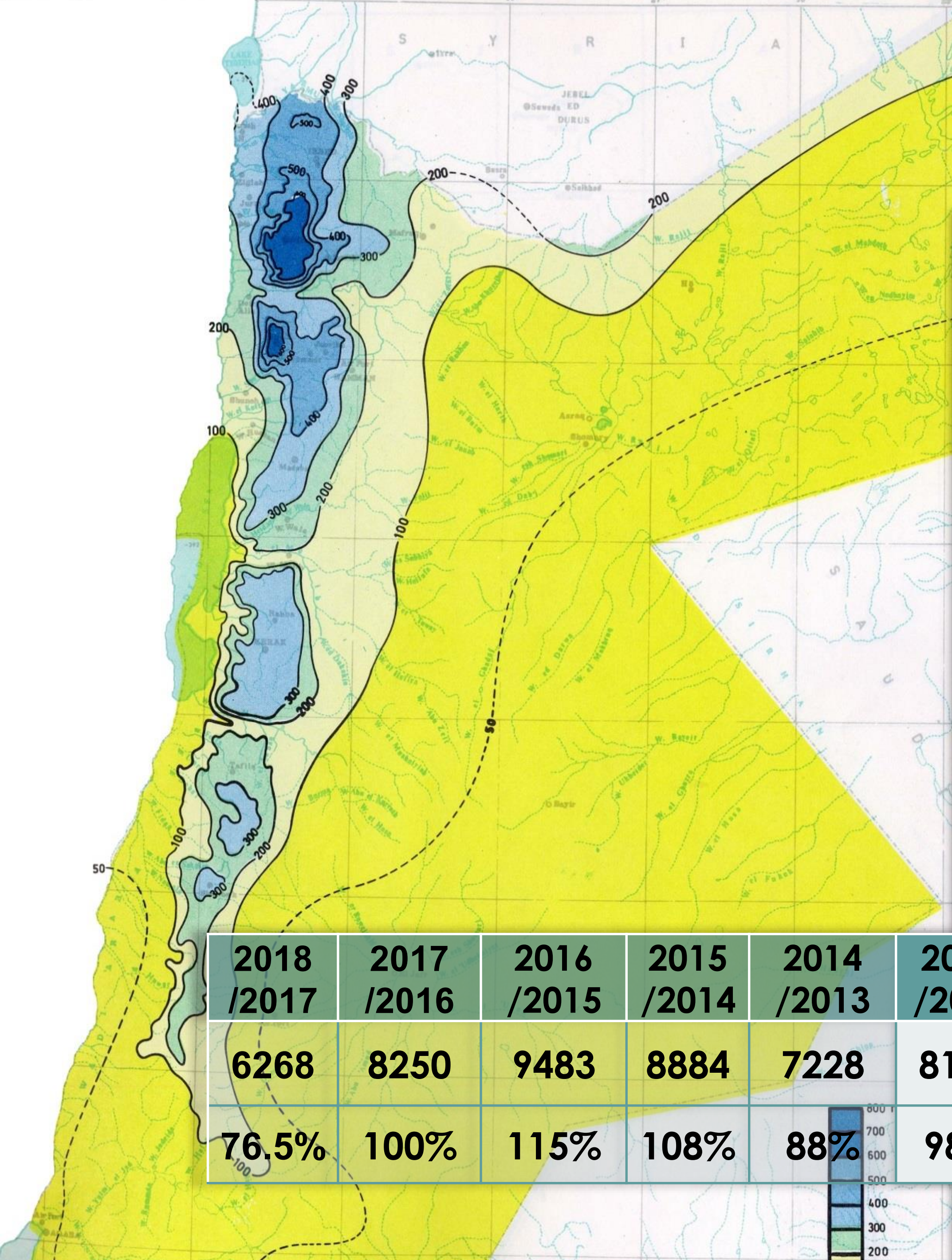
Water Sector in Jordan Current Situation, Challenges , Strategies, and Information Management

Available Water Resources

- Rainfall is the main source of water
- Surface Water
- Ground Water
  - Renewable resources
  - Non renewable resources
  - Brackish water
  - Deep aquifers

- - Treated Waste Water
- - Desalinated Water (Sea water)

Long term rainfall rates in Jordan (1937-2018)



- Jordan Valley

50 - 300 mm/yr (5.7%)

- Highlands

400 - 600 mm/yr (2.9%)

- Badia areas

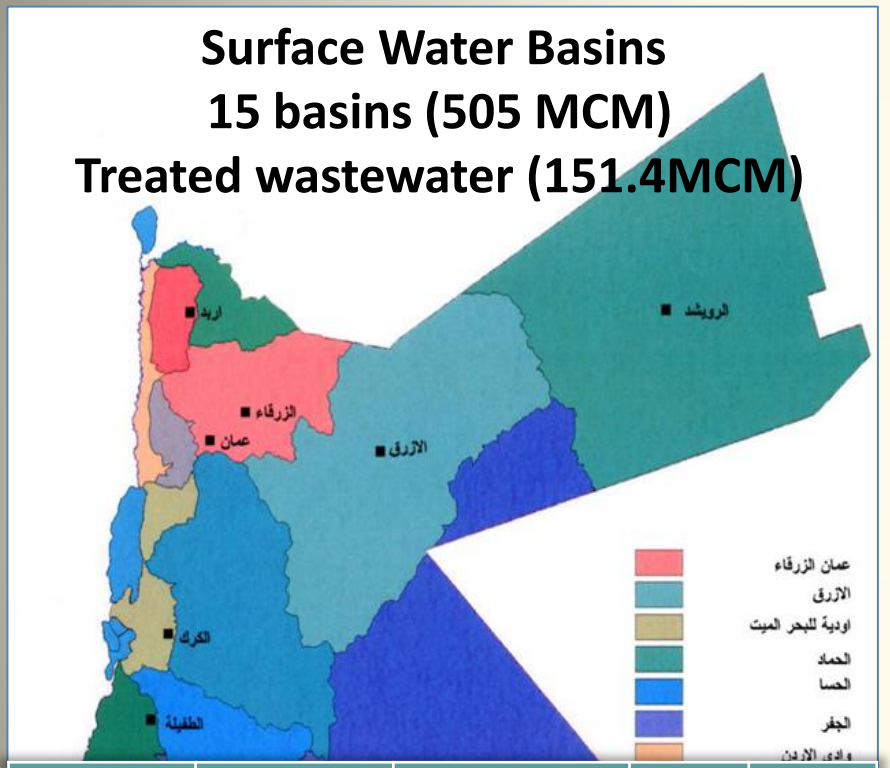
50 -200 mm/yr (91.4%)

Only 8% is utilized as surface and ground water

2018 /2017	2017 /2016	2016 /2015	2015 /2014	2014 /2013	2013 /2012	2012 /2011	2011 /2010	2010 /2009	2009 /2008	Year
6268	8250	9483	8884	7228	8120	5943	6477	8728	6379	Volume (MCM)
76.5%	100%	115%	108%	88%	98%	72%	79%	106%	77%	%

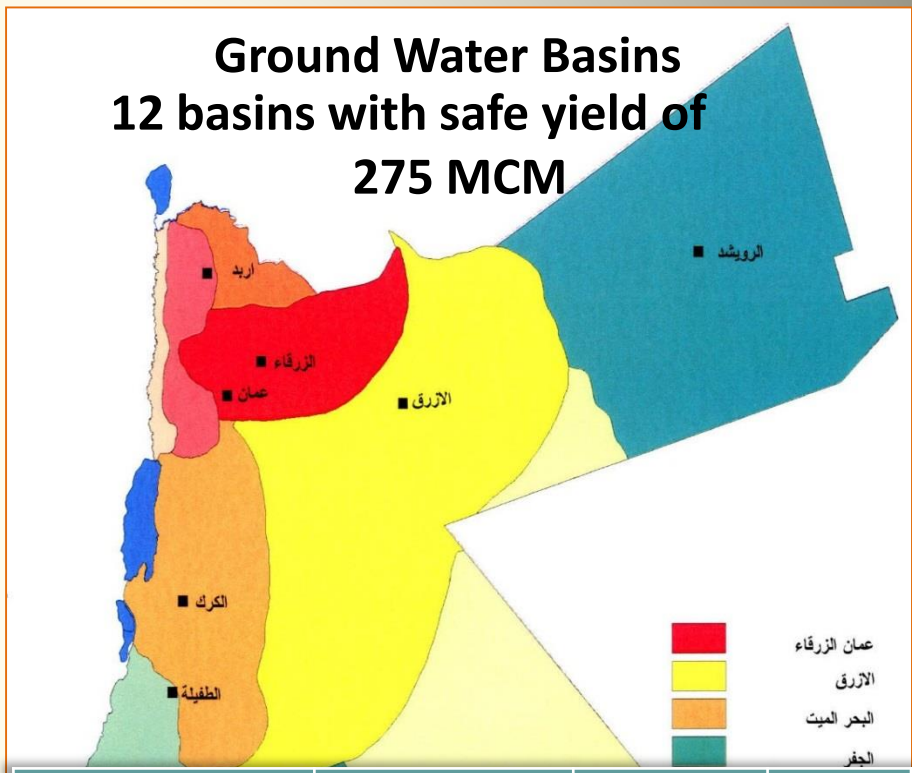
Available Water Resources

Surface Water Basins
15 basins (505 MCM)
Treated wastewater (151.4MCM)



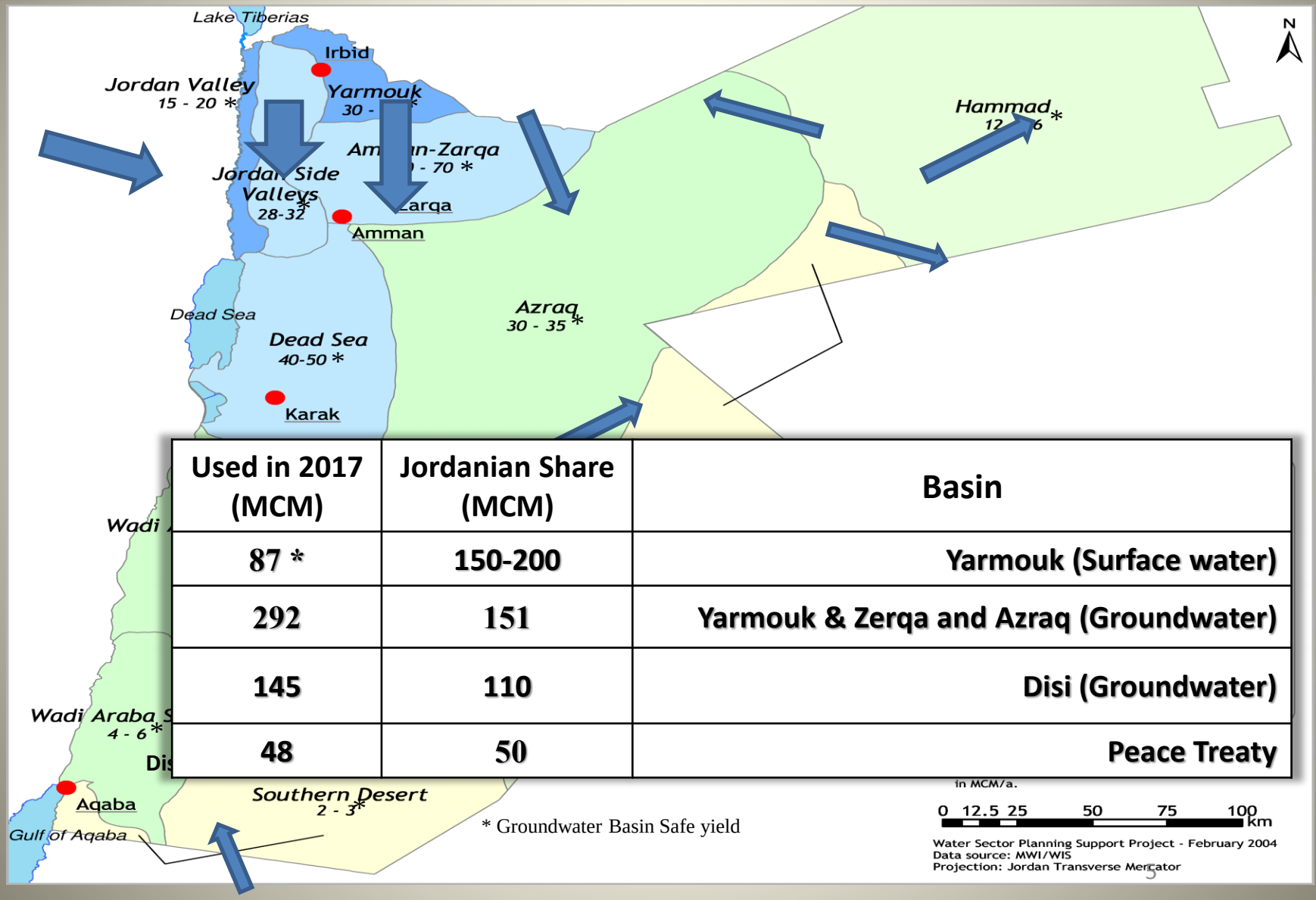
Source	Current (MCM)	Capacity (MCM)	No.	%
SW basins	376	505	15	74%
TWWP	164	220	33	90%
Dams	138	336	14	41%

Ground Water Basins
12 basins with safe yield of 275 MCM



Groundwater	Abstraction (MCM)	Safe Yield (MCM) م3	%
Renewable	275	470	171%
Non renewable	150	143	105%

Water Resources – Shared Resources



Used in 2017 (MCM)	Jordanian Share (MCM)	Basin
87 *	150-200	Yarmouk (Surface water)
292	151	Yarmouk & Zerqa and Azraq (Groundwater)
145	110	Disi (Groundwater)
48	50	Peace Treaty

* Groundwater Basin Safe yield

Water Resources – Transboundary cooperation

Shared water basins with neighboring countries are politically and technically regulated under agreements, where 40 percent of Jordan's water resources is shared water:

- **Jordanian Syrian Agreements**

Dealing with Surface water resources of Yarmouk river basin)

- **Jordanian Israeli Peace Treaty**

Dealing with all transboundary water resources

- **Jordanian Saudi Arabian agreement**

Dealing with Disi-Saq Groundwater aquifer management

Other Cooperation:

- **Red Sea Dead Sea Project (Jordan, Israel, Palestinian Authority)**

Desalination of Sea water in Gulf of Aqaba, transboundary allocation of desalinated water, power generation, rescue of Dead Sea

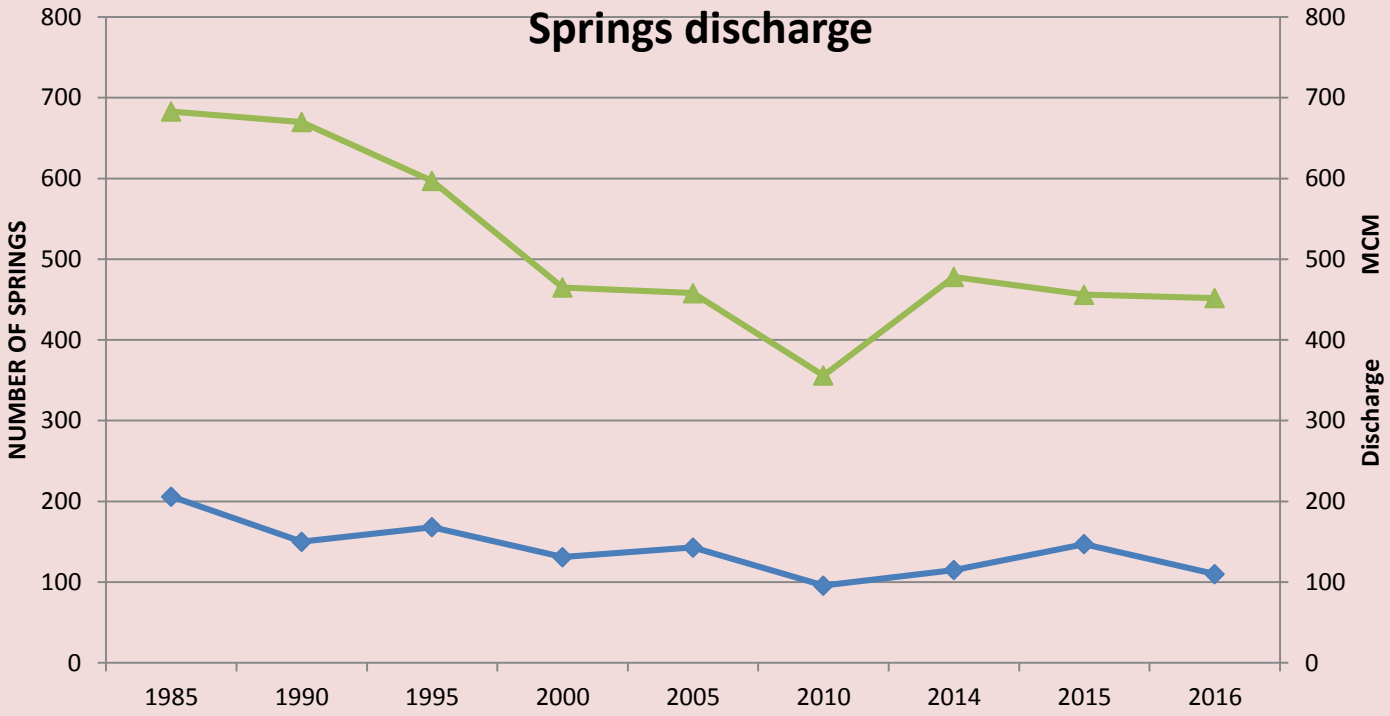
- **Other Regional Projects for Sharing Experience and Cooperation**

Water resources – Water Uses (2017) in MCM

Sector	Surface water	Renewable ground water	Non Renewable ground water	Treated Waste Water	Total	Percentage
Agriculture (government + private)	149.4	222	29.1	144.2	544.7	51.7%
Drinking (government + private)	131	225.9	112.5	0.0	469.4	44.5%
Industrial	2.4	22.3	4.9	2.5	32.1	3%
Rural	5	2.1	0.0	0.0	7.1	0.06%
Total	287.8	472.6	146.5	146.7	1053.6	
Percentage	27.3%	44.8%	13.9%	13.9%		

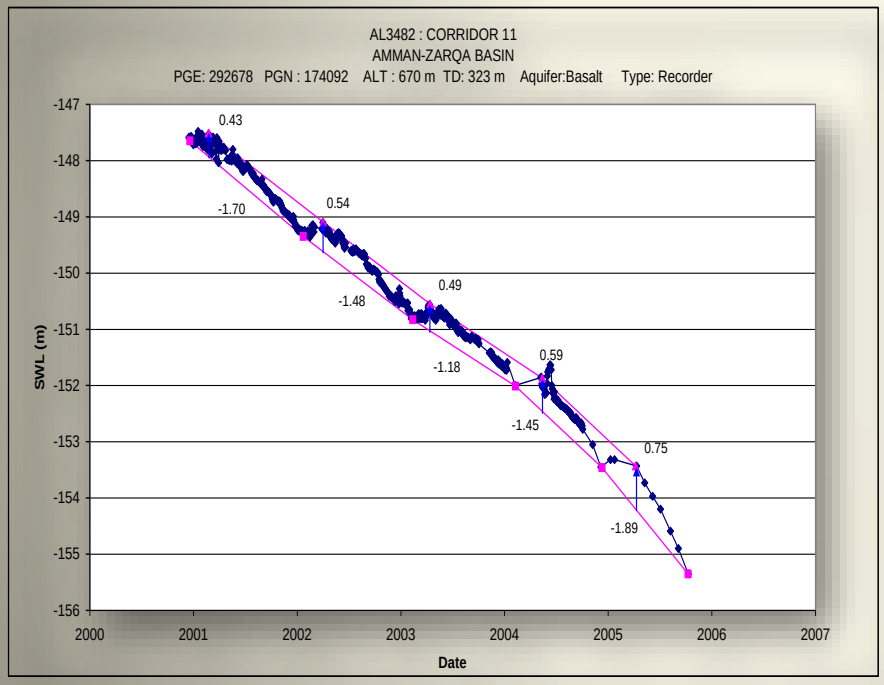
Water Resources – Springs Discharge

One third of Jordan springs have dried (> 250 springs)till 2016

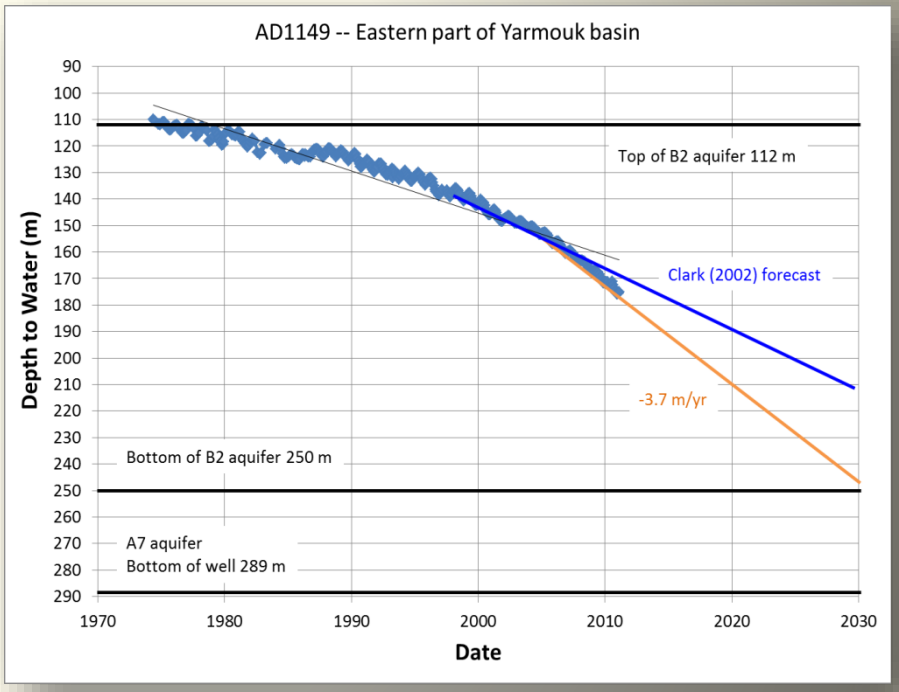


Water Resources

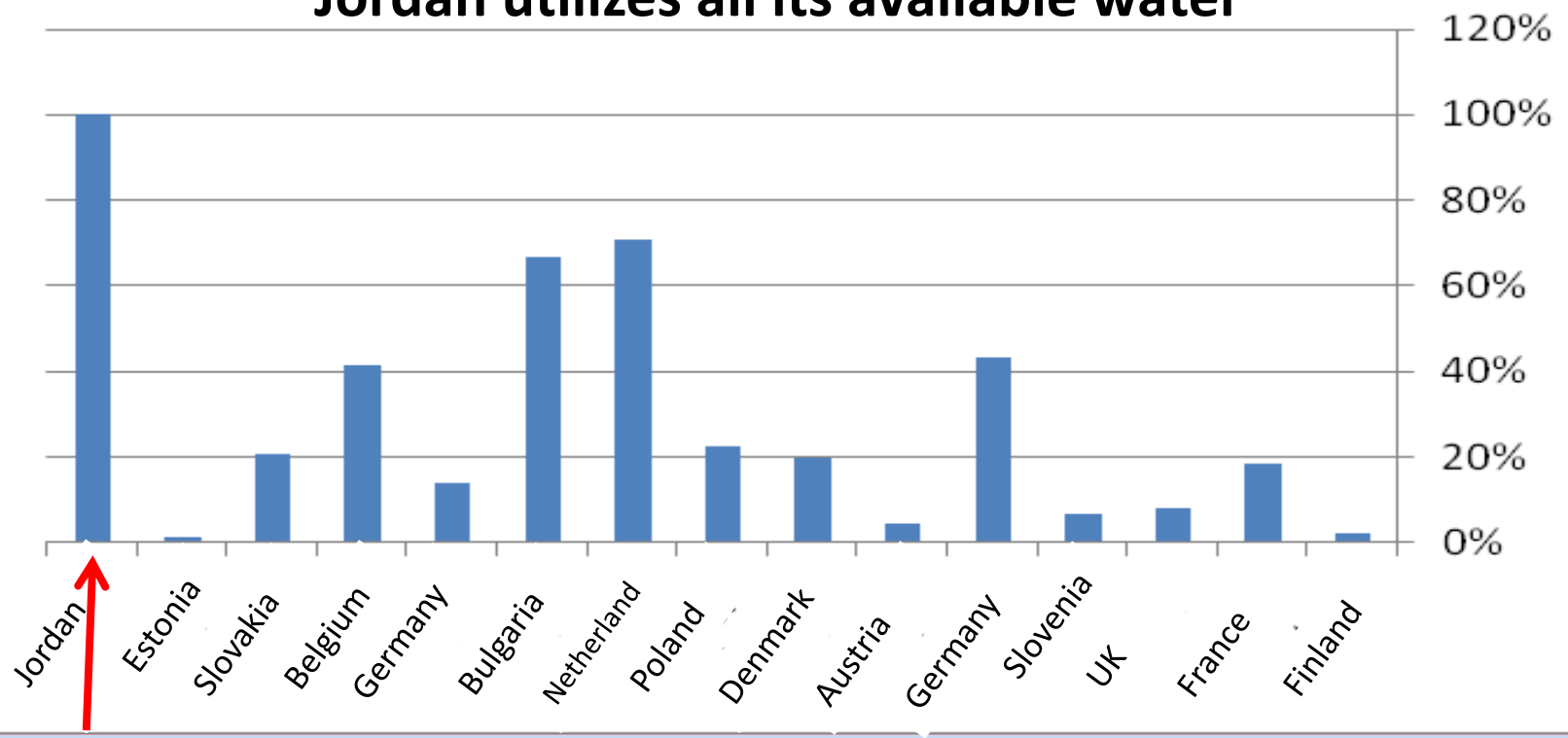
Water Level at the Corridor well No. 11



Water level at the eastern part of Yarmouk basin Well No. AD1149



Water Resources – Limited Resources



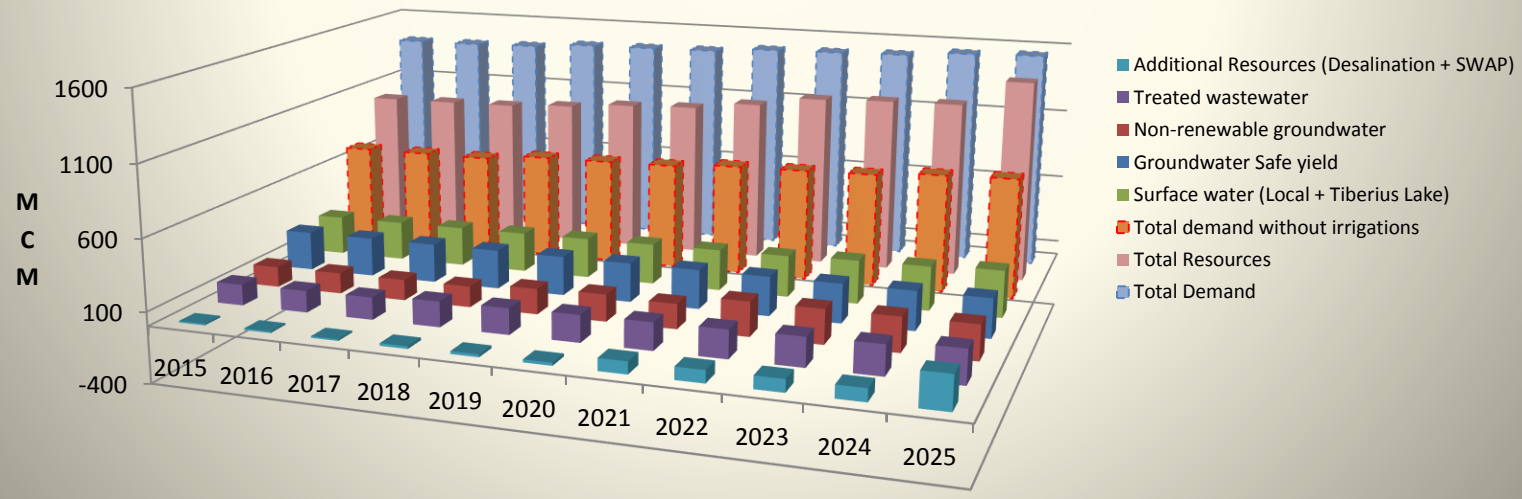
- **Per capita share of water for domestic use in Jordan ranges between 40 – 150 L/c/d depending on the governorate**
- **Annual share of water per capita for all uses is less than 90 m^3 that is less than 10% of the global water poverty line**

Challenges – Increasing Gap Between Supply and Demand

- **Limited renewable water resources and its continuous decrease:**
  - ❑ **The over abstraction of the strategic water storage and its impact on the quality and the quantity of the available water**
  - ❑ **Jordan is not receiving its shared water rights**
- **Unexpected demand growth due to the following reasons:**
  - ❑ **Population growth and the economic development**
  - ❑ **Syrian influx (1.4 million)**
  - ❑ **Unstable regional situation**
  - ❑ **Climate change (spatial and temporal rainfall distribution)**
- **Low annual per capita share of the water available for all uses to less than 10% of the global water poverty line.**

Challenges – Increasing Gap Between Supply and Demand

	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Groundwater Safe yield	275	275	275	275	275	275	275	275	275	275	275
Non-renewable groundwater	144	149	145	147	178	189	174	240	241	242	243
Groundwater Over Abstraction	160	195	156	148	144	140	136	131	127	122	118
Surface water (Local + Tiberius Lake)	274	289	278	280	283	286	290	293	306	311	329
Treated wastewater	147	151	155	177	182	188	191	196	202	208	235
Additional Resources (Desalination + SWAP)	10	8	11	18	19	20	85	86	87	88	233
Total Resources	1010	1067	1020	1045	1081	1098	1151	1221	1238	1246	1433
Sustainable Resources	832	872	836	886	920	942	1030	1106	1125	1131	1341
Municipal, Industrial, Touristic demands	701	703	703	717	723	730	737	746	755	766	778
Irrigation demand	700	700	700	700	700	700	700	700	700	700	700
Oil shale and Nuclear power demand				25	25	25	48	48	48	70	70
Total demand without irrigations	701	703	703	742	748	755	785	793	803	836	848
Total Demand	1401	1403	1412	1442	1448	1455	1485	1493	1503	1536	1548
Deficit in MCM/a (with over abstraction)	391	336	392	397	367	357	334	272	265	290	115



Water Resources and Projected Demand in (MCM/annual)

Challenges – Negative Impact of Water Deficit

- Social and Economic impacts: the inability to achieve the desired development rates from the development plans set by the government which will reflect negatively on the social and economic growth in the Kingdom.

- Impact on Investments: the sector inability to provide sufficient water quantity to meet the economic needs will lead to a decline in industrial, commercial, agricultural and tourism investments which will reflect negatively on the extensive efforts taken on the highest levels to attract these investments.

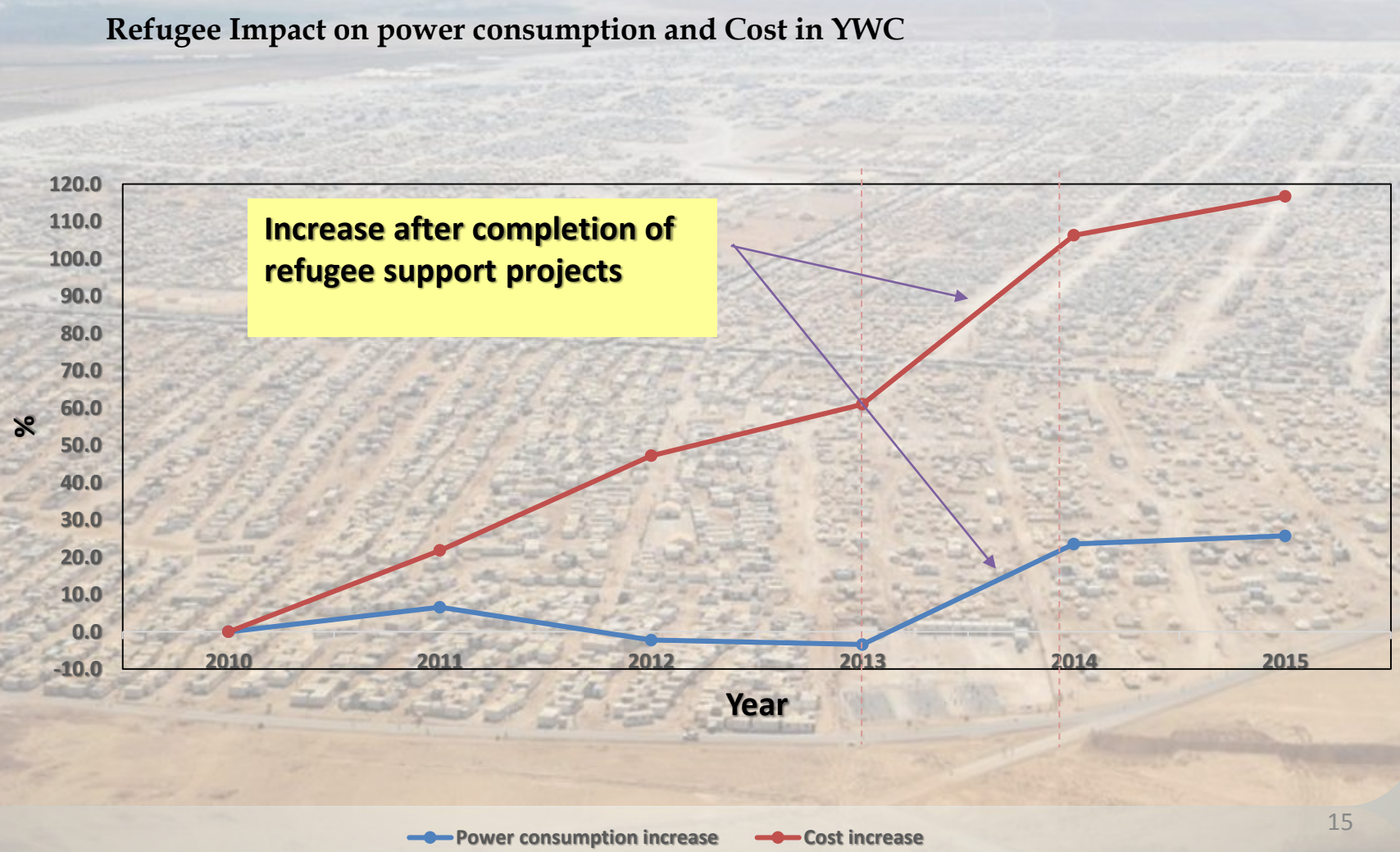
- These negative impacts limit the government ability to achieve the national goals of Jordan Vision 2025 and the Sustainable Development Goals (SDGs), the implementation of the aspirations, strategies and the plans set by all development sectors. Without the implementation of the strategic projects for water sector, the national development plans will be an unachievable vision which will reflect negatively on the social and economic security.

Challenges – Syrian Refugees Influx impact on the Water Sector

	Before Syrians Refugees	After Syrians Refugees
Water use for All purposes	899 MCM	1053MCM
Domestic Water Use	352 MCM	470MCM
Per capita share for all uses	147 m^3/capita/year	90 m^3/capita/year
Per Capita Share for domestic use	158 l/capita/year	130 l/capita/year
Domestic water demand in North Governorates	56 MCM	76 MCM
Non-Revenue Water	41%	51.5%
Percentage of Operational Cost Coverage	108%	84%

Challenges – Syrian Refugees Influx impact on the Water Sector

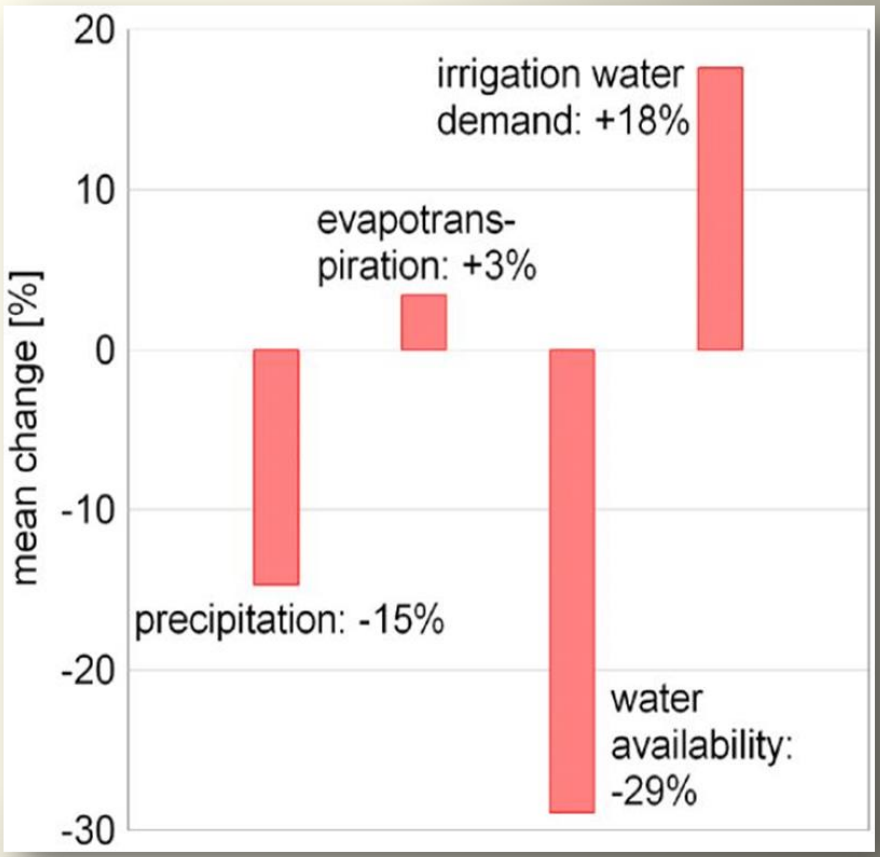
Energy Consumption – Yarmouk Company



Challenges – Climate Change Impact on Water Sector

Climate Change Impact on the Middle East (2031-2060)

- **Decrease annual rainfall rate by15%.**
- **Increase evaporation rate by 3%**
- **Decrease the available water resources by 29%**
- **Increase the agricultural water demand by 18% to maintain the existing crops**



Water Sector Strategy and Policies

The ministry is working on the development of policies and a clear strategy, in line with the vision of Jordan 2025 and the goals of sustainable development (SDGs). The policies and strategies were updated and approved by the Cabinet on February 2016

Water Strategy (2016)	Policies (2016)	Action Plans (2016)
National Strategy Water (2016 - 2025) The National Strategy for Water preparation (2016 - 2025), taking into account the lessons learned from the Water Strategy in Jordan (2008 - 2022) and the water strategy in Jordan and policies in 1997	Energy Efficiency and Renewable Energy	Capital Investment Plan (2016-2025)
	Surface water utilization	Executive Program (2016 -2018)
	Water Reallocation	Water Sector Losses Reduction Plan(2013)
	Groundwater sustainability	Water Sector Capacity building (2016)
	Management of Decentralized WWTP	Jordan Response Plan (JRP)
	Climate Change policy for A Resilient Water Sector	National Plan for operational and maintenance WWTP`s
	Water substitution	Communication and Media Plan
	Water demand management	

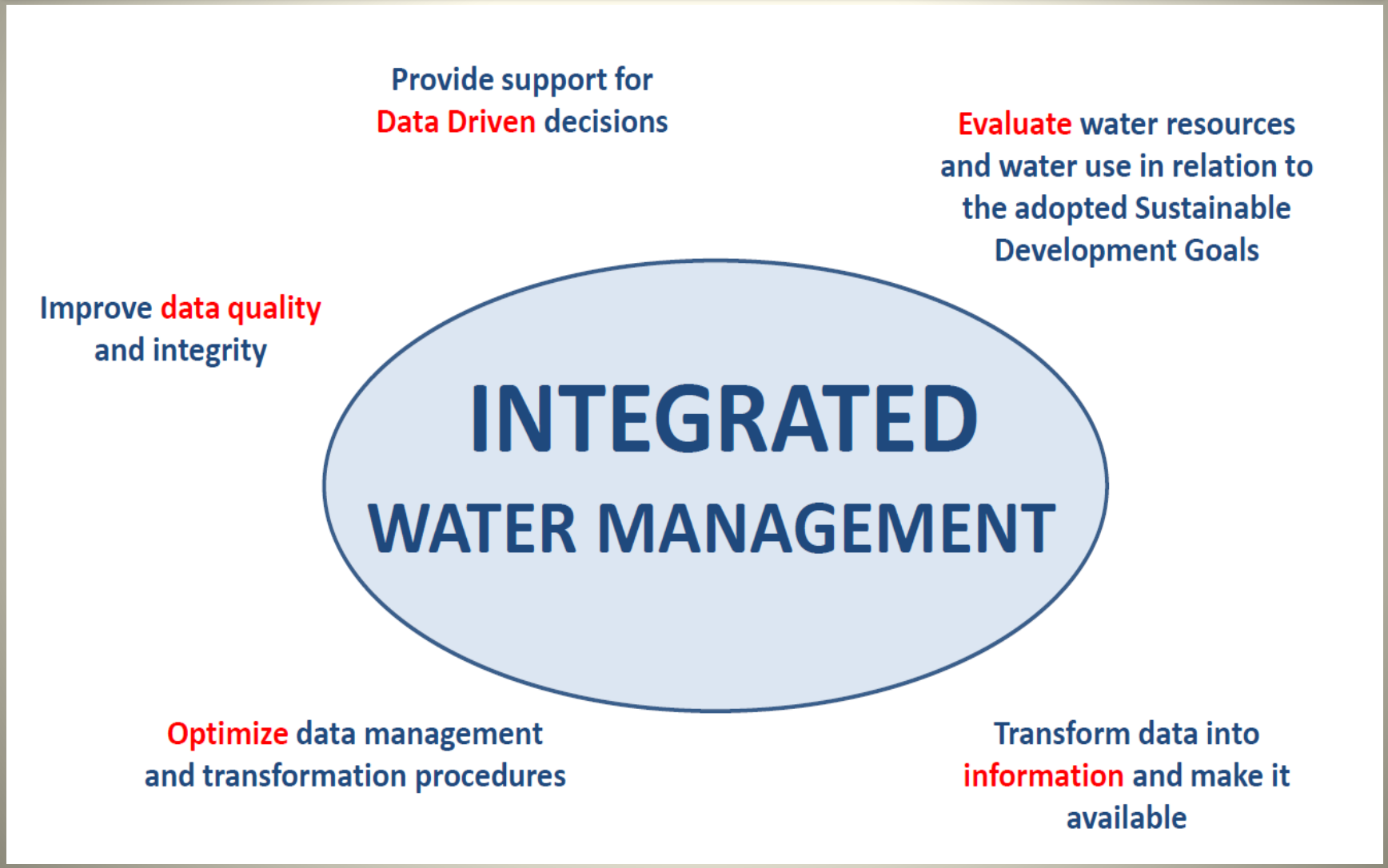
Fourth: Water Strategy and related Policies Water Sector KPI`s

	2014	2018	2021	2025
Percentage of Operation and Maintenance Coverage	70%	96%	101%	105%
Energy Used per M3 billed (KWh/M3/billed)	4.31	4.03	3.86	3.66
Percentage of Water service Coverage	94%	94%	95%	95%
Percentage of Wastewater service coverage	63%	69%	74%	80%
Water share Per capita (L/C/D)	61	71	86	105
Available water resources (M3/year)	832	886	1030	1341
Water share per capita for all uses (m3/year)	90	90	95	114
Dams Storage capacity	325	340	353	400
NRW	52%	45%	36%	30%
Percentage of over abstraction	160%	153%	149%	140%
Percentage of protected resources	35%	40%	50%	60%

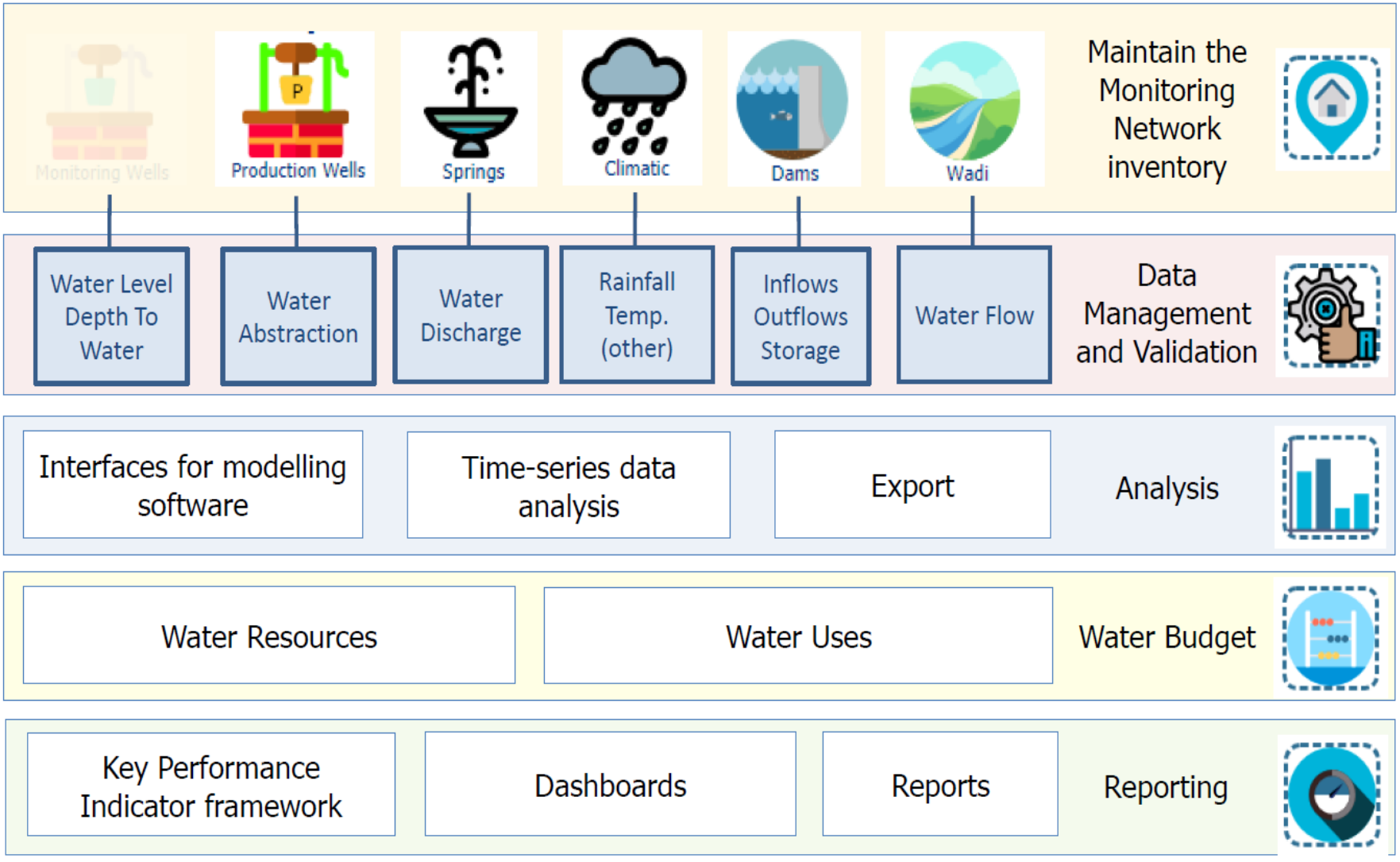
Results of SDG Goal 6 indicators

Indicator	Description	Value
6.1.1	Proportion of population using safely managed drinking water services	%94.3
6.2.1	Proportion of population using safely managed sanitation services, including a hand-washing facility with soap and water	%84
6.3.1	Proportion of wastewater safely treated	%60
6.3.2	Proportion of bodies of water with good ambient water quality	%79
6.4.1	Change in water-use efficiency over time,	%3.0-
6.4.2	Level of water stress: freshwater withdrawal as a proportion of available freshwater resources	%131
6.5.1	Degree of integrated water resources management implementation (0-100)	%63
6.5.2	Proportion of transboundary basin area with an operational arrangement for water cooperation	%21
6.6.1	Change in the extent of water-related ecosystems over time	%17
6.a.1	Amount of water and sanitation-related official development assistance that is part of a government-coordinated spending plan	%85
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	%17

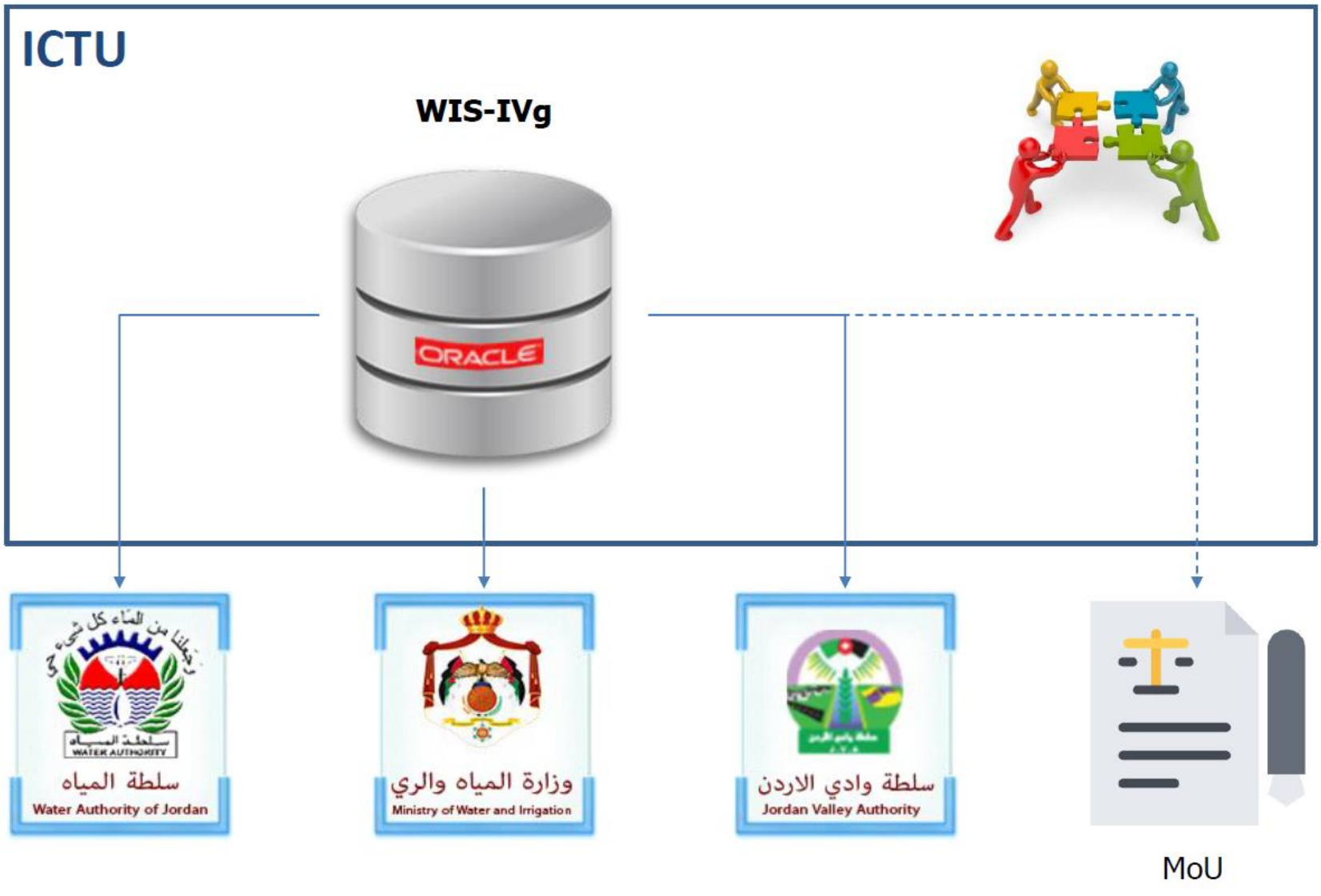
The National Water Information System



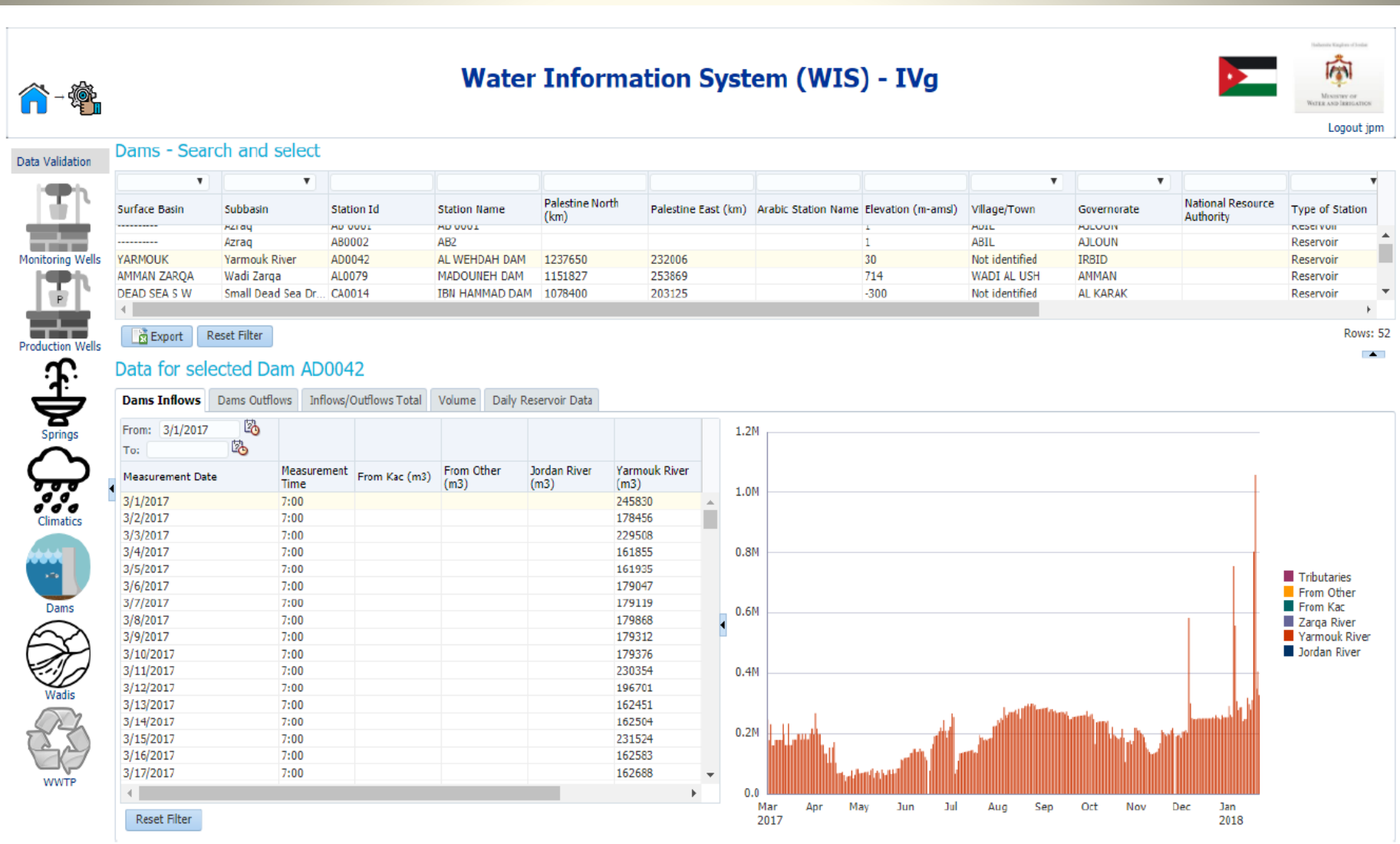
Components of the NWIS



Data Sources for the NWIS



Data Analysis and Validation



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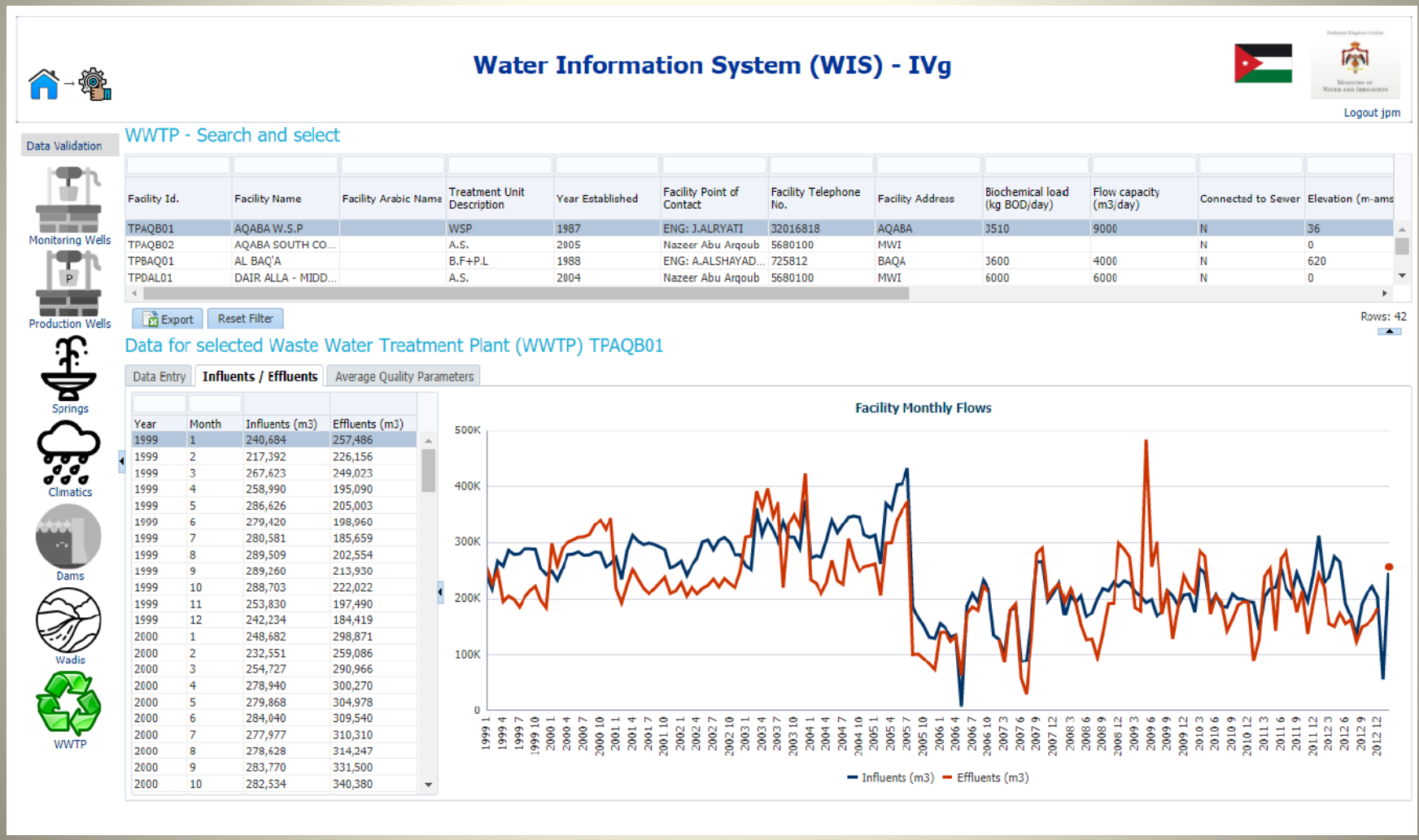


Thank You