**Literature review modified**

Decades of abuse perpetrated to the natural environment have led contemporary societies at the edge of a ‘chaos point’ in which two pathways are envisioned: an imminent environmental global collapse or the opportunity for global renewal (Laszlo, 2014). To avoid the former, the plea echoing across all sectors is to introduce changes and alternatives to development that also reform the current value system of the natural environment as a commodity (Bakker, 2010; Norton, 2015). This shift in values could also restore the fragile relationship between the natural environment and the people residing in highly urbanized cities who often might have restricted access to biodiverse urban green spaces (Nasr, 1990). Noteworthy are the efforts to restore the human connection to the natural environment by increasing the access to urban green infrastructure which have been influenced by research in the fields of biophilia, social ecology systems and others (Tidball, 2012 (others)). A remarkable example of this can be found in the city-state of Singapore where urban policies have been introduced to increase the number of accessible urban green infrastructure today, quantified in an extensive green network of connected parks and natural reserves that protect primary and secondary rainforests (Tan et al., 2013). The urban green infrastructure agenda in Singapore is threefold: 1) to introduce a new paradigm of sustainability with nature in the city; 2) to promote health and wellbeing of citizens through the exposure to natural environments; and 3) to increase inclusivity to urban green spaces across the population (Sustainable plan, 2021).

Interestingly, increasing the number of and enhancing access to urban green spaces to help improving the health and wellbeing of citizens is not having the desired effects as indicated by recent studies. By 2019, nearly 80% of Singaporean residents reported to suffer from depression or anxiety disorders (Subramaniam et al., 2019), situation that has since been exacerbated by the Covid-19 pandemic (Teo, 2020). Considering the current scenario, we argue that increasing the number of urban green spaces in Singapore might not be sufficient to enhance the health and wellbeing benefits brought by natural environments exposure (Parosns, 1991; Kaplan, 1995; Berto, 2014) etc.). Furthermore, we concord with previous studies on nature connectedness arguing that moving beyond a superficial contact with nature and promoting a closer identification and interconnectedness with nature is necessary to bring the benefits of being exposed and connected to the natural environment (Lumber et al., 2017). Scholars assert that this problem is linked to the values system of nature that introduce an anthropocentric and extractive view of nature ‘rather than depending on and entangled with, the environment’ (Neo & Schneider-Mayerson, 2021).

Nevertheless, the discussion of the intrinsic value of nature as living and sentient organism is often considered an esoteric topic mostly discussed in spiritual ecology scholarship (Nasr, 1990; Becci et al., 2021). Yet, recent developments in social sciences and humanities suggest an increased awareness on the significance and meanings of biodiversity for those that interact with it (Jetzkowitz et al., 2018). This could lead to interconnectedness and self-identification with non-human life, which in turn could awake a human sensitivity as part of nature (Lumber et al., 2017). Although from this perspective, the value of nature comes from an anthropocentric view, it introduces an alternative to promote a sense of agency with the natural environment and the opportunity to recognize, attribute meaning to those experiences (Thorén & Stålhammar, 2018), and promote stewardship (Hes and Hernandez-Satin, 2020).

**The way to do it in Singapore: Nature-Placemaking**

Studies in environmental psychology have indicated that increasing the agency of individuals in green spaces could enhance wellbeing (Bell *et al.,* 2014). The way for this to happen is to allow individuals to strengthen their human-nature connection in meaningful ways as they interact with the natural environment. For instance, Mattijssen *et al.* (2017) and Smith (2014) analysed the benefits of active engagement in activities in green places identified as placemaking in which individuals take part in the process of construction and maintenance of the green places. Such benefits include feelings of empowerment, place attachment, health, and wellbeing etc.

Although placemaking is not a new practice as it can be traced back to ancestral communities (Nasr, 1990; Lefebvre, 1991; Verschuuren *et al.,* 2010), it is only in 1960 that modern schools of design led by Jane Jacobs and William Whyte re-introduced the notion of placemaking. The need to design cities capable of enacting a stronger sense of connection to place (Alzahrani et al., 2016) inspired a movement that enabled citizens to have a direct engagement in the design of urban spaces (Kalandides, 2018). Interestingly, the benefits of placemaking transcend the physical changes of the space and it recognises all the aspects that characterise a place, which is something that is shaped by socio-spatial interactions over time (Goodman 1972; Relph, 1976; Tuan, 1977; Lombard, 2014). In this sense, placemaking could be understood as something that happens spontaneously and creates collective and individual meanings through interactions even after a place is designed and built (Schneekloth and Shibley, 1995; Burkner, 2006).

Placemaking not only deals with the space and its functional aspects, but also acknowledges the meaning and significance that is attained by the users. From this perspective, placemaking could be applied in different scenarios not only for the design of specific public spaces (Beza and Hernández-Garcia, 2018), but also for activities that enable new community interactions, values, and unique identities (Massey, 1991; Lippard, 1997). In fact, placemaking has been analysed as a potential catalyser of societal changes that could help resolve the current fractured human-nature relationship found in cities (Hes and Hernandez-Satin, 2020).

According to Bush and colleagues(2020), nature is fundamental to life and to the health and wellbeing of humans and when placemaking respond to a natural local context through engagement, the result are communities expressing values that are grounded in nature. Substantial evidence to this can be found in ancient Western and Eastern traditions and in autochthonous communities in North and South America who sustain a transcendental connection to the natural environment (Nasr, 1990). Although the way we sustain a connection with nature in cities has substantially changed from past civilizations and autochthonous communities (Merchant, 2006) introducing nature within urban environments still offers an opportunity to reconnect with the natural environment in a way that could enhance our subjective sense of health and wellbeing and promote environmental changes (e.g., environmental awareness, pro-environmental attitudes, etc.) (Davis *et al.,* 2011; Lumber et al., 2017). Nevertheless, the presence of nature is not enough to enact social-ecological changes since nature is much more than green elements introduced in the urban space (Bush *et al.,* 2020). Hence, the relevance of enabling emotions, meanings, and compassion in placemaking activities that promote interconnectedness with the natural environment (Lumber et al., 2017).

Placemaking involving nature programmes in farming and gardening activities that enable self-reflection, gratitude, and compassion for the natural environment – also known as ‘nature-placemaking’ (Bush *et al.,* 2020) – have been found to have positive impact in people’s health and wellbeing (Berto, 2014). Taking part in these activities could enhance social inclusion, positive emotions, healthy relationships with their community, and the perception of being part of a community (Berto, 2014). This direct interaction with the natural environment has also been found to be a catalyst for social cohesion and social capital, components that enhance psychological health and wellbeing (Jennings and Bamkole, 2019). The benefits of these programmes are better linked to the participative character of placemaking (e.g., enhancing sense of belonging and sense of community (Dempsey et al., 2014; Strydom, et al., 2018). However, for these activities to take place, there must be an external enabler that facilitates the emergence of such practices. The caveat of such activities is that they can fail to achieve long term involvement in the maintenance of the green space (Tan & Neo, 2009; Mattijssen *et al,* (a)2017), often turning into a superficial beautification process in which citizens have minimal engagement in the long-term (Hes *et al.,* 2020) defeating the purpose of implementing nature-placemaking activities (Schneekloth *et al.,* 1995; Dempsey & Smith, 2014; Mattijssen *et al.,* 2017).

An example is found in Singapore, where placemaking programmes are implemented by the government to increase the active engagement of individuals in the construction and maintenance of the green places. Regrettably, the long-term engagement of participants fades as soon as the facilitator (i.e., government) concludes the activities. Additionally, there is no evidence that environmental awareness and/or pro-environmental attitudes are achieved after the programmes are concluded. Interestingly, to counterpoise the government initiatives, dispersed NGO-led citizen initiatives integrating nature-placemaking activities have emerged in Singapore. Some of these initiatives aim at re-introducing social characteristics such as community bonding, environmental awareness (e.g., sustainability), meaningful nature connection and citizen agency, which in turn create opportunities for psychological restoration.

**Nature-placemaking led by NGOs and its facilitators**

Nature-placemaking activities guided by NGOs enhance the psychological health and wellbeing. For instance, sense of community (Leon & Neo, 2009), behaviours grounded in environmental awareness (Fettes & Judson, 2010), and feelings that contribute to sustain long-term engagement and motivation (i.e., autonomy, competence, relatedness, self-esteem, and self-efficacy) (Ryan & Deci, 2000; Sheldon & Kasser, 1998; Gillison et al., 2019). According to Tan & Neo (2009), being involved in nature related activities led by NGOs can help increase peoples’ passion towards nature and creates a genuine and non-partisan civic activism. The socially constructed experience with nature also helps individuals to forge new connections with likeminded people (Wolsko & Lindberg, 2013), whereby confidence and empowerment are generated in individuals (Rai Singh & Rahman, 2012). The result of being part of a nature self-motivating environment is that individuals can sustain citizen engagement and thus build a sense of ownership towards the environment over time and construction of alternative values towards nature (Bruyere & Rappe, 2007).

It is known that the NGOs placemaking activities depend largely on the facilitators of place who mediate peoples’ interactions and the activities that are developed. This positions the role of the facilitators at the core of the process, since facilitators, according to Alwaer & Cooper (2019) not only promote engagement and inclusion of individuals and groups, but also create a ‘values system’ in which the participants can relate to and can feel valued (Wates, 2014; Pancholi *et al.,* 2015). Self-awareness and self-management are essential skills in facilitators as their role is to understand their relationships with groups and help others self-reflect on their practice (Mosely *et al.,* 2021). As such, the facilitation style, and the process in which it occurs are crucial to prevent the activities to be biased or over-powering (Alwaer & Cooper, 2019). Nevertheless, since nature-placemaking conducted by NGOs is a relatively new topic (Bush *et al.,* 2020) how facilitators influence the process and what are the best practices of nature-placemaking that could positively influence the health and wellbeing of city residents is a vaguely discussed topic. Hence, to contribute to this topic, in this study we analyse how an NGO in Singapore integrating nature-placemaking activities are conducted, what alternative values towards the natural environment are enacted, what frequency of interaction and time of engagement is needed build these values, and how facilitators influence this process. Furthermore, although there are some indications that nature-placemaking could substantially provide benefits to the psychological health and wellbeing of individuals taking part in the activities, there are not enough studies that analyse how the facilitators of programmes developed by NGOs might influence the perceived sense of psychological health and wellbeing of people participating in nature-placemaking activities.

To investigate this, an in-depth case study following a sequential mixed-methods design (Yin, 2011; Larkin et al., 2014) was conducted from August 2019 until March 2020 in the volunteer-driven NGO Ground-Up Initiative (GUI) known for its unique nature-placemaking programmes. The paper is structured in four sections presenting the research methods and explanation of the case study under investigation, qualitative and quantitative results, discussion, and conclusions.

## New references to add

Alwaer, H., & Cooper, I. (2019). A Review of the Role of Facilitators in Community-Based, Design-Led Planning and Placemaking Events. Built Environment, 45(2), 190–211. <https://doi.org/10.2148/benv.45.2.190>.

Babiano M., Lee G. 2020. People in Place: Placemaking Fundamentals. In Placemaking Fundamentals for the Built Environment. Palgrave Macmillan, Singapore.

Bakker, K. (2010). The limits of ‘neoliberal natures’: Debating green neoliberalism. Progress in Human Geography, 34(6), 715–735. https://doi.org/10.1177/0309132510376849.

Becci, I., Grandjean, A., Monnot, C., & Okoekpen, S. (2021). Special Issue Introduction: Toward a ‘Spiritualization’ of Ecology? Sociological Perspectives from Francophone Contexts. Journal for the Study of Religion, Nature and Culture, 15(3), 287–296.

Burkner H. 2006. Place-making, PlaceMeg concept guidance paper. Project workshop on methods and concepts, 20–22 February, Institute for Regional Development and Structural Planning.

Bush J., Hernandez-Santin C., Hes D. 2020. Nature in Place: Placemaking in the Biosphere. In Hes, D., Hernandez-Santin, C., Beer, T., & Huang, S. W. (2020). Place evaluation: measuring what matters by prioritising relationships. In Placemaking Fundamentals for the Built Environment (pp. 275-303). Palgrave Macmillan, Singapore.

Chong K. H., 2018. Reclamation of urban voids and the return of the “kampung spirit” in Singapore’s public housing. In Creative Ageing Cities: Place Design with Older People in Asian Cities. Routledge London.

Davis JL, Le B, Coy AE. Building a model of commitment to the natural environment to predict ecological behavior and willingness to sacrifice. Journal of Environmental Psychology. 2011; 31: 257-265.

Goodman, R. (1972). After the planners. Pelican: Harmondsworth.

Hes D., Hernandez-Santin C., Beer T., Huang S., 2020. Place Evaluation: Measuring What Matters by Prioritising Relationships. In Placemaking Fundamentals for the Built Environment. Palgrave Macmillan, Singapore.

Jetzkowitz, J., van Koppen, C. S. A. (Kris), Lidskog, R., Ott, K., Voget-Kleschin, L., & Wong, C. M. L. (2018). The significance of meaning. Why IPBES needs the social sciences and humanities. Innovation: The European Journal of Social Science Research, 31(sup1), S38–S60. https://doi.org/10.1080/13511610.2017.1348933.

László, Ervin. 2014. The Chaos Point: The World at the Crossroads. London: Little, Brown Book Group.

Lefebvre, H. (1991). The production of space (D. Nicholson-Smith, Trans.). Oxford, UK; Cambridge, MA: Blackwell.

Lombard M. 2014. Constructing ordinary places: Place-making in urban informal settlements in Mexico. Progress in Planning 94, pp. 1–53.

Lumber, R., Richardson, M., & Sheffield, D. (2017). Beyond knowing nature: Contact, emotion, compassion, meaning, and beauty are pathways to nature connection. PLOS ONE, 12(5), e0177186. <https://doi.org/10.1371/journal.pone.0177186>.

Merchant C. The scientific revolution and the death of nature. Focus-Isis. 2006; 97: 513533.

Mosely, G., Markauskaite, L., & Wrigley, C. (2021). Design facilitation: A critical review of conceptualisations and constructs. Thinking Skills and Creativity, 42, 100962. https://doi.org/10.1016/j.tsc.2021.100962.

Nasr H. S. 1990. Man and Nature: The Spiritual Crisis of Modern Man. Allen & Unwin Australia Pry Ltd.

Neo, X., & Schneider-Mayerson, M. (2021). Nature, disappeared: Anti-environmental values in Singapore’s history textbooks, 1984–2015. Environmental Education Research, 0(0), 1–18. https://doi.org/10.1080/13504622.2021.1968350.

Norton B., G. 2015. Sustainable Values, Sustainable Change. The University of Chicago Press.

Relph, E. (1976),Place and Placelessness, Pion Limited, London.

Schneekloth, L., & Shibley, R. (1995). Place-making: The art and practice of building communities. New York: Wiley. Sepe, M. (2013). Planning and place in the city. Mapping place identity. Abingdon: Routledge.

Thorén, H., & Stålhammar, S. (2018). Ecosystem services between integration and economics imperialism. Ecology and Society, 23(4). https://doi.org/10.5751/ES-10520-230444.

Tidball, K. (2012). Urgent Biophilia: Human-Nature Interactions and Biological Attractions in Disaster Resilience. Ecology and Society, 17(2). <https://doi.org/10.5751/ES-04596-170205>.

Tuan, Y-F. (1977), Space and Place: The Perspective of Experience, University of Minnesota Press, Minneapolis.

Vershuuren B., Wild R., Mcneely J., Oviedo G. 2010. Sacred Natural Sites: Conserving Nature and Culture. (n.d.). Routledge & CRC Press.