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ECOLOGICAL IMPACT OF RUBBER *(HEVEA BRASILIENSIS)* PLANTATIONS IN NORTH EAST INDIA:

2. SOIL PROPERTIES AND BIOMASS RECYCLING

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Influence of rubber and teak plantations and natural forest on soil properties, nutrient enrichment, under-storey vegetation and biomass recycling has been studied in the Siliguri sub-division (Darjeeling district) of West Bengal. The study indicates that rubber, teak and natural forest had comparatively high input of organic carbon enriching the soil. Teak had the highest organic matter content in the surface layers. However, the depletion of organic carbon with depth was the highest for teak and the least for natural forest, depletion pattern for rubber being close to that of natural forest. The water retention characteristics showed that soil under rubber had the highest volumetric water content at field capacity (-0.033 MPa) and also at -1.5 MPa. The results suggest that the depletion of sub-surface soil moisture would be less under rubber than teak. The soils under teak showed a higher calcium content in the surface layers. The distribution of available nutrients otherwise did not show much variation in the soils under rubber, teak and natural forest.

Biomass and floor accumulation revealed luxurient under-storey vegetation under all the three conditions. The data on floor accumulation showed that litter accumulation under rubber was lower than that of teak and natural forest which could be attributed to a faster rate of decomposition under a higher moisture regime and higher available nutrient. The study establishes ecological desirability of rubber in terms of habitat diversity, soil physical properties and nutrient recycling.

Key words:- Ecological impact, Rubber plantation, Soil properties, Biomass, North East India.

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INTRODUCTION

Ecological implications of plantation forestry in the tropics in general and that of rubber in particular have been studied only to a limited extent. Though rubber cultivation had been traditionally confined to the southern districts in India, the crop has been extended to non-traditional regions during the last two decades and the north-eastern zone is regarded as one of the important areas. Raising forestry plantations is one of the methods adopted to recuperate the fragile ecology resultant of denudation of forests for various purposes, including shifting cultivation, in the north-eastern region.

An earlier report (Krishnakumar *et al.*, 1990) has indicated the beneficial effect