IDENTIFICATION OF AGRO-CLIMATICALLY SUITABLE AREAS FOR NATURAL RUBBER CULTIVATION IN LEFT WING EXTREMISM AFFECTED STATES

Shammi Raj and James Jacob

Rubber Research Institute of India, Kottayam-686 009, Kerala, India

The present study was undertaken to assess the agro-climatic suitability of left wing extremism (LWE) affected states of India for cultivating natural rubber (NR). Monthly means of maximum temperature, amount of rainfall, number of rainy days, potential evapotranspiration, hot degree days, vapour pressure deficit and aridity index were used in the present analyses. Variations in these parameters in the LWE affected districts of Odisha from Kottayam and Kanyakumari districts which have more congenial conditions for NR cultivation were first estimated. No district fell within a variability of up to 20 per cent from Kottayam and Kanyakumari districts when all the above parameters were taken together. When aridity index (A_I), which is a function of air temperature, wind speed, vapor pressure deficit, solar radiation and rainfall alone was considered, Ratnagiri district in Maharashtra was at par and four districts in West Bengal were within 20 per cent variability of Kanyakumari district. It was also found that between periods 1901-1955 and 1956-2002, there was no significant variation in A_I in the study areas. Earlier studies have shown that favorable limits of climate parameters for NR cultivation are: annual rainfall ≥1500 mm, rainy months ≥6, monthly maximum temperature ≥36^0C, monthly minimum temperature ≥10^0C and A_I ≥0.50. Considering these parameters as the normal climate tolerance limit (CTL), we found that 10 districts in LWE affected regions fall within these normal limits. By relaxing the CTL favourability by 10 and 20 per cent from the normal, a total of 29 and 76 districts, respectively could be identified. Maximum number of districts were from Odisha and West Bengal. Identification of suitable districts for growing NR using the A_I and CTL approach should be taken with abundant caution even as it is not known how stressful it would be to grow NR commercially in a district where the A_I or CTL is 10 or 20 per cent different from the normal range. Moreover, the east coast states, particularly Odisha are prone to frequent cyclonic storms almost every year. Therefore, results from the present study could be used only as a general indication. Ecological Niche Modelling and Geo-spatial approaches could be used in conjunction with the present analyses for identifying suitable areas for cultivating NR with greater confidence.

Key words: Agro-climatic suitability, Area-under-curve, Climate tolerance limits, Natural rubber

INTRODUCTION

Natural rubber (*Hevea brasiliensis*) being a native of the Amazon basin, grows well in areas where there is good distribution of annual rainfall (2000 mm per year) and the climate is warm (21 to 35^0C) and humid

Correspondence: Shammi Raj (Email: shammiraj@rubberboard.org.in)