

Opportunities for participatory data collection	Yes, it would be ideal if the Willingness to Accept for distance and monetary value is calculated specifically for the municipality where the indicator is going to be applied. In that case, voluntaries properly trained such university students can help with the application of the Willingness to Accept surveys.
Additional information	The procedure for calculating this indicator is being developed as part of the PhD Thesis of Javier Babí Almenar (to be submitted at the end of 2020). Reference: Babi Almenar, Javier. 2020 (<i>Anticipated</i>). Characterisation, biophysical modelling and monetary valuation of urban nature-based solutions as a support tool for urban planning and landscape design. PhD Thesis. University of Bordeaux and University of Trento.
References	Bernath, K. and Roschewitz, A. (2008) Recreational benefits of urban forests: Explaining visitors' willingness to pay in the context of the theory of planned behavior, <i>Journal of Environmental Management</i> , 89(3), 155–166. doi: 10.1590/S0001-37652012000100017. Ta, M., Tardieu, L., & Levrel, H. (2020). Specifying preference heterogeneity regarding natural attributes of urban green spaces to inform renaturation policies. In <i>CIRED Working Paper</i> (No. 2020-78).

23.7 Overall economic, social and health wellbeing

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Overall economic, social and health well-being	New Economic Opportunities and Green Jobs
Description and justification	This indicator provides information about the change in the general well-being of individuals in the community in proximity to the NBS. General measures of well-being will include economic components (incomes and or consumption) as well as social and health components. As a 'cross-cutting' indicator this will provide strong evidence of the impact of the NBS on key aspects of peoples' lives and will be easily linked to existing data collection activities throughout Europe and the world.
Definition	The change in the aggregate HDI (Human Development index) or Social Deprivation Index (SDI) for people living in the vicinity of the NBS.

	<p>(HDI = GNI/capita; life expectancy at birth, years of education – as defined and reported by the United Nations – see below) OR</p> <p>(SDI has various definitions depending upon the region – see measurement discussion below)</p>
<p>Strengths and weaknesses</p>	<ul style="list-style-type: none"> + The indicator is easy to define and understand + The data are available and already collected (but perhaps not easy to disaggregate to the community area impacted – see weaknesses) + The HDI indicator is collected annually for all countries by the UN and so may be comparable across countries and their NBS implementations. SDIs are often calculated for populations in smaller geographic areas (see UK/Irl) and so may be more suited to NBS with smaller geographic footprints - If the NBS has a very small geographic area of impact, it may be necessary to collect large quantities of data about individuals within this area in order to construct the relevant index
<p>Measurement procedure and tool</p>	<p>The approach to measuring HDI is widely available from UN sources, with the original methodology and measurement explanation found in Anand & Sen (1994). Their summary explanation is reproduced here for convenience (http://hdr.undp.org/en/content/human-development-index-hdi):</p> <p>“The HDI was created to emphasize that people and their capabilities should be the ultimate criteria for assessing the development of a country, not economic growth alone. The HDI can also be used to question national policy choices, asking how two countries with the same level of GNI per capita can end up with different human development outcomes. These contrasts can stimulate debate about government policy priorities.</p> <p>The Human Development Index (HDI) is a summary measure of average achievement in key dimensions of human development: a long and healthy life, being knowledgeable and have a decent standard of living. The HDI is the geometric mean of normalized indices for each of the three dimensions.</p> <p>The health dimension is assessed by life expectancy at birth, the education dimension is measured by mean of years of schooling for adults aged 25 years and more and expected years of schooling for children of school entering age. The standard of living dimension is measured by gross national income per capita. The HDI uses the logarithm of income, to reflect the diminishing importance of income with increasing GNI. The scores for the three HDI dimension indices are then aggregated into a composite index using geometric mean. Refer to Technical notes for more details.</p>

Social Deprivation Indices are generally specific to a country and their definition of social deprivation. However, in 2008, the World Health Organisation recommended an international approach to track social (and economic) determinants of health outcomes which laid the ground work for a number of countries' approaches to measuring social deprivation. Phillips et al (2016) provide an overview of how a range of countries calculate social deprivation with all of them incorporating components related to income, employment, housing status and education. Within a given country, using the relevant SDI index for areas affected by the NBS is likely to be a useful tool for comparing the impact over time and across regions.

Understanding and identifying the buffer zone surrounding NBS and determining the relevant geographic area from which to report HDI/SDI is a critical component of this indicator. It may be useful to define the area surrounding the NBS similarly as defined in the indicator *Distribution of public green space*, e.g., land or properties with a 5 min walk from NBS (Madureira et al., 2011). Alternatively, proximity of land or property to NBS could be defined similarly to urban green space accessibility as in the indicator *Accessibility of urban green spaces*, i.e., land or properties within a 300-500 m distance from NBS (Tamosiunas et al., 2014).

From a data availability standpoint, however, it is like to be more convenient to define the impact area in relation to existing administrative boundaries for which the HDI/SDI indicator is already reported. Note that administrative areas are often established based on population numbers (e.g., electoral districts, community healthcare zones, etc.). This means that the economic data is available for pre-defined geographic areas that may – or may not – align with the expected impact 'buffer zone' or be comparable to other impact indicators' geographic span of impact.

Therefore, it may be necessary to assess the proportion of a given administrative area's population / economy that is affected by the NBS in order to use existing data to represent overall impact. In Connecting Nature, we are trialling an approach that will establish thresholds of geographic coverage to determine what proportion of a given administrative area's measurements to include / what weight to assign. Our initial approach will be to set a maximum threshold of geographic coverage above which the entire administrative area's measurements will be included and a minimum threshold below which the area will not be included in the indicator measurement at all. In between these thresholds, it will be up to the relevant measurement body and NBS promoter to

	<p>assess the relevant proportion of the population in the administrative area to include in the overall measurement.</p> <p>The type and size of a given NBS, and the different economic and/or recreational opportunities and aesthetic values associated with the NBS, will largely determine the extent (in distance, population size and/or time) and magnitude of its impact on the affected community.</p>
Scale of measurement	District to global scale
Data source	
Required data	<p>See definition of HDI above – which is generally collected from national census bureaus (by the UN) and reported at global, national and sub-national (states, etc.) level. For 2019, the UN data was gathered from the following sources:</p> <ul style="list-style-type: none"> • Life expectancy at birth: UNDESA (2019). • Expected years of schooling: UNESCO Institute for Statistics (2019), ICF Macro Demographic and Health Surveys, United Nations Children’s Fund (UNICEF) Multiple Indicator Cluster Surveys and OECD (2018). • Mean years of schooling: UNESCO Institute for Statistics (2019), Barro and Lee (2018), ICF Macro Demographic and Health Surveys, UNICEF Multiple Indicator Cluster Surveys and OECD (2018). • GNI per capita: World Bank (2019), IMF (2019) and United Nations Statistics Division (2019). <p>SDI-related data is generally gathered by a range of public data collection agencies and aggregated/reported by a designated agency / institute within the country at local area, regional and national levels. A typical example (from Ireland) may be found at: https://www.compass.ie/pobal-hp-deprivation-index-2016-launched/ which draws on Census data and is compiled using a methodology developed by Trutz Haase and Jonathan Pratschke. This index draws on a range of demographic, social class and labour market data – all of which are available at small area scales from the Central Statistics Office. For details regarding the construction of this index see Haase and Pratschke (2017).</p>
Data input type	Quantitative
Data collection frequency	Before and after NBS implementation – but will be determined by the periodicity of the existing data collection and reporting processes
Level of expertise required	Moderate (assuming the use of existing data can be mapped to the specific area impacted by the NBS)
Synergies with other indicators	Synergies with the indicator group <i>New Economic Opportunities and Green Jobs</i> indicators; <i>Social Justice & Social Cohesion</i> indicators and <i>Place Regeneration</i> Indicators.

Connection with SDGs	SDG 1 No Poverty; SDG 3 Good Health & Well-being; SDG 4 Quality Education; SDG 8 Decent work and Economic Growth; SDG 10 Reduced Inequalities and economic growth.
Opportunities for participatory data collection	No opportunities identified
Additional information	
References	<p>Anand, S. and Sen, A.K. (1994) "Human Development Index: Methodology & Measurement". Occasional Papers Series, UN Human Development Report Office, accessed Jun 2020 at https://ora.ox.ac.uk/objects/uuid:98d15918-dca9-4df1-8653-60df6d0289dd/download_file?file_format=application/pdf&safe_filename=HDI_methodology.pdf&type_of_work=Report</p> <p>Haase, T. & Pratschke, J. (2017) "The 2016 Pobal HP Deprivation Index for Small Areas (SA): Introduction and Reference Tables" accessed June 2020 at: http://trutzhaase.eu/deprivation-index/the-2016-pobal-hp-deprivation-index-for-small-areas/</p> <p>Phillips, Robert L., Winston Liaw, Peter Crampton, Daniel J. Exeter, Andrew Bazemore, Katherine Diaz Vickery, Stephen Petterson, and Mark Carrozza (2016) "How other countries use deprivation indices – and why the United States desperately needs one", <i>Health Affairs</i>, 35(11), pp.1991-1998. DOI 10.1377/hlthaff.2016.0709</p> <p>UNDP. 2019. <i>Human Development Report 2019. Beyond income, beyond averages, beyond today: Inequalities in human development in the 21st century.</i> New York: NY. http://hdr.undp.org/en/content/human-development-report-2019</p>