Variation of soil degradation in tea lands and its impact on bush debilitation

As the little information is available on the loss of productivity of tea lands in terms of soil degradation, the present study was carried-out in 15 selected tea estates representing low, mid and up country. The degree of bush debilitation and death of bushes after planting were recorded by taking bush counts of the selected fields with varying soil conditions. Soil samples collected from tea fields and the adjoining forests, were analyzed according to the standard procedures. The relationships between different variables were established by regression analysis.

Results showed that there was a significant positive correlation between bush stand and tea yield in the low country and up country with r^2 = 0.60 ($p<0.001$) and0.42 ($p<0.01$), respectively. Bush stand (number of bushes ha^{-1}) was positively correlated with elevation, soil depth, soil pH, organic carbon %, soil nitrogen % and moisture content at field capacity of soil with r^2 = 0.38, 0.23, 0.23,0.23,0.30, and 0.19,respectively ($p<0.05$), while it had a negative correlation with rock %, gravel %, sand % and bulk density with r^2 = 0.31, 0.06,0.24 and 0.08, respectively ($p<0.05$).Soil degradation in tea lands was high in the low and mid elevations compared with that of high elevation. The difference in soil properties, *i.e.* soil depth, organic carbon content, and gravel % of soil, between forests and tea fields widened with decrease in elevation with r^2 = 0.24, 0.33 and 0.14, respectively ($p<0.05$). It was also found that the bush stand reduced with increase in the difference (between the forests and tea soils) of soil properties such as soil depth (r^2 =

0.24), organic carbon content (r^2 = 0.15), sand % (r^2 = 0.25) and gravel % (r^2 = 0.08) at $p<0.05$. the results confirm that the productivity of tea lands reduced with soil degradation and hence emphasis the need for enhancing organic carbon status of soil and adaptation of proper sol and moisture conservation measures.