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Urban soil ecosystem services: contributing to sustainable urban development

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Soil in urban areas has largely been left out of traditional soil research, however, there is now a growing interest in its importance due to the key role that cities will play in a more sustainable future. Soil provides vital ecosystem services, and these are becoming more pertinent for cities as the population of urban areas continues to grow. Services such as flood regulation, urban food growing, urban heat island mitigation and carbon storage, as well as cultural and recreational services, are unpinned by the healthy functioning of soils.

The role of urban soil in providing ecosystem services in urban areas is understudied, and the complexities of understanding and quantifying soil ecosystem services has yet to be translated to the varied and highly heterogeneous context of cities. In this work, we will review the literature on soil ecosystem services in cities and present a state-of-the-art picture of current knowledge.

We will discuss the variation of urban soils, their treatment and management in urban areas, and the associated difficulty in investigating and classifying them. The trends of urban soil ecosystem services research will be presented, considering which services have been most commonly studied across supporting, provisioning, regulating and cultural categories; and in which countries. A co-occurrence analysis of key terms in the literature will also be presented, highlighting further patterns and gaps in knowledge. This will also lead to a discussion on the key drivers behind the soil threats in urban areas, such as soil compaction, sealing with impervious surfaces and contamination.

The most studied services will be investigated further to allow a more detailed discussion into what we know about these services, and the impacts of urbanisation on their provision. This presentation will bring together the growing body of work on this relatively new research area, will identify gaps in our knowledge, and will highlight the impacts of urbanisation for urban soils. This will inform the way we treat and manage soil in urban areas, helping to optimise the provision of urban soil ecosystem services and contributing to more sustainable urban development for the future.