References	

24.25 Innovation impact

Project Name: CONNECTING Nature (Grant Agreement no. 730222)

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Innovation Impact	New Economic Opportunities and Green Jobs
Description and justification	This indicator provides information about the impact that the NBS has had on innovation by firms / organisations involved in developing and/or maintaining the NBS. The expectation is that the challenges and opportunities presented by climate change and urban development – along with the disparate perspectives and knowledge brought by stakeholders to the NBS project - will result in innovations that can generate economic value as well as be deployed elsewhere.
Definition	'Innovation' is generally defined as "the generation, acceptance and implementation of new ideas, processes, products or services (Thompson 1965:2)". There is no indicator that could capture every type or aspect of innovation that might possibly arise out of an NBS project, but the economic focus of this indicator suggests that *new products and services* are the appropriate aspects of innovation in this case. Furthermore, we draw on literature that suggests specific types of inputs / processes that would be expected to result in new innovations, which may be measured as a proxy / leading indicators for the emergence of innovations at a later stage. This is consistent with the understanding that innovation is not just about discrete items, but also that it may be embedded in processes and that certain processes are core to innovation. Across the literature, all definitions of innovation – no matter their disciplinary source – will include the word 'new'. Therefore it is important to provide the definition of 'new' so that evaluators can clearly explain how they have designated something as an innovation. The OECD defines *new* products as those that "differ

	significantly in their characteristics or intended uses from products previously produced ...” (OECD 2005). Furthermore, patent offices generally require that inventors demonstrate that their inventions are: ‘novel’ (not published / made available previously); ‘inventive’ (non-obvious solutions to a problem); and useful/practical (has identifiable benefits and is possible to produce). In assessing whether something is an innovation or not, evaluators should keep these criteria in mind. It may also be helpful to consider the extent to which the problem being addressed by the innovation is well-understood. Satell (2017) suggests that there are 4 types of innovation – varying along two dimensions: 1) how well the problem is defined, and 2) how well the skills necessary to solve the problem are understood. Well-defined problems requiring well-defined skills will result in ‘Sustaining Innovation” – or innovation that creates incremental improvements to existing areas of activity. “Basic Research” is innovation that addresses undefined problems and requires unknown types/levels of skills. In between these two extremes (of defined problem/skills domains) are: “Breakthrough innovations” which address well-defined problems but require unusual / unexpected knowledge & skills and “Disruptive Innovations” which occur when things we know how to do are combined in unexpected ways and result in solutions to problems we didn’t know we had. Considering the type of innovation being counted will aid the assessment process and provide better evidence for why (or why not) an innovation was counted. Satell’s article highlights the fact that new ways of combining and fostering skills and knowledge are critical components of innovation processes and outcomes. Assessing the extent to which skills / knowledge are being combined / developed in new ways will provide a leading indicator of the likelihood of current/future innovation. Recent research confirms that 'knowledge distance' is an important element of creativity which can lead to innovation (Taques et al 2020; Acar and van den Ende 2016). Looking more broadly at innovation indicators, Dziallas and Blind (2019) examined 226 articles relating to innovation indicators between 1980-2015 and found 82 different indicators for measuring innovation. They also found that there were more indicators looking at the ‘process’ of innovation than at the ‘products’ of innovation, and concluded that: “Despite the high number of well-known indicators and factors, concrete indicators to evaluate innovations are difficult to identify (p. 16)”. Hence, the measurement procedures recommended here should be reviewed regularly against emerging literature and best practice.
Strengths and weaknesses	+ The indicator is strongly aligned with public policy to encourage and deliver innovation

	+ The indicator provides leading information about the potential for future economic gain + The indicator is a meaningful and may be aggregated (depending upon measurement used) - Depending upon the measurement used, it may require significant resources to collect and analyse - Depending upon the measurement used, there may be challenges in comparing measures across projects.
Measurement procedure and tool	The assessment team will first need to confer with NBS project management to determine which of the recommended measures to use. It may be that multiple indicators are selected – which would be consistent with recommended practice in industry, but extremely time consuming. The five measurement options are: - No. of patents; - No. of new products / services; - Annual revenue arising for sales of new products / services; - No. of hours spent by relevant individuals in research, ideation and/or innovation training; - Range of knowledge / perspectives involved in design, development or ongoing governance of NBS. Choosing between these will generally be driven by relevance for the NBS and NBS-related activities; resources and data availability; and interest from relevant stakeholders. Data on patents filed is publicly available in most jurisdictions and so may be the least expense / time-consuming to collect. The challenge will be to attribute patents to the NBS project and this will require determining the firms/organisations that have worked with the NBS and the period over which any patents filed could reasonably have been influenced by their involvement with the NBS. Data on new products and services will need to be collected through interviewing the relevant firms/organisations just after the implementation of the NBS and throughout the operations (maintenance) period to ask for the number (No.) of new products and services and the Annual Revenue (in relevant currency) from sales of these. The evaluation team should use the guidance provided in the definition above – and any other sources at their disposal – to provide the definition of new products and services to firms / organisations in order to ensure comparability across respondents. Data on hours spent on research, ideation or innovation training should be collected from firms/organisations involved in the NBS during the planning and development phases on an as-agreed basis and would generally be reported upon the completion of the

	development phase and (if-desired) on an annual basis throughout the maintenance phase. Reporting the range of knowledge / perspectives brought together by the project will be more of a qualitative assessment by the project team and may be difficult to compare across projects. Nevertheless, it could be of significant interest to assess the relationship between this measure and a number of other measures across the spectrum of NBS indicators. It is likely that – should this indicator be chosen – the evaluation team will need to discuss how best to assess this. The decision to use this indicator will need to be done as close as possible to the beginning of the project as it would be very difficult to credibly assess this on a post-project basis. For those wishing to explore more quantitative ways of measuring knowledge distance, Acar & van den Ende (2020) used a survey instrument developed by Jeppesen & Lakhani (2010) to measure knowledge distance in relation to a given problem – which in this case could be the NBS itself. Respondents rated the extent to which the problem they are addressing was within their field of expertise on a scale from 1 to 7 (1 = inside my field of expertise , 4 = at the boundary of my field of expertise , 7 = outside my field of expertise). While the resulting measure is a number, it cannot be said that it is an 'objective' measure. Another way of quantifying the range of perspectives involved would be to determine the number of individuals involved in the design, development and/or governance of the NBS from different stakeholder groups. Sectors could be defined in any number of ways including the 5 groups in the Quintuple Helix: Academic; Industry; Government; Media; Nature (Carayannis et al 2012); 3 sectors of civil society: State; Market; Civil Society (including non-profit organisations and households); or other typologies of stakeholders as appropriate.
Scale of measurement	Site/Project and may be aggregated across projects and over time.
Data source	
Required data	No. of patents produced by NBS-related firms/organisations (output – quantitative) No. of new products / services created by NBS-related firms/organisations (output - quantitative) Annual revenue from new products / services created by NBS-related firms/organisations (output - quantitative) No. of hours spent by NBS-related firms/organisations' employees / project members on research/ideation and/or innovation training (process – quantitative)

	Range of knowledges / perspectives involved in design, development or ongoing governance of NBS (process – qualitative)
Data input type	Quantitative (4); Qualitative (1)
Data collection frequency	Post implementation and then periodically (suggest every 2-3 years) during the maintenance phase
Level of expertise required	High
Synergies with other indicators	Synergies with *GDP, Jobs, Income per capita and Skills & related earnings increase* indicators. Note that innovation process indicators (Hours spent on research, etc., and Range of knowledge/perspectives involved) may have synergies with indicators in other NBS Indicator groups.
Connection with SDGs	SDG 8 Decent Work and Economic Growth; SDG 9 Industry, Innovation and Infrastructure
Opportunities for participatory data collection	
Additional information	
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24.26 Income / Disposable income per capita

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Income / Disposable Income per Capita	New Economic Opportunities and Green Jobs
Description and justification	This indicator provides information about the change in individual's incomes living in proximity to the NBS. Although not a providing a complete picture – this information will provide input into assessments of the extent to which people are being pulled out of poverty and income inequality is being addressed in the vicinity of the NBS.
Definition	'Income' is defined as the total monetary payments received for labour, use of an individual's capital/land and any financial transfers (state or otherwise) over a specified period (usually one year). This measurement may also be called 'Gross Income'. 'Disposable income' is the amount of income remaining minus taxes and social security payments. Note that 'Discretionary Income' is a third measure that is often found in public reports on income levels and this is calculated as Disposable Income minus 'Necessary Expenses'. Necessary expenses may be defined differently in different jurisdictions and so this is not included in the indicator as measurements would not be comparable. Finally, Income/Disposable Income per Capita is the average of total incomes across the relevant population.
Strengths and weaknesses	+ The indicator is widely reported and generally understood