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Effects of Selected soil and water conservation measures on soil erosion in the Koga Catchment, Northwestern Ethiopia

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This study was performed in the 98.4km2 upper part of the Koga catchment, Northwestern Ethiopia. The Koga catchment is agriculturally dominated with high rates of soil loss that is threatening the livelihoods of the small scale farmers in the area. So far it has not been clear which conservation measures are the most effective. This paper evaluates the effectiveness of alternative soil and water conservation measures based on simulations with the distributed AnnAGNPS (Annualized Agricultural Non-point source) model which has been calibrated and validated for the catchment. The study indicates that contour farming accompanied by terraces on the high erosion risk (soil loss>35 Mg ha-1yr-1) areas reduces soil loss from the entire study area by 39% while this measure does not reduce runoff. Reforestation of the high erosion risk areas results in a 64% reduction in soil loss and a 22% reduction in runoff. Combined reforestation, contour farming and terracing in areas with different levels of erosion risk results in a reduction of soil loss by up to 88% and runoff by up to 22% from the entire study area. Mulch till of all the crop fields reduces soil loss by 20% while it has almost no effect on runoff. The study suggests that these conservation measures can go a long way in improving the situation in the Koga catchment.