

GROUNDWATER RECHARGE PATTERNS IN ATTANAGALU OYA UPPER CATCHMENT BY STABLE ISOTOPES

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Stable isotope (¹⁸O & ²H) composition of surface water and groundwater were measured to interpret the recharge mechanism of groundwater in the *Attanagalu Oya* upper catchment during the less rainy period (March 2013) and well distributed rainy season (May 2013). Isotopic composition values of rain water were used to determine

the Local Meteoric Water Line (LMWL) - ($\delta H = 7.95\delta O + 12.24$). The δO and δH in surface water varied from -3.13 to -5.30 and -18.43 to -30.34‰ respectively in March.

These isotopic values are depleted in May in surface water (-4.74 for δO to -5.94 and -25.65 to -33.18 ‰ for δH). Shallow groundwater is characterized by lighter isotopes (δO , -4.20 to -5.67 and δH , -25.45 to -31.81 ‰), when compared with surface water in March. This was different in heavy rainy period in May; isotope values of shallow groundwater is lie on surface water (δO , -3.85 to -5.32 ‰ and δH , -34.36 to -21.29 ‰). Similar observation was shown in deep groundwater, δO and δH vary between - 4.33 to -5.55 ‰ and -27.15 to -33.31 ‰ in March and -4.56 to -5.44 ‰ and -25.67 to -36.04 ‰ in May. The groundwater was more depleted than the average rain water

values (δO and δH , -4.38 and -22.62 ‰) in study area during the study period and it indicates that the rain experiencing in the higher elevations of basin would recharge the groundwater through regional flow lines and the contribution of local rain is very less for the groundwater recharge. Contribution of stream water for the groundwater recharge is more significant in rainy season. Study reveals that long-term monitoring of isotope indices could facilitate precise assessment of the groundwater recharge mechanism. Electrical Conductivity of water samples also were measured and its downstream values higher than the upper stream values.

Key words: Electrical Conductivity, Groundwater recharge, Local Meteoric Water Line, Stable isotope