4.44 Dissolved oxygen (DO) content of NBS effluents

Project Name: UNaLab (Grant Agreement no. 730052)

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Dissolved oxygen of NBS effluents	**Water Management**
Description and justification	Water quality can profoundly impact both aquatic and terrestrial ecosystems. Changes to the quality of water may occur due to many different factors, including human activities. It is therefore important to monitor water quality in environments likely to be affected by anthropogenic activity, or in particularly sensitive aquatic ecosystems. Basic water quality parameters include pH, temperature, electrical conductivity (EC), dissolved oxygen (DO) content and flow rate.
Definition	Concentration of oxygen dissolved in water (mg/L or % O_2 saturation). The significance of DO content of natural waters is the requirement for sufficient oxygen to support aquatic life.
Strengths and weaknesses	+ An easy and straightforward assessment + Can be automated to ensure continuous data collection - Potential difficulties with maintenance and calibration of the automated equipment
Measurement procedure and tool	a. Dissolved oxygen content (DO) is traditionally measured in the laboratory using a Winkler method. For the Winkler method, water samples are collected overflowing in the sample bottles to minimize the air interference, and then using a set of reagents the oxygen is “fixed”. The reagents include: • 2 ml Manganese sulfate • 2 ml alkali-iodide-azide • 2 ml concentrated sulfuric acid • 2 ml starch solution • Sodium thiosulfate

	After that, the sample is titrated until reaching the endpoint (i.e., colour change). The endpoint determines the concentration of the DO in the water sample, which is equivalent to the number of millilitres of titrant used. b. An alternative and less chemical-intensive method is measuring the DO content using a DO meter and a probe that require calibration according to the manufacturer's instructions. The DO content of water is inversely related to temperature, with decreasing O_2 solubility in water as temperature increases. DO and temperature should always be measured together to ensure accuracy. Many DO meters have an in-built temperature probe and will display DO content in mg/L as well as the per cent (%) O_2 saturation, along with the measured water temperature (in °C). Excessive nutrient (N and P) load to the water bodies results in depleted DO concentrations and degradation of watercourses.
Scale of measurement	Plot scale
Data source	
Required data	Dissolved oxygen and temperature measurement data
Data input type	Quantitative
Data collection frequency	Daily (using automated measurements) or weekly
Level of expertise required	Low
Synergies with other indicators	Synergies with the indicator group *Water quality* indicators
Connection with SDGs	SDG 13 Climate action, SDG 14 Life below water
Opportunities for participatory data collection	Participatory data collection is possible under supervision
Additional information	
References	A number of standard methodologies for water testing are available from, e.g., the International Organization for Standardization (ISO), American Public Health Association (APHA), the European Environment Agency (EEA), and others.