



Water Resources Policy & Management in Jordan



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Introduction

- Jordan lies among the dry and semi dry climatic zones.
- The temperature below zero in the winter to around 46 °C in the summer season.
- Annual precipitation : 50 mm in the desert to 600 mm in the northwest highlands. 9% of Jordan's area receives more than 200 mm.
- 92.2% of the rainfall evaporates,
 - 5.4% recharges the groundwater.
 - 2.4% goes to the surface water.



Surfacewater Resources

- Surface water is developed through 15 surface water basins distributed all over the country.
- The long-term average surface flow is estimated at 710 MCM, while the average flood water is 255MCM.
- In year 2006, surface water was 505 MCM.
- Currently there are 26 dams in Jordan with a storage capacity of 254 MCM to harvest floodwater.



Groundwater Resources

- Groundwater is of two types, renewable and nonrenewable fossil water distributed among 12 basins. The safe yield is around 275 MCM.
- In 2006 abstraction was 415 MCM
 - 275 MCM was from renewable groundwater.
 - 140 MCM from fossil water.
- Continuation of groundwater overexploitation led to mining these sources as well as deteriorating the quality of abstracted water, which led at the end to an extensive damage of the aquifers.



Treated Wastewater

- Jordan has relied waste stabilization ponds to treat wastewater. These plants have been or are being replaced by mechanical treatment plants.
- Yearly around 86 MCM are used for irrigation and it will have an estimated combined treatment effluent usage of 207 MCM in the year 2020.
- For sustainable reuse of wastewater:
 - monitored industrial discharges.
 - divert high salinity wastewaters from sewer system.
 - adjusted Standards and regulations.



Available Water Resources

- In year 2006, the amount of water supplied was 1006 MCM.
 - 415 MCM came from groundwater
 - 505 MCM came from surface water
 - 86 MCM from treated wastewater
- Municipal uses 29%, Irrigation uses 66%, Industrial uses 5% of the total consumption.
- Water deficit for all uses is projected to be 437 MCM by the year 2020, comparing with 320 MCM in 2006.



Available Water Resources

- The problem of water shortage in Jordan has been exacerbated as a result of :
 - high natural population growth.
 - influxes of refugees and returnees to the country.
 - rural to urban migration.
 - increased modernization and higher standards of living.
- These show the necessity for adopting a long term water plan and future scenarios of water management that consider both demand management and non-conventional water resources.



Water Strategy in Jordan

- Stresses the need for improved water resources management with emphasis on the sustainability of present and future uses, and protection against pollution, quality degradation, and depletion.
- The highest practical efficiency in the conveyance, distribution, and use of water resources.
- Indicates that full potential of surface and groundwater shall be tapped to the extent permissible.



Water Strategy in Jordan

- Wastewater shall be treated to allow its reuse in unrestricted agriculture and non-domestic purposes, groundwater recharge, or blending with freshwater.
- Water with marginal quality, brackish, and seawater sources shall be enlisted for desalination.
- The general trend is to limit irrigation demand by use of new technologies and changes in crops that consume less water.



Water Policies

- Water Utility Policy (1997) .
- Irrigation Water Policy (1998).
- Groundwater Management Policy (1998) .
- Wastewater Management Policy (1998) .



Water Utility Policy

- The depletion of groundwater aquifers was assigned as the major problem facing Jordan's water sector.
- The legal and financial measures have to be implemented to gradually reduce groundwater withdrawals to the safe yield of aquifers.
- WW as a strategic water resource should be used in an environmentally sound manner. Industries encourage to recycle part of their WW and to treat the rest.
- Brackish water was considered to have the highest potential to augment the country's water resources.



Groundwater Management Policy

- The policy stated that water withdrawal from the 12 water basins is more than their safe yield.
- The over pumping ratio ranges from 146% in minor aquifers to 235% in major ones.
- The policy stresses the need to reduce the abstraction rate to the annual recharge.
- The policy recognized the importance of the Disi water for domestic use.



Groundwater Action Plan

- The action plan calls for greater private sector participation.
- The plan stresses the need to enhance enforcement measures, and to establish new agricultural tariffs.
- To reduce GW abstractions, summer crops shall be banned in drought years.
- Brackish water is planned to gradually substitute fresh water used for agriculture.



Groundwater Action Plan

- It is committed to setting municipal water tariffs at a level, which at a minimum will recover the costs of operation and maintenance.
- MWI will attempt to establish differential pricing for different qualities of water and end uses.



Groundwater Action Plan

- Efficiency of operation through employee reduction and training is essential.
- Public awareness campaigns were conducted as it is considered one of the main components for enhancing water conservation in Jordan.
- The Government intends to transfer infrastructure and services from the public to the private sector in order to improve performance and efficiency in the water sector.



Water Demand Management

- Despite the overexploitation of water resources, Jordan still has faced water shortages problems during the past few years in all water sectors, especially in the summer season.
- The solution to this problem has been through introducing a number of measures to reduce demand. These measures are:



Water Conservation

- Conservation in the domestic sector is practiced every summer through rationing program (water is pumped once/ week for 24 hours).
- The government has encouraged the use of water saving plumbing fixtures. Outdoor use for lawn watering or automobile washing using water hoses have been prohibited by law.
- The government has started a number of projects to replace the old water supply networks with new ones.



Water Conservation

- To reduce the amount of irrigation water, the irrigation system has been converted to pressure pipe network.
- Drip irrigation is the main irrigation method used in the Jordan Valley (70 %) and in the uplands (90%). Sprinkler irrigation is only about (10%).
- Shifting production to crops of low water consumption, and changing the irrigation practices are necessary.



Water Conservation

- Replacing fresh water with marginal water should be accompanied by changing crops to salinity-tolerant crops.
- Most large industries use water from their own groundwater wells.
- Recently the government imposed water use restrictions and pricing policies, together with wastewater quality requirements should motivate them to reduce their water use.



Water Pricing Policies

- The pricing of water should be designed to be fair; to ensure that water is allocated and used efficiently; and to recover the cost of delivery, operation, and maintenance.
- In water scarce regions, the price should be set equal to the marginal cost of supplying the last unit delivered.
- Water pricing policies has never been designed to reflect the true value of water. This has been caused by the high cost burden that consumers have to suffer if they pay the real cost of water.



Water Pricing Policies

- Water pricing policies have been put in place to reduce water consumption. For example,
 - Household consuming 100 m³/3 months would have to pay about 5.5 times the amount of money if only 50 m³ were consumed, and about 22 times the amount of money if only 20 m³ were consumed.



Water Pricing Policies

- This pricing policy has encouraged most consumers to consume only about 40–60 m³/household/3 months as a maximum.
- As for industrial and commercial users, these pay a higher rate per m³ regardless of their consumption (about 1.4 US Dollars/m³).

Thank You