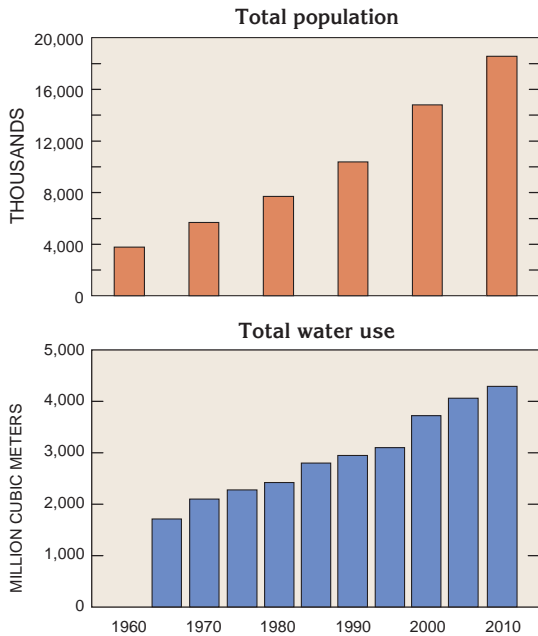


# Population and Water Supply: Growing Needs for a Limited Resource

The available supply of water varies areally and temporally; and is influenced by climate, available water-resources technology, and management practices. Water use will continue to increase with population and economic growth and will be further influenced by the modernization of agricultural practices, as well as governmental, socioeconomic, and developmental policies.



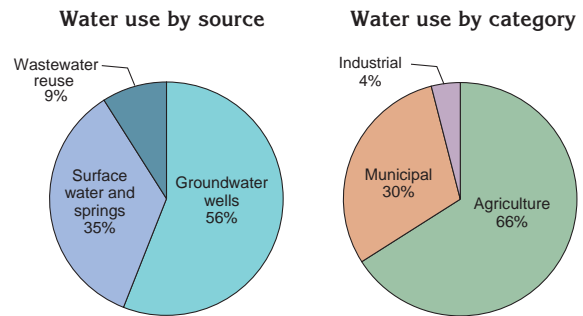
Water use will continue to increase with population and economic growth.

The supply of water is limited to that naturally renewed by the hydrologic cycle or artificially replenished by anthropogenic (human) activities. Periodically, the amount of natural replenishment can exceed water demands during unusually wet periods or fall far below demands during drought periods. The reality of growing needs for a limited resource is one of the factors driving water conservation efforts and considerations of alternate water sources.

Renewal of water resources depends on the overall amount of precipitation and is affected by temperature, evaporation and transpiration to plants (evapotranspiration), as well as rates of runoff and groundwater infiltration (recharge). On the western side of the Jordan Rift Valley, an average of approximately 30 percent (%) of the total precipitation that falls on the region is usable: 70% is lost through evapotranspiration, 5% is runoff, leaving 25% to recharge groundwater. On the eastern side of the Jordan Rift Valley, 90% of the total precipitation is lost to evapotranspiration, 5% is runoff, leaving only 5% for groundwater recharge. Of the 5% to 25% that infiltrates to groundwater, a portion eventually is discharged into streams or springs which then are classified as surface-water resources. The

remaining infiltrated water is stored in the groundwater reservoirs (aquifers) and potentially is available for withdrawal from wells.

Total water withdrawal in the region in 1994 was about 3,050 million cubic meters (MCM), of which 56% was withdrawn from wells, 35% from springs and surface-water sources, and 9% from wastewater reuse and artificially recharged water. The estimated total renewable water supply that is practically available in the region is about 2,400 million cubic meters per year (MCM/yr). There is then a water deficit in the region of about 375 MCM/yr that is being pumped from the aquifers without being replenished. Available water supply can be enhanced or expanded to a limited extent by desalination of brackish or sea water sources, leak reduction in infrastructure systems, water awareness and conservation where appropriate, dam construction and/or enlargement, and the increased use of treated wastewater.



Most of the region's water supply is pumped from groundwater; agriculture is the largest water user. Total withdrawals in 1994 were more than is naturally replenished in an average year.



Water distribution systems, such as the Israeli National Water Carrier and the Jordanian King Abdullah Canal, distribute water from areas of water surplus to areas of water deficiency. The northern end of the King Abdullah Canal, shown here, receives water diverted from the Yarmouk River via a 900-meter (m) long tunnel.