

7.3 Soil organic matter

Project Name: OPERANDUM (Grant Agreement no. 776848)

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Soil organic matter content	Green Space Management
Description and justification	Soil organic matter influences many soil characteristics including colour, water and nutrient holding capacity (cation and anion exchange capacity), soil pH, nutrient turnover and stability, soil microbial activity and composition, decomposition, which in turn influence water relations, aeration and workability.
Definition	Measure of the soil organic carbon contained within the soil organic matter
Strengths and weaknesses	<p>Strengths: the only true measure of organic carbon present in a soil; easy to measure through loss on ignition (LOI) method -i.e., gravimetric method; elevated temperatures ensure the combustion of all the carbon forms present; possible to generate digital soil maps using a relatively low amount of data inputs.</p> <p>Weaknesses: no universal standard protocol for LOI; it does not include the organic carbon from volatile compounds as these are lost during digestion and drying; LOI method needs site-specific calibration to retrieve information on soil organic matter.</p>
Measurement procedure and tool	Repeated field sampling followed by laboratory analysis by either: a) dry combustion method using elemental analyser [heat a small sample (usually a fraction of a gram) of dry pulverized soil to around 900°C and measure the carbon dioxide gas that is a combustion product]; or, b) Loss on Ignition test (the weight loss of a dry soil sample after it is heated in an oven or muffle furnace to 360–450°C for 2 h). The results are expressed as the percent carbon in the sample.
Scale of measurement	micro
Data source	
Required data	Soil sample Measurement unit: %
Data input type	-

Data collection frequency	Seasonal
Level of expertise required	Low for sampling, intermediate/high for testing/interpretation.
Synergies with other indicators	Moisture content, field capacity, wilting point, soil type, soil strength
Connection with SDGs	11,13,15,17
Opportunities for participatory data collection	yes
Additional information	
References	Gonzalez-Ollauri, A. and Mickovski, S.B., 2017. Plant-Best: A novel plant selection tool for slope protection. <i>Ecological Engineering</i> 106 (2017) 154–173. Hoogsteen, M.J.J., Lantinga, E.A., Bakker, E.J., Groot, J.C.J. and Tittonell, P.A. (2015), Estimating soil organic carbon through loss on ignition: effects of ignition conditions and structural water loss. <i>Eur J Soil Sci</i> , 66: 320-328.

7.3.1 Soil Organic Matter Index

Project Name: Nature4Cities (Grant Agreement no. 730468)

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Soil Organic Matter Index	Green Space Management
Description and justification	SOM is a crucial parameter of soil biological, chemical and physical quality. All soil properties are highly depending on this parameter (soil aggregation, soil nutrients, soil decomposers...)
Definition	This indicator is a numerical value used to ensure/Improve soil organic matter content to allow long-term soil quality. This indicator is available to everyone and easy to implement It is possible to apply the indicator in different locations. The indicator has been used in different circumstances (different soil uses) and delivered reasonable results.