RUBBER SOIL INFORMATION SYSTEM (RubSIS): A DECISION MAKING TOOL FOR SKIPPING FERTILIZER APPLICATION IN RUBBER PLANTATIONS

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A study was carried out to estimate the extent of rubber area with high status of soil organic carbon (SOC) and soil depth greater than one meter to calculate the net savings by skipping chemical fertilizers in such holdings in the traditional rubber growing regions of Kerala and Kanyakumari district of Tamil Nadu using geo-spatial approach. Satellite-derived rubber plantation maps, SOC and soil depth maps were used for the present analysis. Thematic layers of SOC and soil depth were taken from the data base of Rubber Soil Information System (RubSIS) developed recently by Rubber Research Institute of India. The extent of rubber area with high soil OC status having a depth of more than one meter were delineated using spatial overlay analysis. Regions qualifying for this dual criteria were considered to estimate the net savings, including fertilizer cost and labour charges. Results indicated that in 1,61,911 ha of mature rubber area in Kerala and Kanyakumari district of Tamil Nadu, fertilizer application can be skipped for short periods which accounted for a net annual saving of Rs. 87 crores per year. District-wise interpretation revealed that net annual savings was the highest in Kottayam district (Rs. 27.4 crore per year) and in all other districts net annual savings would be below Rs.10 crores per year. Geo-spatial analysis was helpful in identifying mature rubber area where fertililizers can be skipped for short periods which could reduce the cultivation cost and avoid unnecessary pollution.

Key words: Chemical fertilizer, Overlay analysis, Rubber plantation, RubSIS, Soil depth, Soil organic carbon

Traditionally natural rubber (*Hevea brasiliensis*) is being cultivated across the foot hills of Western Ghats in Kerala and Kanyakumari district of Tamil Nadu which produces about 90 per cent of total latex production in India. Total rubber area (>3 years of age) in Kerala and Kanyakumari district of Tamil Nadu recorded 5,58,600 ha (RRII and ATMA, 2013). This perennial tree crop has a productive life cycle of 25 to 30 years and its continuous cultivation in Kerala and Kanyakumari district has turned third cycle and proper agro-management practices need to be followed to sustain soil health and productivity of rubber plantations in these regions.

Rubber Board had conducted an extensive soil sampling in rubber growing regions of South India and found that about 75 per cent of total rubber growing regions were having high soil organic carbon status (Rubber Board, 2017). Reduction of soil carbon content is not observed in mature rubber plantations since carbon input from leaf litter of rubber spread homogeneously all over the plantation (Guillaume *et al*.,