# BANGKOK'S MILLION TREES: ASSESSING DIVERSITY AND CLIMATE RESILIENCE

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## Abstract

In 2022, the Bangkok Metropolitan Administration launched a large-scaled tree planting initiative, the so-called 'Million-Tree Project', aimed at improving urban environmental quality. However, questions remain regarding how biodiverse these newly-planted tree communities are and how resilient they will be to future climate change. We quantify diversity of trees in Million-Tree Project and their thermal and hydrological suitability. Species-specific climatic tolerance data were obtained from the TreeGOER database, whilst current climate data were sourced from the Thai Meteorological Department. A total of 335 species (618,250 trees) were assessed and classified into safe, at risk, and unsuitable categories, both overall and in comparisons between native (479,978 trees, 228 species) and non-native species (138,272 trees, 107 species). Results indicate that the majority of trees (562,504 trees; 90.98%) remain within their safety margin, whilst 55,218 (8.93%) were identified as at risk and only 528 (0.09%) were classified as unsuitable under current thermal conditions. Both native and non-native species show high thermal suitability, despite a slightly greater proportion of non-natives classified as either at risk or unsuitable. In contrast, precipitation represents a major constraint, with 65.64% of trees are unsuitable during the wettest month and 80.55% during the driest month, leaving only 18.90% within safe conditions. Non-native species were particularly vulnerable under dry conditions. Overall, our findings demonstrate that while temperature remains within tolerable limits for most trees, precipitation—particularly under drought conditions in Bangkok—is the primary constraint, with native species exhibiting relatively greater resilience and therefore warranting prioritisation in long-term urban greening strategies.

**Keyword:** Urban trees, Species tolerance, Maximum temperature, Hydrological suitability, Native and non-native tree species