

# EFFECTS OF LINPAN SIZE AND TREE DISTRIBUTION ON WINTER MICROCLIMATE OF THE LINPAN SETTLEMENTS IN CHENGDU PLAIN, CHINA

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## 1 ABSTRACT

*Linpan settlement (abbreviation Linpan) is the most important and traditional rural settlement and the main agroforestry ecosystem in Chengdu Plain. It shows a comfortable seasonal microclimate, which matches local residents' preferences for thousands years. However, in the past two decades, urbanization has accelerated the disappearance of Linpan. The purpose of this study is to identify the winter microclimate variation in Linpan, find out the relationship among the microclimate parameters, and explore the impacts of Linpan size and tree distribution (surrounding, central, unilateral, and scattered) on winter microclimate. Microclimate parameters (i.e., air temperature, light intensity, wind speed, relative humidity, and so on) were separately measured in the 12 Linpan samples from December to February in 2015 and 2016. The results showed the air and soil temperatures of Linpan were positively influenced by Linpan size, but the air temperature difference exhibited a strong negative correlation with Linpan size. The relative humidity exhibited a positive correlation with Linpan size. Tree distribution patterns differed remarkably with respect to the winter microclimate. Light intensity and wind speed were strongly affected by the tree distribution pattern. Scattered patterns showed the optimal temperature preservation and windproof effects than other patterns in winter. Among the four parameters, air temperature supplied a strongly effect on relative humidity. While, only a significant negative correlation between air temperature and wind speed in winter was observed, which suggested that wind protection is the crucial factor in maintaining temperatures of Linpan in winter.*

### 1.1 Keywords

Linpan size; Tree distribution ; Winter; Microclimate parameters