University of East London

RECLAIM

UNIVERSITY OF SURREY

# Clean Air Garden Project

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## 1 INTRODUCTION

Domestic gardens have been linked to positive effects on mental health and well-being, but their potential benefits regarding air quality improvement and temperature regulation remain relatively unexplored. Given the increasing health risks associated with air pollution and rising temperatures due to climate change, understanding the impact of domestic garden design on these factors could offer opportunities to protect residents and local communities from their harmful effects while longer-term solutions to air pollution reduction are incrementally implemented. This project seeks to better understand how garden design can positively impact local air quality and temperature regulation, with a focus on some of London's most deprived areas.

## 2 METHOD

**I. Study site**
- Neighbourhoods in London where areas of social deprivation and poor air quality coincide

**II. Garden designs**
- Open garden
- Grey infrastructure barrier garden (≥1.5 m)
- Vegetated barrier garden (≥1.5 m)

**III. Data collection**
- Air pollutants concentration ($PM_{10}$, $PM_{2.5}$)
- Temperature

## 3 RESULTS

**I. Study site:** Identify areas where poor air quality and social deprivation coincide in London.
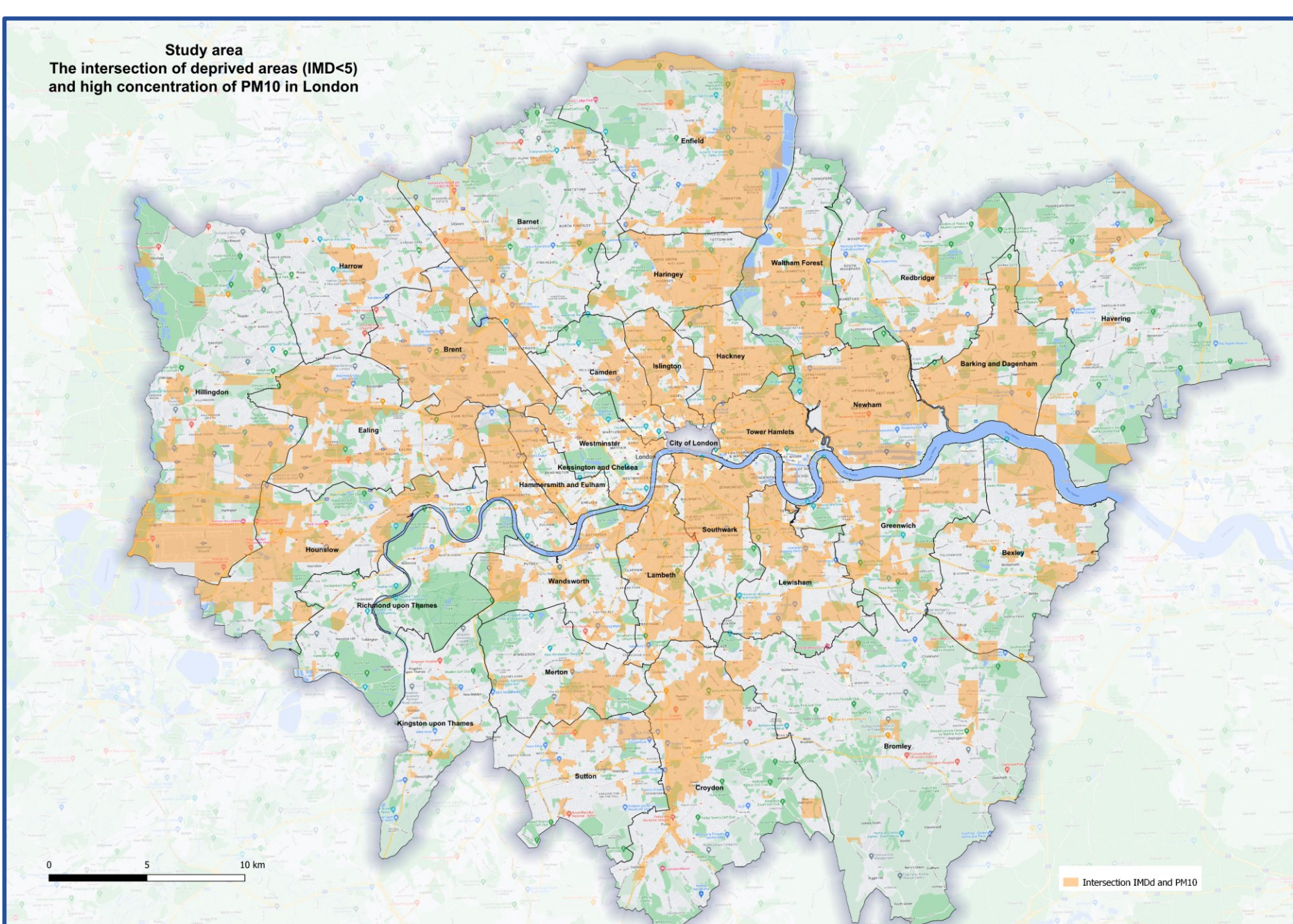


**Figure 1.** Studies areas in London (orange colour) where deprived areas with the Index of Multiple Deprivation are ≤ 5 and high levels of particulate matter coincided. Initial scoping survey to identify pollution hotspots used GLA and TfL air quality datasets and overlayed them with IMD data to pinpoint our target areas/streets.

## 3 RESULTS

**II. Garden designs:** Within these areas, we identified three sets of three domestic garden designs to explore how these designs impact air pollution levels within the garden spaces.
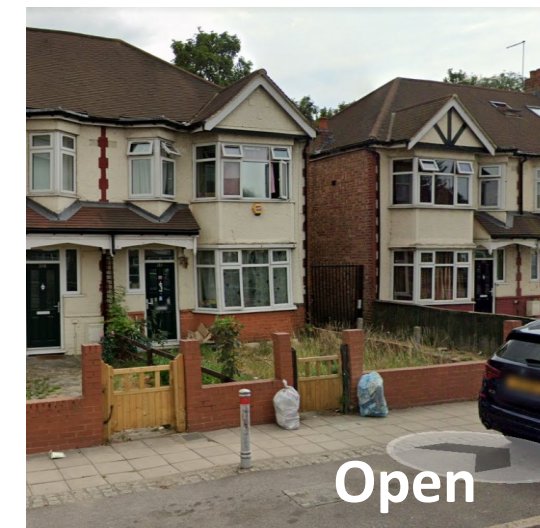


**Figure 2.** During June and July 2023, leafleting took place in Barking and Dagenham, Enfield, and Tower Hamlets. The three included photos showcase open, grey barrier, and vegetated domestic gardens from our study.

**III. Data collection:** Differences in temperature and $PM_{10}$ concentrations during a week of sampling in summer 2023
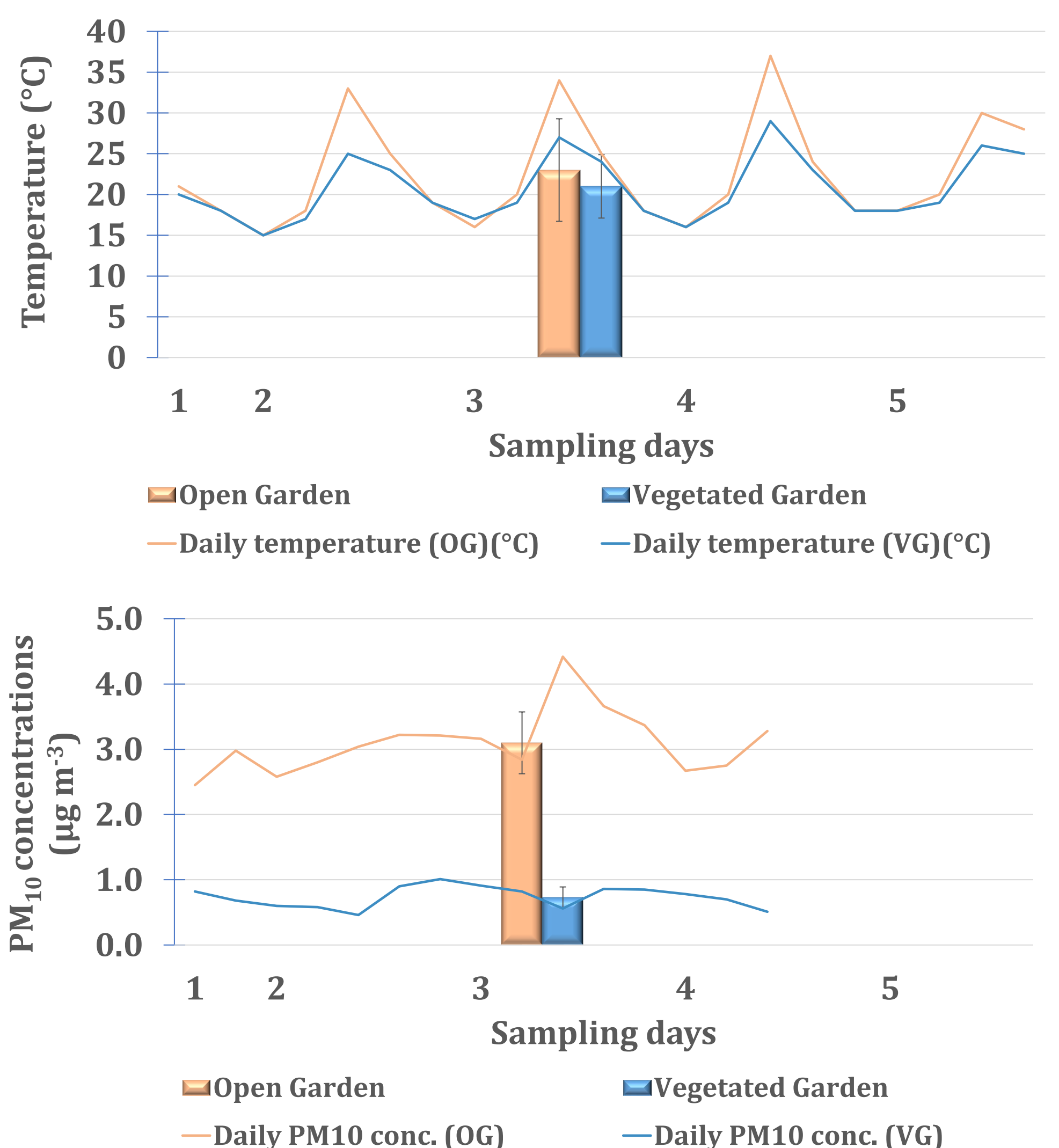


**Figure 3.** Comparison of temperature and $PM_{10}$ levels during four days in open and vegetated gardens.

## 4 NEXT STEPS

- Continue to measure air quality and thermal comfort in the three garden designs, including comparing performance during summer and winter seasons.
- Identify the most common plants planted in domestic gardens and their impact on air quality.
- Lessons learned from this initial exploratory research will be fed into a preliminary domestic garden design guidance.