Qatar has experienced rapid economic growth due to the discovery and production of fuel oil and natural gas (NG). The natural renewable water resources (rainfall and groundwater [GW]) are depleted; and are estimated as 71-m³/yr per capita in 2005. This is far below the water poverty line of 1,000-m³/yr. The GW withdrawal is excessive (compared to replenishment) and is used mainly for irrigation. A very small amount of GW is treated to become potable water and is distributed to consumers. The municipal potable water mainly contains (99%) desalted seawater (DW) and 1% GW. The consumption of DW and electric power (EP) is continuously rising due to the increase in both population and the standard of living. The population has been more than doubled from 2000 to 2010. The DW is produced in power plants generating both EP and DW, and is called Cogeneration Power Desalting Plants (CPDP). These CPDPs are using either: simple gas turbines (GT) cycle or GT combined with steam turbine (ST) to form a GT combined cycle (GTCC). A thermally driven multi-stage flash (MSF) desalting system is mainly used to desalt seawater. Large MSF units are operated in the CPDP to get their thermal energy (as steam) needs either from: (i) heat recovery steam generators coupled with GT or (ii) steam extracted or discharged from the ST of the GTCC. The CPDPs consume large amounts of fossil fuel (FF), mainly NG. The burning FF pollutes the environment by emitting the carbon dioxide (CO₂), carbon monoxides, and nitrogen oxides (NOx). The CO₂ and NOx are greenhouse gases causing global warming. Raising the efficiencies of EP and DW production can reduce their negative impact on the environment. The sustainability of water in Qatar is questionable: the extracted GW is several times its replenishment rate. The municipal water supply depends almost on desalting seawater by MSF, which is energy intensive and costly process. Deploying a more energy-efficient desalting system such as Seawater Reverse Osmosis system can save a lot of NG, the nation’s main source of income. The use of treated wastewater (TWW) is limited to some agriculture and landscaping. The ratio of TWW to municipal water supply is low, about 25%. It is also essential to promote conservation measures for both water and power. This paper reviews the water profile in Qatar and recommends solutions to solve the growing water scarcity in Qatar.

Keywords: Desalination; Wastewater treatment; Cogeneration power desalting plants; Multi-stage flash desalination; Seawater reverse osmosis desalting system

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