



Ministry of Water and Irrigation



Jordan Water Sector Facts and Figures 2020



Ministry of Water and Irrigation

**Jordan Water Sector
Facts and Figures
2020**



Opening Statement

**H.E. Eng. Mohammad Najjar
Minister of Water and Irrigation**

Jordan suffers from water scarcity, which poses a threat that would affect all sectors that depend on the availability of water for the sustainability of their activities, development and prosperity.

Water is an essential element for the uses of households, industry and agriculture, the growing water deficit from one year to another and increasing challenges in light of the increasing population and climate change, pose serious threat which leaves its impact on all sectors.

The availability of information is one of the most important determinants of dealing with the situation and the development of strategies, policies and plans. The information availability contributes to making the right decisions and helps all concerned sectors to understand and accept the decisions that will have an impact on the sectors' development and growth. Consequently, the Ministry of Water and Irrigation is issuing this bulletin to provide information to stakeholders in the water sector including individuals, public and private sectors in addition to the funding and donors agencies of the water sector. We hope that the published information will be of value to all stakeholders and other parties that may have an interest in the water sector. MWI will continue to provide such information in the future and on periodic basis.





Opening Statement

Dr. Jihad Saleh AlMahamid
Secretary General - Ministry of Water and Irrigation

The Ministry of Water and Irrigation has the mandate to develop studies, strategies, policies and plans necessary for the water sector, in collaboration with the Water Authority of Jordan, the Jordan Valley Authority and the water companies operating throughout Jordan.

These studies and strategies are made available to the decision makers to be used in the most optimal manner for water resources management, directing them to demand areas, according to the priorities to ensure provision of water continuously to various users; domestic, industrial and agricultural.

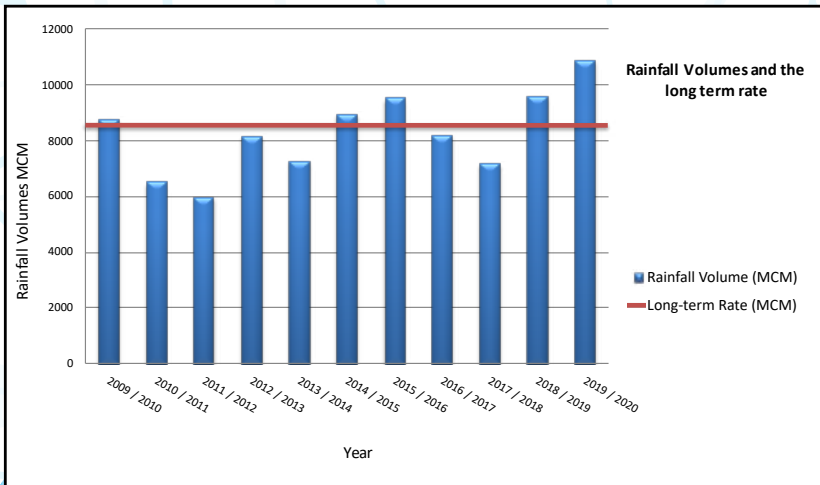
Within the interest of the water sector to implement the principle of transparency in providing the water sector facts and figures to the stakeholders and those interested in the water situation of Jordan, the ministry is publishing this information bulletin that aggregates and describes the water sector.

The information herewith is the result and outcome of the efforts of Ministry of Water and Irrigation staff who work to serve Jordan and its citizens. The ministry intends to publish this information and update it periodically. This publication is intended to facilitate access to information related to the water sector from its source Periodically. Hence, we welcome any positive feedback to improve this bulletin in the future.



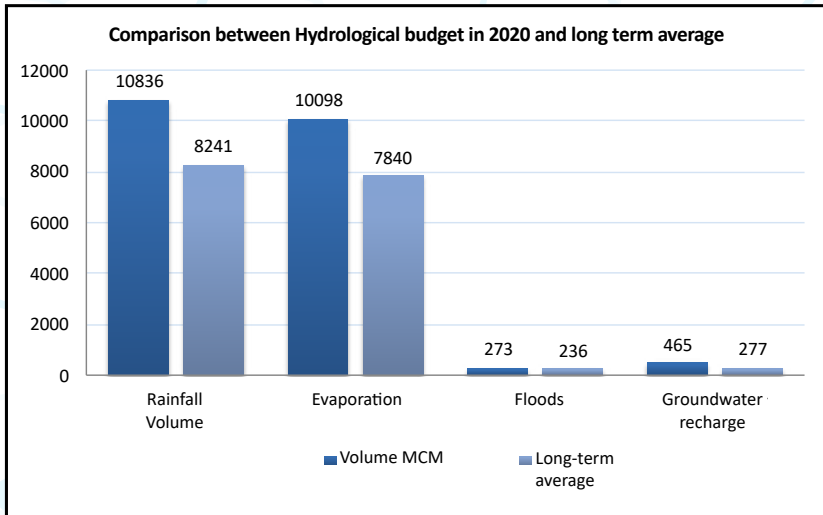
Rainfall Volumes from (2010-2020) and the long term rate

year	Rainfall Volume MCM	Long-term average MCM	Deviation from Long term average
2009 / 2010	8728	8249	479
2010 / 2011	6477	8225	-1748
2011 / 2012	5943	8195	-2252
2012 / 2013	8120	8194	-74
2013 / 2014	7228	8181	-953
2014 / 2015	8884	8191	693
2015 / 2016	9483	8207	1276
2016 / 2017	8165	8206	-41
2017 / 2018	7146	8165	-1019
2018 / 2019	9568	8210	1358
2019 / 2020	10836	8241	2595



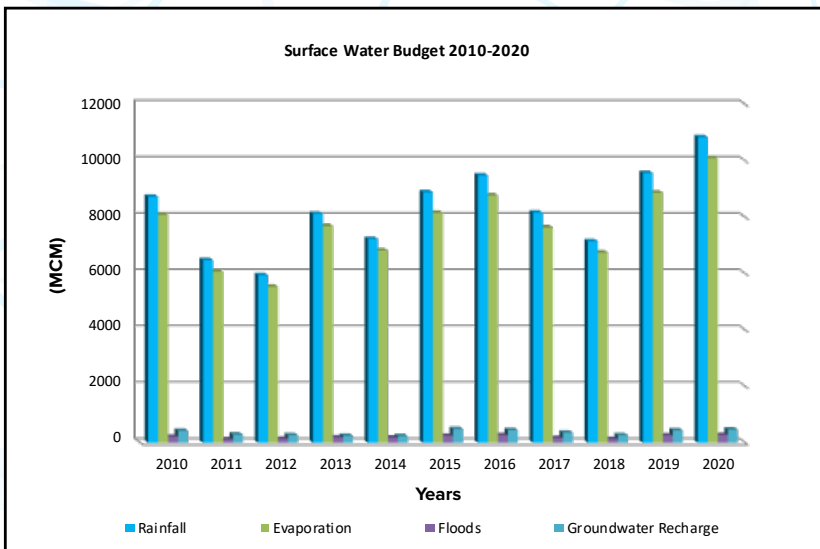
Surface Water Budget 2020

Hydrological elements	Volumes MCM	Long-term	Percentage to Rainfall	Volumes MCM
Rainfall Volume	10836		8241	131%
Evaporation	10098	93%	7840	129%
Floods	273	3%	236	116%
Groundwater Recharge	465	4%	277	168%



Surface Water Budget in Million Cubic Meter (2010-2020)

year	Rainfall	Evaporation	Floods	Groundwater Recharge
2010	8728	8092	210	425
2011	6477	6073	119	285
2012	5943	5535	139	269
2013	8120	7689	187	244
2014	7228	6817	180	231
2015	8884	8154	245	485
2016	9483	8772	266	445
2017	8165	7636	167	362
2018	7146	6748	128	269
2019	9568	8871	256.8	439.8
2020	10836	10098	273	465



Dams Design capacity, storage, inflows, and outflows in 2020

Dam	Design Capacity (MCM)	Total Inflows (MCM)	Total Outflows (MCM)	Storage End of 2020 (MCM)
Wehdeh	110	61.56	53.17	13.75
Wadi Arab	16.8	11.36	9.04	5.23
Zeqlab	4	0.91	0.57	0.9
Kufranjeh	7.8	16.74	16.21	3.69
King Talal	75	156.6	169.05	34.87
Karameh	55	4.1	1.26	23
wadi Shueib	1.4	18.29	18.39	1.42
Kafrain	8.5	18.56	18.28	4.08
Zrqaa maeen	2	1.6	1.73	0.22
Allajon	1	0.8	0.75	0.13
Tanour	16.8	7.15	6.63	2.37
Wala	8.2	20.73	21.15	5.52
Mujeb	29.8	26.2	29.12	7.74
Karak	2	1.94	1.82	0.23
Total	338.3	346.54	347.17	103.15
Percentage of storage from design capacity				30.50%

*Design capacities of dams has been changed after the year 2020, Karameh dam has been taken out from dams' budget

Water Uses for Different Purposes from Jordan Valley resources 2020

Use Type	Quantity (MCM)
Municipal from King Abdullah canal	86
Municipal from Zara Ma'in	41.2
Total Municipal	127
Irrigation (Jordan Valley)	218.3
Industry	6
Total	351

Water Users Associations in Jordan Valley irrigated areas

Location	No. of WUA's	Coverage Percentage from the directorate %	Coverage Percentage from the Valley %
Northern Ghours	6	67	21
Middle Ghours	3	25	8
South Shuna	6	84	17
Southern Ghours	3	37	6
Total	18		52

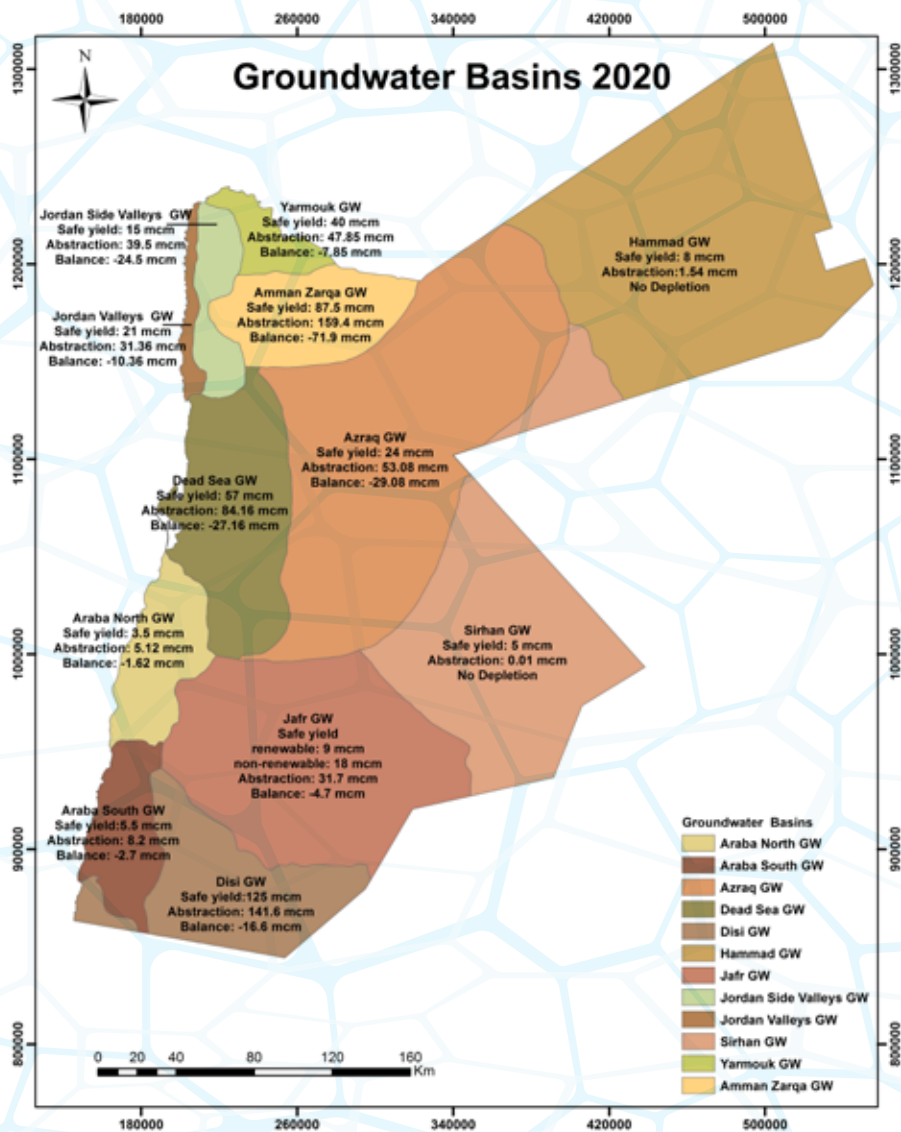
Water Harvesting projects (Desert Dams, Earth Ponds and Concrete Ponds)

Water Harvesting type	Count	Design Capacity (MCM)
Desert Dams (Constructed)	63	96.55
Concrete Ponds	65	0.295
Earth Ponds (Constructed)	276	25.2
Earth Ponds (Under Construction)	6	0.268
Total	410	122.45

Groundwater basins, Safe Yield, Abstraction Volumes in 2020 and Deficits

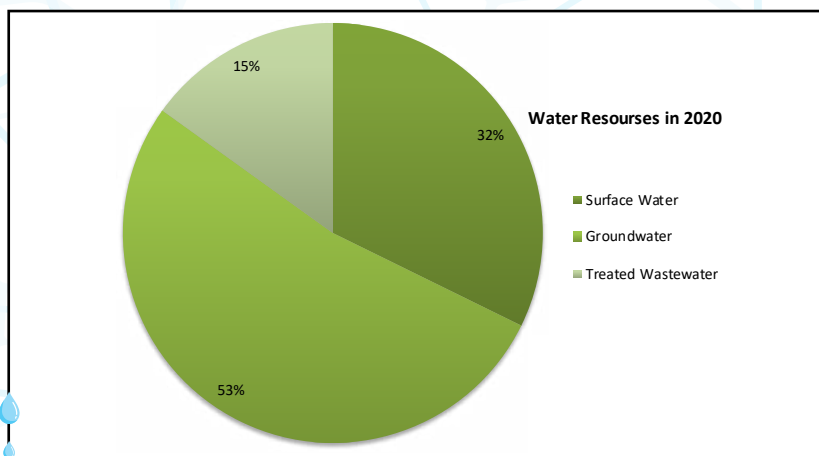
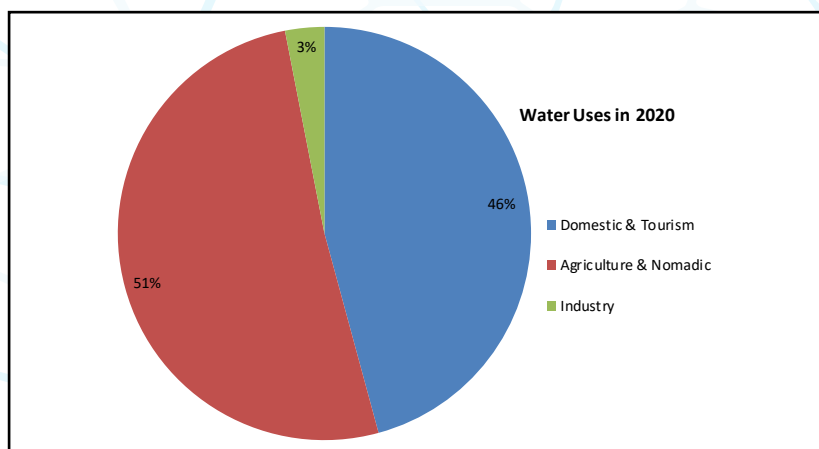
Groundwater Basin	Safe Yield (MCM)	Abstraction (MCM)	Deficit (MCM)
Disi & Mudawara	125	148.1	-23.1
Amman-Zarqa	87.5	159.4	-71.9
Yarmouk	40	47.85	-7.85
Jordan Side Valley	15	39.5	-24.5
Azraq	24	53.08	-29.08
Jafer	27	31.7	-4.7
Jordan Valley	21	31.36	-10.36
Dead Sea	57	84.16	-27.16
Araba South	5.5	8.2	-2.7
Hammad	8	1.54	6.46
Sirhan	5	0.01	4.99
Araba North	3.5	5.12	-1.62

Groundwater basins Map



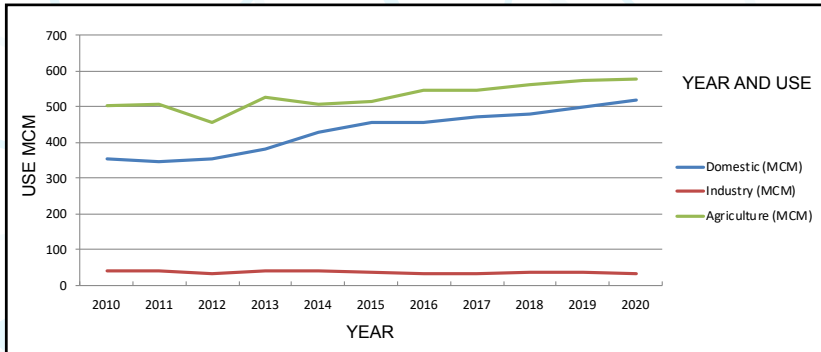
Water uses and resources in 2020(MCM)

Uses/Resources MCM	Surface Water (MCM)	Groundwater (MCM)	Treated Wastewater (MCM)	Total (MCM)
Domestic & Tourism	149	367	0	516
Agriculture & Nomadic	209	201	167	577
Industry	6	25	3	35
Total	364	594	170	1128



Water Uses (MCM) for Different Purposes 2010-2020

Year and Use	Domestic (MCM)	Industry (MCM)	Agriculture (MCM)	Total
2010	352	41	501	894
2011	347	39	506	892
2012	354	34	455	843
2013	381	39	525	945
2014	429	39	504	972
2015	457	38	514	1009
2016	457	32	547	1036
2017	470	32	545	1047
2018	480	38	562	1080
2019	497	37	574	1108
2020	516	35	577	1128

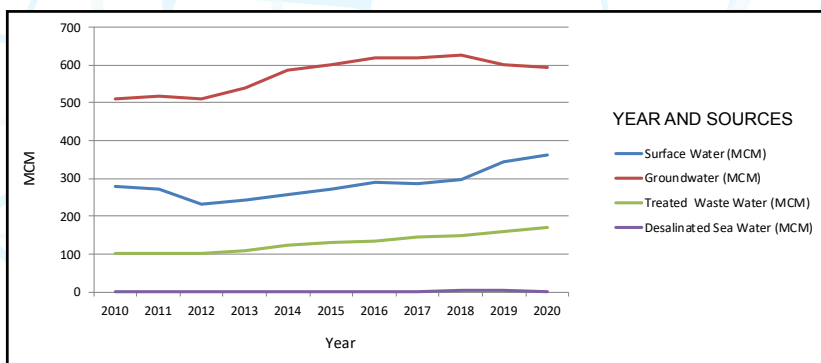


Water Resources Monitoring Stations

Monitoring Stations	Telemetric	Manual	Total
Rainfall Stations	100	174	274
Climate Stations	51	21	72
Runoff Stations	8	23	31
Groundwater Level	131	109	240
Spring Discharge		425	425
Dams	8		8

Development of water resources for all uses in MCM (2010-2020)

Year Sources	Surface Water (MCM)	Ground-water (MCM)	Treated Waste Water (MCM)	Desali-nated Sea Water (MCM)	Total (MCM)
2010	280	511	103	0	894
2011	272	517	103	0	892
2012	231	509	102	0	842
2013	245	540	109	0	894
2014	259	588	125	0	972
2015	274	600	133	0	1007
2016	289	619	136	0	1044
2017	288	619	147	0	1054
2018	298	625	149	4	1076
2019	344	601	160	2	1109
2020	364	594	170	3	1130



Number of Operational Wells According to Water Uses 2010-2020

Year Well uses	Industrial	Agriculture	Drinking	Live-stock	Total
2010	201	2284	591	22	3098
2011	192	2311	599	19	3121
2012	181	2254	588	20	3043
2013	206	2210	602	16	3034
2014	200	2000	781	50	3031
2015	201	2163	756	18	3138
2016	188	2170	761	26	3145
2017	203	2210	805	54	3272
2018	188	2262	824	47	3321
2019	180	2164	797	42	3183
2020	181	2189	796	42	3208

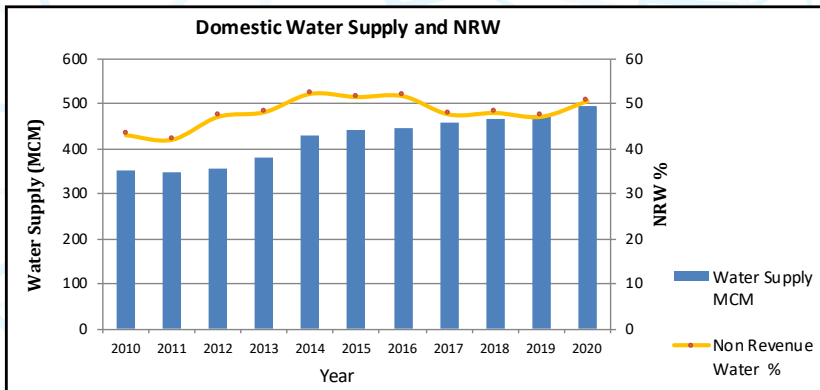
Number of Backfilled Illegal Wells 2010-2020

Year	Number of Wells
2010	57
2011	29
2012	19
2013	141
2014	562
2015	174
2016	167
2017	177
2018	111
2019	74
2020	37



Drinking Water Supply and Non Revenue Water 2010-2020

Year	Water Supply MCM	Non Revenue Water%
2010	352	43
2011	347	42
2012	354	47
2013	381	48
2014	429	52
2015	440	51
2016	447	52
2017	458	48
2018	466	48
2019	474	47
2020	493	50



Samples of Drinking Water Conforming to Jordanian water quality standards

Year	Conforming Percentage %
2014	99.6 %
2015	99.5 %
2016	99.6 %
2017	99.7 %
2018	99.7 %
2019	99.6 %
2020	99.4 %

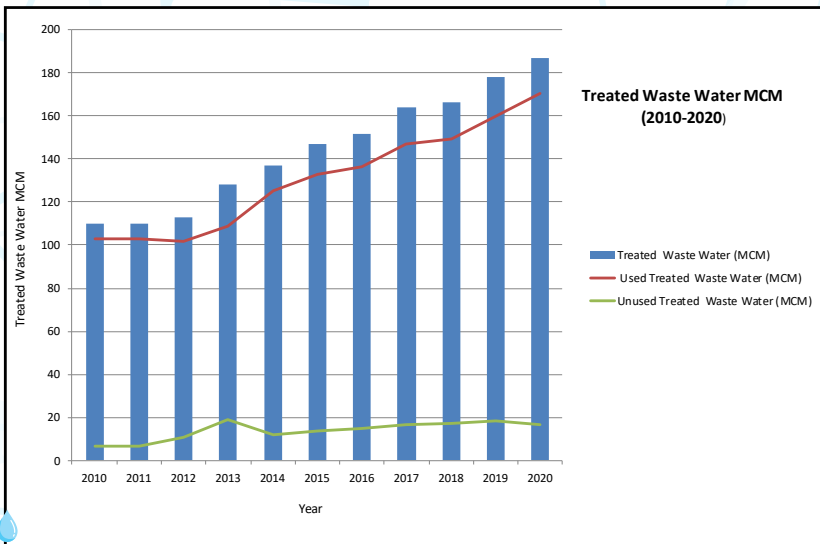
Water Supply (l/c/d) 2010- 2020

Year	Water Supply
2010	134
2011	125
2012	121
2013	123
2014	132
2015	128
2016	127
2017	125
2018	124
2019	123
2020	125



Treated Wastewater Volumes (MCM) 2010-2020

Year	Treated Waste Water (MCM)	Used Treated Waste Water (MCM)	Unused Treated Waste Water (MCM)
2010	110	103	7
2011	110	103	7
2012	113	102	11
2013	128	109	19
2014	137	125	12
2015	147	133	14
2016	151	136	15
2017	164	147	17
2018	167	149	17
2019	178	160	18
2020	187	170	17

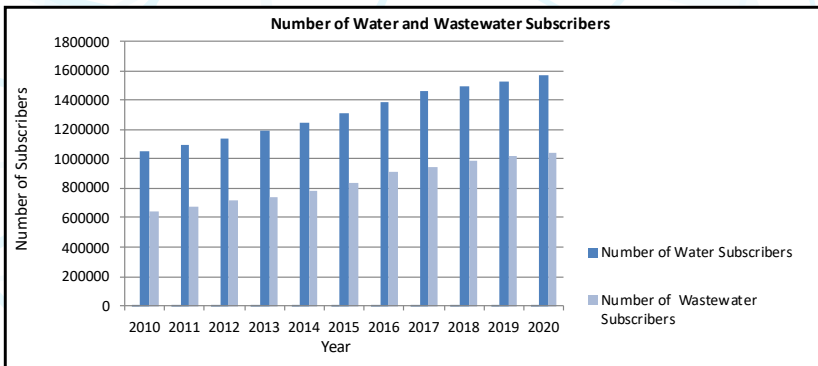


Wastewater Treatment Plants in Jordan 2020

Name of WWTP	Stations developed and under development	Design capacity m ³ /day	Actual load flow / 2020 m ³ /day	Technology	Operation Year	BOD5 Design mg/L
Natural Aqaba	under development	9000	6000	Natural	1987	400
Mechanical Aqaba	under development	12000	15000	Under construction	2005	500
Albaqaa / Ain Albasha	Under study and designs for new plant	14900	14900	Biological filters	1987	800
Alfoheis and Mahis	Activated sludge	2400	3000	Activated sludge	1997	600
Irbid Central	converted into activated sludge	13300	11000	Activated sludge	1987	600
(Jarash (east	Developed	9500	2500	Activated sludge	1983	1100
Almeearad		10000	3500	Activated sludge	2011	600
Old Karak	under development	1000	1200	Activated sludge	1988	800
Kufr Najah	converted into activated sludge	9000	3500	Activated sludge	1989	600
Madaba	From natural to mechanical	7600	7400	Activated sludge	1989	950
Almafraq Natural	converted into a mechanical	5500	3500	Aerated basins	2017	708
Maan	From natural to mechanical	7000	2500	Activated sludge	1989	600
Abu Naseer	under development	4000	3385	Activated sludge	1986	900
Alramtha	From natural to mechanical	5000	4300	Activated sludge	1987	1000
Alsalt	Under study and designs for new plant	7700	9000	Activated sludge	1981	600
Altafelih	Development is under construction 7500 capacity	1600	2200	Biological filters + Activated sludge	1988	1060
Wadi Alarab		21000	13000	Activated sludge	1999	582
Wadi Hassan		1600	1000	Activated sludge	2001	800
Wadi Musa		3400	3000	Activated sludge	2000	500
Wadi Alseir / Naour	under development	17000	4976	Aerated basins	1997	670
Alakedar		4000	3000	Natural basins	2005	4000
Allajon	From normal to Airy basin	1200	500	Natural basins	2005	1500
Tal Almantah	under development	400	400	Biological filters + Activated sludge	2005	4000
Aljezah		4000	895	Activated sludge	2008	900
Alshobak		350	115	Natural basins	2010	1850
Alsamraa	From natural to mechanical	365000	343802	Activated sludge	old 1984 2008New	700
Almansorah		50	10	Natural basins	2010	1850
South Amman		52000	16000	Activated sludge	2015	750
Wadi Alshalaleh		13700	10000	Activated sludge	2014	762
Mutah Almazar and Aladnaneih		7000	1500	Activated sludge	2014	673
North Shoneh		1200	700	Natural basins	2015	2200
Zaatari refugee camp		3500	1468	MBR+TF	2015	1130
Total		614900	493251			

Number of Water and Wastewater Subscribers 2010-2020

Year	Number of Water Subscribers	Number of Wastewater Subscribers	Household Served in Sewer Systems % 4
2010	1048207	646519	62%
2011	1095191	677961	62%
2012	1142457	716671	63%
2013	1190831	742763	62%
2014	1240360	780661	63%
2015	1308043	834093	64%
2016	1382628	906291	66%
2017	1455417	946917	65%
2018	1491326	989416	66%
2019	1524191	1016774	67%
2020	1563566	1044004	67%



Cost Analysis for Water Authority and water companies in Million JD

Description	2015	2016	2017	2018	2019	2020
Running Costs (O&M) without interests	245	256	233	230	236	215
Capital Costs divided into:						
Self-Financed expenses	206	181	170	173	171	143
Expenses covered by International loans	55	59	29	41	43	19
Expenses covered by external grants	75	53	29	24	26	17
Payments of installments and benefits (external + internal)	103	153	147	68	57	35

Energy Consumption per Billed Water with Energy Consumption Rate

Water Authority of Jordan			
Year	Electricity Consumption (GW.h)	Billed Water MCM	Electricity Consumption
2019	1654	249	6.637
2020	1793.5	256	7.01

Jordan Valley Authority			
Year	Electricity Consumption (GW.h)	Billed Water MCM	Electricity Consumption Rate (KW.h/CM)
2019	49	299	0.164
2020	55	315	0.175

Water Sector			
Year	Electricity Consumption (GW.h)	Billed Water MCM	Electricity Consumption Rate (KW.h/CM)
2019	1704	549	3.105
2020	1848.5	517	3.576

Facts

- Jordan ranks as the world's second water-poorest country.
- Less than 100 m³ of annual renewable water resources is available per person (below global line of absolute water scarcity of 500 m³).
- Jordan is classified into of 15 surface water basins and 12 groundwater basins.
- Of the twelve basins out of the fifteen basins underlying Jordan are being depleted beyond their recharge volumes.
- The shared water with neighboring countries is around 26% of the total water resources.
- Sources of water for all uses are: 32% surface water, 15% treated waste water and 53% groundwater.
- Quantity of renewable water resources available for different purposes is around 977 MCM annually.
- The number of working wells in Jordan exceeds 3211 wells.
- The groundwater level in the main aquifers drops at a rate of 2 meters per year, but the decline in some depleted areas reaches 5 to 20 meters. this would affect Groundwater quality causing salinization, and drying up wells and aquifers and increasing the energy consumption of abstraction.
- The safe yield abstraction quantity from renewable groundwater is 275 MCM, while the safe yield abstraction quantity from nonrenewable groundwater for 50 years is about 143 MCM.
- Quantity of over pumping from groundwater is about 200 MCM.
- 51% of available water in used in Agriculture, 35% of which is groundwater sources.
- 95% of water sources are described as "safely managed" (SDGs), 96% of population are connected to piped water supply in urban areas and the percentage is 88% in rural areas.



- The increase in demand for Domestic water in the northern governorates has increased by 40% in the last few years as a result of hosting Syrians.
- The percentage of the Jordanian population who has a water supply for 24 hours/week or less is estimated at 50.3%, while the water supply for 49.7% of Jordanians ranges from 24-48 hours/week.
- The estimated water demand quantity for all sectors is 1158 MCM in 2020.
- 90% of the drinking water supplied to the capital comes for sources distanced 125 to 325 km away and elevate up to about 1200 m above sea level with 5 pumping stages, while 42 % of the drinking water supplied to northern governorates comes from sources distanced 20 to 76 km away and elevated up to about 1100 m above sea level with 5 pumping stages in (this is reflected to higher cost of water supply).
- About 15% of electricity consumption in Jordan is consumed by the water and sanitation services.
- Electricity costs about 50% of the operating costs of the water sector, which leads to an increase in the cost of water and sanitation services.
- The estimated non-revenue water is 50% in 2020 comparing to 43% in 2010; it is divided to more than 50% as an administrative losses and less than 50% physical losses from the networks.
- 68% of households in Jordan have sewer connection; only 3% have sewer connection in rural areas and, 88.5% of sanitation systems are described as safely managed.
- 51% of the price of domestic water is subsidized by the Government, costing the Government 291 M JD in 2020.
- Each Syrian refugee costs the water sector around 440JD/year, as financial, environmental, and economic costs.



Jordan Water Sector Facts and Figures 2020

Ministry of Water and Irrigation

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