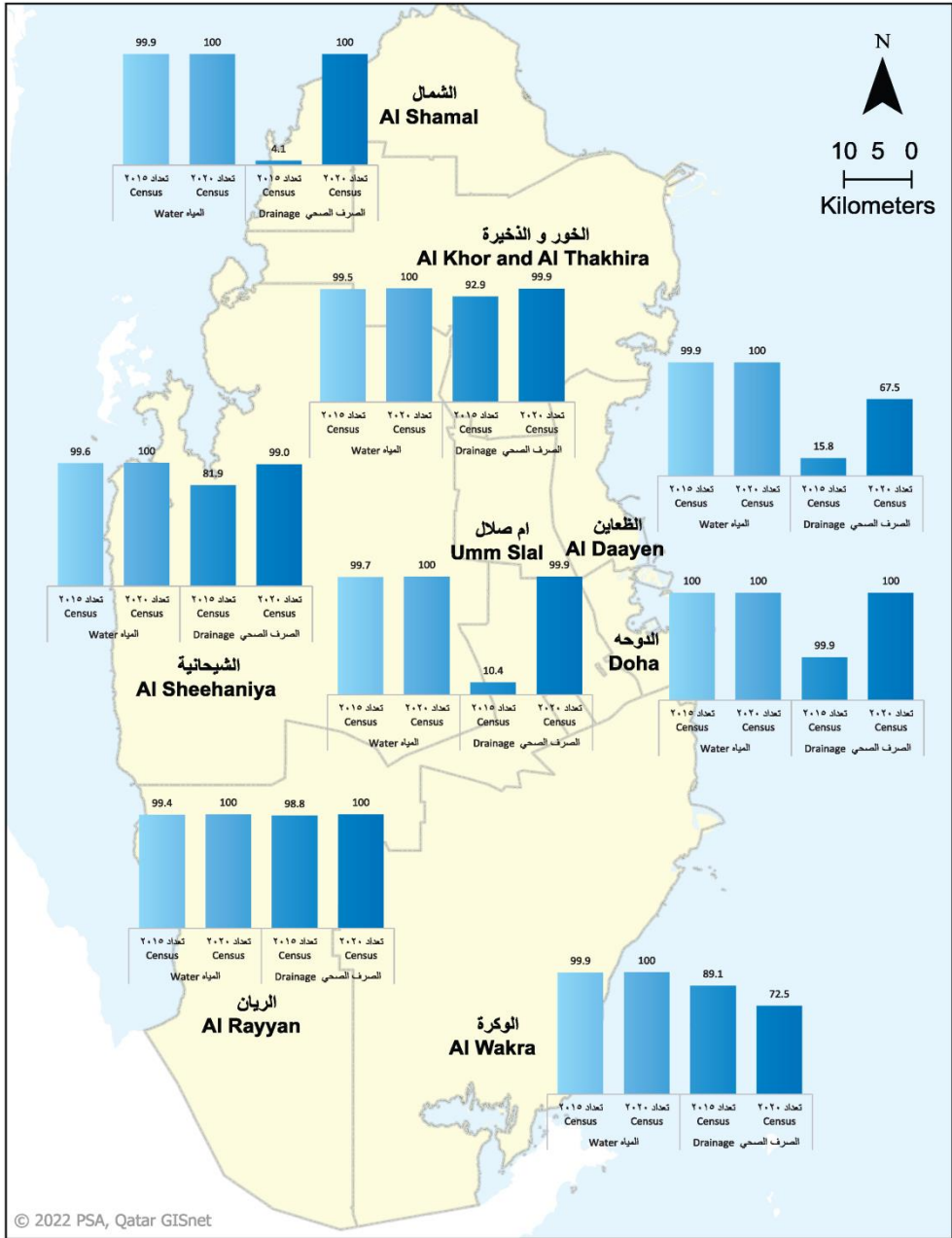
Source: National Planning Council.

Map 5.1: Percentage of Completed Residential Buildings Connected to Public Networks by Municipality, Census 2020



Source: National Planning Council.

Map 5.2: Percentage of Completed Buildings Connected to the Water and Sewage Networks by Municipality, 2015 and 2020 Censuses



Source: National Planning Council.

Table 5.1: Amount of wastewater at sewage plants, 2018 - 2023

Statement	2018	2019	2020	2021	2022	2023
Number of wastewater treatment plants	24	26	26	23	21	22
Total design capacity of wastewater treatment plants (1000 m ³ / day)	965	966	1,022	994	982	1053
Total design capacity of wastewater treatment plants with primary treatment - mechanical treatment (1000 m ³ / day)	0.0	0.0	0.0	0.0	0.0	0.0
Total design capacity of wastewater treatment plants with – biological treatment (1000 m ³ / day)	2.0	2.0	1.14	1.95	1.1	1.1
Total design capacity of wastewater treatment plants with tertiary treatment - advanced treatment (1000 m ³ / day)	936.0	964.0	1,020.0	992.1	981.0	1,053
The amount of collected wastewater (1000 m ³ /yr)	257,829	278,216	285,816	253,210	264,326	283,258
Amount of wastewater treated (1000 m ³ /yr)	256,467	276,114	285.8	253.2	264.3	282.09
Proportion of treated wastewater to total wastewater	99.5%	99.3%	98.0%	99.2%	99.75%	99.6%
Treated wastewater used to irrigate agriculture (1000 m ³ /yr)	79,669	86,056	88,957	77,156	76,132	70,734
Treated wastewater used to irrigate green spaces (1000 m ³ /yr)	71,208	76,648	86,568	107,862	113,344	125,659
Treated wastewater used for groundwater injection (1000 m ³ /yr)	66,892	79,706	78,034	54,697	50,599	45,620
Treated wastewater discharged into lagoons (1000 m ³ /yr)	38,161	33,001	32,313	13,401	23,353	38,171
Treated wastewater discharged into the sea (1000 m ³ /yr)	546	713	55	107	884	1,948
Dry sludge from wastewater (tons /yr)	37,688	39,096	40,960	41,349	49,049	46,246
Sludge from sewage (1000 m ³ /yr)	202	191	203	208	261	248
Wastewater not collected at the sewage plant and untreated discharge into lagoons (Mm ³ /yr)	1.62	0.995	0.825	0.678	0.661	0.629
Total surface groundwater discharged into the sea (Mm ³ /yr)	100.9	90.9	98.5	81.5	138.5	122.2

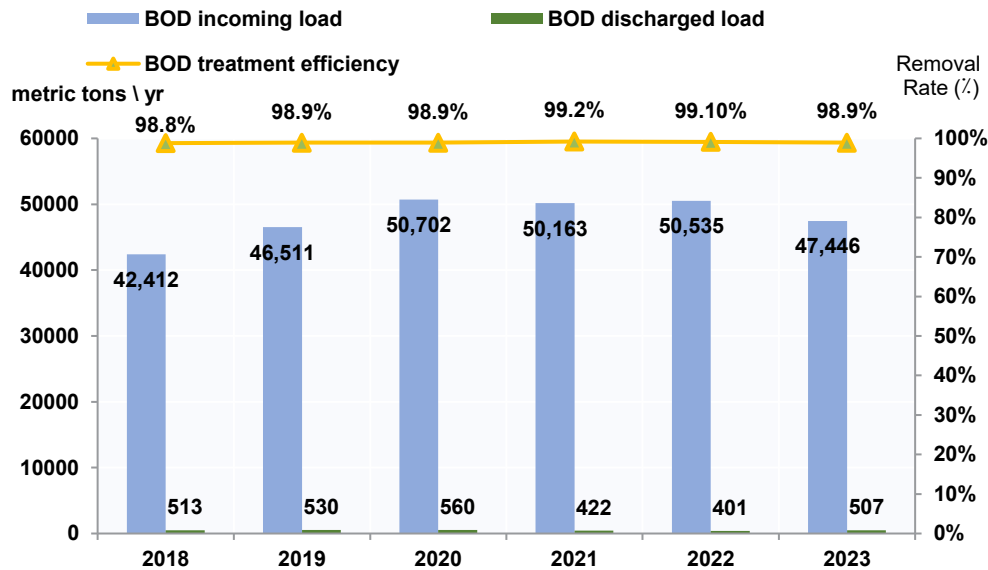
Source: Public Works Authority (Ashghal)

The number of sewage treatment plants reached 22 plants in 2023. According to Table 5.1 statistics, the design capacity for the treatment of wastewater generated from urban areas increased from 965 m³/day in 2018 to 1,053 m³/day in 2023 (an annual growth rate of 2%). All urban wastewater treatment plants are equipped with (at least secondary) treatment methods, ensuring that organic pollution is largely eliminated.

5.3 Treatment Efficiency of Urban Wastewater Treatment Plants

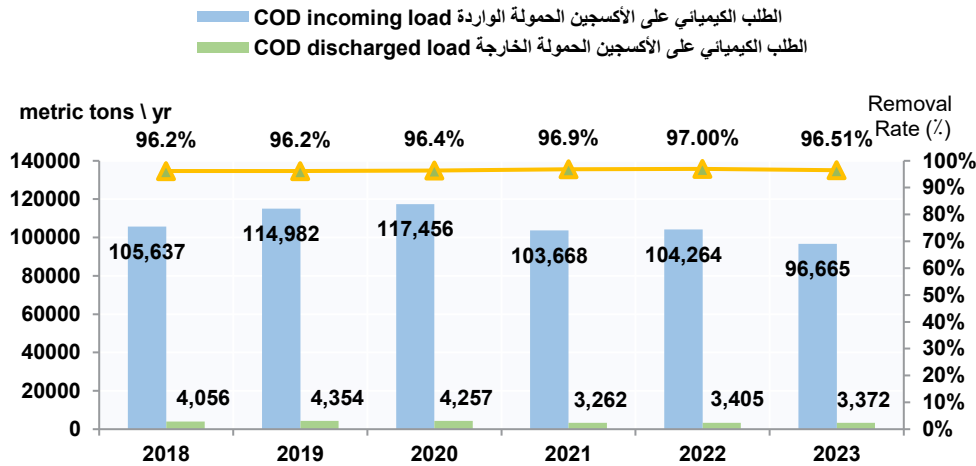
Figures 5.3 and 5.4 indicate that 99% of organic contamination, in terms of biochemical oxygen demand (BOD), was eliminated in most years during the period from 2018 to 2023. In terms of chemical oxygen demand (COD), the removal rates reached 97% in most years during the same period (2018-2023).

Figure 5-3: Treatment of Biological Oxygen Demand, 2018-2023



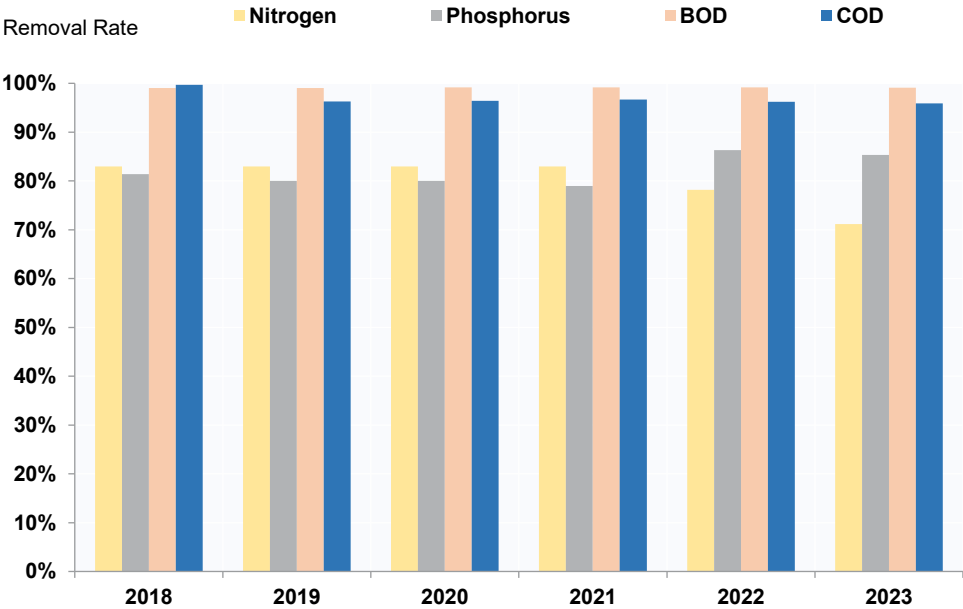
Source: Public Works Authority and National Planning Council Calculations.

Figure 5.4: Treatment of Chemical Oxygen Demand, 2018–2023



Source: Public Works Authority and National Planning Council.

Figure 5.5: Rates of BOD, COD, total nitrogen and phosphorus removal at UWWTP Doha West, 2018-2023

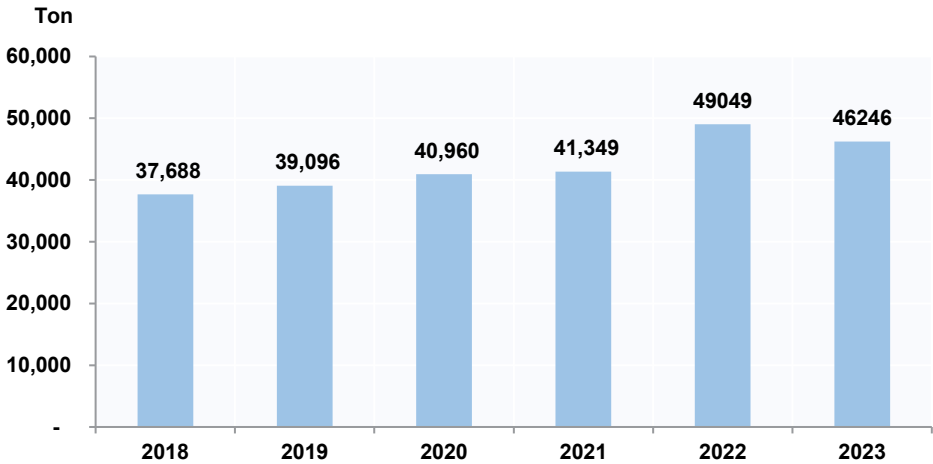


Source: Public Works Authority and National Planning Council Calculations.

5-3-2 Sewage Sludge Production

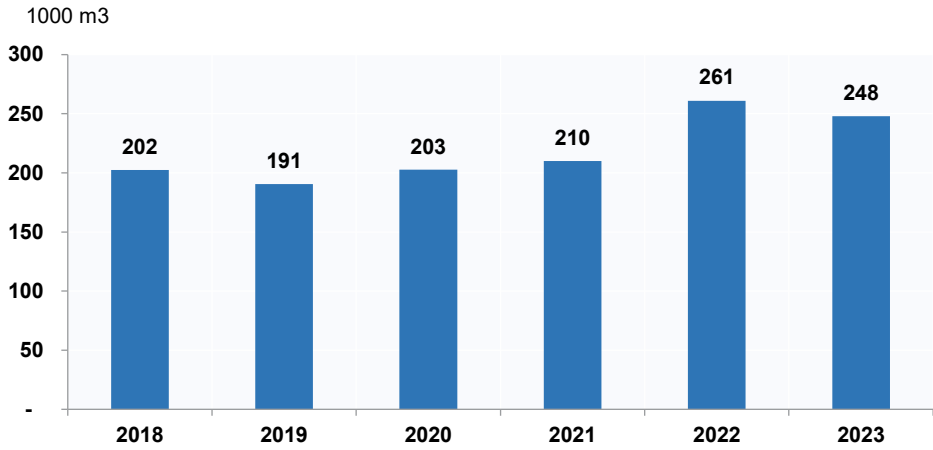
As the treatment design capacity of the UWWTPs has increased, so has the generation of sewage sludge. In 2018, 202,000 m³ of sewage sludge were produced, with dry solid contents reaching 38,000 tons (where water content accounts for about 83%). In 2023, UWWTPs in Qatar produced 248,000 m³ of sewage sludge, which included 46,000 tons of dry solids (with water content making up about 84%). (see Figures 5.7 and 5.8).

Figure 5.6: Sewage Sludge Production in Wastewater Treatment Plants by Mass (tons of dry solids), 2018 – 2023



Source: Public Works Authority.

Figure 5.7: Quantity of Sewage Sludge Production in Wastewater Treatment Plants by volume (thousand cubic meters), 2018 - 2023

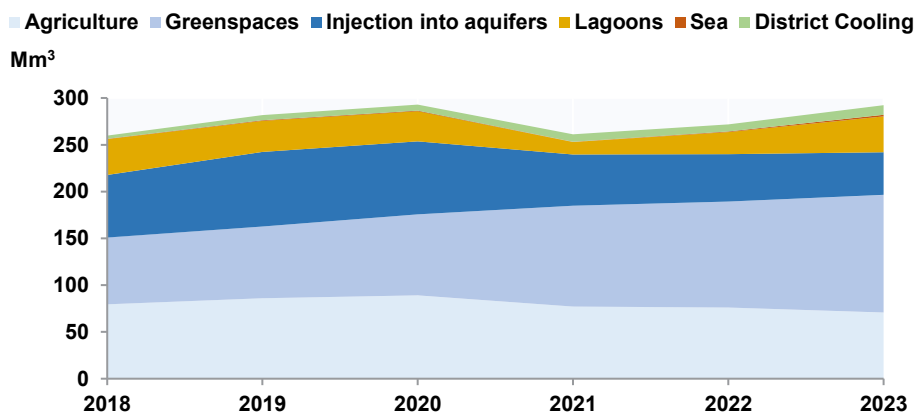


Source: Public Works Authority.

5-3-3 Discharge and Reuse of Treated Wastewater

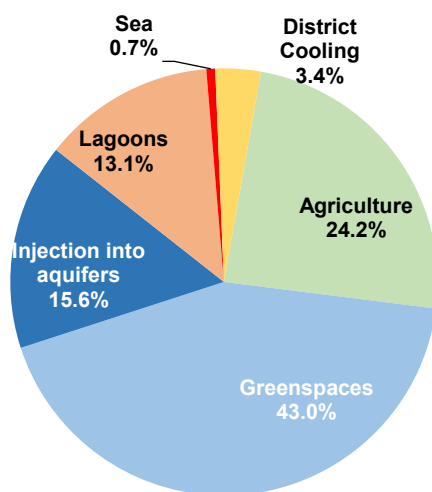
With the increase in wastewater treatment capacity since 2018, the production of treated wastewater grew from 256 million m³ (2018) to around 282 million m³ (2023). The government activity became the largest user of treated wastewater (43% of treated wastewater is used to irrigate green spaces), followed by agricultural activity (24.2% in 2023). Moreover, about 15.6% of treated wastewater was used for deep injection into underground basins, while 13.1% was discharged into open artificial lagoons without use in 2023, and approximately 3.5% was used for district cooling (see Figures 5.8 and 5.9).

Figure 5.8: Use and discharge of treated wastewater (Mm³) 2018–2023



Source: Public Works Authority and National Planning Council

Figure 5.9: Percentage distribution of treated wastewater use and discharge, 2023



Source: Public Works Authority and National Planning Council Calculations

Annexes

Definitions

ISIC Code(s)	Economic Activity	ISIC Rev. 4
<u>E</u> 36	Water supply industry	Water collection, treatment and supply includes water collection, treatment and distribution activities for domestic and industrial needs. Collection of water from various sources, as well as distribution by various means is included.
<u>E</u> 37	Wastewater Treatment (Sewerage)	Sewerage includes: - Operation of sewer systems or sewer treatment facilities - Collection and transport of human and industrial sewage from one or more users, as well as rainwater collection by means of sewerage networks, collectors, tanks and other means of transport (sewage vehicles, etc.) - Emptying and cleaning of cesspools and septic tanks, sinks and pits from sewage; and servicing chemical toilets - Treatment of wastewater (including human and industrial wastewater, water from swimming pools etc.) by means of physical, chemical and biological processes like dilution, screening, filtering, sedimentation etc. - Maintenance and cleaning of sewers and sinks including drainage pipes.
<u>A</u> 01-03	Agriculture, forestry and fishing	Agriculture, forestry and fishing cover: crop and animal production, hunting and related service activities; forestry and logging; and fishing and aquaculture. This section includes the exploitation of vegetal and animal natural resources, comprising the activities of crop cultivation, raising and breeding of animals, harvesting of timber and other plants, animals or animal products from a farm or their natural habitats.
<u>C</u> 10-33	Manufacturing	Manufacturing includes the physical or chemical transformation of materials, substances, or components into new products. The materials, substances, or components transformed are raw materials that are products of agriculture, forestry, fishing, mining or quarrying as well as products of other manufacturing activities. Substantial alteration, renovation or reconstruction of goods is generally considered to be manufacturing.
<u>D</u> 351	Electricity Industry	Electricity generation, transmission and distribution.

Term	Definitions
Precipitation	Total volume of atmospheric wet precipitation (rain, snow, hail, dew, etc.) falling on the territory of the country over one year, in millions of cubic metres.
Actual evapotranspiration	Total actual volume of evaporation from the ground, wetlands and natural water bodies and transpiration of plants. According to the definition of this concept in hydrology, the evapotranspiration generated by all human interventions is excluded, except unirrigated agriculture and forestry. The 'actual evapotranspiration' is calculated using different types of mathematical models, ranging from very simple algorithms (Budyko, Turn Pyke, etc.) to schemes that represent the hydrological cycle in detail.
Internal flow	Total volume of river run-off and groundwater generated over the period of a year, in natural conditions, exclusively by precipitation into a country. The internal flow is equal to precipitation, less actual evapotranspiration and can be calculated or measured. If the river and groundwater generation are measured separately, transfers between surface and groundwater should be netted out to avoid double counting.
Inflow of surface and groundwaters from neighbouring countries	Total volume of actual external inflow of rivers and groundwater, coming from neighboring countries. Boundary waters should be divided 50/50 between the two riparian countries, unless other water-sharing agreements exist.
Renewable freshwater resources	= Internal flow + Inflow of surface and groundwaters from neighboring countries.
Outflow of surface and groundwaters to neighboring countries	Actual outflow of rivers and groundwater into neighboring countries.
Secured by treaties	The volume of surface water and groundwater that moves out of the country of reference that is guaranteed by formal agreements to adjacent countries per year.
Not secured by treaties	The volume of surface water and groundwater that moves out of the country of reference that is not guaranteed by formal agreements to adjacent countries per year
Outflow of surface and groundwater into the seas	Actual outflow of rivers and groundwater into the sea.

Term	Definitions
Long-term annual average	Arithmetic average over at least 30 consecutive years. Please provide average over available period and indicate the length of the time period in the footnotes.
Fresh surface water	Water which flows over, or rests on, the surface of a land mass; natural watercourses such as rivers, streams, brooks, lakes, etc., as well as artificial watercourses such as irrigation, industrial and navigation canals, drainage systems and artificial reservoirs. For purposes of this questionnaire, water obtained through bank filtration is included under (fresh) surface water. Seawater, and transitional waters, such as brackish swamps, lagoons and estuarine areas are not considered fresh surface water. Bank filtration is the use of existing geologic formations adjacent to surface water bodies to filter drinking water. Wells are dug in fine, sandy sediments next to water bodies and water is extracted from these wells. Water in the water bodies filters through the sediments, removing contaminants.
Fresh groundwater	Water, which is being held in, and can usually be recovered from, or via, an underground formation. All permanent and temporary deposits of water, both artificially charged and naturally, in the subsoil, of sufficient quality for at least seasonal use. This category includes phreatic water-bearing strata, as well as deep strata under pressure or not, contained in porous or fracture soils. For purposes of this questionnaire, groundwater includes springs, both concentrated and diffused, which may be subaqueous.
Fresh surface water abstracted	Water removed from any surface water sources, such as rivers, lakes, reservoirs or rainwater, either permanently or temporarily.
Fresh groundwater abstracted	Water removed from any groundwater sources, either permanently or temporarily.
Fresh water abstracted	Water removed from any water source (surface water sources, such as rivers, lakes, reservoirs or rainwater; and groundwater sources) either permanently or temporarily. This includes abstraction by the water supply industry for distribution and direct abstraction by other activities for own use. The volume of water abstracted is broken down by main groups of economic activity of the abstractors (according to ISIC Rev.4) and households.

Term	Definitions
(Freshwater abstracted by) Water supply industry (ISIC 36)	The volume of water abstracted from surface water sources (rivers, lakes, reservoirs etc., including the volume of rainwater collected) and groundwater sources, by economic units whose main activities are the collection and treatment of water and its distribution to households and other users (ISIC 36: Water collection, treatment and supply). The volume of water abstracted by the water supply industry for the operation of irrigation canals is excluded here and should be reported under Freshwater abstracted by agriculture, forestry and fishing.
Freshwater abstracted by households	The volume of water abstracted directly from surface water sources (rivers, lakes, reservoirs etc., including the volume of rainwater collected) and groundwater sources by households for own use.
Freshwater abstracted by agriculture, forestry and fishing (ISIC 01-03)	The volume of water abstracted directly from surface water sources (rivers, lakes, reservoirs etc., including the volume of rainwater collected) and groundwater sources by economic units belonging to ISIC 01-03 for own use. It includes water abstracted by the water supply industry (ISIC 36) for the operation of irrigation canals.
Freshwater abstracted by manufacturing (ISIC 01-33)	The volume of water directly abstracted from surface water sources (rivers, lakes, reservoirs etc., including the volume of rainwater collected) and groundwater sources by economic units belonging to ISIC 10-33 for own use.
Freshwater abstracted by Electricity Industry	The volume of water abstracted directly from surface water sources (rivers, lakes, reservoirs etc., including the volume of rainwater collected) and groundwater sources by economic units belonging to ISIC 35 for own use. Water for hydroelectricity generation (e.g., water behind dams) is excluded.
Freshwater abstracted by other economic activities	The volume of water abstracted directly from surface water sources (rivers, lakes, reservoirs etc., including the volume of rainwater collected) and groundwater sources by economic units belonging to all other ISIC categories not specified above for own use.
Desalinated water	The total volume of water obtained from the desalination of seawater and brackish water.
Reused water	Used water directly received from another user with or without treatment for further use. It also includes treated wastewater received for further use from treatment plants. It excludes water discharged into a watercourse and used again downstream. It also excludes the recycling of water within industrial sites.
Imports of water	Total volume of bulk water that is imported from other countries as a commodity through pipelines or on ships or trucks. It excludes bottled water.

Term	Definitions
Exports of water	Total volume of bulk water that is exported to other countries as a commodity through pipelines or on ships or trucks. It excludes bottled water.
Total freshwater available for use	= Net freshwater abstracted + Desalinated water + Reused water + Imports of water - Exports of water.
Loss during transportation	The volume of water lost during transport between a point of abstraction and a point of use, and between points of use and reuse. It includes evaporation and leakages.
Total freshwater use	Water use is the total volume of water, either self-abstracted or received from a water supplier, which is used by final users, such as households or economic activities for their production or consumption processes. The volume of water used is broken down by main groups of economic activity of the final users (according to ISIC Rev. 4) and households.
Freshwater used by households	The volume of water used by households, either supplied by the water supply industry or directly abstracted by households for own use. Water used in the normal functioning of households (e.g., drinking or washing). It includes watering of household gardens but should not include water used for commercial agriculture.
Freshwater used by agriculture, forestry and fishing (ISIC 01-03)	The volume of water used for economic activities belonging to agriculture, forestry and fishing (ISIC 01-03), either directly abstracted from water sources for own use or supplied by the water supply industry.
Agricultural Irrigation	Artificial application of water on land to help grow crops and pastures.
Freshwater used by Manufacturing (ISIC 01-33)	The volume of water used for economic activities belonging to manufacturing (ISIC 10-33), either directly abstracted from water sources for own use or supplied by the water supply industry.
Freshwater used by Electricity Industry (ISIC 351)	The volume of water used in economic activities involved in the generation, transmission and distribution of electricity (ISIC 351), either directly abstracted from water sources for own use or supplied by the water supply industry. Water used for hydroelectric power generation (such as water behind dams) is excluded.
Freshwater used by other economic activities	The volume of water used for all other economic activities not specified above, either directly abstracted from water sources for own use or supplied by the water supply industry.
Gross freshwater supplied by water supply industry (ISIC 36)	Water supplied by the water supply industry to the user. It includes losses during transport. The water supplied by water supply industry for the operation of irrigation canals is excluded.
Net fresh water supplied by the	Gross freshwater supplied by water supply industry minus freshwater losses during transport. The net volume of freshwater supplied by the water supply industry to final users is broken down by

Term	Definitions
water supply industry (ISIC 36)	households and by main groups of the economic activity of the final users (according to ISIC Rev. 4).
Total population supplied by water supply industry (ISIC 36)	Percentage of the total resident population using water supplied by the water supply industry (ISIC 36).
Urban population supplied by water supply industry (ISIC 36)	Percentage of the urban resident population using water supplied by the water supply industry (ISIC 36).
Rural population supplied by water supply industry (ISIC 36)	Percentage of rural resident population using water supplied by the water supply industry (ISIC 36).
Total wastewater generated	Wastewater is water which is of no further value to the purpose for which it was used because of its quality, quantity or time of occurrence. Total wastewater generated is the total volume of wastewater generated by economic activities (agriculture, forestry and fishing; mining and quarrying; manufacturing; electricity; and other economic activities) and households. Cooling water is excluded.
Wastewater generated by other economic activities	Excluding wastewater generated by ISIC 37 (Sewerage).
Urban wastewater treatment	Urban wastewater treatment is all treatment of wastewater in urban wastewater treatment plants (UWWTP's). UWWTP's are usually operated by public authorities or by private companies working by order of public authorities. It includes wastewater delivered to treatment plants by trucks. UWWTP's are classified under ISIC 37 (Sewerage).
Other wastewater treatment	Treatment of wastewater in any non-public treatment plant, i.e., industrial wastewater treatment plants (IWWTP). Excluded from "other wastewater treatment" is the treatment in septic tanks. IWWTPs may also be classified under ISIC 37 (Sewerage) or under the main activity class of the industrial establishment they belong to.
Primary wastewater treatment	Treatment of wastewater by a physical and/or chemical process involving settlement of suspended solids, or other process in which the Biochemical Oxygen Demand (BOD5) of the incoming wastewater is reduced by at least 20% before discharge and the total suspended solids of the incoming wastewater are reduced by at least 50%. To avoid double counting, water subjected to more than one type of

Term	Definitions
	treatment should be reported under the highest level of treatment only.
Secondary wastewater treatment	Post-primary treatment of wastewater by a process generally involving biological or other treatment with a secondary settlement or other process, resulting in a Biochemical Oxygen Demand (BOD5) removal of at least 70% and a Chemical Oxygen Demand (COD) removal of at least 75%. To avoid double counting, water subjected to more than one type of treatment should be reported under the highest level of treatment only.
Tertiary wastewater treatment	Treatment (additional to secondary treatment) of nitrogen and/or phosphorous and/or any other pollutant affecting the quality or a specific use of water: microbiological pollution, color, etc. The different possible treatment efficiencies ('organic pollution removal' of at least 95% for BOD5, 85% for COD, 'nitrogen removal' of at least 70%, 'phosphorous removal' of at least 80% and 'microbiological removal') cannot be added and are exclusive. To avoid double counting, water subjected to more than one type of treatment should be reported under the highest level of treatment only.
Independent wastewater treatment	Collection, preliminary treatment, treatment, infiltration or discharge of domestic wastewater from dwellings generally between 1 and 50 population equivalents, not connected to a wastewater collection system. An example is septic tanks. This excludes systems with storage tanks from which the wastewater is transported periodically by trucks to a wastewater treatment plant.
Sewage sludge production (dry matter)	The accumulated settled solids, either moist or mixed, with a liquid component as a result of natural or artificial processes, that have been separated from various types of wastewater during treatment. Data on dry weight should be provided. If data is only available for wet weight, please fill in the data for wet weight and specify in a footnote.
Population connected to wastewater collecting system	Percentage of the resident population connected to wastewater collecting systems (sewerage). Wastewater collecting systems may deliver wastewater to treatment plants or may discharge it without treatment to the environment.
Population connected to wastewater treatment network	Percentage of the resident population whose wastewater is treated at wastewater treatment plants.

Term	Definitions
Population with independent wastewater treatment (e.g., septic tanks)	Percentage of the resident population whose wastewater is treated in individual, often private facilities such as septic tanks.
Population not connected to wastewater treatment network	Percentage of the resident population whose wastewater is neither treated in treatment plants nor in independent treatment facilities.
Freshwater	Freshwater is water that contains only minimal quantities of dissolved salts, especially sodium chloride, thus distinguishing it from sea water or brackish water.
Brackish water	Water that is saltier than freshwater and less salty than sea water. Technically, brackish water contains between 500 and 30,000 milligrams of salt per liter, but most brackish water has a concentration of total dissolved salts in the range of 1,000-10,000 milligrams per liter (mg/l).
Seawater	Seawater is water from a sea or ocean. On average, seawater in the world's oceans has a salinity of 35,000 milligrams per liter.

List of abbreviations

Abbreviation	English	Arabic
Mm ³	Million Cubic Meters	مليون متر مكعب
BOD5	Biological Oxygen Demand	الطلب البيولوجي على الأكسجين 5
COD	Chemical Oxygen Demand	الطلب الكيميائي على الأكسجين
GDP	Gross Domestic Product	الناتج المحلي الإجمالي
LTAA	Long-term Annual Average	المتوسط السنوي طويل الأمد
NPC	National Planning Council	المجلس الوطني للتخطيط
QMD	Qatar Meteorological Department	إدارة الأرصاد الجوية
Kahramaa	Qatar General Electricity and Water Corporation	المؤسسة العامة القطرية للكهرباء والماء
Ashghal	Public Works Authority	هيئة الأشغال العامة
UWWTP	Urban Wastewater Treatment Plant	محطة معالجة مياه الصرف الصحي في المناطق الحضرية
TSE	Treated Sewage Effluent	مياه الصرف الصحي المعالجة
Q.R	Qatari Riyal	ريال قطري

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Tables

جدول (1): موارد المياه العذبة المتجددة

Table (1): Renewable Freshwater Resources

Line	Category	Unit	2018	2019	2020	2021	2022	2023	الوحدة	الفئة	الخط
1	Precipitation	mio m ³ /y	901	810	574	134.8	537.8	1368.2	ملليون متر مكعب في السنة	الهطول	1
2	Actual evapotranspiration	mio m ³ /y	802	720	511	120	478.6	1217.7	ملليون متر مكعب في السنة	البخر الشعلي	2
3	Internal flow (=1-2)	mio m ³ /y	99	89	63	14.8	59.2	150.5	ملليون متر مكعب في السنة	التدفق الداخلي (2-1=)	3
4	Inflow of surface and groundwater from neighboring countries	mio m ³ /y	0	0	0	0	0	0	ملليون متر مكعب في السنة	التدفق الداخلي للمياه السطحية والمياه الجوفية من البلدان المجاورة	4
5	Renewable freshwater resources (=3+4)	mio m ³ /y	99.0	89.0	63.0	14.8	59.4	150.5	ملليون متر مكعب في السنة	موارد المياه العذبة المتجددة (4+3=)	5
6	Outflow of surface and groundwaters to neighboring countries	mio m ³ /y	0	0	0	0	0	0	ملليون متر مكعب في السنة	التدفقات الخارجة للمياه السطحية والمياه الجوفية إلى البلدان المجاورة	6
7	Of which: Secured by treaties	mio m ³ /y	0	0	0	0	0	0	ملليون متر مكعب في السنة	ومنهما: المكفول بمعاهدات	7
8	Not secured by treaties	mio m ³ /y	0	0	0	0	0	0	ملليون متر مكعب في السنة	غير المكفول بمعاهدات	8
9	Outflow of surface and groundwaters to the sea	mio m ³ /y	18	18	18	18	18	195	ملليون متر مكعب في السنة	التدفق الخارج للمياه السطحية والمياه الجوفية إلى البحار	9

جدول (2): استخراج المياه العذبة واستخدامها

Table (2): Renewable Freshwater Resources

Line	Category	Unit	2018	2019	2020	2021	2022	2023	الوحدة	الفئة	الخط
1	Fresh surface water abstracted	mio m ³ /y	0	0	0	0	0	0	ملليون متر مكعب في السنة	المياه السطحية العذبة المستخرجة	1
2	Fresh groundwater abstracted	mio m ³ /y	250	250	250	250	250	200	ملليون متر مكعب في السنة	المياه الجوفية العذبة المستخرجة	2
	• Fresh Groundwater abstracted	mio m ³ /y							ملليون متر مكعب في السنة	• المياه الجوفية العذبة	
	• Brackish Groundwater abstracted	mio m ³ /y							ملليون متر مكعب في السنة	• المياه الجوفية قليلة الملوحة	
	• Saline Groundwater abstracted	mio m ³ /y							ملليون متر مكعب في السنة	• المياه الجوفية المالحة	
	• From renewable groundwater resources	mio m ³ /y							ملليون متر مكعب في السنة	• من مصادر مياه جوفية متجددة	
	• From non-renewable groundwater resources	mio m ³ /y							ملليون متر مكعب في السنة	• من مصادر مياه جوفية غير متجددة	

Line	Category	Unit	2018	2019	2020	2021	2022	2023	الوحدة	الفئة	الخط
	• Water abstracted for own use	mio m ³ /y							ملليون متر مكعب في السنة	• المياه المسحوبة (المستخرجة للاستخدام الذاتي)	
	• Water abstracted for distribution	mio m ³ /y							ملليون متر مكعب في السنة	• المياه المسحوبة (المستخرجة للتوزيع)	
3	Gross freshwater abstracted (=1+2)	mio m ³ /y	250	250	250	250	250	200	ملليون متر مكعب في السنة	المياه العذبة المستخرجة = (2+1)	3
4	Water returned without use	mio m ³ /y							ملليون متر مكعب في السنة	المياه المعادة دون استخدام	4
5	Net freshwater abstracted (=3-4)	mio m ³ /y							ملليون متر مكعب في السنة	صافي المياه العذبة المستخرجة (=4-3)	5
	Of which abstracted by:									ومنها:	
	• Water supply industry (ISIC 36)	mio m ³ /y							ملليون متر مكعب في السنة	• صناعة إمدادات المياه (ISIC 36)	
	• Households	mio m ³ /y	10	10	10	10	10	10	ملليون متر مكعب في السنة	• الأسر المعيشية	
	• Agriculture, forestry and fishing (ISIC 01-03)	mio m ³ /y	230	230	230	230	230	180	ملليون متر مكعب في السنة	• الزراعة والحراجة وصيد الأسماك (ISIC 01-03)	
	• Of which for: Irrigation in agriculture	mio m ³ /y							ملليون متر مكعب في السنة	• استخدم منها بواسطة الري الزراعي	
	• Mining and quarrying (ISIC 05-09)	mio m ³ /y							ملليون متر مكعب في السنة	• التعدين واستغلال المحاجر	
	• Manufacturing (ISIC 10-33)	mio m ³ /y	10	10	10	10	10	10	ملليون متر مكعب في السنة	• الصناعة التحويلية (ISIC 10-33)	
	• Electricity, gas, steam and air conditioning supply (ISIC 35)	mio m ³ /y							ملليون متر مكعب في السنة	• إمدادات الكهرباء والغاز والبخار وتكييف الهواء (ISIC 35)	
	• Of which for: Electric power generation, transmission and distribution (ISIC 351)	mio m ³ /y							ملليون متر مكعب في السنة	• توليد الطاقة الكهربائية ونقلها وتوزيعه (ISIC 351)	
	• Construction (ISIC 41-43)	mio m ³ /y							ملليون متر مكعب في السنة	• التشييد (ISIC 41-43)	
	• Other economic activities	mio m ³ /y	0	0	0	0	0	0	ملليون متر مكعب في السنة	• الأنشطة الاقتصادية الأخرى	
6	Desalinated water	mio m ³ /y	637	668.4	691	669	670	669	ملليون متر مكعب في السنة	المياه المزالة ملوحتها	6
	• Water abstraction from the sea	mio m ³ /y							ملليون متر مكعب في السنة	• سحب (استخراج) المياه من البحر	
	• Groundwater before mixing	mio m ³ /y							ملليون متر مكعب في السنة	• المياه الجوفية قبل الخلط	

Line	Category	Unit	2018	2019	2020	2021	2022	2023	الوحدة	الفئة	الخط
	• Groundwater after mixing	mio m ³ /y							ملليون متر مكعب في السنة	• المياه الجوفية بعد الخلط	
7	Reused water	mio m ³ /y	150.9	162.7	175.5	185.1	189.5	196.4	ملليون متر مكعب في السنة	المياه المعاد استعمالها	7
	Rainwater collection	mio m ³ /y							ملليون متر مكعب في السنة	جمع مياه الأمطار	
8	Imports of water	mio m ³ /y	N\A	N\A	N\A	N\A	N\A	N\A	ملليون متر مكعب في السنة	واردات المياه	8
9	Exports of water	mio m ³ /y	N\A	N\A	N\A	N\A	N\A	N\A	ملليون متر مكعب في السنة	صادرات المياه	9
	Returns of water	mio m ³ /y							ملليون متر مكعب في السنة	إعادة مرتجعات (المياه إلى المصدر البيئية)	
10	Total water available for use (=5+6+7+8-9)	mio m ³ /y	1038	1084	1117	1104	1110	1065	ملليون متر مكعب في السنة	إجمالي المياه العذبة المتاحة للاستخدام (9-8+7+6+5=)	10
11	Losses during transport	mio m ³ /y	25	26	39	41	38	38	ملليون متر مكعب في السنة	الفاقد أثناء النقل	11
12	Total freshwater use (=20-21)	mio m ³ /y	1010	1055	1076	1063	1071	1028	ملليون متر مكعب في السنة	إجمالي استخدام المياه العذبة (= 20-21)	12
13	Households	mio m ³ /y	256	281	285	283	317	309	ملليون متر مكعب في السنة	الأسر المعيشية	13
	Public Network - Drinking Water	mio m ³ /y							ملليون متر مكعب في السنة	الشبكة العامة - مياه الشرب	
	Public Network - Other use	mio m ³ /y							ملليون متر مكعب في السنة	الشبكة العامة - استخدامات أخرى	
	Water Truck - Drinking Water	mio m ³ /y							ملليون متر مكعب في السنة	سيارات وصهاريج - مياه الشرب	
	Water Truck - Other use	mio m ³ /y							ملليون متر مكعب في السنة	سيارات وصهاريج - استخدامات أخرى	
	Wells - Drinking Water	mio m ³ /y							ملليون متر مكعب في السنة	بئر - مياه الشرب	
	Wells - Other use	mio m ³ /y							ملليون متر مكعب في السنة	بئر - استخدامات أخرى	
	Other - Drinking Water	mio m ³ /y							ملليون متر مكعب في السنة	أخرى - مياه الشرب	
	Other - Other use	mio m ³ /y							ملليون متر مكعب في السنة	أخرى - استخدامات أخرى	
14	Agriculture, forestry and fishing (ISIC 01-03)	mio m ³ /y							ملليون متر مكعب في السنة	الزراعة والحراجة وصيد الأسماك (ISIC 01-03)	14

Line	Category	Unit	2018	2019	2020	2021	2022	2023	الوحدة	الفئة	الخط
15	of which for: Irrigation in agriculture	mio m ³ /y	310	316	322	311	311	255	مليون متر مكعب في السنة	استخدم منها بواسطة الري الزراعي	15
16	Mining and quarrying (ISIC 05-09)	mio m ³ /y							مليون متر مكعب في السنة	التعدين واستغلال المحاجر (ISIC 05-09)	16
17	Manufacturing (ISIC 10-33)	mio m ³ /y	25.8	34.2	29	30	41	45	مليون متر مكعب في السنة	الصناعة التحويلية (ISIC 10-33)	17
18	Electricity, gas, steam and air conditioning supply (ISIC 35)	mio m ³ /y	Unavailable	Unavailable	Unavailable	Unavailable	Unavailable	Unavailable	مليون متر مكعب في السنة	إمدادات الكهرباء والغاز والبخار وتكييف الهواء (ISIC 35)	18
19	of which for: Electric power generation, transmission and distribution (ISIC 351)	mio m ³ /y							مليون متر مكعب في السنة	توليد الطاقة الكهربائية ونقلها وتوزيعه (ISIC 351)	19
20	Construction (ISIC 41-43)	mio m ³ /y							مليون متر مكعب في السنة	التشييد (ISIC 41-43)	20
21	Other economic activities	mio m ³ /y	148	242	238	265	289	298	مليون متر مكعب في السنة	الأنشطة الاقتصادية الأخرى	21

Table 3: Water Supply Industry (ISIC 36)

جدول (3): صناعة إمدادات المياه (ISIC 36)

Line	Category	Unit	2018	2019	2020	2021	2022	2023	الوحدة	الفئة	الخط
1	Gross freshwater supplied by water supply industry (ISIC 36)	mio m ³ /y	637	671	689	669	670	669	مليون متر مكعب في السنة	إجمالي المياه العذبة التي توفرها صناعة إمدادات المياه (ISIC 36)	1
2	Losses during transport by ISIC 36	mio m ³ /y	25	26	39	41	38	38	مليون متر مكعب في السنة	فقد المياه العذبة أثناء النقل بواسطة (ISIC 36)	2
3	Net freshwater supplied by water supply industry (ISIC 36) (=1-2) (=4+5+6+7+8+10+11)	mio m ³ /y	612	645	652	628	632	631	مليون متر مكعب في السنة	صافي المياه العذبة التي توفرها صناعة إمدادات المياه (ISIC 36) (=1-2) (=4+5+6+7+8+10+11)	3
4	Households	mio m ³ /y	246	271	275	273	307	299	مليون متر مكعب في السنة	الأسر المعيشية	4
5	Agriculture, forestry and fishing (ISIC 01-03)	mio m ³ /y	0.3	0.2	3	4	5	4	مليون متر مكعب في السنة	الزراعة والحراجة وصيد الأسماك (ISIC 01-03)	5
6	Mining and quarrying (ISIC 05-09)	mio m ³ /y							مليون متر مكعب في السنة	التعدين واستغلال المحاجر (ISIC 05-09)	6
7	Manufacturing (ISIC 10-33)	mio m ³ /y	26	34	29	30	31	35	مليون متر مكعب في السنة	الصناعة التحويلية (ISIC 10-33)	7
8	Electricity, gas, steam and air conditioning supply (ISIC 35)	mio m ³ /y							مليون متر مكعب في السنة	إمدادات الكهرباء والغاز والبخار وتكييف الهواء (ISIC 35)	8
9	Electric power generation, transmission and distribution (ISIC 351)	mio m ³ /y							مليون متر مكعب في السنة	توليد الطاقة الكهربائية ونقلها وتوزيعه (ISIC 351)	9
10	Construction (ISIC 41-43)	mio m ³ /y							مليون متر مكعب في السنة	التشييد (ISIC 41-43)	10
11	Other economic activities	mio m ³ /y	77	165	151	157	176	172	مليون متر مكعب في السنة	النشاط الاقتصادية الأخرى	11
	Population supplied by water supply industry (ISIC 36)									السكان الذين يزودون من صناعة إمدادات المياه (ISIC 36)	
12	Total population supplied by water supply industry (ISIC 36)	%	100%	100%	100%	100%	100%	100%	%	إجمالي السكان الذين يحصلون على المياه من صناعة إمدادات المياه (ISIC 36)	12
13	Urban population supplied by water supply industry (ISIC 36)	%	100%	100%	100%	100%	100%	100%	%	سكان الحضر الذين يحصلون على المياه من صناعة إمدادات المياه (ISIC 36)	13

Line	Category	Unit	2018	2019	2020	2021	2022	2023	الوحدة	الفئة	الخط
14	Rural population supplied by water supply industry (ISIC 36)	%	N\A	N\A	N\A	N\A	N\A	N\A	%	سكان الريف الذين يحصلون على المياه من صناعة إمدادات المياه	14

Table 4: Wastewater Generation and Treatment

جدول (4): إنتاج المياه العادمة ومعالجتها

Line	Category	Unit	2018	2019	2020	2021	2022	2023	الوحدة	الفئة	الخط
1	Total wastewater generated	1000 m ³ /d							ألف متر مكعب يومياً	إجمالي المياه العادمة المنتجة	1
2	by: agriculture, forestry and fishing (ISIC 01-03)	1000 m ³ /d							ألف متر مكعب يومياً	بواسطة الزراعة والحراجة وصيد الأسماك (ISIC 01-03)	2
3	Mining and quarrying (ISIC 05-09)	1000 m ³ /d							ألف متر مكعب يومياً	التعدين واستغلال المحاجر (ISIC 05-09)	3
4	Manufacturing (ISIC 10-33)	1000 m ³ /d							ألف متر مكعب يومياً	الصناعة التحويلية (ISIC 10-33)	4
5	Electricity, gas, steam and air conditioning supply (ISIC 35)	1000 m ³ /d							ألف متر مكعب يومياً	إمدادات الكهرباء والغاز والبخار وتكييف الهواء (ISIC 35)	5
6	Electric power generation, transmission and distribution (ISIC 351)	1000 m ³ /d							ألف متر مكعب يومياً	توليد الطاقة الكهربائية ونقلها وتوزيعه (ISIC 351)	6
7	Construction (ISIC 41-43)	1000 m ³ /d							ألف متر مكعب يومياً	التشييد (ISIC 41-43)	7
8	Other economic activities	1000 m ³ /d							ألف متر مكعب يومياً	الأنشطة الاقتصادية الأخرى	8
9	Households	1000 m ³ /d							ألف متر مكعب يومياً	الأسر المعيشية	9
	Volume of Wastewater collected	1000 m ³ /d	706	762	799	699	727	776	ألف متر مكعب يومياً	حجم المياه العادمة المجمعة	
	Volume of Wastewater treated	1000 m ³ /d	703	757	783	694	724	773	ألف متر مكعب يومياً	حجم المياه العادمة المعالجة	
10	Wastewater treated in urban wastewater treatment plants	1000 m ³ /d	703	757	783	694	724	773	ألف متر مكعب يومياً	المياه العادمة المعالجة في محطات معالجة المياه العادمة في الحضر	10
11	Of which: Primary treatment	1000 m ³ /d	0	0	0	0	0	0	ألف متر مكعب يومياً	ومنهما: معالجة أولية	11
12	Secondary treatment	1000 m ³ /d	1	1	1	0.8	0.7	0.7	ألف متر مكعب يومياً	معالجة ثانوية	12
13	Tertiary treatment	1000 m ³ /d	702	756	782	693	723	772	ألف متر مكعب يومياً	معالجة ثالثية	13
14	Wastewater treated in other treatment plants	1000 m ³ /d							ألف متر مكعب يومياً	المياه العادمة المعالجة في محطات معالجة أخرى	14
15	Of which: Primary treatment	1000 m ³ /d							ألف متر مكعب يومياً	ومنهما: معالجة أولية	15
16	Secondary treatment	1000 m ³ /d							ألف متر مكعب يومياً	معالجة ثانوية	16
17	Tertiary treatment	1000 m ³ /d							ألف متر مكعب يومياً	معالجة ثالثية	17
18	Wastewater treated in independent treatment facilities	1000 m ³ /d							ألف متر مكعب يومياً	المياه العادمة المعالجة في مرافق معالجة مستقلة	18
19	Non-treated wastewater	1000 m ³ /d	4	3	2	2	2	2	ألف متر مكعب يومياً	مياه عادمة غير معالجة	19

Line	Category	Unit	2018	2019	2020	2021	2022	2023	الوحدة	الفئة	الخط
20	Sewage sludge production (dry matter)	1000 t	38	39	41	41	49	46	ألف طن	إنتاج حمأة الغائط (المادة الجافة)	20

Table 4: Population Connected to Wastewater Treatment

جدول (5): السكان الموصولون بمعالجة المياه العادمة

Line	Category	Unit	2018	2019	2020	2021	2022	2023	الوحدة	الفئة	الخط
1	Population connected to wastewater collecting system	%							%	السكان الموصولون بشبكة لجمع المياه العادمة	1
2	Population connected to wastewater treatment	%	100%	100%	100%	100%	100%	100%	%	السكان الموصولون بشبكة لمعالجة المياه العادمة	2
3	Of which: at least secondary treatment	%	100%	100%	100%	100%	100%	100%	%	ومنهم الموصولون بمعالجة ثانوية على الأقل	3
4	Population with independent wastewater treatment (e.g., septic tanks)	%							%	السكان الموصولون بمعالجة مستقلة للمياه العادمة (مثل خزانات المجاريير)	4
5	Population not connected to wastewater treatment (100% - (2) - (4))	%	0	0	0	0	0	0	%	السكان غير الموصولين بشبكة لمعالجة المياه العادمة (100%- (4)-(2))	5

Table 6: Water Sector Infrastructure

جدول (6): البنية التحتية لمصادر المياه

Line	Category	Unit	2018	2019	2020	2021	2022	2023	الوحدة	الفئة	الخط
1	Precipitation stations - Number	Number	42	50	50	70	70	61	عدد	محطات هطول الأمطار - عدد	1
2	WWTP stations - Number	Number	25	27	26	23	21	22	عدد	محطات معالجة المياه العادمة - عدد	2
3	Primary treatment - Mechanical treatment	Number	0	0	0	0	0	0	عدد	المعالجة الأولية - الميكانيكي	3
4	Secondary treatment - Biological treatment	Number	5	7	3	4	3	3	عدد	المعالجة الثانوية - المعالجة البيولوجية	4
5	Tertiary treatment - Advanced treatment	Number	20	20	23	19	18	19	عدد	المعالجة الثلاثية - العلاج المتقدم	5
6	WWTP stations - Design Capacity	1000 m ³ /d	965	966	1022	994	982	1052	1000 متر مكعب / يوم	محطات معالجة المياه العادمة - سعة التصميم	6
7	Primary treatment - Mechanical treatment	1000 m ³ /d	0	0	0	0	0	0	1000 متر مكعب / يوم	المعالجة الأولية - الميكانيكي	7
8	Secondary treatment - Biological treatment	1000 m ³ /d	1.95	1.95	1.95	1.95	1.14	1.14	1000 متر مكعب / يوم	المعالجة الثانوية - المعالجة البيولوجية	8
9	Tertiary treatment - Advanced treatment	1000 m ³ /d	963	964	1021	992	981	1051	1000 متر مكعب / يوم	المعالجة الثلاثية - العلاج المتقدم	9
10	WWTP stations - Design Capacity	BOD	258248	258248	247448	279643	275762	277262	BOD	محطات معالجة المياه العادمة - سعة التصميم	10
11	Primary treatment - Mechanical treatment	BOD	0	0	0	0	0	0	BOD	المعالجة الأولية - الميكانيكي	11
12	Secondary treatment - Biological treatment	BOD	390	390	390	390	228	228	BOD	المعالجة الثانوية - المعالجة البيولوجية	12
13	Tertiary treatment - Advanced treatment	BOD	257858	258208	282003	279253	275534	277034	BOD	المعالجة الثلاثية - العلاج المتقدم	13
14	Desalination stations - Number	Number	9	9	9	9	9	9	عدد	محطات تحلية المياه - عدد	14
15	Multi-Stage Flash Distillation (MSF)	Number	7	7	7	25	25	25	عدد	التبخير الوميضي المتعدد المراحل	15
16	Reverse Osmose (RO)	Number	1	1	1	35	35	35	عدد	التناضح العكسي	16
17	Multiple effect distillation (MED)	Number	1	1	1	10	10	10	عدد	التقطير متعدد التأثير	17
18	Other	Number	0	0	0	0	0	0	عدد	أخرى	18
19	Desalination Stations - Design Capacity	1000 m ³ /d	2165	2165	2165	2444	2444	2444	1000 متر مكعب / يوم	محطات تحلية المياه - سعة التصميم	19
20	Multi-Stage Flash Distillation (MSF)	1000 m ³ /d	1446	1446	1446	1446	1446	1446	1000 متر مكعب / يوم	التبخير الوميضي المتعدد المراحل	20
21	Reverse Osmose (RO)	1000 m ³ /d	433	433	433	712	712	712	1000 متر مكعب / يوم	التناضح العكسي	21
22	Multiple effect distillation (MED)	1000 m ³ /d	286	286	286	286	286	286	1000 متر مكعب / يوم	التقطير متعدد التأثير	22

Line	Category	Unit	2018	2019	2020	2021	2022	2023	الوحدة	الفئة	الخط
23	Other	1000 m ³ /d	0	0	0	0	0	0	1000 متر مكعب / يوم	أخرى	23
24	Water Quality Stations - Number	Number							عدد	محطات جودة المياه - عدد	24
25	Water Quality Stations - Design Capacity	1000 m ³ /d							1000 متر مكعب / يوم	محطات جودة المياه - سعة التصميم	25
26	Lakes - Number	Number	N\A	N\A	N\A	N\A	N\A	N\A	عدد	البحيرات - عدد	26
27	Lakes - Surface area	Ha	N\A	N\A	N\A	N\A	N\A	N\A	هكتار	البحيرات - المساحة	27
28	Lakes - Volume capacity	Mm ³	N\A	N\A	N\A	N\A	N\A	N\A	مليون متر مكعب	البحيرات - سعة وحدة التخزين	28
29	Reservoirs - Number	Number	117	124	131	134	143	145	عدد	الخزانات - عدد	29
30	Reservoirs - Design Capacity	Mm ³	1478	1678	2204	2331	2396	2417	مليون متر مكعب	الخزانات - سعة التصميم	30
31	Dams - Number	Number	N\A	N\A	N\A	N\A	N\A	N\A	عدد	السدود - عدد	31
32	Dams - Surface	Ha	N\A	N\A	N\A	N\A	N\A	N\A	هكتار	السدود - السطح	32
33	Dams - Design Capacity	Mm ³	N\A	N\A	N\A	N\A	N\A	N\A	مليون متر مكعب	السدود - سعة التصميم	33
34	Aflag - Number	Number	N\A	N\A	N\A	N\A	N\A	N\A	عدد	الافلاج - عدد	34
35	Aflag - Length	km	N\A	N\A	N\A	N\A	N\A	N\A	كم	الافلاج - طول	35
36	Springs - Number	Number	N\A	N\A	N\A	N\A	N\A	N\A	عدد	الينابيع - عدد	36
37	Springs - Location	X Y coord	N\A	N\A	N\A	N\A	N\A	N\A	X Y احداثيات	الينابيع - الموقع	37
38	Water distribution Network	Length	7900	8136	8189	8366	8427	8696	طول	شبكة توزيع المياه	38
39	Household Connections	Number	Connecti ons: 186000	Connecti ons: 136347	Connecti ons: 141275	Connecti ons: 150770	Connecti ons: 154606	Connecti ons: 172376	عدد	التوصيلات المنزلية	39
			Meters: 329832	Meters: 349037	Meters: 381558	Meters: 406112	Meters: 428727	Meters: 481131			
40	Water Truck - Number	Number	53	44	48	49	52	52	عدد	شاحنات المياه الصهاريج - عدد	40
41	Water Truck - Volume	Mm ³	35.2	30.3	23.2	23.2	21.4	16.0	مليون متر مكعب	حجم شاحنة المياه	41
42	Wells	Number	7000	7427	7833	7865	8023	8023	عدد	الآبار	42

