RESEARCH PAPER Asian Science (June, 2011) Vol. 5 Issue 1 : 103-107

Multipurpose cropping model to improve economic and ecological viability in abandoned tea lands in mid country of Sri Lanka

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ABSTRACT

This particular multipurpose cropping model has been established at Delpitiya of Gampola-Sri Lanka in November 1979 in one hactare of absolutely eroded abondoned tea land on experiemtal basis. This study was carried out during 2004-2010; soil loss was measured by installing physical soil erosion measuring units. Technical purpose of multipurpose cropping model was estimated in order to identify the potential increase in productivity of marginal tea lands where have been becoming serious environmental, social and ecological hazards in mid country of Sri Lanka. This system urges us to compare and analyze with and with out project benefits. Total soil loss on degraded marginal tea lands has been recorded 174.28 for 7 years. But total soil loss of with agroforestry has been come down to 11.51 tons/ha with in tested period of 7 years. This is almost 15.2 times less erosion than with out projects and average annual soil loss has been reported as 24.8 and 1.64 tons/ha/year marginal lands and agroforestry, respectively. The model showed higher CBR, NPV and IRR values to confirm economic viability of the system.

Prasad, Dharmasena (2011). Multipurpose cropping model to improve economic and ecological viability in abandoned tea lands in mid country of Sri Lanka. *Asian Sci.*, **6**(1 & 2):103-107.

Key Words : Soil erosion, Economic viability, Agroforestry, Tea plantations

INTRODUCTION

When British planters started commercial tea plantations in the country, well planned soil conservations methods or erosion mitigation technologies were not followed due to priorities of hasty profits making. Ex. line plantings of seedling tea plants instead to contour plantings is one reason for soil erosion accelerated. Wider spacing between up and down planting rows (1.2m *0.9m) is another reason for soil deterioration. The history of plantations industry in Sri Lanka reveals that the tea industry has been started by clearing of virgin forest/ untouched lands and Patna lands. Before, tea and coffee plantations in Sri Lanka, these virgin forest and Patna area would be rich with biodiversity, virgin soils and eco systems. It is assumed that ecosystem and bio diversity were disturbed with the starting of plantations industry as well as deterioration of virgin soil was another ecological problem identified. The results of degradation of virgin soil have been declined physical, chemical, biological and social values with the exposure of forest soil for commercial plantations. It was one reason to increase extent of marginal lands in plantations sector later on.

In additions to these reasons, planters from British period to present have been failed to under take proper infilling programs on annual requirements. Some manual weeding controlling systems such as usage of scrapers also was responsible for accelerated soil erosion and time of replanting of old seedling fields top soil loss is substantially high. With the time being those factors have been resulted for marginalization of tea lands in Sri Lanka as removal of top soils and its' fertility.

Some policy failures also can be identified as a major factor to be marginalized tea lands. Ex: when the lands clearing under taken prior to nationalization of plantations sector in Sri Lanka, there was not a proper national environment and forestry acts / policies or actions plans pertaining to the land clearing or environmental conservation. Hence, tea lands marginalization problem is not unexpectedly risen one. It has been developed gradually due to mismanagement of the plantations sector due to no of reasons before and after nationalization and also unplanned establishment of tea with out sufficient environmental attention by British planters and local planters.

Land degradations have been a major 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. Large tracts of these old seedling tea plantations have been either neglected or left fallow. It is estimated that about 30 per cent of the entire tea land is marginal or uneconomic (40% of this is totally abandoned). Long steeps and poor management practices are responsible for severe soil erosion on tea lands (Sivapanal, 1993).

Early plantations industry was under the