WATER RESOURCES POLICY AND MANAGEMENT IN JORDAN

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Abstract. Jordan water resources are very limited, among the lowest in the world on a per capita basis. Water demand at present exceeds the available renewable water resources which have been overexploited to bridge the gap. This gap is expected to widen in the future in all water sectors. This situation can not be maintained without endangering sustainable development. The adoption of a new strategy for water planning is therefore crucial. The strategy should focus on demand management and development of non-conventional water resources. The objective of this paper is to present the water situation in Jordan along with various components of water development and planning, and future water management scenarios.

Keywords: demand management; desalination; fossil water; Jordan Red-Dead Sea Canal; wastewater reuse; water conservation; water pricing.

1. Introduction

Jordan is about 90,000 km² in area, and lies among the dry and semi dry climatic zones which are characterized by their minimal rainfall and high percentage of evaporation. Its climate is a mix of Mediterranean and dry desert climate. The temperature varies from a few degrees below zero in the winter to around 46 degrees centigrade in the summer season. Annual precipitation ranges from 50 mm in the desert to 600 mm in the northwest highlands. Only

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nine percent of Jordan’s area receives more than 200 mm of the rainfall annually. Approximately 92.2% of the rainfall evaporates, 5.4% recharges the groundwater and the rest 2.4% goes to the surface water.

Recently, 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 in response to political situation in the Middle East area, rural to urban migration and increased modernization and higher standards of living. Consequently, Jordan is facing a future of very limited water resources among the lowest in the world on a per capita basis. Available water resources per capita are decreasing as a result of population growth, they are projected to decline from more than 160 m³ per capita per year for all uses at present to only 91 m³ per capita per year by 2025, putting Jordan in the category of having an absolute water shortage (Al-Halasah, 2003).

2. Available Water Resources and Water Demand

In the year 2000, the amount of water supplied was about 817 million cubic meters (MCM). Out of these 473 MCM came from groundwater, 272 MCM from surface water sources, and 72 MCM from treated wastewater (MWI, 2002a). Municipal uses represented around 29%, irrigation uses represented around 66%, and industrial uses represented around 5% of the total consumption (MWI 2000). Based on projections of available water amounts, the gap between supply and demand from all sources is increasing annually. Despite the huge investment in the water sector for the coming years, water deficit for all uses is projected to be 437 million m³ by the year 2020, comparing with 320 million m³ in 2000 (MWI, 2002a). These figures 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, in order to decrease the gap between supply and demand.

2.1. SURFACE WATER RESOURCES

About 91% of Jordan's area receives an average annual rainfall below 200 mm. Estimates of long-term records indicate that the average annual rainfall volume over the country is around 8360 MCM (World Bank, 2001). Surface water is developed through 14 surface water basins distributed all over the country. Surface water resources consist of base flow originating from the discharge of groundwater through springs. Floodwater resulting from rainfall in winter is the second category of surface water. The amount of flood water fluctuates from year to year, with an average of about 255 MCM. The long-term average surface flow is estimated at 710 MCM (JICA, 2001). Currently there are 26