Level of expertise required	High
Synergies with other indicators	
Connection with SDGs	12
Opportunities for participatory data collection	Given the high degree of expertise needed to calculate this indicator, technical stakeholder can contribute to the provision of data needed for the estimation of the expected damages.
Additional information	
References	U.S. Environmental Protection Agency (1993), *A Guide for Cost-effectiveness and Cost-benefit Analysis of State and Local Ground Water Protection Programs*.

24.9 Payback period for NBS

Project Name: PHUSICOS (Grant Agreement no. 776681)

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Payback Period	**New Economic Opportunities and Green Jobs**
Description and justification	Indicators of Cost-Benefit Analysis of the Intervention sub-criterion will assess the financial feasibility of the project scenario.
Definition	The length of time required for the expected intervention to recover the cost of an investment. The payback period of a given investment or project is an important determinant of whether to undertake the position or project, as longer payback periods are typically not desirable for investment positions.
Strengths and weaknesses	+ Easy to understand and to calculate; Once the calculation method is defined, it is unambiguous and does not lend itself to misinterpretation.

	- It does not consider the flows achieved in the periods following the payback period; it does not consider the financial value of time; it does not consider the amount of capital invested; it is an indicator of risk (temporal exposure), not of yield.
Measurement procedure and tool	The formula to calculate the payback period (PBP) of an investment depends on whether the periodic cash inflows from the project are even or uneven. If the cash inflows are even (such as for investments in annuities), the formula to calculate payback period is: *PBP = Initial Investment / Net Cash Flow per Period* When cash inflows are uneven, we need to calculate the cumulative net cash flow for each period and then use the following formula: *PBP = A + (B / C)* where: *A* is the last period number with a negative cumulative cash flow; *B* is the absolute value (i.e., value without negative sign) of cumulative net cash flow at the end of the period A; *C* is the total cash inflow during the period following period A Cumulative net cash flow is the sum of inflows to date, minus the initial outflow.
Scale of measurement	years
Data source	
Required data	Initial costs and cash flows for the proposed project.
Data input type	Quantitative
Data collection frequency	It could be assessed when the project scenario is clear and defined.
Level of expertise required	Medium
Synergies with other indicators	Connected to other economic indicators such as initial cost and maintenance costs.
Connection with SDGs	12
Opportunities for participatory data collection	Given the high degree of expertise needed to calculate this indicator, technical stakeholder can contribute to the

	provision of data needed for the estimation of the cash flows.
Additional information	
References	Williams, J.R., et al. (2012), *Financial and Managerial Accounting*, McGraw-Hill.

24.10 Reduced / avoided damage costs

Project Name: RECONECT (Grant Agreement no. 776866)

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Reduced / avoided damage costs from hydro-meteorological risk reduction	**New Economic Opportunities and Green Jobs**
Description and justification	Determining direct damage is commonly done using depth-damage curves, which denote the damage that would occur at specific water depths per asset or per land-use class.
Definition	Expected annual damage
Measurement procedure and tool	In general the damage costs are calculated as expected annual damage, EAD, to account for random fluctuations in actual occurrences of hydro-meteorological events. This is why calculated hazard maps are used rather than direct observations. The EAD is calculated by numerical integration between based on the following equation: $$EAD = \frac{1}{2}\sum_{i=1}^{n}\left(\frac{1}{T_i} - \frac{1}{T_{i+1}}\right)(D_i + D_{i+1})$$ where Ti and Di are return period and calculated damage for return period i. The required number of calculation points are discussed in e.g., Olsen et al (2015). In general the majority of the calculation points should be close to the return period where damages start to occur, since very high return periods rarely contribute substantially to the overall risk in spite of their high cost (when they occur).
Data source	