RESEARCH PAPER:

Assessment of replacement cost (on-site cost) of soil erosion in Uva high lands tea plantations of Sri Lanka

■PRASAD DHARMASENA AND M.S. BHAT

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SUMMARY

The Uva High lands tea plantations in Sri Lanka represent intermediate zone on agro-climatic classification. This study was conducted to assess the runoff, soil loss and subsequent nutrient losses from Vegetative Propagation (VP) and Old Seedling Tea (OST) plantations of Passara region of Uva high lands in Sri Lanka. Four experimental soil erosion measurement units were installed, 2 each for both land categories of 25 m length and 4 m width during 2010-2011 for one successive year. From these land uses were quantified the following standard methodologies. The annual runoff soil loss of old seedling tea fields were recorded as 25.52 tons/ha/yr and VP fields were calculated as 3.41 tons/ha/yr respectively of Uva regions in Sri Lanka. Loss of N was recorded as 29.34 and 4.80 kg/ha/yr from seedling and VP tea fields, respectively. Loss of P of seedling tea field was observed as 2.10 and P from VP field was 0.92 kg/ha/yr. Loss of K was calculated as 182.4 kg/ha/yr of seedling field and K was assessed in VP as 13.6 kg/ha/yr. Total loss of organic matter was evaluated as 319.01 and 60.03 kg/ha/yr seedling and VP tea fields, respectively. Subsequently, total replacement (onsite) cost of one hectare seedling tea fields was recorded as Rs. 18011.45 and the replacement cost of VP field was Rs.8270.89 with the labour charges for spreading fertilizers and repairing and maintaining costs.

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Key **W**ords :
Land use, Seedling, Soil and nutrient loss, Runoff, Uva, NPK, Organic matter

Author for Correspondence -
PRASAD DHARMASENA
P.G. Department of Geography and Regional Development, University of Kashmir, SRINAGAR (J. & K.) INDIA

See end of the paper for **Coopted authors**

Land degradations have been a major environmental issue in tea estates of Sri Lanka compared to rubber and coconut plantations. Nearly about 80 per cent of the land is old seedling tea which is often poorly managed (Krishnaraja, 1983). Large tracts of these old seedling tea plantations have been either neglected or left for fallows. It is estimated that about 30 per cent of the entire tea land is marginal or uneconomic in mid country. Long steeps and poor management practices are responsible for severe soil erosion on tea lands (Sivapanal , 1993).

Early plantations industry was under the management of British planters and there were no other parties in the industry with entitlement for the plantations. But tea industry of Sri Lanka today depends on three parties on management systems namely government tea estate, large scale private plantations and small holders. As this research concerned with large scale plantations where can be seen more seedling tea lands where is required as immediate rehabilitation and management. Seedlings tea lands of the large scale tea plantations (Special reference to the Regional Plantations Companies in Sri Lanka- RPCs) have two types of marginal lands on the definition of Dharmasena (2008). Those are low productive lands, Zero productive lands. Well managed VP tea fields are ecologically and economically stabilized on records maintained by the respective plantations companies.

Study area:

Study sites are based in Passara tea growing region, which is one of controversial regions in environment management of the country and is rested in eastern slopes of the central mountain of the country. It is proved that more abandoned lands in Badulla tea region district are observed in Passara region compared with other tea growing areas of the district where boarded to two dry zone extremes.

EXPERIMENTAL METHODOLOGY

Four soil sedimentation plots were