

## **Micro-climatic gradients across an isolated rainforest remnant bordered by different landuse types in the Knuckles range, Sri Lanka**

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Forest degradation is a serious problem especially in developing countries. Once continuous tracts of forests are fragmented, the forest interior exposes to external climatic conditions resulting microclimatic gradients across edges those can affect on the ecological processes there. The study investigated the presence of microclimatic gradients in a forest remnant bordered by different landuse types to find the effects of those landuse types on edge habitats. Moraella forest, lowland rainforest remnant in the foothills of the Knuckles Range, is bordered by different landuse types *viz.*, *Pinus*, grasslands, tea and scrublands. Linear quadrats laid parallel to the forest-landuse edge (FLE) at different distances from the FLE (0, 10 and 30 m towards the forest interior and 10, 30 and 50 m towards the bordering landuse) were used in the study. Soil temperature (ST, °C), photosynthetic active radiation (PAR,  $\mu\text{mol s}^{-1} \text{m}^{-2}$ ), air temperature (AT, °C), relative air humidity (RH, %) and soil moisture content (SM, %) were taken using a LI-COR 1400 data logger to represent dry and a wet seasons. The data were analyzed using Generalized Linear Model with pair-wise ranking in Minitab 17. Results showed different microclimatic gradients exist across edges bordered by different landuse types with few exceptions. PAR showed a decreasing gradient towards the forest interior (FI) especially during the dry season, with open grassland having the highest PAR values. In contrast, AT and RH showed increasing trends towards for FI during wet and dry seasons, respectively. All parameters tested showed marked seasonal variations except SM. Results also demonstrated more fluctuations in the bordering landuse types, with less fluctuation within the FI. The findings of the present study collectively paved the way to conclude that the fragmentation and bordering landuse types can create different microclimatic gradients across forest edges with potential influences on the edge effect and other processes.

**Keywords:** *Forest-landuse edge, Moraella forest, microclimate, landuse types*

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