

Suitability of multipurpose trees, shrubs and grasses to rehabilitate gullies in the sub-humid tropics

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Vegetation plays a vital role for sustainable rehabilitation of degraded lands. However, the selection of suitable and effective plant species remains a long-lasting challenge in most parts of the sub-humid tropics. To address this challenge 18 multipurpose plant species (6 trees, 3 shrubs and 9 grasses), preselected from the regional species pool in Southwest Ethiopia were planted in severely degraded gullies and monitored from July 2011 to June 2014. The experiment had a split-plot design with farmyard manure (FYM) application, as main plot and plant species as sub-plot factors repeated in three blocks. The study revealed that grasses were the most successful to rehabilitate the gully within the monitoring period, compared to trees and shrubs. The survival rate of the four most successful grass species, *Chrysopogon zizanioides*, *Pennisetum macrourum*, *Pennisetum polystachion* and *Pennisetum purpureum* ranged from 61 to 90% with FYM application and from 20 to 85% without FYM, while most of the well-known indigenous and exotic trees and shrubs failed to survive. For the grass *Pennisetum purpureum*, shoot height, shoot and root dry biomass increased by 300%, 342% and 578% respectively due to FYM application, with a remarkably higher response to FYM compared to all the other studied species. The overall results demonstrate that severely degraded lands can be effectively restored by using early successional species such as locally adapted and selected grasses before the plantation of trees and shrubs.