

# EVALUATION OF SOIL, GROUNDWATER AND VEGETABLE QUALITY IN LISBON URBAN ALLOTMENT GARDENS

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**TOPIC AREA:** “Quality of soils, groundwater and vegetables in urban gardens versus environmental pressures”

## ABSTRACT

The food safety of vegetables produced in an urban environment is often questioned due to its proximity to a range of city pressures including road traffic, aircraft corridors, fuel filling stations, and industrial areas. Besides, past urban/industrial activities might have contaminated city soils, namely throughout air pollution deposition.

In addition, the agricultural and in particular the horticultural land management practices themselves may lead to potential inputs from inadequate management of applied materials, such as fertilizers, composts and pesticides, as well as household items (e.g. fences, including materials such as paints or asbestos). These products can be an additional source of contamination for soil, water and edible vegetables, with harmful impacts on humans and other species. Moreover, the intrinsic concentration of soils can be high, depending on the chemical composition of the parent-rock (Kabata-Pendias, 2001).

In this context, Lisbon Municipality, based on the decision to open, in partnership with the National Laboratory for Civil Engineering (LNEC), a new public urban allotment garden (UAG) in LNEC campus, a potentially sensitive area due to its proximity to the airport, has decided to promote a protocol to study this situation with the local government “Junta de Freguesia de Alvalade” and, on this scope, enlarge this cooperation to other UAG in the city.

This study aimed to analyse the quality of soil, ground- and irrigation water, and plant species in UAG, and to correlate its nature and characteristics with their location within the city and the gardening activity. Materials and methods included the quality assessment of wet atmospheric deposition, manure, soil, vadose zone water and plant species, for six UAG in Lisbon. Results were compared with other EU studies (e.g. Hursthouse *et al.*, 2004).

As an overall conclusion, despite the fact that concentrations in soils and waters have exceeded the recommended values in some areas, the vegetables rarely presented contamination.

**Key-words:** Lisbon Urban Allotment Gardens; Quality; Soil; Groundwater; Vegetables.

## 1. ALLOTMENT GARDENS SELECTED AND ASSOCIATED CITY PRESSURES

Six UAG have been selected aiming to integrate different city pressures, geological parent rocks, and agronomic practices. Figure 1 presents their location within the city and associated environmental pressures.