

# Influence of micro-climatic factors on biodiversity of cocoa (*Theobroma cacao* L.) plantations in Tamil Nadu

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**SUMMARY :** In India, cocoa is a viable intercrop in coconut, arecanut and oil palm plantations. Presently, the area under cocoa cultivation is expanding and this necessitates systematic investigations to assess the influence of cocoa plantations on micro-climatic factor and biodiversity. In this context automated micro-climatic analyzers with sensors were installed in both cocoa intercropped with coconut and coconut monoculture plantations in the farmer's field for continuous monitoring of weather parameters to assess the impact of cocoa cultivation as an intercrop on micro-climatic factors. The observations from automated micro-climatic analyzers with sensors showed a decrease in the air temperature under cocoa intercropped with coconut to a extent of 0.11<sup>o</sup>C to 0.34<sup>o</sup>C and a reduction in the soil temperature to a tune of 0.03<sup>o</sup>C to 0.7<sup>o</sup>C. The wind velocity was reduced drastically as the cocoa trees act as the wind barriers. The average solar radiation was reduced by 68.8 per cent under cocoa canopy. The soil moisture was high in the cocoa cultivated soil by 19 per cent as the cocoa litter fall acts as a mulching agent. The relative humidity was also altered by the cocoa cultivation. An increase in the faunal population by 34 to 42 per cent was recorded with the introduction of cocoa as an intercrop with the coconut. Drastic increase in the insect diversity, intensity and distribution were observed, as the shade and humid condition encouraged the insect diversity. The bird species diversity was not much altered but there was an increase in population as the cocoa has higher insect population. Overall field observations unequivocally demonstrated the positive impact of cocoa as an intercrop with coconut plantations in improving the biodiversity. Cocoa alters the micro-climatic factors which it turns provides a favourable condition to improve the biological health.

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