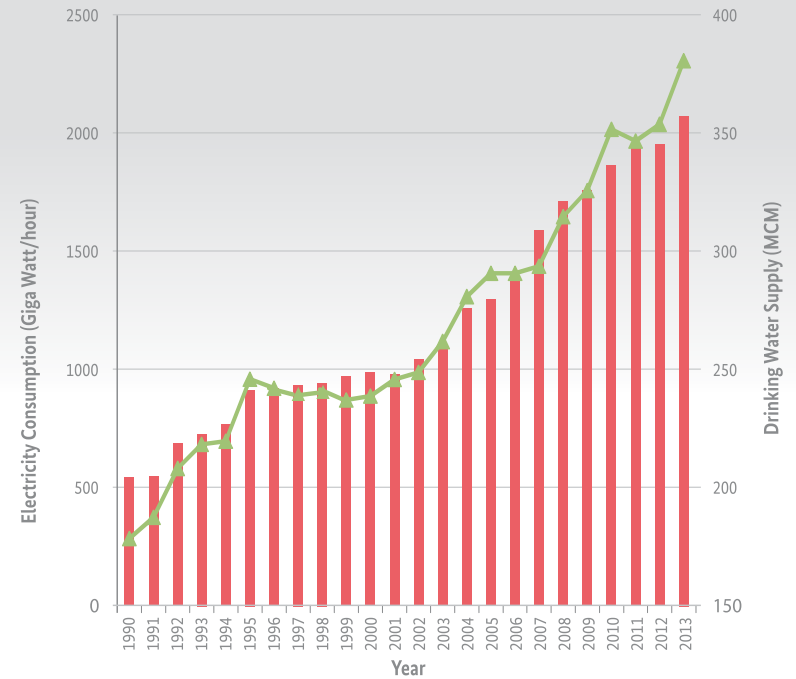




Ministry of Water & Irrigation

# Jordan Water Sector Facts and Figures 2013



# Jordan Water Sector Facts and Figures

## 2013

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## **Opening Statement**

**H.E. Dr. Hazim El-Naser  
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 for their 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 because of Syrian asylum to Jordan poses a serious threat which will leave its impact on all sectors.

The availability of information is one of the most important determinants of dealing with the threat and the development of strategies, policies and plans. The information availability contributes to making the right decisions and helps and 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 decided to issue this bulletin and provide information to stakeholders in the water sector such as individuals public sector and private sectors in addition to the community of funding agencies and donors of the water sector. We hope that the published information will be of help to every stakeholder and any party that has an interest in the water sector, provided that we continue to make it available in the future and on an annual basis by all means available.

## **Opening Statement**

**H.E Eng. Basem Telfah**

**Secretary General - Ministry of Water and Irrigation**

The Ministry of Water and Irrigation has the mandate to develop strategies, policies and plans for the water sector, and is operating through the Water Authority of Jordan and the Jordan Valley Authority. The ministry, therefore has the role of collecting the information about the water sector through these institutions and use the in the optimal manor in the management of water resources and directing them to demand centers, according to the priorities to ensure provision of water to users from various sectors, domestic, industrial and agricultural.

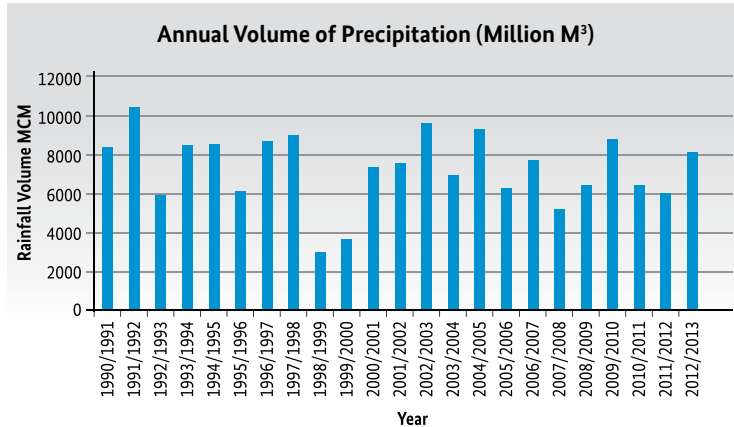
Within the desire of the water sector and implementing principle of transparency in putting up the facts and figures in the reach of the water sector stakeholders and those wanting to inquire about the water situation in Jordan, the ministry and for the first time is publishing this information bulletin that aggregates and describes the water sector in this publication.

The information here with is the result and outcome of the efforts of the Ministry of Water and irrigation staff who are working hard to serve the nation and its citizens. The ministry intends to publish this information and update it annually. This publication is the first attempt to facilitate access to information for all, and will be the first seed to follow up on these efforts and published on an annual basis on all means of communication. Hence, we welcome any positive criticism to improve this bulletin in the future.

## Water Resources

Annual Volume of Precipitation (Million M<sup>3</sup>)  
(1990/1991-2012/2013) Water Years

Year	Rainfall volume(MCM)	Year	Rainfall volume(MCM)
1990/1991	8379	2002/2003	9708
1991/1992	10429	2003/2004	6951
1992/1993	589	2004/2005	9304
1993/1994	8440	2005/2006	6258
1994/1995	8524	2006/2007	7683
1995/1996	6046	2007/2008	5194
1996/1997	8746	2008/2009	6379
1997/1998	9110	2009/2010	8728
1998/1999	2973	2010/2011	6477
1999/2000	3651	2011/2012	5943
2000/2001	7375	2012/2013	8120
2001/2002	7545	long term*	8194

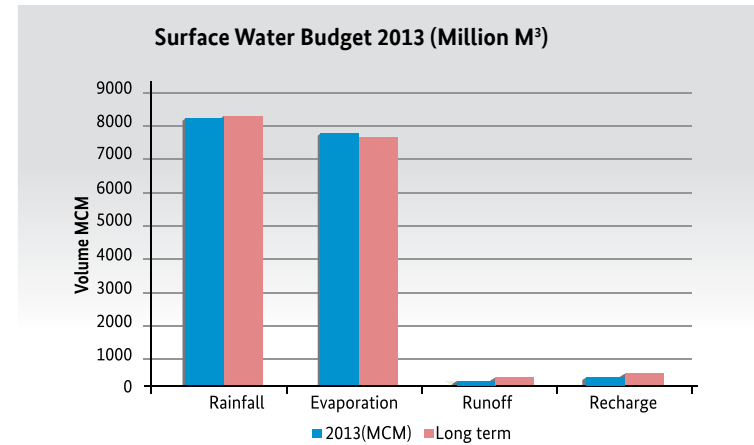


## Water Resources 2013

Surface Water Budget 2013 (Million M<sup>3</sup>)

	2013(MCM)	percentage from Rainfall	long term	Percentage from long term
Rainfall	8120		8194	99
Evaporation	7689	94.7	7582	101
Runoff	187	2.3	194	96
Recharge	244	3.0	418	58

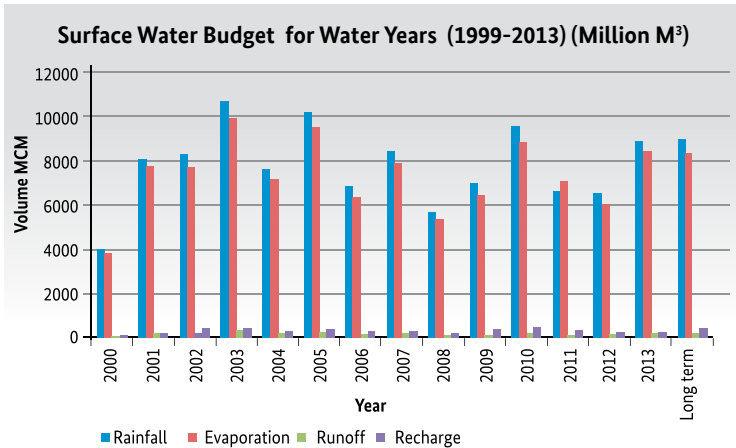
•MCM: Million Cubic Meter



Surface water Comparison between water year 2012/2013 and long term average

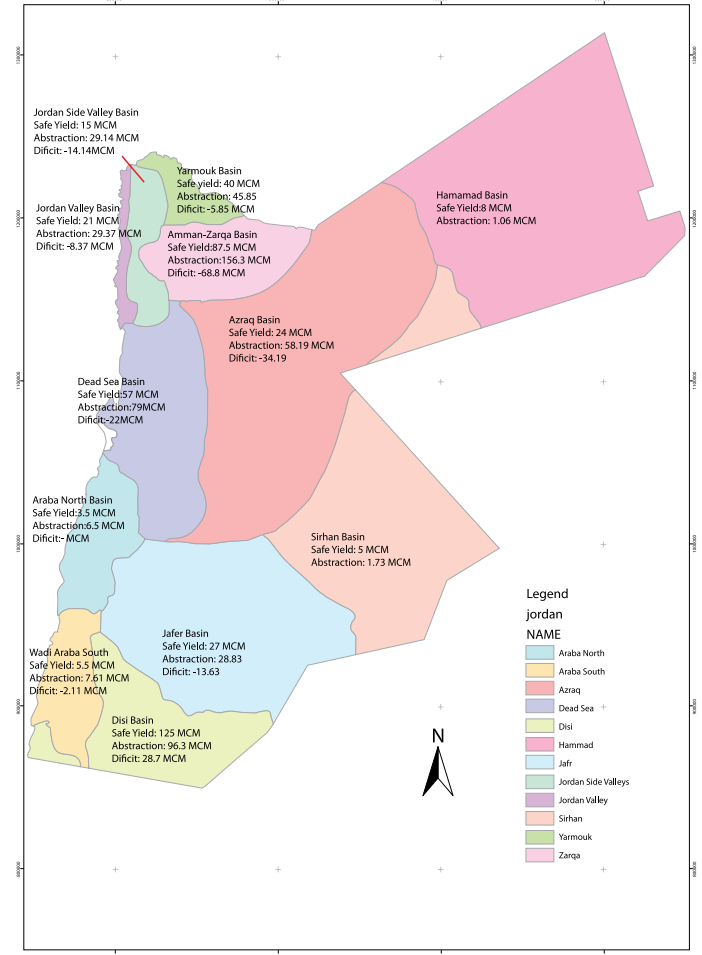
**Surface Water Budget for Water Years (1999-2013) (Million M<sup>3</sup>)**

Year	Rainfall	Evaporation	Runoff	Recharge
2000	3651	3474	75	102
2001	7375	7063	148	164
2002	7545	7012	162	371
2003	9708	9026	275	406
2004	6951	6551	134	266
2005	9304	8671	270	364
2006	6258	5813	157	289
2007	7683	7201	195	288
2008	5194	4869	115	209
2009	6379	5903	127	349
2010	8728	8092	210	425
2011	6073	6477	119	285
2012	5943	5535	139	269
2013	8120	7689	187	244
Long term	8194	7582	194	418



**Groundwater Budget**

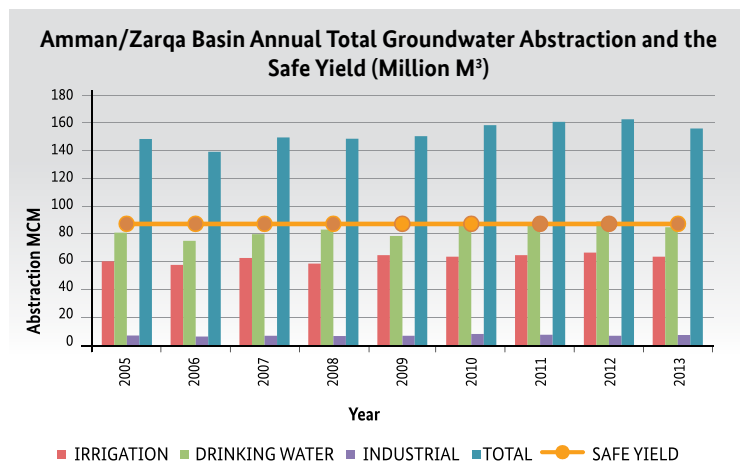
**Groundwater Basin, Safe Yield, Abstraction and Deficit for 2013**



Example:

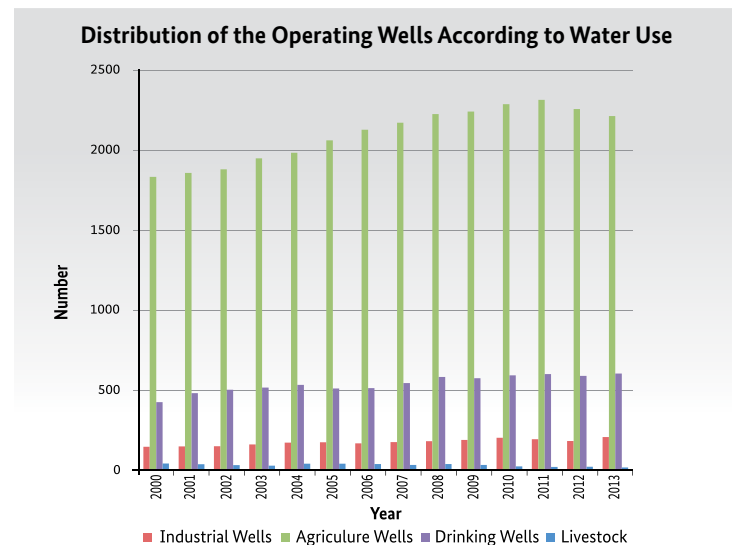
**Amman/Zarqa Basin Annual Total Groundwater Abstraction and the Safe Yield (Million M<sup>3</sup>)**

Amman-Zarqa Basin	2005	2006	2007	2008	2009	2010	2011	2012	2013
Irrigation	61	58	63	59	65	64	65	67	64
Drinking Water	81	75	80	83	79	87	88	89	85
Industrial	7	6	7	7	7	8	8	7	7
Total	149	139	150	149	151	159	161	163	156
Safe Yield	88	88	88	88	88	88	88	88	88
Deficit	-61	-52	-62	-61	-63	-71	-73	-75	-69



**Distribution of the Operating Wells According to Water Use**

Year	Industrial Wells	Agriculture Wells	Drinking Wells	Livestock	Total
2000	145	1830	424	41	2440
2001	147	1855	480	36	2518
2002	148	1878	501	30	2557
2003	159	1946	515	27	2647
2004	171	1981	531	39	2722
2005	173	2058	509	39	2779
2006	166	2125	511	37	2839
2007	174	2169	543	31	2917
2008	180	2223	581	37	3021
2009	188	2238	573	31	3030
2010	201	2284	591	22	3098
2011	192	2311	599	19	3121
2012	181	2254	588	20	3043
2013	206	2210	602	16	3034

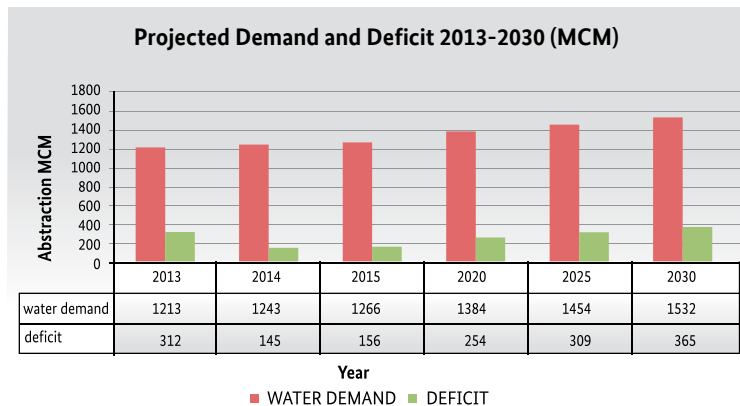


**Number of Pumping Stations and Storage Reservoirs Distribution According to Governorates (2013)**

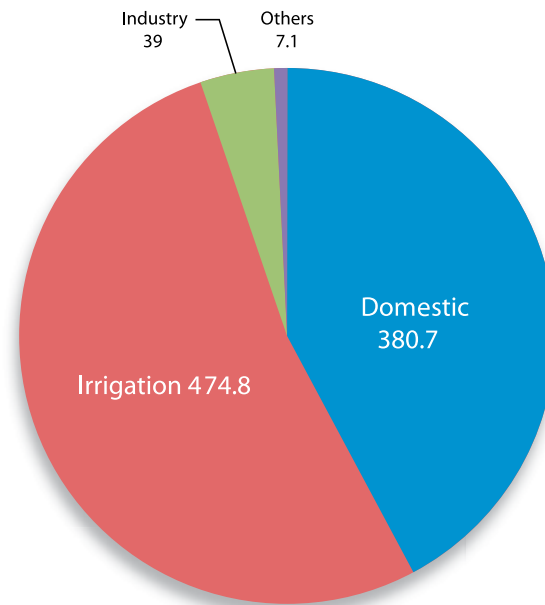
Governorate	Pumping Station	Reservoir no.	Reservoir Capacity M3
Irbid	73	52	127855
Zarqa	44	22	60100
Ajloun	12	22	15695
Jerash	12	14	9750
Tafielah	18	7	13900
Ma'an	32	18	27280
Mafraq	58	44	15545
Balqa	73	33	57153
Madaba	10	5	19500
Karak	16	17	29650
Amman	51	83	700000
Aqaba	4	24	46410

**Water Uses in 2013 (Million M<sup>3</sup>)**

Uses	Surface Water	Groundwater	Total Volume (MCM)
Domestic	123	257	381
Irrigation	225	250	475
Industry	7	32	39
Others	7	0	7
Total	362	540	902



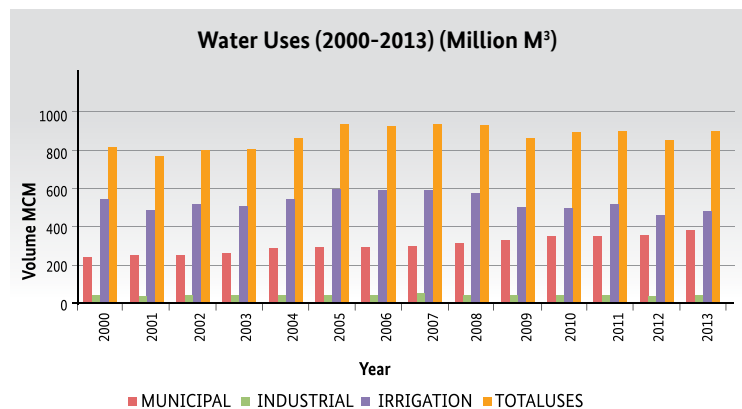
**Water Uses 2013 (MCM)**





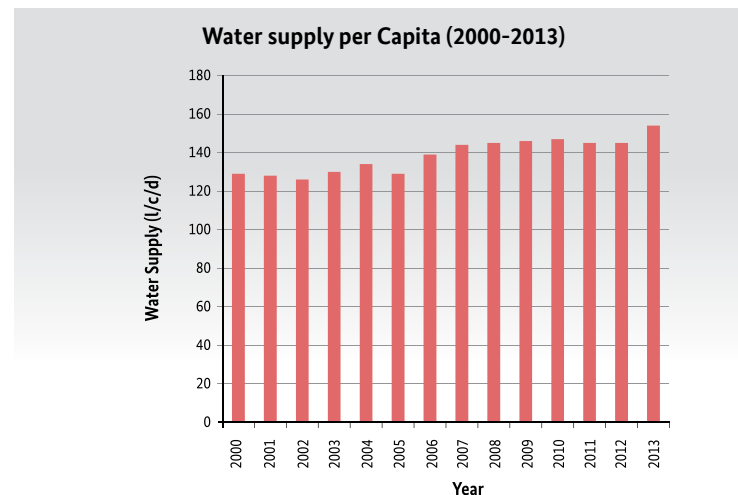
**Water Uses (2000-2013) (Million M<sup>3</sup>)**

Year	MUNICIPAL	INDUSTRIAL	IRRIGATION	TOTAL USES
2000	239	37	541	817
2001	246	33	487	766
2002	249	37	517	803
2003	262	36	506	804
2004	281	38	541	860
2005	291	38	603	932
2006	291	38	588	917
2007	294	49	589	932
2008	315	39	574	928
2009	326	37	500	863
2010	352	40	501	893
2011	347	37	515	899
2012	354	33	462	849
2013	381	39	481	902



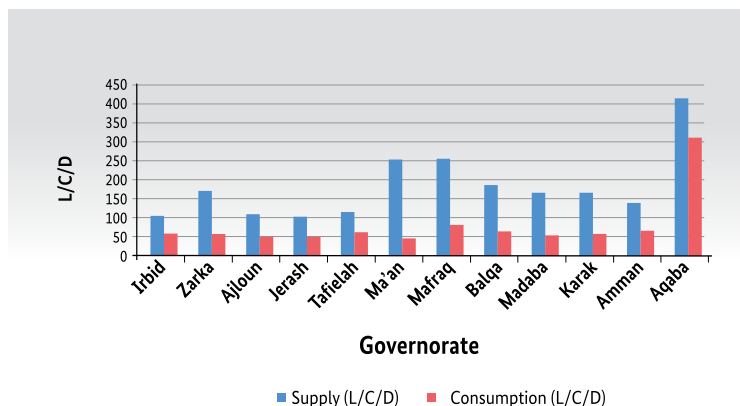
**Water supply per Capita (2000-2013)**

Year	water supply (l/c/d)
2000	129
2001	128
2002	126
2003	130
2004	134
2005	129
2006	139
2007	144
2008	145
2009	146
2010	147
2011	145
2012	145
2013	154



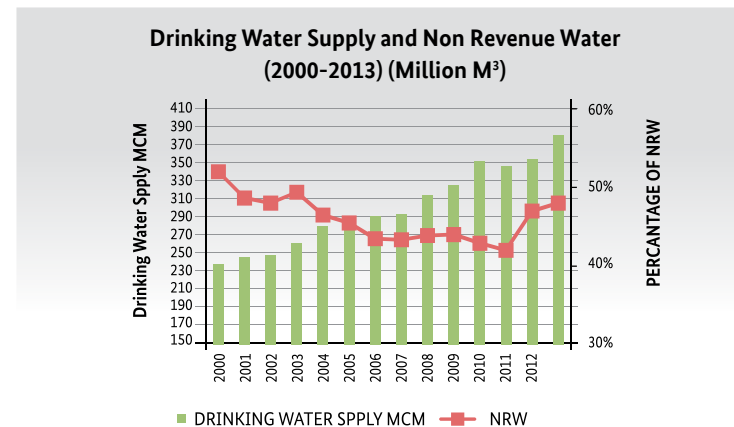
**Water Supply and Consumption per Governorate 2013**

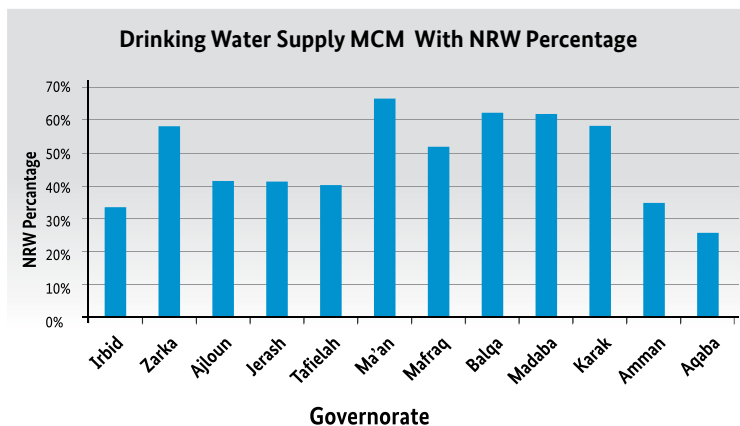
Governorate	Supply (L/C/D)	Consumption (L/C/D)	NRW
Irbid	120	77	33.59%
Zarqa	185	75	58.17%
Ajloun	124	73	41.56%
Jerash	118	69	41.35%
Tafielah	130	78	40.30%
Ma'an	268	89	66.59%
Mafraq	270	90	51.960%
Balqa	201	76	62.27%
Madaba	181	69	61.93%
Karak	180	75	58.31%
Amman	154	91	34.91%
Aqaba	429	326	25.81%



**Drinking Water Supply and Non Revenue Water (2000-2013) (Million M³)**

Year	NRW	Drinking Water Supply MCM
2000	52.00%	239
2001	48.65%	246
2002	48.00%	249
2003	49.39%	262
2004	46.48%	281
2005	45.48%	291
2006	43.47%	291
2007	43.34%	294
2008	43.88%	315
2009	44.00%	326
2010	42.90%	352
2011	42.00%	347
2012	47.00%	354
2013	48.00%	381





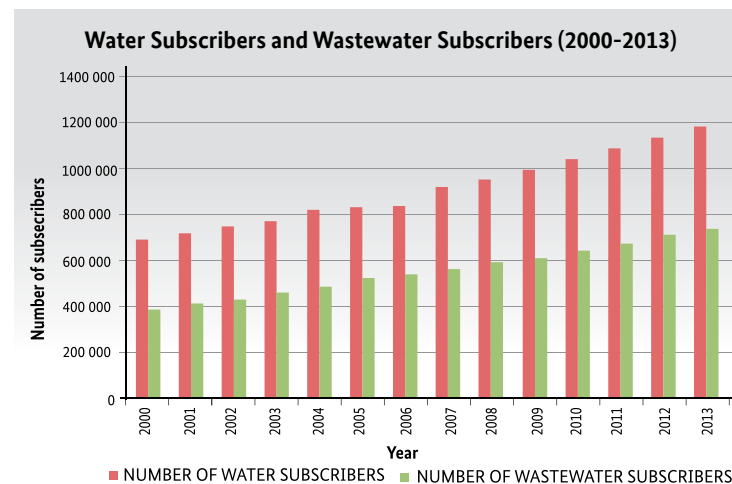
### Non-Revenue Water for Different Governorate

#### Number of Illegal wells closed

Year	Number of wells
before 2007	235
2007	26
2008	45
2009	46
2010	57
2011	29
2012	19
2013	141

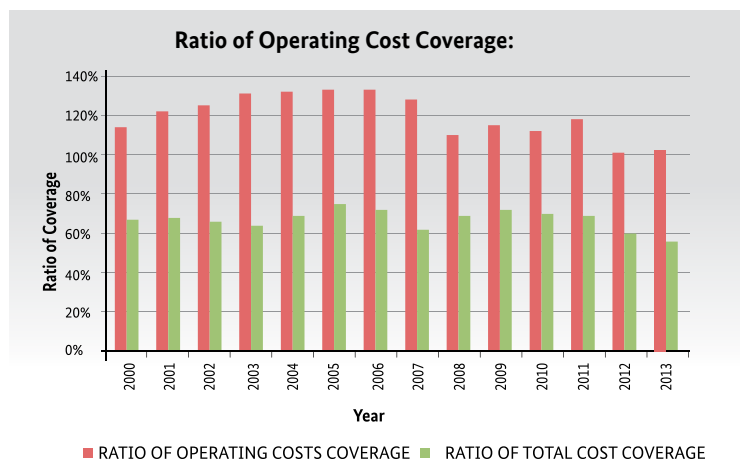
### Water Subscribers and Wastewater Subscribers (2000-2013)

Year	Number of Water Subscribers	Number of Wastewater Subscribers
2000	695906	389347
2001	722775	415172
2002	752983	432742
2003	776257	463700
2004	826217	489316
2005	837626	527578
2006	842805	543596
2007	925708	565948
2008	959118	596503
2009	1001217	613826
2010	1048207	646519
2011	1095191	677961
2012	1142457	716671
2013	1190831	742763



## Ratio of operating costs coverage and ratio of total cost coverage (2000-2013)

Year	Ratio of operating costs coverage	Ratio of total cost coverage
2000	114%	67%
2001	122%	68%
2002	125%	66%
2003	131%	64%
2004	132%	69%
2005	133%	75%
2006	133%	72%
2007	128%	62%
2008	110%	69%
2009	115%	72%
2010	112%	70%
2011	118%	69%
2012	101%	60%
2013	102%	56%

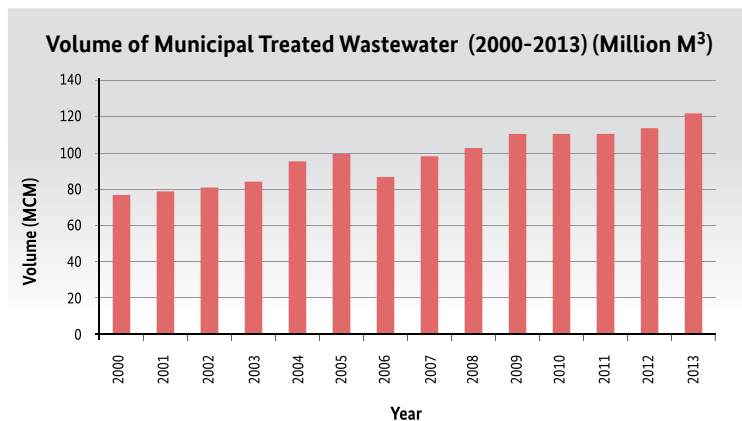


## Wastewater Treatment Plants 2013

WWTP NAME	TECHNOLOGY	Service Governorate	Design Capacity
Aqaba - Natural	Waste Stab Ponds	Aqaba	9000
Aqaba - Mechanical	Extended Areration	Aqaba	12000
Baqa	Trickling Filter (TF)	Amman, Balqa	14900
Fuheis	Activated Sludge	Amman, Balqa	2400
Irbid - Central	TF & Activ Sludge	Irbid	11023
Jerash-East	Oxidation Ditch	Jerash	9000
Karak	Trickling Filter (TF)	Karak	5500
Kufranja	Trickling Filter (TF)	Ajloun	9000
Madaba	Activated Sludge	Madaba	7600
Mafraq	Waste Stab Ponds	Mafraq	6050
Ma'an	Extended Areration	Ma'an	5772
Abu Nuseir	Active Sludge R,B,C	Amman	4000
Ramtha	Activated Sludge	Irbid	7400
Sult	Extended Areration	Balqa	7700
Tafila	Trickling Filter (TF)	Tafila	7500
Wai Al Arab	Extended Areration	Irbid	21000
Wadi Hassan	Oxidation Ditch	Irbid	1600
Wadi Mousa	Extended Areration	Ma'an	3400
Wadisseeer	Aeration Lagoon	Amman	4000
Alekeder-Tankers	Waste Stab Ponds	Mafraq	4000
Lajjon-Tankers	Waste Stab Ponds	Karak	1200
Tal AlMantah-Tankers	TF & Activ Sludge	Balqa	400
Al Jiza	Activated Sludge	Amman	4500
Samra	Activated Sludge	Amman, Zarqa	364000
Al Merad	Activated Sludge	Jerash	9000
Shobak - Tankers	Waste Stab Ponds	Ma'an	350
Mansorah - Tankers	Waste Stab Ponds	Ma'an	50
South Amman		Amman	52000
Mu'tah and Adnaniyyah		Karak	7060
Shallaleh		Irbid	13700
Shouna Shamaliyyah		Irbid	1200

**Volume of Municipal Treated Wastewater (2000-2013) (Million M<sup>3</sup>)**

Year	Treated Wastewater (MCM)
2000	77
2001	79
2002	81
2003	84
2004	95
2005	99
2006	86
2007	98
2008	102
2009	110
2010	110
2011	110
2012	113
2013	121



**Jordan Valley Dams/ Excavation in Jordan (Storage Capacity)**

Dam/ Excavation	Number	Storage Capacity (MCM)
Dam under implementation	1	6.00
Dams Tendered	2	0.14
Excavation tendered	9	0.70
Excavation under implementation	15	1.45
implemented Desert Dams	24	83.06
implemented Desert Dams in cooperation with Ministry of Agriculture	29	2.82
implemented Excavation	65	0.30
implemented Excavation in cooperation with Ministry of Environment	139	16.73
Implemented Dams in cooperation with Pepsi Company	1	0.23
<b>Total</b>	<b>285</b>	<b>111.43</b>

**Water Efficiency in the Irrigation Distribution Networks**

Efficiency	Percentage %
Distribution efficiency 2012	93
Distribution efficiency 2013	87
Selling efficiency 2012	91
Selling efficiency 2013	89

**Jordan Valley Dams in Jordan (Storage Capacity)**

Dam	Capacity (MCM)
Wehdeh	110
Wadi Arab	16.8
Zeqlab	3.9
King Talal	75
Karameh	55
Wadi Shueib	1.43
Kafrain	8.5
Wala	7.1
Mujeb	29.8
Tanour	16.8
Alwhady	1.7
Shaitham	0.3

### Water Quality

#### Number of tests and samples conducted for drinking water

Year	Samples	Tests
2003	10243	59407
2004	9549	53527
2005	8520	49454
2006	7855	44801
2007	7967	45528
2008	7512	42899
2009	9103	59923
2010	9150	60122
2011	8456	54122
2012	7732	50915
2013	6709	42218

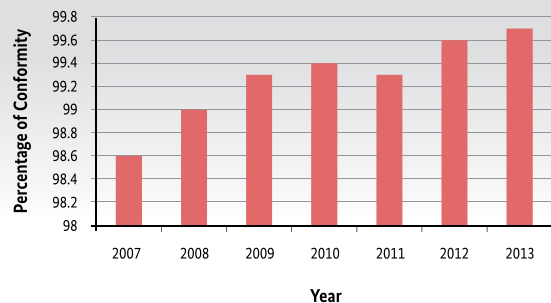
#### Samples of Drinking Water conforming to Jordan Quality Standards

year	Percentage of the conforming
2007	98.6
2008	99
2009	99.3
2010	99.4
2011	99.3
2012	99.6
2013	99.7

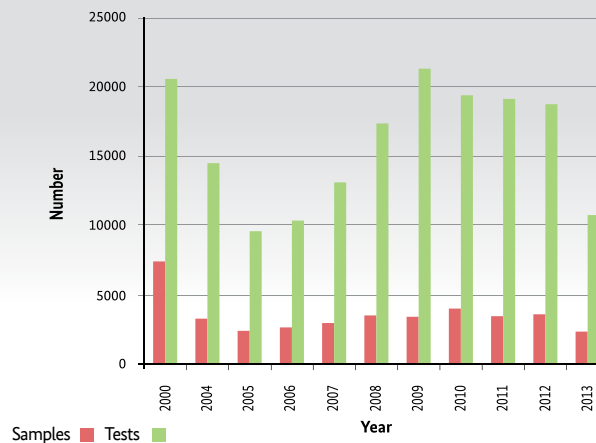
#### Number of tests and samples conducted for wastewater

Year	Samples	Tests
2003	7396	20562
2004	3262	14483
2005	2392	9580
2006	2628	10348
2007	2952	13101
2008	3494	17359
2009	3404	21312
2010	3988	19392
2011	3444	19124
2012	3586	18738
2013	2339	10749

#### Samples of Drinking Water conforming to Jordan Quality Standards

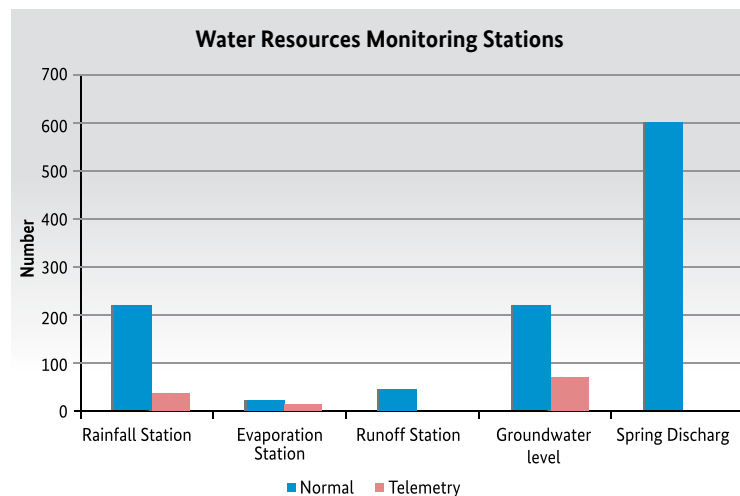


#### Wastewater- Number of Samples and Tests



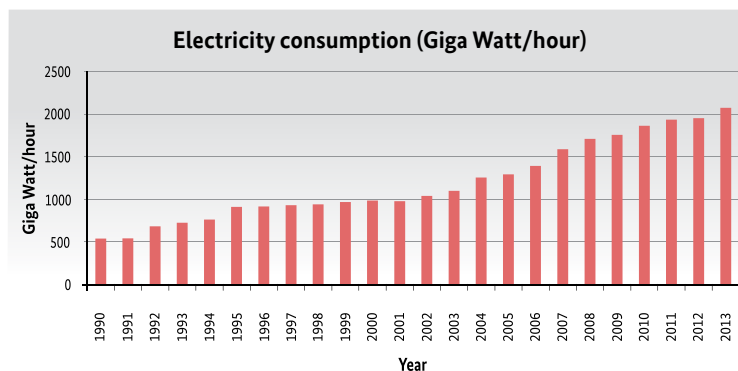
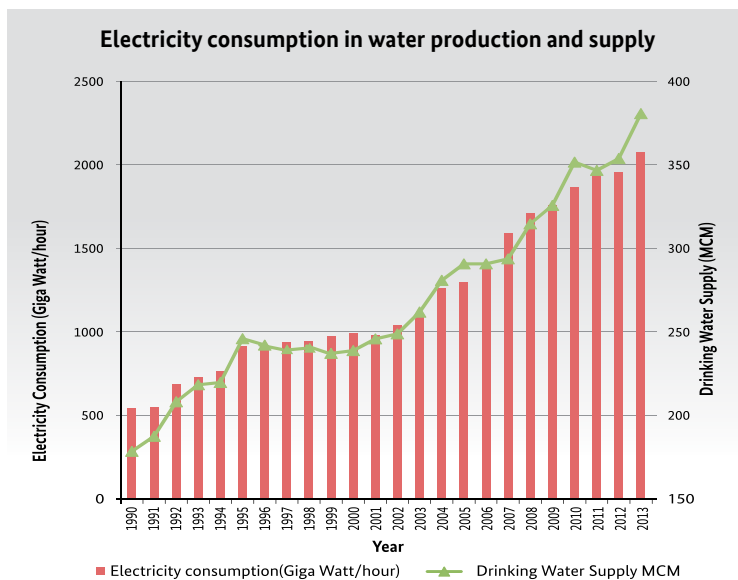
### Water Resources Monitoring Stations

Monitoring Station	Normal	Telemetric	Total
Rainfall Station	221	37	258
Evaporation Station	21	18	39
Runoff Station	47	3	50
Groundwater level	153	71	224
Spring Discharge	600	0	600



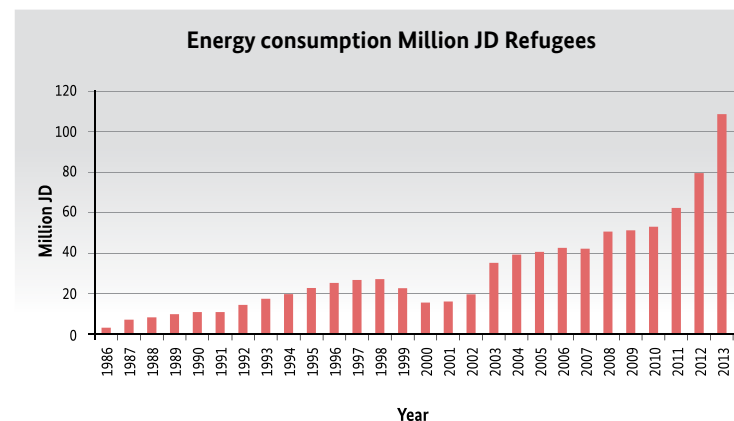
### Electricity consumption in water production and supply

Year	Electricity consumption (Giga Watt/hour)	Drinking Water Supply MCM
1990	545	178.6
1991	548	187.6
1992	688	208.2
1993	730	218.5
1994	768	219.9
1995	916	246.1
1996	921	242.3
1997	936	240.0
1998	945	241.0
1999	972	237.4
2000	990	239.0
2001	982	246.0
2002	1044	249.0
2003	1104	262.0
2004	1261	281.0
2005	1298	291.0
2006	1396	291.0
2007	1592	294.0
2008	1713	315.0
2009	1761	326.0
2010	1867	352.0
2011	1939	347.0
2012	1955	354.0
2013	2076	381.0



### Energy Consumption Cost (Water Sector) JD

Year	Energy consumption Million JD	Year	Energy consumption Million JD
1986	3.249	2000	15.650
1987	7.226	2001	16.115
1988	8.319	2002	19.649
1989	9.898	2003	35.220
1990	10.909	2004	39.252
1991	10.984	2005	40.669
1992	14.514	2006	42.570
1993	17.496	2007	42.143
1994	19.799	2008	50.643
1995	22.841	2009	51.209
1996	25.332	2010	53.013
1997	26.803	2011	62.293
1998	27.201	2012	79.434
1999	22.673	2013	108.558





### Cost of Hosting Syrian Refugees

Financial Costs (JD)	Cost per refugee	Yearly Cost for refugees in Host Communities 2014	Yearly Cost for estimated refugees 2015
Capital cost (Water and Wastewater)	174.55	96,438,875	100,889,900
O & M (Water and Wastewater)	59.13	32,669,325	34,177,140
<b>TOTAL</b>	<b>233.68</b>	<b>129,108,200</b>	<b>135,067,040</b>

Economic costs 2014	Cost Per refugee	Yearly Cost for refugees in H.C. 2014	Yearly Cost for estimated refugees 2015
Over-pumping	59.13	32,669,325	34,177,140
Crisis management	29.21	16,138,525	16,883,380
Opportunity	175.2	96,798,000	101,265,600
<b>TOTAL</b>	<b>263.54</b>	<b>145,605,850</b>	<b>152,326,120</b>

### Cost of Syrian Refugees Living in Host Communities

	Yearly Cost for refugees in H.C. 2014	Yearly Cost for estimated refugees 2015	Per refugee
Financial cost (JD)	129,108,200	135,067,040	233.68
Economic cost (JD)	145,605,850	152,326,120	263.54
<b>TOTAL</b>	<b>274,714,050</b>	<b>287,393,160</b>	<b>497.22</b>

- Estimated Numbers of Syrian Refugees 650000 a for 2014 (15% in camps, %85 in Host Communities; and **680.000 for 2015 according to MoPIC**

### Facts

- Jordan is composed of 15 Surface water Basins and 12 Ground water Basins
- The number of working wells in Jordan exceeds 3000 wells.
- Quantity of renewable water resources available for different purposes is around 750 MCM.
- The safe yield quantity available from renewable groundwater is 275 MCM.
- The safe yield abstraction quantity from non-renewable groundwater for (50) years is about 143 MCM.
- Quantity of over pumping from renewable groundwater is about 160 MCM.
- The drawdown from static water level between 1-2 m yearly.
- The quantity of water supplies for different purposes is about 900 MCM.
- The quantity of Water demand about 1200 MCM for all sectors.
- Per capita water supply for all uses is less than 15% in comparison to the international standards.
- Capacity of main Dams is about 330 MCM.
- Capacity of small dams and excavation about 100 MCM.
- Amount of treated Wastewater around 120 MCM.
- About 40% from water resources is trans-boundary water.
- The conformity of drinking water supply to the Jordanian standard about 98.5%.
- The water sector consumes about 14% from electricity produced in Jordan.
- The ratio of the Non Revenue Water stands at 43%.
- Each Syrian refugee cost the water sector around 500 JD/year.

