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Connecting land. A transdisciplinary workshop to envision a nature-connecting human habitat

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ABSTRACT

The design of the human habitat can either promote or oppose healthy living, sustainable lifestyles, and the ability to value nature in people. The goal of this paper is to provide some insights to shape a transdisciplinary agenda for future human habitats that are socially and ecologically sustainable. This is what *Connecting Land* is. Through a planned workshop, 19 professionals from a variety of complementary backgrounds create a vision for Connecting Land and then discuss policy actions required to achieve such a vision. The produced vision highlights a physically and emotionally healthy community that celebrates local nature in their traditions and rituals. Nature experiences are next door and symbiosis with nature is the constant background of the inhabitants' habits. The policy actions emerging from the workshop suggest that achieving Connecting Land requires integrated policies that simultaneously address children's experience-based education, the elimination of physical barriers to nature access, and legal actions to establish the rights of natural elements. To this goal, synergies between the design of natural landscapes, children's education, and short and long-term people's wellbeing are worth further exploration in both academia and practice. Sustainable human habitats that promote a healthy and sustainable culture do not need to be utopian.

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Nature-connecting habitat; biophilia; transdisciplinarity; nature routine; Connecting Land

Introduction

Humanity is now predominantly urban (United Nations 2014). Addressing sustainability challenges in urban areas is key to transform the unsustainable model of human development that dominate modern lifestyles (Elmqvist *et al.* 2019). Of crucial importance is how today's generations decide to design future human habitats. The design of urban landscapes can either promote or oppose healthy living, sustainable lifestyles, and the ability to value nature in people. Biophilic urban design is an example of how cities have faced the challenge of identifying and promoting these benefits by integrating nature into their planning (Beatley 2011). Biophilic cities are meant to be sustainable, resilient, and promoters of healthy societies (Beatley 2017). This approach to urban design is just a recent example of a long history of attempts to re-join human and natural habitats through urban design. Elements of this approach can be traced back to the 'Garden city' conceived by Ebenezer Howard in 1898. In here, areas for residence, industry, and agriculture were carefully planned to create a self-contained community that would have the best of urban and rural living. This ideology has been emulated internationally and to this date is still inspiring many in urban design (Hall and Ward 2014). Similar intentions have led Ian McHarg to

write the seminal book 'Design with nature' (McHarg 1971) and Jan Gehl to explore how cities can be designed to promote health and wellbeing (Gehl 2010). The Accessible Natural Greenspace Standard (<http://www.naturalengland.org.uk> n.d.), which impose a hierarchy of accessibility to natural spaces (e.g. 2 ha within 300 m, 20 ha within 2 km), is an example of a policy that exemplify these efforts. However, many aspects that contribute to healthy and ecologically sustainable living are still understudied and the ecological challenges imposed by the Anthropocene (Steffen *et al.* 2007) impose a broader set of expertise to produce urban masterplans that are able to address the current climate and biodiversity crisis.

The design of many urban environments suffer from lack of direct nature experiences (Soga and Gaston 2016), insufficiently integrated ecosystem services (Andersson *et al.* 2014), and narrowly consider public health and wellbeing (McDonald *et al.* 2018). Envisioning and identifying synergies between biophysical and cultural sustainability is of direct importance to ensure that sustainable human habitats will have a long-term impact on the sustainability of humankind. To achieve this goal, interdisciplinary and transdisciplinary collaborations are required and this study intends to be a provide an example, even if limited, of how these collaborations might play out.

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The aim of this paper is to provide some insights to shape a transdisciplinary agenda for future human habitats that are socially and ecologically sustainable. Within this broad agenda, the paper uses nature-connecting habitats as a starting point of discussion to ensure a social-ecological approach to discussing sustainable living spaces. Designing nature-connecting habitats is a core strategy to combat the cycle of disaffection and disconnection from nature that is generated by the extinction of nature experiences currently dominating urban lives (Soga and Gaston 2016, Soga *et al.* 2020). However, the cognitive dimension of spatial planning has been largely understudied (Marcus *et al.* 2016), despite the potential of close interaction with nature being of direct value to personal health (Engemann *et al.* 2019) and to building the foundation of a sustainable culture (Chawla 1999, Giusti *et al.* 2014). Hence, spaces of interaction and reconnection with nature in people's everyday living environments are of central value to curb the unsustainable standards of life of modern societies. Positive relationships with the environment are shown to not only mediate restorative experiences and permeate all aspects of human life (Hartig *et al.* 2014, Giusti and Samuelsson 2020), but also to be primal steps towards a variety of pro-environmental behaviours and lifestyles (Chawla 1999, Kellert 2002).

The objective of this study is therefore to envision sustainable human habitats that are able to integrate personal, social, and environmental factors, and then identify potential actions that could be useful to achieve such a vision. In the sections below, we present the methods used and show the results of a brainstorming exercise to envision a hypothetical human habitat that is socially and ecologically sustainable: Connecting Land. Then, we show the results from the back-casting exercise (Dreborg 1996, Robinson 2003) in which we explore a variety of actions and strategies to achieve such a vision. Lastly, we identify and discuss key synergies and future research areas that can bridge ecological urban sustainability with healthy living environments. These insights contribute to defining a transdisciplinary agenda for nature-connecting habitats.

Methods

This study is transdisciplinary in nature. This is because the methodology is based on a process of collaboration between scholars and non-scholars on a specific real-world problem (Haider *et al.* 2017). This study is indeed based on a non-hierarchical workshop in which professionals and academics jointly structure and discuss the vision of a healthy and sustainable living environment. This approach is congruent with existing transdisciplinary strategies to address sustainable urban planning (Brink *et al.* 2018). Accordingly,

the results are reported with no manipulation from the authors and the study can be considered a systematic synthesis of a transdisciplinary workshop.

Participants

The participants of the study were 19 professionals participating at the workshop: 'Home for future Earth lovers' during the International Children & Nature Network conference occurred between 16 May to 18 May 2019 in Oakland California. Participants have independently chosen to be part of the workshop and their professions include environmental educators, landscape architects, urban planners, academics, and environmental activists. Each professional joined the workshop from different points of views and their diversity ensures a variety of valuable perspectives in the workshop. Participants were divided into five groups around five round tables at the beginning of the workshop. On each table, a large sheet of paper, pens, and post-its were provided.

Workshop structure

The workshop is composed of four phases for a total of 75 minutes. The first phase is a brief presentation (15 minutes) of the theoretical and practical foundations of nature-connecting habitats. This introduces to the participants' concepts such as 'nature routines' (Giusti *et al.* 2014, Marcus *et al.* 2016), 'nature-connecting habitats' (Giusti 2018), and 'Human-Nature Connection' (Ives *et al.* 2017). Additionally, the Assessment framework for Children's Human Nature Situations (i.e. ACHUNAS) is presented to support the conceptualisation of human habitats that encourage sustainable relationships with nature (Giusti *et al.* 2018).

The second phase is a brainstorming exercise (20 minutes). Participants are introduced to the hypothetical scenario of Connecting Land with the following prompt. 'It's 2040! Thanks to this workshop we have examples of nature-connecting habitats emerging everywhere on the planet! These are communities of 1000 people living in an area the size of 20 football fields within cities or in rural areas. They could be on mountains or in deserts, but they all have some attributes in common. They are all able to ecologically sustain their population and nurture children's connection with nature, and they provide nature experiences to the whole population in both quantity and quality. Connecting Land is one of these communities.' In this phase, participants are asked to brainstorm about the important aspects that constitute everyday life in Connecting Land, note their own thoughts on post-its or directly on the big sheet of paper provided, and then discuss aloud them within the groups while taking further notes of the conversation. This process is self-organised within the group.

The third phase is a back-casting exercise (20 minutes) (Dreborg 1996, Robinson 2003). Participants are asked to identify the essential policy actions that need to be put in place to achieve Connecting Land with the following prompt: ‘Which short-term and long-term actions do we have to take to achieve Connecting Land?’. Participants are asked to first think of potential actions on their own, then write them down on post-its or directly on the big sheet of paper provided, and then share and discuss ideas within the group.

In the last phase (10 minutes), each of the five groups reports to the others for a few minutes the main insights regarding the vision of Connecting Land and about the policy actions needed to achieve it. After this last phase of sharing insights, the workshop concludes. At this point, all participants are invited to write their own email address on a sheet of paper to provide further clarifications on the insights produced. All participants were also invited to write this paper.

Analysis

During the fourth phase of the workshop, the insights produced within each group are compared and discussed with the other four groups. After this last phase, there are five visions of Connecting Land and five sets of policy actions useful to achieve these visions in front of each group. These are in the form of notes on post-its, written text and drawings on the big sheets of paper. After the participants have left the room, the first author of this paper has collected this information. This data is consequently digitalised in digital texts and drawings. Afterwards, all this material has been sent to those participants who have shown interest in clarifying their insights. The insights reported as results below are those reported by the participants with little or no manipulation done by the authors. This study can, therefore, be considered a systematic synthesis of the transdisciplinary workshop occurred.

Results

Envisioning Connecting Land

The different set of professionals within each of the five groups produced overlapping and complementary visions for Connecting Land. The main insights produced in their discussions are reported below and construct the common vision of Connecting Land produced by the workshop. Afterwards, we present the results for the policy actions that are required to achieve such a vision.

The vision

Connecting Land hosts physically and emotionally healthy people. Across all age groups, the cost of medical care is significantly reduced in Connecting Land thanks to increased physical activities and the abundance of nature interactions in people’s everyday routine. As participants noted in the workshop: ‘health care come from the soil up and from the sun down’. Work-life-play balance is also encouraged to regulate stress and ensure psychological health within the community. Equity, solidarity, and healthy community dependency are fundamental cultural traits to shape strong supportive relationships in Connecting Land. Celebrating the local natural environment is also an established tradition that provides cultural support to a sustainable relationship with nature. There is a strong attachment to the local environment which is considered an extension of the family. The community has legally recognised the rights of many natural elements (from rivers to mountains) and have constituted ‘connection land groups’ to enforce these rights. A deep sense of place is shared by the community and it shapes the basis of a form of ecological civic identity. Inhabitants experience a profound sense of belonging to natural features of Connecting Land.

Children’s formal and informal learning experiences nurture emotionally resilient children. A main objective of education in Connecting Land is cultivating a cooperative relationship with nature in which reciprocity and empathy are core values. Educational activities are place-based and occur mostly outdoor through direct experiences and management of the ecological resources upon which the community relies. Comfortable risk-taking is encouraged as challenging situations are used to promote in children social abilities and competences essential for their development as citizens. Overall, learning experiences are intentionally designed to allow children to build, touch, and engage with nature, and they occur together with the community because intergenerational interaction is highly valued as a culture-making practice. Outside of educational activities, children are encouraged to roam, explore, and utilise the whole landscape of Connecting Land.

Native flora and fauna are predominant, varied, and easy to access to all the population. Closeness between schools and a variety of different biotopes is directly taken into consideration when planning. The landscape is overall calming, safe, and with healthy functioning ecosystems. Fruit orchards, community gardens, and wild areas are common in the landscape and the top layer is mostly permeable with few hard-surface areas. There are different degrees of density for both natural and human habitats to satisfy various ecological and social needs: from social high wide views to low intimate and close views (Figure 1).

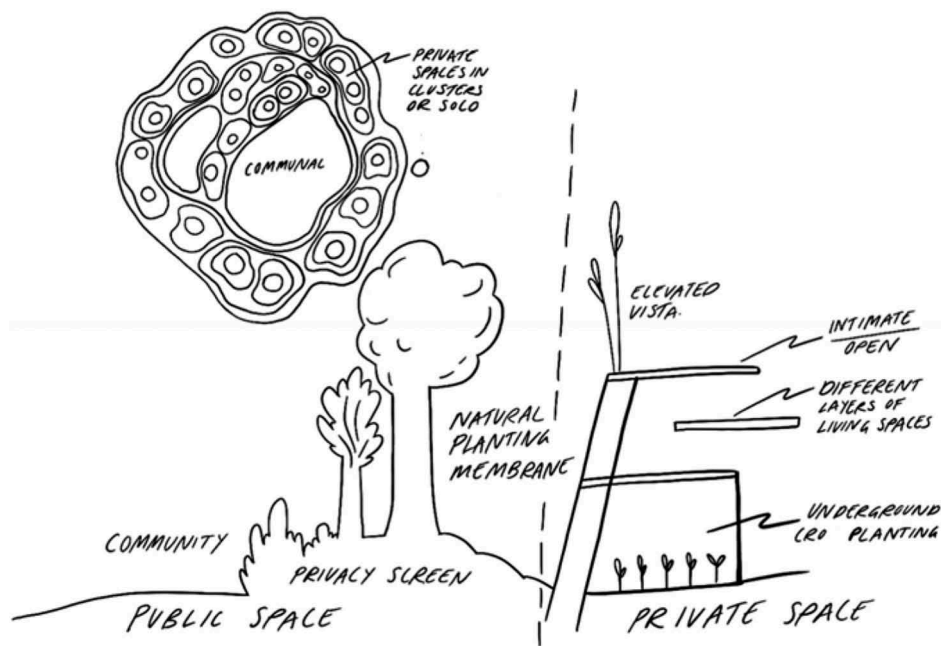


Figure 1. Examples of spatial solutions envisioned for Connecting Land.

Established gardening practices and hydroponic systems have evolved in combination with information technologies to ensure healthy produce and resilient ecosystems.

Achieving Connecting Land

The professionals noted a variety of short and long-term actions that can be taken to achieve Connecting Land. Although change could be enacted through governance, and legislative change, in the immediate future participants recognise the importance of small actions and grass-root movements. Participants recognise the urgent need to ‘leave nature natural’ and plant for native species that can support healthy ecosystems and biodiversity. Alongside the rewilding of the landscape, participants see children’s education to be a top priority to achieve Connecting Land. In this regard, experience-based education and the cultivation of nature leaders is seen as primal. Additionally, a confronting issue discussed among participants is how individuals are isolated from neighbours, streets, and wider communities. This psychological separation is currently very often physically reinforced with fences that confine individual properties. Creating a membrane between public and private land so that the distinction would become blurred is an important action to ensure a new space that is shared and cared for by the community in which children can move freely (Figure 2).

Significant changes in how people relate to the natural environments can also be achieved by altering the design of everyday objects (e.g. see Figure 3 for ‘outdoor showers’) and structures that we currently use in order to make them self-sufficient in their

function and ecologically cyclical. The outdoor showers are just one example of a shifting paradigm behind the creation of objects that meet the ethos of nature-connecting habitats.

In the longer term, participants see the crucial importance of policies that legally recognise nature’s personhood and value its inherent importance. Participants consider it particularly important to recognise the externalities of current economic structures and account in economic models for all health benefits that nature interactions provide to people. This is a governmental pursuit in which the language of nature is strongly introduced in legal documents.

Discussion

The aim of this paper is to provide insights to shape a transdisciplinary agenda for biophilic human habitats. Connecting Land is a hypothetical example of such habitat. It has been prompted by the corresponding author to be a human habitat of about 20 football pitches sufficient to ecologically sustain the living necessities of its 1000 inhabitants and to provide them with a variety of high-quality nature experiences. In the USA, where the workshop took place, this information provided to the participants means that Connecting Land is from 12.4 to 16.4 ha, which means a population density from 81 to 61 people/ha equal to cities like San Francisco (66 people/ha), Lisbon (65 people/ha), and Milan (75 people/ha). The envisioning process resulted in a vision of sustainable human habitats that integrate personal, social, and environmental factors seamlessly. Below, we describe how these results suggest key

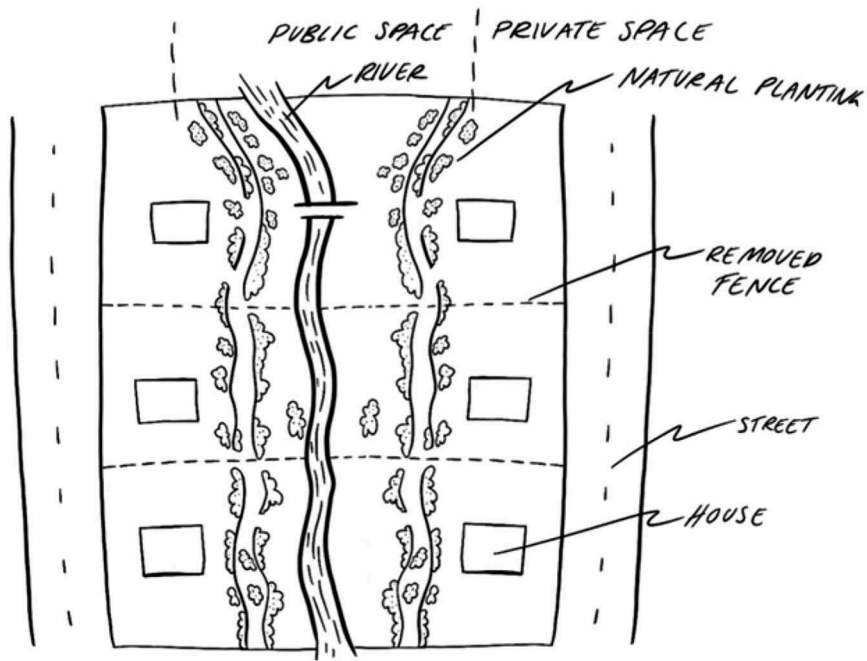


Figure 2. Private and public membrane envisioned for Connecting Land.

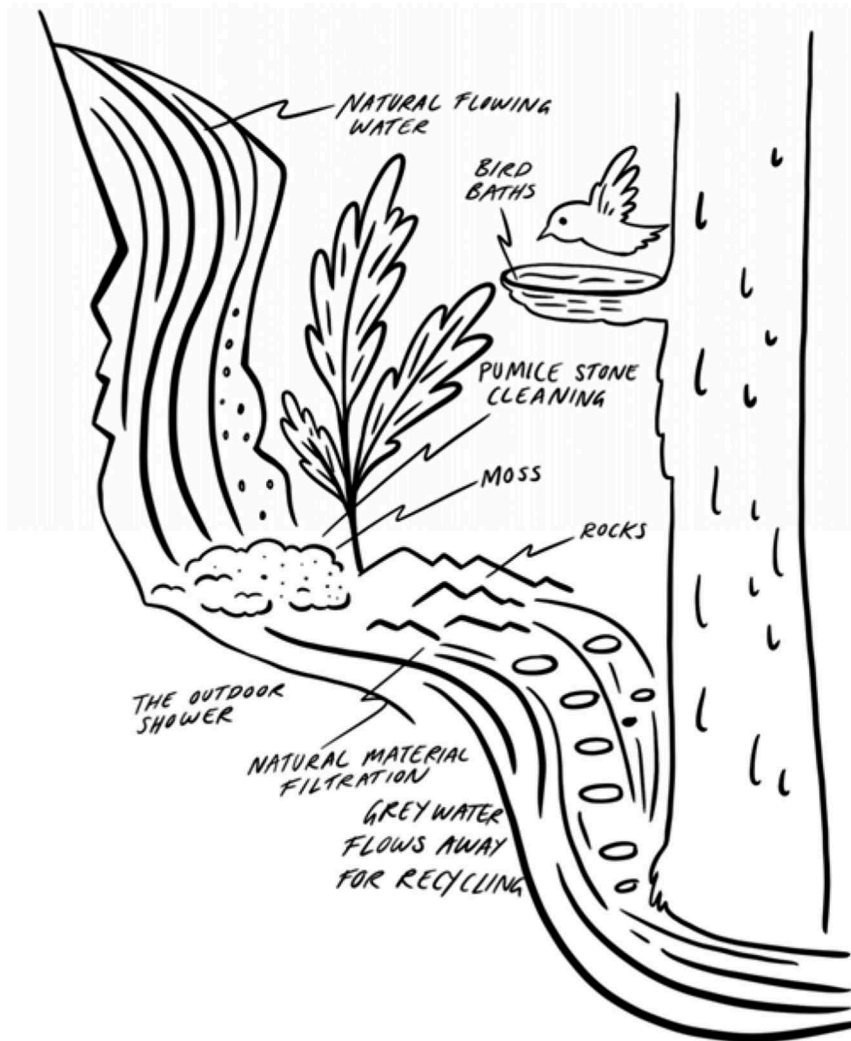


Figure 3. Detail of the outdoor showers envisioned for Connecting Land.

synergies that can be exploited during the process of urban design and key research areas that need further analysis in academic settings.

Missing key synergies

The collective vision emerging from the workshop suggests a variety of psychological, physical, cultural, and environmental attributes that interplay with each other. Nature experiences in Connecting Land are described to provide health benefits to the human mind and body at every age and improve cognitive and physical development. These insights are already supported by scientific evidence (Burdette and Whitaker 2005, Ginsburg 2007, Keniger *et al.* 2013, Hartig *et al.* 2014). The importance of nature experiences for health and wellbeing is indeed already a well-developed body of literature (Bowler *et al.* 2010, Hartig *et al.* 2014). However, participants envision a form of nature that is so physically interwoven into the community space that natural experiences (ephemeral or enduring) happen repetitively and become habits. Truly ‘next door nature’ experiences in Connecting Land are so repetitive that, as one participant noted ‘they have the same habitual importance of lunchtime.’ The temporal dimension of nature experiences is key in Connecting Land and it allows nature-based solutions to embed synergies with the health-care system, sense of place, and children’s environmental education. The local landscape of Connecting Land simultaneously provides provisioning, regulating, and cultural ecosystem services. It is therefore evident that there are a multitude of cost-effective synergies to be exploited between inhabitants’ health, children’s education, and the local provision of ecosystem services (Andersson *et al.* 2014, Bennett *et al.* 2015). Co-benefits for nature-based solutions exist with the health-care system, the educational system, the institutional and political system, and also with the economic system. These synergies appeal to a pool of actors that include local officials, educators, lawyers, ecologists, landscape architects, and medical doctors. Given the wide range of actors benefitting from Connecting Land, it is evident that such variety of actors have also to be involved in its planning. The conservation and design of ecologically functioning natural areas are indeed not independent from providing children with the natural areas space required for their outdoor education. Cultural and social relations have to be reintroduced in the architectural process of creating space. As Giusti and Samuelsson noted ‘Supporting inhabitants’ wellbeing, conserving local flora and fauna, and promoting environmental education should be seen as different requirements of the same design intervention’ (Giusti and Samuelsson 2020, p. 13). Lastly, Connecting Land requires legal structures that go

beyond the local classification of space and calls for legal actions at higher levels of governance. The inclusion of various actors including children and the multi-level legal requirements are some considerable planning challenges that the future design of the human habitat will have to face.

Future key research areas

The results of the workshop highlight two dimensions of nature experiences that required further academic attention for the design of socially and ecologically sustainable cities: the temporal and holistic dimensions. First, the temporal repetition of nature experiences and its importance in creating sustainable cultures is a topic only marginally explored in academia that requires further analysis (Beery 2012, Giusti *et al.* 2014). Such an investigation is essential to ensure that children’s education would be based on hands-on nature experiences that intertwine with the existing practices, rituals, and technologies. To this goal, understanding the qualities of reoccurring (Giusti *et al.* 2018), incidental (Beery *et al.* 2017), and self-directed or shared nature experiences (Clayton *et al.* 2017) is central to promote the evidence-based design of nature-connecting habitats.

Second, given that the simultaneous personal, social, and environmental co-benefits of socially and ecologically sustainable living we suggest that holistic and embodied frameworks are more appropriate to conceptualise, identify, and analyse these synergies (Raymond *et al.* 2017). A holistic and embodied approach would allow for the network of relationships and benefits to be fully explicit and therefore manageable to understand. Nonetheless, even just through a simple brainstorming exercise like the one performed in this study, is evident that there is much ground to cover to understand the full range of co-benefits that healthy ecosystems could support. Much research is required to cover this ground. For instance, the same exercises performed here could be an inspiration for future methodologies that intend to guide a network of professionals to explore real-case scenarios and unveil synergistic nature-based solutions.

Limitations of the study

The study is performed on a limited and somehow specific pool of people. All participants of this study are also participants to the Children & Nature Network conference on the benefits of children’s exposure to nature. Thus, the discussions developed during the workshop and the results reported here might be biased towards a positive integration of people and nature. In so doing, they might fail to address geographical or cultural constraints that are inevitable

in real-world scenarios. We are aware of this limitation and we warn that the result here should indeed be taken as a possible, yet idyllic, best case scenario. Additionally, we also acknowledge that the workshop was of limited duration. With less than one hour to explore and discuss the vision and policy actions for Connecting Land the results are obviously indicative and do not intend to be realistic design guidelines.

Conclusion

Nature-connecting human habitats can exist and can be designed (Giusti 2018). Alternatively to the questioned panacea of smart cities (Colding and Barthel 2017), here we propose a vision for the development of future human habitats in which technologies, rituals, education, and health act synergistically. Connecting Land is an explorative vision of a variety of different professionals that shows the possibility to achieve a multitude of co-benefits through sustainable nature-based solutions. Human habitats that are ecologically sustainable, and promote a place-connected, healthy, and sustainable culture do not need to be utopian. New infrastructure planning strategies can benefit from a variety of stakeholders that have vested interests in biophilic habitats. Research is increasingly asking for integrated planning interventions (Giusti and Samuelsson 2020). However, planning and designing such environments could be challenging. Through creativity, ingenuity, and professionalism, this paper shows that we can move into a future where the living environment works in synergy with all its occupants, humans and not. Sustainability, education, architecture, and technology are all essential facets of a healthier, happier, and more sustainable future.

Disclosure statement

No potential conflict of interest was reported by the authors.

Notes on contributors

Matteo Giusti is a transdisciplinary researcher in Sustainability Science at the Urban Studio (Högskolan i Gävle). Over the past 10 years, Matteo has combined environmental psychology, sustainable urban design, and systems thinking to research what is a sustainable relationship with nature, and how to promote it in children.

Wenpei Wang is a landscape designer en route to become Landscape Architect. She currently works at Cliff Lowe Associate in San Francisco. Her projects include housing development, school yard design, public space development etc. Her interest is to develop designs that can better connect people with nature. She holds bachelor of art in Landscape Architecture from University of California, Berkeley.

Tanya Marriott is multidisciplinary designer who works in a variety of media including interactive design and play, character and toy design, experience design and animation.

Her work seeks to build meaningful experiences and storytelling opportunities between digital and tangible activities.

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