Title:	**Developing Quantitative And Qualitative Relationships Of Wadi-Aquifer Interaction In The Semi-Arid Watershed Of Faria, Palestine**

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Abstract:

This paper aims to investigate the potential existence of wadi-aquifer interaction (i.e. transmission losses that are taking place in the wadi bed and their potential recharge to the aquifer) in the semi-arid region of Faria catchment. Faria catchment, 320 km2, located in the northeastern part of the West Bank. Surface runoff in the catchment consists mainly form springs discharge, runoff generated from winter storms, and untreated wastewater effluent from the eastern part of Nablus city and Al-Faria refugee camp. As such, wadi-aquifer interaction may exert serious pressures on groundwater quality and jeopardize further development in the catchment. Evidence of wadi-aquifer interaction is presented through quantitative analysis of rainfall records, wadi flows, and change in the water table levels in addition to quality analysis of groundwater wells. Quantitative analyses show that the water table level in a selected groundwater well next to the main wadi is significantly changed and spiked as a result of increasing rainfall and corresponding runoff in the wadi. This in turn provides good evidence that the hydrogeology allows wadi-aquifer interaction to take place in the catchment. Many quantitative measures are determined such as: travel time, hydraulic conductivity, and well's capture zone. In general, these measures showed that the soil layers in the region next to the main wadi have high flow conductance, and so there is a high probability for the flow to transmit from the wadi to the aquifer. Also, the well's capture zone was found to have a total width of 26.64 m which is considered to be relatively large enough to receive the pollutants infiltrated from the wadi bed. On the other hand, quality analyses show that some chemical and microbial pollutants were found in the sampled well. This can be attributed to untreated wastewater flows in the wadi which provide another evidence of wadi-aquifer interaction in the catchment. Those concentrations were found to have higher trends in summer than in winter due to the lack of diluting rainfall water in the dry season.

Keywords: *Faria catchment; Semi-arid, Wadi-aquifer interaction; Untreated wastewater effluent; and Hydrogeology*