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## Analyzing Soil Nutrient Balance in Hills of Nepal: Do Socio-economic Factors Matter for Sustainable Land Use?

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### Abstract

Soil Nutrient balance studies have become increasingly influential in policy discussions for soil fertility management and sustainable agriculture. However, debates on such issues often bypass the fact that besides biophysical factors, socio-economic characteristics of farm households may demonstrate significant impact in shaping the processes of balancing soil nutrients. This study is, therefore, an attempt to analyse the influence of socio-economic factors on soil nutrient balance in the context of mid hill farming system of Nepal. With primary data collected from 280 households in 2007, the study estimates balance of three macro-nutrients, namely; Nitrogen, Phosphorus and Potassium as indicators of sustainability of the farming system. The study further employs Ordinary Least Squares (OLS) regression model to find out the significant factors that influence each nutrient balance. The findings of this study show that average farm households in the study area show annual surplus of 31 kg ha<sup>-1</sup> nitrogen but annual deficit of 20 kg ha<sup>-1</sup> phosphorus and 45 kg ha<sup>-1</sup> potassium indicating the trend of mining for the later two nutrients. Depletion of phosphorus and potassium is of great concern for sustainability of farming system in study area. It is estimated that value of phosphorus and potassium mining is equivalent to 9% and 10% of the gross margin received by the farmers respectively. With regards to socio-economic factors, distance of households from market centres, land holdings and possession of sloppy lands show negative influence on balance of nutrients. On the other hand, family size, household with male head, use of biogas slurry, use of composting and engagement in cash crops such as potato and vegetables positively influence nutrient balance. Based on the findings, the study suggests that future soil fertility management strategies should consider not only biophysical factors but also socio-economic attributes of farmers in the mid hill region of Nepal.

**Keywords:** Nepal, socio-economic factors, soil nutrient balance, sustainable land use