KNOWLEDGE AND SOCIAL CAPACITY BUILDING FOR SUSTAINABLE URBAN TRANSFORMATION

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15 RECOMMENDED INDICATORS OF KNOWLEDGE AND SOCIAL CAPACITY BUILDING FOR SUSTAINABLE URBAN TRANSFORMATION

15.1 Citizen involvement in environmental education activities

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

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Environmental Education Opportunities	Knowledge and Social Capacity Building
Description and justification	Environmental education (EE) is a learning process that increases people's knowledge and awareness about the environment and associated challenges, develops the necessary skills and expertise to address the challenges, and fosters attitudes, motivations, and commitments to make informed decisions and take responsible action (UNESCO, Tbilisi Declaration, 1978). EE is aimed at producing a citizenry that is knowledgeable concerning the biophysical environment and its associated problems, aware of how to help solve these problems, and motivated to work toward their solution (Stapp, Havlick, Bennett, Bryan, Fulton, & MacGregor, 1969), i.e., *an environmentally literate citizenry*. The term EE refers to education about the environment, including population growth, pollution, resource use and

misuse, urban and rural planning, and modern technology with its demands upon natural resources. The goals and objectives of EE were agreed upon at UNESCO's Tbilisi Intergovernmental Conference (UNESCO, 1978), came to define the aforementioned notion of environmental literacy (i.e., components), and include *awareness, knowledge, affect, skills, and participation*. EE departs from learning opportunities that help people better understand and connect with the environment close to home, i.e., the environment in their own neighborhoods and communities (Carter and Simmons, 2010). Cole (2007) draws attention to local and cultural appropriateness in designing these learning opportunities, in that the ideas taught need to originate from and resonate with locally and culturally appropriate knowledge, values, and ways of living. Although not all EE programs have the potential to generate social capital among participants (e.g., classroom instruction), there are forms of EE that can foster social connectivity, trust, and associational and volunteer involvement (e.g., programs that incorporate collective opportunities for volunteer and associational involvement around stewardship, like community gardening and tree planting, or those that incorporate opportunities for intergenerational learning and collective decision-making, like place-based learning, school-community partnership for sustainability, environmental action, action competence, community-based natural resource management EE, social-ecological systems resilience) (Krasny, Kalbacker, Stedman, & Russ, 2015). For this reason, environmental education opportunities presented to a community are envisioned as a significant indicator of its resources for associational involvement in NBS, and of contexts for building trust.

Hailing the importance of green spaces beyond health benefits, Wolsink (2012a, 2012b) reports data of an explorative study conducted in all secondary schools in Amsterdam that indicates that proximity to green spaces is associated with the number of environmental education excursions. Specifically, the study suggests that increasing urban green spaces has a positive impact on environmental education activities, including the number of visits to green places. The author strongly affirms the environmental justice imperative of recognizing environmental education "as a viable stake in the urban development of green spaces" (Wolsink, 2012 a, p. 179).

Using a quasi-experimental research design, Kudryavtsev, Krasny and Stedman (2012) found empirical support for the hypothesis that interventions such as environmental

	education can nurture sense of place (Kudryavtsev, Stedman, & Krasny, 2012) in high school students. As sense of place has been found to cultivate place-specific pro-environmental behaviors (see Indicator SC 6), data gathered by Kudryavtsev et al. (2012) on youth participants in urban environmental education summer programs in the Bronx support the expectation that urban environmental education programs that cultivate the significance of urban green space "may inspire community-based initiatives to create more urban farms, roof gardens, community gardens and greenways, or to further restore aquatic ecosystems and urban forests" (p. 11). Derr (2017) emphasizes the sustainable benefits of participatory environment education by finding empirical support for *built environment education (BEE)*, an empowering model of education aimed at facilitating a stronger role of young people in decision making and shaping their environments. Elaborating on two cases in the City of Boulder, Colorado where children and youth were involved in the redesign of a natural public space, the author argues that BEE which includes participatory processes that facilitate group action and action competence furnishes "a holistic educational framework in which young people can explore nature, integrate multiple capabilities, and think about care of the social, cultural, and natural environment" (Derr, 2017, p. 14).
Definition	EE opportunities generally designate educational programs sponsored by elementary and secondary schools, colleges and universities, youth camps, municipal recreation departments, local or international not-for-profit organizations, and private entrepreneurs.
Strengths and weaknesses	+ indicator of resources (capacity-building, psychosocial, etc.) that forge participation, pro-activeness and tenacity in the pursuit of environmentally responsible goals + oriented towards inclusiveness, high potential to further sense of belonging and trust within community, and to inculcate a community sense of pride, and efficacy -limited information on outcomes (environmental literacy, EL) - data on EE opportunities reflects enough potential for capacity-building, but the actual quality of EE curricula (e.g., local/cultural appropriateness), as well as the outcome (i.e., environmental literacy) can only be explored through studies aimed at evaluating EE programs (see Cole, 2007; Farmer et al., 2007; Kopnina, 2013; McBeth & Volk, 2010; Merenlender et al., 2016; Tidball & Krasny, 2010; Varela-Losada, et al., 2016)

Measurement procedure (P) and tool (T)	☒ *Quantitative P*: Scale inventory/Questionnaire (survey procedure, paper-and-pencil administration, computer-based administration) o T: add-on items to any survey/questionnaire to collect accounts of EE programs attended in the past year, if any, as well as topic/theme covered; open-ended question(s) can be included to collect information about perceived usefulness, and/or how the knowledge/skills garnered have been put to use, if the case. o T: adapted items from "Instructor/Student/Parent Environmental Survey" (see Cruz Lasso de la Vega, 2004, p. 25 and Appendix)  de la Vega 2004 see NEP instrument 200(☒ *Qualitative P*: ▪ *Qualitative methodologies can be used to explore the outcomes of EE opportunities experienced by community members in longitudinal research* o T: case study methodology – structured interviews, case study analysis, phenomenological analysis o T: participatory data collections methods, such as collaborative participatory data collection, bodies as tools for data collection, photo elicitation
Scale of measurement	▪ *EE Opportunities - 4 items* to investigate accounts of EE programs attended in the past year, and their perceived usefulness (formulated for present study) 1. Have you participated in an EE program in the past year? Yes No (skip to …) 2. What was the main theme of the EE program you attended? (*please indicate*) …….. 3. How would you rate the applicability of the knowledge and skills acquired in the EE program? 1 very low …..5 very high 4. Have you had a chance to apply the knowledge and/or skills acquired since your participation in the EE program? If so, please describe. Yes (*please describe*) …….. No
Data source	
Required data	✓ Essential: NBS characteristics for each city/site, more specifically objectives (long-term) and challenges

	✓ Desirable: evaluations of EE programs, especially of those designed to promote NBS
Data input type	Quantitative (quantitative and qualitative, if participatory data collection methods are opted for)
Data collection frequency	Aligned with NBS implementation and timing of targeted objectives
Level of expertise required	☒ Methodology and data analysis requires high expertise in psycho-social research ☒ Quantitative data collection requires no expertise ☒ Qualitative data collection (case study, for example) requires high expertise in psycho-social research o Basic training needed if participatory data collection is opted for
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 SC11.1 Positive environmental attitudes motivated by contact with NBS SC11.2 Environmental Identity SC12 Social desirability
Connection with SDGs	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	Participatory methods (e.g., phenomenological analysis) may be applied to collect community-relevant information on EE programs (and their outcomes) specifically related to a certain NBS/green space initiative in a community/city, and accounting for country/community/place-distinctive culture.
Additional information	
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15.2 Social learning regarding ecosystems and their functions/services

Project Name: URBAN GreenUP (Grant Agreement no. 730426)

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Social learning concerning ecosystems and their functions and services	**Knowledge and Social Capacity Building**
Description and justification	Social learning has long been established as essential to policy change, and thus is essential to mainstreaming NBS. To monitor social learning, it is essential to examine how policies and processes have actually changed. Such changes can encompass adoption of new interventions, techniques, policy, and processes in response to past experience and new information (Hall, 1993). Semi-