Ecosystem Service	**Erosion control**
CICES class name	Control of erosion rates
CICES Section	Regulation & Maintenance (Biotic)
CICES Class code	2.2.1.1

Sample Indicators

Indicator values from			
Experiment or direct measurement	(microscope icon)	Survey	(clipboard icon)
Expert assessment	(expert icon)	Statistical- or census data	(chart icon)
Model or GIS	(monitor icon)	Literature values	(book icon)
Stakeholder participation	(group icon)	Not provided	(prohibition icon)

Table 1: Field Scale

Indicator	**Unit**	**Indicator values from**
[1] Sediment lost by erosion	$t * yr^{-1}$	Not provided
[8] Soil loss	Not provided	Literature values
[9] Annual total sediment yield in runoff	$t * ha^{-1}$	Model or GIS
[2] Erosion regulation potential	$t * ha^{-1} * yr^{-1}$	Literature values
[5] Erosion by water	$t * ha^{-1} * yr^{-1}$	Model or GIS
[6] Erosion by water	$t * ha^{-1} * yr^{-1}$	Model or GIS
[5] Erosion by wind (measured with DIN 19706 method)	-	Model or GIS
[6] Erosion by wind (measured with DIN 19706 method)	-	Model or GIS
[3] Change in soil height, measured by means of pins hammered into the soil at the beginning of measurements	mm	Experiment or direct measurement
[7] Bare soils	Not provided	Literature values
[3] Soil mulch cover (non-living vegetative biomass)	$kg * ha^{-1}$	Experiment or direct measurement
[7] Litter cover	Not provided	Literature values

[7] Biological soil cover	Not provided	
[4] Drainage	mm * yr^{-1}	

Table 2: Farm Scale

Indicator	Unit	Indicator values from
[11] Prevention of water erosion: rate of water infiltration into the soil	mm * ha^{-1}	
[12] Bank stability: Share of irrigation channel bank considered stable (not vertical, un-vegetated or eroded), expressed as a four-level index	%, Index: poor-fair-good-excellent	
[12] Vegetation cover, expressed as a four-level index	%, Index: poor-fair-good-excellent	
[10] Index for share of fields with continuous living cover. The index is calculated by dividing the observed value by a target value. Target values may be average or maximum values found in region or empirical values from literature. If the calculated index is higher than 1, it is set to one.	Index 0 - 1	,
[10] Index for share of farm fields protected by conservation structures such as field buffers. The index is calculated by dividing the observed value by a target value. Target values may be average or maximum values found in region, or empirical values from literature. If the calculated index is higher than 1, it is set to one.	Index 0 - 1	,

Table 3: Regional Scale

Indicator	Unit	Indicator values from
[35] Annual average erosion	kg * ha^{-1} * yr^{-1}	
[25] Erosion rate calculated by modified Universal-Soil-Loss-Equation (USLE)	t * ha^{-1} * yr^{-1}	
[31] Annual soil erosion, assessed using the Revised Universal Soil Loss Equation (RUSLE)	t soil * ha^{-1} * yr^{-1}	
[20] Modelled erosion, calculated with LANCA model (simplified Universal Soil Loss Equation (USLE)) and with Revised Universal Soil Loss Equation (RUSLE)	t soil * ha^{-1} * yr^{-1}	
[32] Potential soil erosion level calculated with Revised Universal Soil Loss Equation (RUSLE)	t * ha^{-1} * yr^{-1}	,

[36] Soil erosion by water, calculated with Revised Universal Soil Loss Equation (RUSLE)	t soil * ha^{-1} * yr^{-1}	
[9] Annual total sediment yield in runoff	t * ha^{-1}	
[35] Annual average sediment in rivers	t * yr^{-1}	
[35] Annual average sediment retention	kg * ha^{-1} * yr^{-1}	
[19] Sediment retention, calculated with InVEST model based on universal soil loss equation and the land use/land cover specific sediment removal efficiencies	Mg * ha^{-1}	
[35] Annual sediment retention to reservoirs	kg * yr^{-1}	
[27] Modelled rates of water caused erosion and accumulation for a 10-year rainfall event	t * ha^{-1}	
[23] Erosion control: Difference between the calculated erosion (using the Universal Soil Loss Equation) for a situation of bares soils and the current situation (considering the factors C: land cover management and P: supporting practices)	kg * m^{-2}	
[28] Erosion control: Difference between the calculated erosion (using the InVEST Model based on the Universal Soil Loss Equation) in a model run that accounts for land cover and land management and in one that does not	t * ha^{-1}	
[33] Erosion control: Difference between the calculated erosion (using the InVEST Model based on the Revised Universal Soil Loss Equation) in a model run that accounts for land cover and land management and in one that does not	t * ha^{-1}	
[15] Erosion control: Difference between the calculated erosion rates (using the Universal Soil Loss Equation) with- and without considering land cover	t soil * pixel $area^{-1}$ (e.g., 30 m * 30 m)	
[34] Soil conservation calculated by RUSLE equation: $$A = R * K * LS * (1 - C * P)$$ With: A – soil conservation, R – rainfall erosivity factor, K – soil erodibility factor, LS – slope length and steepness factor, C – cover and management factor, P – conservation practice factor	t * ha^{-1} * yr^{-1}	
[14] Soil erosion protection: C-factor in the Universal Soil Loss Equation (USLE)	-	
[17] Soil erosion protection: C-factor in the Universal Soil Loss Equation (USLE)	-	
[29] Soil formation and erosion prevention: expert based index for ES provision by land cover class [1-5] multiplied by the area of land cover class	km^2	, ,

[29] Soil formation and erosion prevention value: expert based index for ES provision by land cover class [1-5] multiplied by the area of land cover class and a literature-based monetary value of ES	$km^2, \$ * ha^{-1} * yr^{-1}$	
[30] Wind erosion: Expert-/stakeholder rating of how much of erosion control can be provided by a landscape (represented by a land use map), using a 6-point Lickert-scale	none - highest capacity	
[30] Wind erosion: Expert-/stak eholder rating based on pairwise comparisons of landscapes (represented by land use maps) in an Analytical Hierarchical Process (AHP). Experts select the landscape with higher capacity for providing erosion control and rate the difference between the two landscapes	1: equal capacity - 9: absolute preference of one landscape	
[18] "Emergy" of topsoil loss, calculated as: $E = L_{OM} * T_{OM} + L_N * T_N + L_P * T_P + L_K * T_K$ With: E – Emergy, L_{OM} – loss of topsoil organic matter, T_{OM} – transformity of organic matter, L_N – loss of topsoil nitrogen, T_N – transformity of nitrogen, L_P – loss of topsoil phosphorus, T_P – transformity of phosphorus, L_K – loss of topsoil potassium, T_K – transformity of potassium	seJ	
[35] Number of prevented hazards	$\# * yr^{-1}$	
[26] Area affected by erosion	ha	
[24] Share of areas without erosion problems relative to municipality's surface. Values were normalized [0-1] using benchmark values where available and observed values otherwise.	%	
[13] Erosion control capacity: values are assigned for different land cover classes. Index values were taken from Burkhard et al. (2012, DOI:10.1016/j.ecolind.2011.06.019)).	Index 0 - 5	
[21] Erosion regulation: values are assigned for different land cover classes. The matrix defined by Burkhard et al., 2012 (DOI:10.1016/j.ecolind.2011.06.019) was adapted and used in this study.	Index 0 - 5	
[16] Relative erosion sensitivity (based on modified Universal Soil Loss Equation (USLE)), considering soil type, slope, land use and distance to water	-	
[22] Resistance to soil erosion from water, calculated using the Universal Soil Loss Equation (USLE): $\text{Resistance} = \text{USLE K\_factor (soil)} * \text{USLE S\_factor (slope)}$		
[22] Resistance to soil erosion from wind	1: very low - 5: very high	
[32] Rating of current service provision per land use class by expert-stakeholders	Rating 0 - 10	

[32] Rating of increases/decreases of service provision in scenarios, relative to the status quo	%	
[37] Soil protection $$SP = NPP * (1 - VC_{NPP}) * (1 - S_{cf}) * 1.5$$ With: NPP – Net Primary Production calculated from NDVI-values and expressed on a relative scale set to [0 – 1000], VC_{NPP} – coefficient of variation of NPP [0 – 1], S_{cf} – slope average correction factor of the study area [0 – 1].	Not specified	
[38] Soil protection factor. Region-specific and land use specific protection factor. Only areas with erosion risk > 2 t * ha^{-1} (calculated using the Universal Soil Loss Equation) are considered.	Not specified	
[35] Natural barriers against floods (dunes, mangroves, wetlands, coral reefs)	ha	
[35] Vegetation cover	%	
[35] Conservation of river banks	km	

Table 4: National Scale

Indicator	**Unit**	**Indicator values from**
[41] Calculated current water Erosion (using modified Universal Soil Loss Equation (USLE))	t * ha^{-1} * yr^{-1}	
[40] Soil erosion risk	Not specified	
[41] Avoided water Erosion: Difference in calculated erosion (modified Universal Soil Loss Equation (USLE)) between the real situation and a hypothetical situation without vegetative cover	t * ha^{-1} * yr^{-1}	
[41] Water Erosion avoided due to small scale structures in arable land: Difference in calculated erosion (modified Universal Soil Loss Equation (USLE)) between a situation without small scale structures and a a situation where erosive slope length is reduced by small scale structures	t * ha^{-1} * yr^{-1}	
[40] Percentage of soil cover in cropland (conservation tillage (low tillage), zero tillage, winter crops, cover crop or intermediate crop, plant residues)	%	
[40] Density of hedgerows	Not specified	
[40] Percentage of grassland cover	%	
[41] Share of organic cultivation in a federal state's arable land	%	

[39] Expert assessment of erosion control for each land use class	very negative (−3) to very positive (+3)	

Table 5: Multinational Scale

Indicator	**Unit**	**Indicator values from**
[42] Erosion regulation: values assigned for Corine land cover classes, based on values published by Burkhard et al. (2009; DOI: 10.3097/LO.200915) and modified for the context of riparian zones.	Index 0 - 5	

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