Garcia, M. (2004). Effects of pesticides on soil fauna: development of ecotoxicological test methods for tropical regions (Vol. 19). Cuvillier Verlag.
Thompson, Dean G., and David P. Kreutzweiser. "A review of the environmental fate and effects of natural" reduced-risk" pesticides in Canada." 2007. 245-274.
van Gestel, C. A., van der Waarde, J. J., Derksen, J. G. M., van der Hoek, E. E., Veul, M. F., Bouwens, S., ... & Stokman, G. N. (2001). The use of acute and chronic bioassays to determine the ecological risk and bioremediation efficiency of oil-polluted soils. Environmental Toxicology and Chemistry, 20(7), 1438-1449.
Nature4Cities, D2.1 - System of integrated multi-scale and multi-thematic performance indicators for the assessment of urban challenges and NBS. https://www.nature4cities.eu/post/nature4cities-defined-performance-indicators-to-assess-urban-challenges-and-nature-based-solutions
Nature4Cities, D2.2 - Expert-modelling toolbox
Nature4Cities, D2.3 – NBS database completed with urban performance data https://www.nature4cities.eu/post/applicability-urban-challenges-and-indicators-real-case-studies
Nature4Cities, D2.4 - Development of a simplified urban performance assessment (SUA) tool

8.26 Soil structure

Project Name: PHUSICOS (Grant Agreement no. 776681)

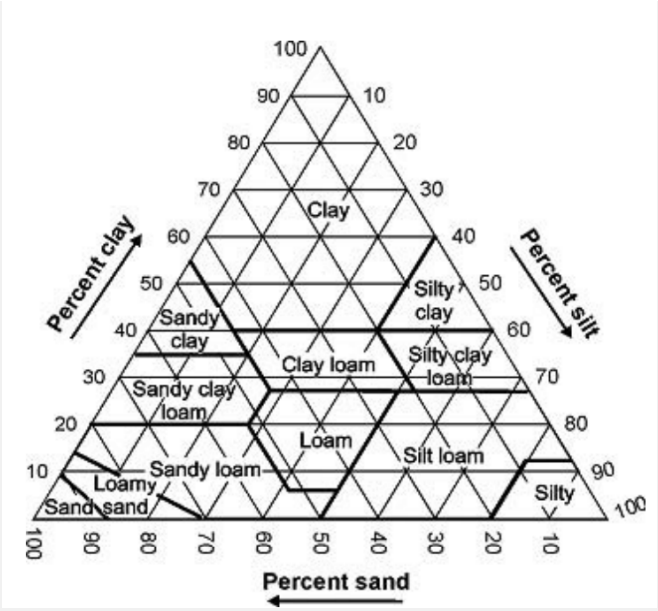
Author/s and affiliations: Gerardo Caroppi[1,2], Carlo Gerundo[2], Francesco Pugliese[2], Maurizio Giugni[2], Marialuce Stanganelli[2], Farrokh Nadim[3], Amy Oen[3]

[1] *Aalto University, Department of Built Environment, Espoo, Finland (gerardo.caroppi@aalto.fi)*
[2] *University of Naples Federico II (UNINA), Department of Civil, Architectural and Environmental Engineering, Naples, Italy*
[3] *Norwegian Geotechnical Institute (NGI), Oslo, Norway*

Soil Structure	Biodiversity
Description and justification	This indicator evaluates the soil fertility, in terms of nutrients, structure and *C* and *N* cycling.
Definition	Defined by the way individual particles of sand, silt, and clay are assembled. Single particles when assembled appear as larger particles. They are called aggregates. Aggregation of particles can occur in different patterns, resulting in different soil structures. The circulation of

	water in the soil strongly varies according to the soil structure.
Strengths and weaknesses	+ Good granular structure allows rapid movement of air and water within the soil. Poor granular structure decreases movement of air and water. - Soil sample collecting could be time and money consuming.
Measurement procedure and tool	The size, shape and character of the soil structure varies (e.g., cube-like, prismlike or platter-like). On the basis of size, the soil structure is classified as: - very coarse: > 10 mm; - coarse: 5–10 mm; - medium: 2–5 mm; - fine: 1–2 mm; - very fine: < 1 mm. Depending on the stability of the aggregate and the ease of separation, the structure is classified as: - poorly developed; - weakly developed; - moderately developed; - well developed; - highly developed.
Scale of measurement	Ordinal scale
Data source	
Required data	Soil samples
Data input type	Semi-quantitative
Data collection frequency	Annually
Level of expertise required	High
Synergies with other indicators	Indicators related to soil fertility (soil available nutrients and texture).
Connection with SDGs	2
Opportunities for participatory data collection	
Additional information	

References	Motsara M.R., Roy R.N. (2008), *Guide to laboratory establishment for plant nutrient analysis*. FAO fertilizer and plant nutrition bulletin.



Soil texture classes according to proportions of sand, silt and clay (Motsara, Roy, 2008)

8.27 Soil chemical fertility

Project Name: Nature4Cities

Author/s and affiliations: Ryad Bouzouidja[1], Patrice Cannavo[1], Stéphanie Decker[2]

[1] *Institut Agro – Ecole interne AGROCAMPUS OUEST, 2 rue André Le Nôtre, 49045 Angers Cedex 01, France; e-mail: patrice.cannavo@agrocampus-ouest.fr*

[2] *NOBATEK/INEF4, 67 Rue de Mirambeau, 64600 Anglet, France*

Chemical fertility of soil - Cfer	Green Space Management
Description and justification	**Cfer** relates to the mineral nutrition of plants via the concepts of biodisponibility of elements, deficiencies, toxicities and equilibria
Definition	Evaluation of the quality of soil, in this case chemical soil fertility (Nature4Cities D2.1) : - to assess the ability of soil to grow ornamental plants and food (vegetables) - to improve the soil properties if necessary (1) addition of limestone to adjust pH, (2) addition of compost to increase