	and knowledge about when a particular policy instrument is appropriate or viable (May 1992). Data from all methods will be analysed using Nvivo, using a combination of deduction and induction, using a priori codes from theory (Creswell 2013), followed by a second level of analysis where emergent themes were identified from coding patterns in the data (Miles and Huberman 1994). A selection of interviews will also be blindly coded by another researcher to check intercoder reliability is at least 85%.
Scale of measurement	City / neighbourhood
Data source	
Required data	
Data input type	
Data collection frequency	
Level of expertise required	Technical / Expert
Synergies with other indicators	
Connection with SDGs	SDG4 / SDG8 / **SDG10** / **SDG11**
Opportunities for participatory data collection	--
Additional information	
References	URBAN GreenUP Deliverable D3.4 - Monitoring program to Liverpool https://www.urbangreenup.eu/insights/deliverables/d3-4---monitoring-program-to-liverpool.kl URBAN GreenUP Deliverable D5.3: City Diagnosis and Monitoring Procedures https://www.urbangreenup.eu/insights/deliverables/d5-3-city-diagnosis-and-monitoring-procedures.kl

15.3 Pro-environmental identity

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

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Environmental Identity	Knowledge and Social Capacity Building
Description and justification	Another concept that describes human-nature relationship and presents the promise of explaining/predicting pro-environmental behavior relevant to NBS is that of environmental identity (EID), understood as a dimension of social identity that resides in our ties to the natural world, like connections to pets, trees, mountain formations, or particular geographic locations which have commonly been studied under the construct of "place identity" (Clayton, 2003). In the overall analysis, environmental identity has been theoretically and methodologically invested with the potency to prompt and sustain ecological behavior both as a product of complex interactions between our self-concept and the natural world (i.e., self-relevant beliefs infused by contact with natural environment), and as a driving force behind personal, social, and political choices and actions (i.e., environmentally sustainable behavior) (Clayton, 2003; Balundė, Jovarauskaitė, & Poškus, 2019; Freed, 2015; Olivos & Aragonés, 2011). For instance., Dresner, Handelman, Steven Braun, and Rollwagen-Bollens (2014) surveyed and interviewed 172 adults participating in 18 urban volunteer events in area parks across Portland, Oregon between February and June 2012. Based on the annual frequency of participation in such events, the stewards were differentiated as first-time volunteers, mid-level volunteers (3-10 events/year), and frequent volunteers (>10 events/year). Environmental identity was reported as one of the main three factors that explained the variation in survey response across the board, alongside pro-environmental behavior and civic engagement. Environmental identity, pro-environmental behavior, and civic engagement were positively correlated with the frequency of volunteer participation in park area events, with frequent volunteers scoring the highest degree of attention to environmental issues, environmental identity, and self-reported pro-environmental behaviors (Dresner et al., 2014). Clayton (2003) devised a psychometric instrument for the measurement of EI (i.e., Environmental Identity Scale - EIS), and advanced research data in support of "the idea that environmental identity is a meaningful and measurable construct, with consequences for attitudes and behavior, and that by thinking about environmental identity we learn something beyond what we learn by talking about attitudes and values" (pp. 52-58). Balundė et al. (2019) carried out a meta-analysis to investigate the relationship between EI and other two constructs devised to represent the human-nature relations, namely "connectedness with nature" (Schultz, 2002) and "environmental self-identity" (van der Werff, Steg, & Keizer, 2013). Their results confirmed a strong correlation between measures of connectedness with

	nature and environmental identity (see also Olivos, Aragonés, & Amérigo, 2011) as well as environmental self-identity, indicative of the fact that, although theoretically discernible, they may be psychometrically undistinguishable, thus redundant (Balundė et al., 2019). Accordingly, we have included EIS (Clayton, 2003) as measurement of participants' relationship with nature, environment, and NBS, in view of its psychometric properties having been examined and confirmed cross-culturally (i.e., Spain) (Olivos & Aragonés, 2011). In line with research on environmental education and the evolution of environmental attitudes (see SC 10 and SC 11.1), Bremer (2014) argues that childhood experiences with nature are highly influential in shaping an environmental identity. Her qualitative analysis of interviews and surveys of six students and their parents indicate that caregivers have a significant role in environmental identity development. The authors concludes that the greatest influence upon environmental identity formation is accomplished when parents "are deeply involved in their child's life, engage in a positive relationship with the child, and guide their child's attention toward the environment while also allowing their child to make discoveries and develop independent moral reasoning" (Bremer, 2014, p. 64). Along similar lines, Prévot, Clayton, and Mathevet (2018) advocate for access and opportunities for children and young people to experience nature freely and bring forth data collected on 919 French students that support the contention that there is a strong positive correlation between childhood experiences with nature (i.e., rurality) and environmental identity. The authors show that this relation is mediated by adult behavior (i.e., visiting natural areas) which "promotes higher scores of environmental identity in a virtuous cycle: previous experiences predict both identity and current behavior, and identity and current behavior reinforce each other." (Prévot et al., 2014, p. 271-272).
Definition	. . . environmental identity is one part of the way in which people form their self-concept; a sense of connection to some parts of the nonhuman natural environment, based on history, emotional attachment, and/or similarity, that affects the way in which we perceive and act towards the world; a belief that the environment is important to us and an important part of who we are. (Clayton, 2003, pp. 45-46)
Strengths and weaknesses	+indicator of resources (beliefs, motivation, affect, etc.) that create preconditions for environmentally responsible choices, decisions, or behaviors +better predictor of behavior than environmental attitudes (EA) (Clayton, 2003; Olivos & Aragonés, 2011), but not a solidly proven predictor of pro-environmental behavior – e.g., Freed (2015) sheds light on how environmental structures (i.e., recycling bins outside classrooms and around campus) can

	influence behaviors without changing a person's environmental identity -variability across cultures of constructs applied to the EI operationalization - as part of social identity, "understanding of oneself in a natural environment cannot be fully separated from the social meanings given to nature and to environmental issues, which will vary according to culture, world view, and religion" (Clayton, 2003, p. 53); EIS is based on North American understandings of the ways in which we value and interact with nature, and thus far cross-cultural validated only on Spanish population (Olivos & Aragonés, 2011)
Measurement procedure (P) and tool (T)	☒ *Quantitative P – self-report measures*: Scale inventory/Questionnaire (survey procedure, paper-and-pencil administration, computer-based administration) o T: *Environmental Identity Scale* (Clayton, 2003) made up of 24 items that measures the relationship between self and nature, inspired by identity theory. The structure of the scale was based in part on discussions of the factors that determine a collective social identity, and include the salience of the identity, the identification of oneself as a group member, agreement with an ideology associated with the group, and the positive emotions associated with the collective (Clayton, 2003, p. 52).
Scale of measurement	▪ EIS (Clayton, 2003) – 24 items *Please indicate the extent to which each of the following statements describes you by using the appropriate number from the scale below.* *1 - not at all true of me ...2...3...4 - neither true nor untrue...5...6...7 - completely true of me* *_____ 1. I spend a lot of time in natural settings (woods, mountains, desert, lakes, ocean).* *_____ 2. Engaging in environmental behaviors is important to me.* *_____ 3. I think of myself as a part of nature, not separate from it.* *_____ 4. If I had enough time or money, I would certainly devote some of it to working for environmental causes.* *_____ 5. When I am upset or stressed, I can feel better by spending some time outdoors "communing with nature".* *_____ 6. Living near wildlife is important to me; I would not want to live in a city all the time.* *_____ 7. I have a lot in common with environmentalists as a group.*

	_____ 8. I believe that some of today's social problems could be cured by returning to a more rural lifestyle in which people live in harmony with the land. *_____ 9. I feel that I have a lot in common with other species.* *_____ 10. I like to garden.* *_____ 11. Being a part of the ecosystem is an important part of who I am.* *_____ 12. I feel that I have roots to a particular geographical location that had a significant impact on my development.* *_____ 13. Behaving responsibly toward the earth -- living a sustainable lifestyle -- is part of my moral code.* *_____ 14. Learning about the natural world should be an important part of every child's upbringing.* *_____ 15. In general, being part of the natural world is an important part of my self-image.* *_____ 16. I would rather live in a small room or house with a nice view than a bigger room or house with a view of other buildings.* *_____ 17. I really enjoy camping and hiking outdoors.* *_____ 18. Sometimes I feel like parts of nature -- certain trees, or storms, or mountains-- have a personality of their own.* *_____ 19. I would feel that an important part of my life was missing if I was not able to get out and enjoy nature from time to time.* *_____ 20. I take pride in the fact that I could survive outdoors on my own for a few days.* *_____ 21. I have never seen a work of art that is as beautiful as a work of nature, like a sunset or a mountain range.* *_____ 22. My own interests usually seem to coincide with the position advocated by environmentalists.* *_____ 23. I feel that I receive spiritual sustenance from experiences with nature.* *_____ 24. I keep mementos from the outdoors in my room, like shells or rocks or feathers.*
Data source	
Required data	✓ Essential: NBS characteristics for each city/site, more specifically objectives (short-, medium-, and long-term) and challenges ✓ Desirable: Data on pro-environmental behaviour relevant to NBS
Data input type	Quantitative
Data collection frequency	Before/after NBS implementation, aligned with medium and long-term objectives.
Level of expertise required	☒ Methodology and data analysis requires high expertise in psycho-social research ☒ Quantitative data collection requires no expertise

Synergies with other indicators	SC1 Bonding social capital SC2 Bridging social capital SC3 Linking social capital SC4.1 Trust in community SC4.2 Solidarity between neighbours SC4.3 Tolerance and respect SC6 Place attachment (Sense of Place): Place Identity SC9 Empowerment: Perceived control and influence over NBS decision-making SC10 Environmental education opportunities SC11.1 Positive environmental attitudes motivated by contact with NBS SC14 Social desirability
Connection with SDGs	Goal 8. Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all Goal 9. Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation Goal 10. Reduce inequality within and among countries Goal 11. Make cities and human settlements inclusive, safe, resilient and sustainable Goal 13. Take urgent action to combat climate change and its impacts Goal 16. Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels
Opportunities for participatory data collection	-
Additional information	
References	Balundė, A., Jovarauskaitė, L., & Poškus, M. S. (2019). Exploring the Relationship Between Connectedness With Nature, Environmental Identity, and Environmental Self-Identity: A Systematic Review and Meta-Analysis. *SAGE Open*, 1-12. doi: 10.1177/2158244019841925 Bremer, A. E. (2014). Cultivating human-nature relationships: The role of parents and primary caregivers in development of environmental identity. *Pitzer Senior Theses.* Paper 49. Retrieved from https://scholarship.claremont.edu/cgi/viewcontent.cgi?article=1048&context=pitzer_theses Clayton, S. (2003). Environmental identity: A conceptual and an operational definition. In S. Clayton & S. Opotow (Eds.), *Identity and the natural environment* (pp. 45-65). Cambridge, MA: MIT Press Dresner, M., Handelman, C., Braun, S., & Rollwagen-Bollens, G. (2015). Environmental identity, pro-environmental behaviors, and civic engagement of volunteer stewards in Portland area parks. *Environmental Education Research*, *21*(7), 991-1010. Freed, A. (2015). *Exploring the link between environmental identity, behaviors and decision making*. Dissertation Abstracts

International, 77-01(E), 1-190. Retrieved from http://adsabs.harvard.edu/abs/2015PhDT.....52F

Olivos, P., & Aragonés, J. I. (2011). Psychometric Properties of the Environmental Identity Scale. *Psychology*, 2(1), 65-74. doi: 10.1174/217119711794394653

Olivos, P., Aragonés, J. I., & Amérigo, M. (2011). The connectedness with nature scale and its relationship with environmental beliefs and identity. *International Journal of Hispanic Psychology*, 4(1), 5-19. Retrieved from https://www.researchgate.net/

Prévot, A. C., Clayton, S., & Mathevet, R. (2018). The relationship of childhood upbringing and university degree program to environmental identity: Experience in nature matters. *Environmental Education Research*, *24*(2), 263-279.

Schultz, P. W. (2002). Inclusion with nature: The psychology of human-nature relations. In: P. Schmuck & W. P. Schultz (Eds.), *Psychology of sustainable development*. Boston, MA: Springer. doi: 10.1007/978-1-4615-0995-0_4

Van der Werff, E., Steg, L., & Keizer, K. (2014). I Am What I Am, by Looking Past the Present: The Influence of Biospheric Values and Past Behavior on Environmental Self-Identity. *Environment and Behavior*, 46(5), 626–657. doi: 10.1177/0013916512475209

15.4 Pro-environmental behaviour

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

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Pro-environmental behaviour	**Knowledge and Social Capacity Building**
Description and justification	Pro-environmental behavior (PEB) represents another dimension of interest in the evaluation of NBS' impact and foreseeable sustainability. Narrowly defined as "behavior which has a significant impact on the environment" (Krajhanzl, 2010, p. 252), PEB has been central to both theoretical and empirical endeavors aimed at shedding light on the factors that foster accountability in relation with nature. Evidently, the behavior addressed in PEB can be encountered in various unintentional forms (e.g., purchase of soya products). Moreover, environmental theory employs a variety of terms to capture different nuances of the pro-environmental manifestation, like "ecological behavior" (Kaiser, 1998), "sustainable behavior" (Tapia-Fonllem, Coral-Verdugo, Fraijo-Sing, & Duron-Ramos, 2013), "environment-protective behavior", "environment-