Measurement procedure and tool	RUSLE (model/survey)
Scale of measurement	Unit of measure: ton/ha/year
Data source	
Required data	Rain data, soil characteristics, land use information.
Data input type	Quantitative
Data collection frequency	
Level of expertise required	High
Synergies with other indicators	
Connection with SDGs	13
Opportunities for participatory data collection	
Additional information	
References	

8.25 Soil Ecotoxicological Factor

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*

Soil Ecotoxicology factor (EcoF)	Green Space Management
Description and justification	This Ecotoxicology factor is able to describe initial planning problems, like ecotoxicity for plant growth, soil microorganisms, micro- meso- and macro- fauna It gives an assessment of the environmental risk due to soil pollution and will help urban planners in choosing the best soil management solution according to the intended use.
Definition	EcoF is based on (i) an evaluation of the concentration of pollutants for which an effect is measured in 50% of a population (EC50) and (ii) the time needed for 50% of a pollutant disappears (DT 50) (Nature4Cities D2.1).

	It will be used for the : ● Evaluation of the effect of contaminants on soil organisms (microorganisms, micro- meso- or macro-fauna) ● Evaluation of the dissipation (sorption, full or partial degradation) of contaminant over time
Strengths and weaknesses	It is possible to apply the indicator in numerous cases (different locations). The indicator has been used in different circumstances (different soil uses) and delivered reasonable results. However it requires a number of samples adapted to soil heterogeneity
Measurement procedure and tool	● soil sampling materials ● calculations must be done to get EC50 Calculating CE50 and DT50 require to collect soil samples and to perform experiments in laboratory.
Scale of measurement	☒ City ☒ Neighbourhood ☒ Object
Data source	● Bibliography ● Measurement/Monitoring
Required data	● Soil or water content in pollutant Measurement unit : ● for EC 50 : mg/L (for water), mg/kg (for soil) ● for DT 50 : in days
Data input type	● quantitative data
Data collection frequency	● Initial diagnostic ● At least 2 times of sampling for being able to measure DT50
Level of expertise required	Medium calculation difficulty and required data
Synergies with other indicators	In Nature4Cities the EcoF Score indicator is based on an evaluation of the concentration of pollutants for which an effect is measured in 50% of a population (EC50) expressed in mg L^{-1} (in case of water) and mg kg^{-1} (in case of soil). EC50 is determined using ISO 6341 (2012) standard method. The index is given in form of a performance bar with numerical values ranked in terms to the best (1) and worst (0) scenario.
Connection with SDGs	SD15 Life on Land, SD14 Life bellow water
Opportunities for participatory data collection	
Additional information	
References	Hommen, U., Baveco, J. M., Galic, N., & van den Brink, P. J. (2010). Potential application of ecological models in the European environmental risk assessment of chemicals I: review of protection goals in EU directives and regulations. Integrated environmental assessment and management, 6(3), 325-337.

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