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Nature Based Solutions to manage the soil contamination of urban allotment gardens: examples from Nantes (France)

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Urban allotment gardens (UAG) are important for the provision of foodstuffs, social cohesion, residents' well-being, and prevention of the formation of local heat islands during summer. The soils of these gardens however may be adversely affected by pollution threats and thus create health risks. In such cases, appropriate management becomes necessary.

For several gardens exhibiting soil contamination (e.g. Pb at 100-400 mg kg⁻¹) in the city of Nantes (France), local actors collaborated, including: scientists, the municipality's Parks and Open Space Department, elected officials, sanitary administration, and each site's gardeners' association. The soil characterization step was performed along with a sanitary risk evaluation and discussion of management options, based on both the pollution characteristics and local context.

The most frequent option consisted of replacing the polluted soils with clean soils. Managing the excavated polluted soils on-site (e.g. for ornamental purposes) limited the economic and environmental impacts associated with this solution. Alternative solutions, including a combined system of non-accumulative cropping vegetables at the time of phytoextraction, were also employed to maintain gardening uses. In some cases, land use (gardening) was changed into, for example, an orchard, open space or ornamental space. A combination of solutions was introduced in several gardens.

The various options available for managing polluted soils, as implemented in Nantes' UAGs and based mainly on NBS, can be applied more generally in order to improve soil quality. In addition to enhancing the quality of both residents' lives and biodiversity, several solutions allow preserving or even restoring soil functions.