



Rooftop and Yards Rainwater Harvesting in Gaza Strip

Sami Hamdan

Palestinian Water Authority, Gaza, Occupied Palestinian Territory (shamdan02@yahoo.com)

Abstract

Groundwater is the only water resource that is used to serve the people in the Gaza Strip. The resource has been much exploited due to over abstraction to fulfill the increasing water demand that coincides with rapid population growth. The deteriorated water quality was reflected in the water services that are supplied in the public water supply system through local water utilities and municipalities. Natural recharge of rainfall is decreasing every year due to urban expansion and roads paving. Rain water harvesting became a must to harvest rain floods which evaporate or flood to the sea. These amounts could reach few million of cubic meters every year which can play an important role in the enhancement of groundwater system. The Gaza Strip has five governorates, North, Gaza, Middle, Khan Younis and Rafah. Using GIS, the areas of building in these governorates were found to be 4.57, 6.42, 2.73, 3.40 and 1.61 Km² respectively.

Many Storm water large projects have been constructed having large infiltration basins, so that water is artificially recharged to the aquifer. However, many of these projects were very costly and with less efficiency in replenishing the water resources. For example, in Gaza city a large lagoon called Sheikh Radwan lagoon with storage capacity of 300,000 m³ was constructed in the late eighties and modified in 1999 to absorb the rain flood of about 3.0 Mm³ every year, and then water should be infiltrated to the aquifer. Unfortunately this lagoon failed to be used as an infiltration system and it is now functioning as a retention basin so that storm collected storm water is pumped to the sea as a wasted water. Consequently, on site infiltration of rainwater are more practical, more economic and easily maintained. At the same time it does not need large infrastructures which are costly in both construction and operation.

The quality of the collected rooftop rainwater and urban storm water are generally good and close to the World Health Organization (WHO) guideline values for drinking water. The roof rainwater quality depends on the atmospheric conditions and roof types mainly. Most of the roofs of Gaza Strip are made from concrete and the same quality of flowing roof rainwater is expected to be the same if the roof cleaning measures were taken. The rooftop rainwater could carry some pollutants coming from aerosols, dust, roof materials, bird drops and others. The chemical analyses from a pilot roof in Gaza made as an experiment showed high water quality in the out flowing rain water. Moreover, the heavy metals in the analyses were acceptable.

Key words: water balance, water quality, rooftop and yard rainwater, on-site infiltration