Abstract No: 194 ***Earth and Environmental Sciences***

STUDY OF GROUNDWATER RECHARGE IN MA-OYA MICRO CATCHMENT OF MAHAWELI RIVER

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Groundwater in an area is recharged in the following ways: natural lateral groundwater flows from outside, infiltrated rain water, streams, artificial sources and urban and rural wastewater. These factors of recharge are often considered theoretically. Therefore, this research was focused on the identification of groundwater recharge sources and quantification of fluctuations of the groundwater table in the Ma Oya, a tributary of the Mahaweli River in the central highlands. Depth to the groundwater table was monitored in 13 shallow domestic wells, situated in the regolith, and in a borehole that has been constructed in the lower reach of the catchment and in an alluvial formation. Rainfall data were obtained from three weather stations installed within the catchment. Groundwater level elevation was calculated by subtracting groundwater depth from the well head surface elevation. Temporal variation of recharge of each and every well was studied by comparing the water-level elevation with different conditions of cumulative rainfall, as one-day, one-week, two-weeks and one-month prior to the water depth measurement. Pearson Correlation Coefficient shows a strong positive relationship for water-level elevation and cumulative rainfall of two-weeks and one-month prior to the water depth measurement. This suggests that one-day rainfall has not significantly impacted the groundwater recharge. The study reveals that groundwater recharge has occurred over a period of one month and the response of the recharge is at a maximum during the period from one week to two weeks. This delay in recharge of aquifers could be attributed to the presence of a thick forest cover and low permeable, clay-rich thick regolith within the catchment. A strong positive relationship was found for water-level elevation in the borehole and the water-level in nearby stream during wet months when the stream water level increased. It could be concluded that the alluvial aquifer is recharged both by rainfall and stream water infiltration during the wet season, whereas the stream is recharged by the aquifer during the dry season with the change in the hydraulic gradient.

Financial assistance from the National Research Council (Grant No. 17-037) is acknowledged.

Keywords: Aquifer, Groundwater, Mahaweli, Recharge Sources