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2.13 Mean or peak daytime temperature

2.13.1 Mean or peak daytime temperature - Direct temperature measurement

Project Name: UNaLab (Grant Agreement no. 730052)

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Mean or peak daytime temperature – Direct measurements	**Climate Resilience**
Description and justification	Green urban infrastructure can significantly affect climate change adaptation by reducing air and surface temperatures with the help of shading and through increased evapotranspiration. Conversely, green urban infrastructure can also provide insulation from cold and/or shelter from wind, thereby reducing heating requirements (Cheng, Cheung, & Chu, 2010). By moderating the urban microclimate, green infrastructure can support a reduction

	in energy use and improved thermal comfort (Demuzere et al., 2014). The cooling effect of green space results in lower temperatures in the surrounding built environment. A simulation of the surrounding buildings showed the potential for a 10% decrease in the cooling load due to the presence of the green area in the vicinity (Yu & Hien, 2006).
Definition	Mean or peak daytime local temperature by direct measurement (°C)
Strengths and weaknesses	+ Straightforward assessment of ambient air temperature + Reliable in the long run - Requires a rather large amount of monitoring stations to be installed to monitor various NBS intervention areas
Measurement procedure and tool	Ambient air temperature can be assessed through continuous monitoring of temperature, near the NBS intervention area, and calculation of mean and peak daytime temperature before and after NBS implementation.
Scale of measurement	Plot to district scale
Data source	
Required data	Automated continuous monitoring of ambient air temperature
Data input type	Quantitative
Data collection frequency	Annually; at minimum, before and after NBS implementation
Level of expertise required	Low
Synergies with other indicators	A prerequisite for *Heatwave Risk* and *Urban Heat Island* indicators, and a requirement for *Depth to groundwater* indicator
Connection with SDGs	SDG 3 Good health and well-being, SDG 11 Sustainable cities and communities, SDG 13 Climate action
Opportunities for participatory data collection	Participatory data collection is feasible through direct temperature measurements if these are not automated
Additional information	
References	Cheng, C.Y., Cheung, K.K.S., & Chu, L.M. (2010). Thermal performance of a vegetated cladding system on facade walls. Building and Environment, 45(8), 1779-1787. Demuzere, M., Orru, K., Heidrich, O., Olazabal, E., Geneletti, D., Orru, H., Faehnle, M. (2014). Mitigating and adapting to climate change: Multi-functional and multi-scale assessment

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2.13.2 Mean or peak daytime temperature - Temperature modelling

Project Name: UNaLab (Grant Agreement no. 730052)

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Mean or peak daytime temperature – Temperature modelling	**Climate Resilience**
Description and justification	Green urban infrastructure can significantly affect climate change adaptation by reducing air and surface temperatures with the help of shading and through increased evapotranspiration. Conversely, green urban infrastructure can also provide insulation from cold and/or shelter from wind, thereby reducing heating requirements (Cheng, Cheung, & Chu, 2010). By moderating the urban microclimate, green infrastructure can support a reduction in energy use and improved thermal comfort (Demuzere et al., 2014). The cooling effect of green space results in lower temperatures in the surrounding built environment. A simulation of the surrounding buildings showed the potential for a 10% decrease in the cooling load due to the presence of the green area in the vicinity (Yu & Hien, 2006).
Definition	Mean or peak daytime local temperature by meteorological modelling (°C)
Strengths and weaknesses	+ Allows the calculation with an hourly resolution at the grid, neighbourhood or city scale neighbourhood - Requires high level of expertise and external data
Measurement procedure and tool	Difference in temperature can be assessed through application of a meteorological model such as the Weather Research and Forecasting model (WRF) (NCAR & UCAR, n.d.; NOAA, n.d.)