Rainwater harvesting practices and resource conservation in agroforestry system in red soils of Bundelkhand

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ABSTRACT : A field study was conducted to evolve a suitable *in-situ* rainwater harvesting practice for resource conservation and augmenting growth of *aonla* in agroforestry system on sloping lands in red soils of Bundelkhand region. The treatments (farmer's practice of *aonla* planting with 0.027 m^3 pit (control), pit filled up to 0.75 m with 1 m^3 pit, crescent shaped micro-catchment with 1 m^3 pit and V-shaped micro-catchment with 1 m^3 pit) were laid out in RBD in four replications in runoff plots of 21 m × 14 m at 2% slope. In inter-spaces, black gram - Indian mustard crop sequence was practiced. Results showed that highest runoff (38.9%), soil loss (3.79 tha^{-1}) and nutrient loss (Organic carbon, N, P and K), lower grain yield in black gram (221 kg ha^{-1}) and Indian mustard (1082 kg ha^{-1}) and low growth of *aonla* (height 1.83 m and girth 1.3 cm) were recorded under farmer's practice. However, lowest runoff (23.3%), soil loss (1.97 tha^{-1}) and nutrient loss, higher grain yield of black gram (334 kg ha^{-1}) and Indian mustard (1580 kg ha^{-1}) and higher growth of *aonla* (height 2.21 m and girth 1.5 cm) were obtained under V-shaped micro-catchment. Based on the present findings, V-shaped micro-catchment could be a suitable *in-situ* rainwater conservation practice for resource conservation and enhancing yield of intercrops and growth of *aonla* under *aonla*-based agroforestry system on sloping lands in red soils of Bundelkhand region.

Key words: Black gram, *Emblica officinalis* rainwater conservation, Indian mustard and red soils.