

Enhancing livelihoods with banana-based agroforestry systems and biochar fertilizer in mid-hills of Nepal

Bishnu Hari Pandit^{1*}, Ian Nuberg², Krishna Kumar Shrestha³, Ewin Cedamon², Swoyambhu Man Amatya¹, Bishow Dhakal¹ and Hans Peter Schmidt⁴

¹Nepal Agroforestry Foundation (NAF), P. O. Box 9594, Kathmandu, Tel: +977 1 5147160; +977 9851090739.

² University of Adelaide, Australia.

³ University of New South Wales, Australia

⁴ Ithaka Institute for Carbon Strategies, Switzerland

*** corresponding author**

Abstract

In view of the declining productivity and costly chemical fertilizer, the action research project on agroforestry implemented in six VDCs of Kavre and Lamjung districts covering 289 sample households. This study particularly focuses on assessing the productivity and livelihood impacts of a banana based Agroforestry (AF) system with biochar fertilization. The paper describes the selection process of agroforestry system and comparison of the effects of different fertilizers on banana yields and thereby over all banana based agroforestry system. The yield of banana from plots treated with urine-biochar plus FYM was more than 41 % than with conventional NPK only application, and more than double (102 %) that with FYM only (farmers' control). The combination of urine biochar and compost with NPK fertilizer did not prove advantageous compared to the purely organic biochar fertilizer treatment. Analysis of the whole Agroforestry system indicated that farmers would benefit most by adoption of biochar based organic fertilization in banana based agroforestry system. The poverty level of the banana based AF system decreased by 30% (from 66% to 36%), at Dhamilikuwa (biochar village) and it is only 19% (from 40% to 21%) at Jita Taxar (non-biochar village). Suggestions are made for future actions both country-wide (promotion of biochar-based organic fertilizer as a priority) and locally adopted marketing system initiated at Dhamilikuwa village. Farmers must diversify their production and achieve better returns from their production in order to escape subsistence poverty and improve their livelihoods.

Keywords: biochar urine organic fertilizer, chemical fertilizer, banana based agroforestry, poverty, yield.