Potential Carbon Offset in Public Plantation, Tarai, Nepal: Offering Opportunity for REDD+ and Soil Fertility

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Abstract: Public plantations are managed under agro-forestry system, which is aligned with the purpose of REDD+ reward but it needs sufficient records of carbon. Thus, objectives of the study were to compare the carbon stocks of public plantations with neighboring sites, estimate the variation in mean annual incremental carbon (MAIC) and explore changes in soil C, N, P and K after plantation. Three public plantations of Mahottary, Nepal were selected for study. Altogether twenty eight sample plots were randomly established navigating GPS coordinates in the quadrates of 10mx10m for pole and 1mx1m for litter and grasses. Height and diameter of pole were measured and samples of others were also collected. The soil samples were collected from the centre of the plot from 0-0.1m, 0.1-0.3m and 0.30-0.60m depths. There were significant differences in carbon stocks with 140.32 t ha^{-1} in plantation and 68.39 t ha^{-1} in neighboring site of Shreepur public plantation. The highest value of MAIC was found nearly 10.19 t ha^{-1} while the values of soil C and N were 31.46 t ha^{-1} and 98.41kg ha^{-1} respectively in 0-0.1m and decreased by soil depths in Shreepur site. Same trend was found in soil P and K to all sites.

Key Words: Agroforestry, Mean annual incremental carbon, Plantation, REDD[+], Soil fertility,