

Impacts of micro-basin water harvesting structures in improving vegetative cover in degraded hillslope areas of north-east Ethiopia.

Sisay Demeku Derib^{A, C}, Tewodros Assefa^A, Belete Berhanu^A and Gete Zeleke^B

^A Sirinka Agricultural Research Center, PO Box 74, Woldia, Ethiopia.

^B Global Mountain Program (GMP), C/O ILRI, PO Box 5689, Addis Ababa, Ethiopia.

^C Corresponding author. Email: sdemeku@yahoo.com

Abstract

Water is one of the most important entry points to improve rural livelihoods in drought affected areas of the north-eastern Amhara region in Ethiopia. Various attempts have been made to overcome this problem by making use of different water harvesting structures. However, the choice of structures has been difficult because of a lack of empirical evidence on the relative effectiveness of the different structures.

An experiment was conducted from 2002 to 2004 to compare and evaluate three different water harvesting structures (eye-brow basin, half-moon and trench) against the normal seedling plantation practice by farmers (normal pit) as a control. Data on root collar diameter (RCD), diameter at breast height (DBH), height and survival rate of *Acacia saligna* tree seedlings was collected at 3-month intervals after planting and annual grass biomass production was also measured. Trench and eye-brow basin structures produced 68, 95, 52 and 44% increases in RCD, DBH, height and survival rate, respectively, 15 months after planting compared with the normal pit. Trench structures increased grass biomass by 41.1% compared with normal pits.

Eye-brow basins are recommended on hillsides where stone is available while trenches could be used where stone is scarce. The results indicated that well designed water harvesting micro-basin structures can mitigate the effect of dry spell shocks on tree seedling performance and land cover rehabilitation. They were also very effective in increasing grass biomass production indicating the potential for improving livestock feed on the available barren hillsides.

Keywords: biomass production, seedling performance.