ASSESSING POTENTIAL DISTRIBUTION OF *HEVEA BRASILIENSIS* IN DIFFERENT REPRESENTATIVE CONCENTRATION PATHWAY SCENARIOS UNDER CHANGING CLIMATE IN INDIA USING ECOLOGICAL NICHE MODELLING

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Para rubber (*Hevea brasiliensis*), naturally growing in the Amazon forests of South America, was widely distributed to South East Asian countries, including India and China in the early 19th Century. The potential distribution range of natural rubber (NR) in India was modelled for 2050 and 2070 under different Representative Concentration Pathways (RCP 2.6, 4.5, 6.0, 8.5) scenarios of changing climate using ecological niche modeling (Maxent) to study the impact of climate change on NR cultivation. The current emissions are tracking close to the RCP 8.5 pathway and if it continues the average increase of temperature in 2081-2100 will be 3.7°C relative to increase during 1986-2005. Under various future emission scenarios, the potential niche for growing NR in India will expand to sub-optimal regions as many colder regions will be warmer and many traditional regions will become less suitable for this species. Our studies indicate that the most significant bioclimatic variable contributing to future distribution patterns of rubber plantations in India is temperature, particularly the maximum temperature during the warmest month/season, followed by annual precipitation.

Keywords: Expansion of cultivation, IPCC future climate, Rubber, Species distribution modelling

INTRODUCTION

Hevea brasiliensis is of great industrial importance as it produces latex and the rubber particles present in the latex is converted into usable form as industrial raw material. Out of the 10 species of the genus *Hevea*, only *H. brasiliensis* is grown commercially for its natural rubber content. At present, approximately 14 million hectares are planted with *H. brasiliensis* globally (IRSG, 2021). In 2020, about 13 million tons of natural rubber was produced globally (IRSG, 2021). For any plant species to grow and perpetuate in a geographical space, climate is one of the most important defining factors. In India, *H. brasiliensis* was grown traditionally in Western Ghats due to the best suited climate of warm temperature and high rainfall. Transportation of rubber seeds from Amazon basin of South America to South East Asia greatly helped its commercial cultivation since climatic

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