13.6 Incorporation of environmental design in buildings

Project Name: UNaLab (Grant Agreement no. 730052)

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Incorporation of environmental design in buildings	Place Regeneration
Description and justification	Environmental design is a broad concept concerning the structural, design and systemic features of buildings defining their impact on their environment. It is related to the concept of green buildings, which refers to environmentally sustainable design, construction, operation, maintenance and end of life of buildings.
Definition	Degree to which buildings are designed to be environmentally friendly with respect to energy efficiency, water consumption, waste production, indoor environmental quality, and implementation of NBS (unitless value)
Strengths and weaknesses	+ Rapid and simple method - Crude assessment of environmental design of buildings
Measurement procedure and tool	The area is divided into buildings, groups of buildings or blocks that represent similar building stock, as seen suitable. Each component is assessed on its environmental design considering incorporated environmental design considering parameters listed in Table 1. The building(s) being assessed are scored from 0 to 1 with respect to each parameter. The average point score (0 to 5) of a building provides the indicator value, i.e., the degree to which buildings are designed to be environmentally friendly with respect to these parameters. Table 1: Parameters for environmental design in buildings (or groups of buildings). | Parameter	Methods to consider (examples)	Scoring	

1	Energy efficiency	Improved insulation Reflecting windows Improved ventilation Heat exchangers in ventilation Smart lighting, smart electronics Renewable electricity (solar/wind) Heat pumps	0 points: No design incorporated 0.5 points: Some measures taken 1 point: Good measures taken
2	Water consumption	Low water toilets Separate greywater collection Rainwater collection and use	As no. 1
3	Waste production	Waste separation On-site composting Building material demolition design	As no. 1
4	Environmental quality	Indoor air quality measure/control Indoor/outdoor noise level control Indoor/outdoor lighting level control	As no. 1
5	Nature-based solutions	Incorporation of NBS A green roof Rain garden	As no. 1
	Environmental design		**Sum of points**

Scale of measurement	District to metropolitan scale
Data source	
Required data	Energy efficiency, water consumption, waste production, indoor environmental quality, and implementation of NBS of buildings
Data input type	Semi-quantitative
Data collection frequency	Annually
Level of expertise required	Low
Synergies with other indicators	Some relation to *Rainwater or greywater use for irrigation purposes* indicator; relation to *CO_2 emissions related to building energy consumption* and *Mean or peak daytime temperature – Predicted Mean Vote-Predicted Percentage Dissatisfied* indicators
Connection with SDGs	SDG 6 Clean water and sanitation, SDG 7 Clean and affordable energy, SDG 9 Industry, infrastructure and

	innovation, SDG 11 Sustainable cities and communities, SDG 13 Climate action
Opportunities for participatory data collection	No opportunities identified
Additional information	
References	Doan, D. T., Ghaffarianhoseini, A., Naismith, N., Zhang, T., Ghaffarianhoseini, A., & Tookey, J. (2017). A critical comparison of green building rating systems. Building and Environment, 123, 243–260. Sharifi, A., & Murayama, A. (2013). A critical review of seven selected neighborhood sustainability assessment tools. Environmental Impact Assessment Review, 38, 73–87. Sharifi, A., & Murayama, A. (2014). Neighborhood sustainability assessment in action: Cross-evaluation of three assessment systems and their cases from the US, the UK, and Japan. Building and Environment, 72, 243–258.

13.7   Preservation of cultural heritage

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Preservation of cultural heritage	Place Regeneration
Description and justification	Unlike ecological, economic and social sustainability, culture is not institutionalised as an aspect of sustainable development at present. Hawkes (2001) introduced cultural sustainability as a "fourth pillar" of sustainable development and emphasised the role of cultural heritage in urban planning. Extensive discourse (e.g., UNESCO, 2001; UNESCO, 2005) on the relationship between culture and sustainable development together with numerous scientific studies exploring social and cultural dimensions of sustainability indicate that cultural sustainability is linked to issues such as social equity and social justice, participation and engaged governance, social cohesion, and social capital (Soini & Birkeland, 2014).