

Soil water movement through vadose zone as influenced by a flooding event in Gareh Bygone (saturated phase)

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To assess the effects of artificial recharge of groundwater using turbid floodwater spreading, 3 wells were dug in a 28 year old recharge basin. Hydraulic properties of the vadose zone layers from the surface to the watertable (28.6 to 31.5 m) were determined. The wall of one well was isolated with concrete rings. The calibrated TDR sensors were placed through the rings at 0.03, 1.0 and 2.0 m intervals for the depths: 0-3, 3-10, and 10-28 m, respectively, with maximum care not to disturb the soil. Volumetric soil water content (SWC) was measured at 6-8 day interval from Aug. 2010 to Oct. 2012 before flood occurrence, twice daily after recharge events for 30 days, and daily thereafter for 60 days. The rainfall, flood volume and duration were also measured by a recording rain gauge and at a hydrometric station. The results show reliable and consistent readings of SWC for each soil layer before the recharge events. A stepwise increase in SWC of the layers occurred to a depth of 4 m. This indicated that infiltration took place despite 28 years of fine sediment accumulation in a recharge basin. It was further observed that 115 mm of rain, which generated 49 hours of flooding, contributed 450 mm of water to the vadose zone of the aquifer as the saturated phase. Moreover, calculations showed 65% of the floodwater diverted into the recharge basin infiltrated into the vadose zone. Unsaturated soil water movement is under investigation.

Biography

M. Pakparvar has earned his MS in soil and water conservation from Tehran University in 1994. He has started his Ph.D. in 2009 in Gent University, Belgium. His research activities have resulted in 5 international and 45 national published papers in reputed journals.

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