

A NEW LANDSCAPE ARCHITECTURE: THE LIVING FENCES EXPERIENCE IN BUENOS AIRES

INNOVATÍV TÁJÉPÍTÉSZELET. „ÉLŐ KERÍTÉS PROJEKT” BUENOS AIRESBEN

SZERZŐ/BY: VERÓNICA FABIO,
JUAN MIGUEL KANAI, JANICE ASTBURY

DOI:
10.3624/2020/55-56/4

ABSTRACT

The *Breathe/Respirar* Project (BRP) explores opportunities to improve air quality in schoolyards using living fences, and to facilitate the multiple social and environmental co-benefits that can result from greening existing urban infrastructures, which include opportunities for environmental education and reconnecting people with nature. This exploration takes place through a series of experiments in Urban Living Labs set in schoolyards of Buenos Aires, Argentina. The experiments involve (1) engaging the school community (teachers, schoolchildren, parents, other stakeholders) to co-create the experiment; (2) designing and implementing interventions in ‘the schoolyard as landscape’; (3) including activities that enhance co-benefits; (4) monitoring integrated effects; and (5) collectively analysing outcomes. The essay discusses preliminary findings from a pilot project’s early set up. With

effectiveness outcomes still in process, we focus on implications for further project implementation and wider lessons learned to inform the practice of landscape architecture in the context of interdisciplinary socio-environmental projects. These speak to a framework of three premises (making environmental commitment a central pillar; using multidisciplinary approaches for multifunctional landscapes; and communicating strong messages through landscapes themselves and complementary activities). We suggest the current relevance of this professional ethos as landscape architecture seeks to play a bigger role in meeting environmental challenges.

INTRODUCTION

This essay reflects on early findings and lessons learned from the *Breathe/Respirar* Project (BRP), a living fences project that addresses air quality in schoolyards and incorporates Urban

Living Labs (ULL) methods to pursue the multiple social and environmental co-benefits that result from enhancing existing urban infrastructures with a green layer of vegetation. Whilst BRP has been undertaken in collaboration between Argentine and British researchers since 2018, the focus herein is on the project’s challenges and implementation in Buenos Aires. The essay aims to assess these against three premises that we propose for a new landscape architecture, which speak more broadly to the profession’s mission and challenges in the face of the planetary ecological crisis and the new role that cities can play as a solution in the context of unprecedented global urbanisation. The essay explains the BRP’s interdisciplinary methodology, which borrows from (i) international ULL’s experimentation within social-ecological systems; (ii) local expertise on urban environmental education; and (iii) research on the hurdles to provisioning green space and articulating a network of nature-based solutions. We conclude with a reflection on BRP’s ongoing activities and implications for landscape architecture.

THE PLANETARY ECOLOGICAL CRISIS AND THE ROLE FOR GREENER CITIES

Landscape architecture is being redefined to confront the fate of humans in the face of the human disruption of the Earth System and its manifold

consequences (Hamilton, 2017). At the IFLA 2019 World Council meeting, President James Hayter remarked that “we have declared a Climate and Biodiversity Emergency on behalf of the profession of landscape architecture worldwide... landscape architects have all the skills, beliefs and passion to not only make a difference but to be the leaders in land management and city making.” <https://www.iflaworld.com/newsblog/ifla-2019-world-congress-closing-remarks-from-president-james-hayter>

Meeting the environmental challenge indeed requires understanding how city making increasingly implicates land management. In the context of the thorough and extensive urbanisation of the world, cities not only house humanity’s majority but also produce footprints that reach far beyond city limits: peri-urban zones exhibit widening buffers and lengthy urbanisation corridors proliferate (Soja and Kanai, 2014; Kanai and Schindler, 2018). Furthermore, high levels of resource consumption and the concentration of command and control functions mean that what happens and is decided in cities affect broad swaths of the planet. Thus, city-building professions have begun to redefine their remit, spatial focus and assumptions about what constitutes the urban realm (Burdett and Kanai, 2005; McHale et al., 2015), and global sustainability strategies no longer question the central role that cities are to play in sustainable development (Parnell, 2015).

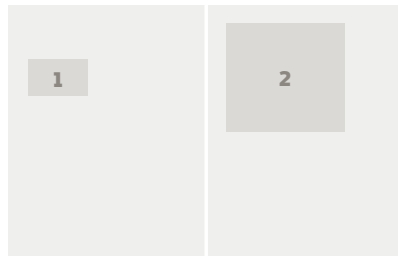


Fig. 1: Children interacting with nature by watering new schoolyard garden at pilot school, January 2020



Fig. 2: Plan for the pilot project schoolyard with its three strata (CREDITS: FABIO, MOUZO, INOMATA, JAUME, PARISI, PICCINI, RIFAH, RUBINSTEIN)



Sustainable cities have intrinsic value. Their urgency is given by the sheer number of people impacted by environmental threats in urban areas. The devastating impacts of urban air pollution on human health constitute a case in point. In 2016 91% of the world population was living in places where the WHO air quality guidelines levels were not met and ambient air pollution was estimated to cause 4.2 million premature deaths worldwide. (WHO, 2016)

Evidence is accumulating on how and where green infrastructure, including green fences and hedges, can reduce the ground-level concentrations of pollutants (Hewitt, Ashworth and MacKenzie, 2020). Landscape architecture should inform these efforts providing expertise on the selection of optimal plant species, integration of green layers to existing built environments, and designs that will garner public interest and raise awareness on urban air pollution, its sources, consequences and the ways to abate it.

THREE PREMISES FOR LANDSCAPE ARCHITECTURE

We believe that a renewed and redefined practice of landscape architecture can be at the forefront of efforts to make cities greener in ways that can contribute towards global sustainability. In particular, the profession has

the capacity to intervene in urban environmental initiatives, such as ecosystem restoration projects, whilst presenting them effectively to diverse publics in order to garner wide social support to maintain them and scale them up over time. Landscape architecture can ensure that there is more nature in urban landscapes and that it is inviting and legible, making visible the workings of the social-ecological system, and sending people a different message about what the city is and how they could and should live in it. The invitation to learn and interact should begin in childhood (Image 1).

If urbanism was historically posited on a fraught separation of city dwellers from nature, with urban green spaces designed as tokens of nature in the city, we now need interventions demonstrating that urban settings are embedded in ecosystems and that humans are part of complex social-ecological dynamics. The growing interest in green infrastructure¹ and nature-based solutions (NBS), which leverage eco-systemic properties, has spearheaded a range of experiments and identification of best practices in cities around the world. Rather than top-down centralised and oft exclusionary interventions based on technological approaches (Hodson and Marvin, 2010), many of these ULLs have highlighted the role of a variety of people in facilitating the provision of ecosystem services by changing the way in which they manage land or water for which they are responsible—or

¹ Tzoulas et al. (2007) consider green infrastructure “to comprise all natural, semi-natural and artificial networks of multifunctional ecological systems within, around and between urban areas, at all spatial scales.” The multifunctional aspect is a particular advantage. Unlike conventional infrastructure, which tends to serve one purpose, the same green space that offers drainage, air filtering and microclimate regulation can also provide habitat to support biodiversity conservation, and serves as a place to play or learn or relax.

have taken responsibility (Astbury and Bulkeley, 2018; Voytenko et al., 2016)

The following three premises provide a guide on how landscape architecture can play a role in this.

1. Landscape architecture should reaffirm its environmental commitment as a pillar for a profession that produces landscapes to be ‘lived in’ rather than landscapes to be ‘looked at’.
2. Landscape interventions should be intended with aesthetic, recreational and functional impacts bound to its environmental programme, in other words with an interdisciplinary approach that considers the inextricable linkages between the environment and the socio-cultural and individual health and wellbeing dimensions of landscape.
3. Landscape improvements should produce clear messages, and if required be accompanied by educational and awareness-raising activities targeted to diverse socio-cultural

groups. Intended beneficiaries should be invited to appropriate and identify with the landscape so they can develop a better understanding of social-ecological processes. We should seek to open up green spaces whilst opening up the minds of those who inhabit them so that they become their advocates and place-keepers.

THE PROJECT’S METHODOLOGY AND ITS IMPLEMENTATION IN BUENOS AIRES

BRP began with a clear objective of addressing local air quality concerns in a school community of Sheffield, UK. A group of staff, parents and university researchers collaborated on planning, designing, building, monitoring and maintaining a green barrier to abate the air pollution that the schoolyard was exposed to due to its near-traffic location. The results of this intervention are still to be published.² Such

² See <https://www.sheffield.ac.uk/landscape/news/breathe-barrier-pollution-hunters-bar-infant-school-maria-redondo-bermudez-break-ground-1.858451> Details of the experience in Sheffield are beyond the scope of this essay but they will be available in a PhD thesis by Maria del Carmen Redondo Bermudez that is nearing completion.

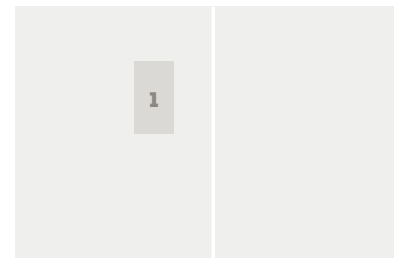


Table 1: Names and quantities of species used (SOURCE: AUTHORS' OWN CALCULATIONS BASED ON THE PLANTATION FRAMEWORK USED IN ARGENTINE AGRONOMIC PRACTICE. SEE [HTTPS://WWW.AGROPTIMA.COM/ES/BLOG/CALCULAR-NUMERO-ARBOLES-HECTAREA/](https://www.agroptima.com/es/blog/calculacion-numero-arboles-hectarea/))

Species	Quantity
Lobularia maritima	20
Asclepias curassavica	8
Arundo multiplex	40
Phyllostachys aurea	52
Cineraria maritima	25
Dietes bicolor	32
Euryops pectinatus	32
Hedera helix	60
Trachelospermum jasminoides	10
Lantana montevidensis	35
Liriope muscari variegado	35
Pilea cadierei	100
Plectranthus ciliatus	115
Salvia involucrate	40
Salvia greggii	8
Senecio kaempferi	30
Stipa tenuissima	5
Tradescantia pallida	100
Weigelia florida variegada	8

green barriers are increasingly used in the UK and elsewhere as a response to growing concern with air quality and its implications for health and well-being (Barwise and Kumar, 2020).

In Buenos Aires, the city's overall levels of contamination exceed WHO air quality guidelines, and in some neighbourhoods they are three times acceptable levels (Greenpeace Argentina, 2018). Despite this, local policy engagement with air pollution is incipient (Abrutzky et al., 2014; Murgida et al., 2013). Yet social awareness on the issue is growing (cf. Greenpeace Argentina, 2018). This inspired the BRP international collaboration predicated on knowledge exchange and mutual learning rather than one-way technical assistance from the UK. Locally led from the Landscape Architecture programme at the University of Buenos Aires, the initiative received enthusiastic initial support from academics of multiple disciplines, government institutions, professional and business circles and advocacy groups.

New hurdles soon became apparent. These included practical problems such as, on the one hand, the costs and technical challenges of monitoring air quality with imported equipment, and on the other hand, the complex governance of city schools requiring multiple permissions before any intervention can occur in schoolyards. Moreover, we found contradictions between the city government's stated intention to increase green coverage, through for example the high-profile programmes that have been launched in the past decade (e.g. Buenos Aires Verde), and the dearth of green (and blue) infrastructure approaches to

address socio-environmental challenges and adapt existing city infrastructures (Kozak et al., 2020). At the society level, social and spatial inequalities shape the provision of and access to urban green spaces (Baxendale and Buzai, 2019; Perelman and Marconi, 2016), which results in a particular dearth of green in densely-built middle class areas and difficult local access to regional parks located in poorer southern neighbourhoods. Moreover, there is a disconnection between ecosystemic approaches of pro-nature NGOs and the economic and environmental concerns of poor people's activism, whereby advocacy for the development of green infrastructure oftentimes lacks resonance with grassroots concerns over trade-offs between employment opportunities and toxicity threats in disadvantaged neighbourhoods (Auyero and Swistun, 2009; Gutiérrez and Isuani, 2014).

The project's implementation in Buenos Aires required a participatory process with several rounds of trial and error to identify and enrol stakeholders in a broadly defined green infrastructure initiative; select opportunity areas of schools with the locational characteristics required for an effective intervention (a city-run public primary school; with a schoolyard at the front facing the road; in an area of the city identified as having poor air quality); and most critically, starting open-ended dialogues on what potential co-benefits would partners and beneficiaries value most intuitively in the fences, and how we could build on those to make issues of air quality and social-ecological sustainability more graspable. This process drew on international lessons from ULLs; local

expertise on pluralistic environmental education; and social science insights on how the politics of urban greening play out in the city given its salient inequalities and fragmentary development.

The landscape design for the pilot project was developed by Landscape Architecture staff and students from UBA with input from international partners. The design responded to the following parameters: (1) The site was a small play area of irregular shape adjacent to the infants' (aged 4-5) classroom who used the garden mainly during their breaks; (2) The play area was at the front of the school exposed to a road used by cars and heavy goods vehicles with consequent noise and air pollution; (3) The schoolyard lacked direct sunlight for most of the day due to the combination of trees and shadows cast by nearby buildings, thus allowing very little vegetation to grow. The combination of these three factors resulted in an unfavourable setting. It called for extensive shade-resistant ground cover and plants with capacity to block contaminants, all of which should contribute to a more attractive and interesting outdoor space for schoolchildren.

The design involved planting in three strata:

1) Ivy (*Hedera helix*) constituted the first line between the exterior and the interior of the schoolyard. This species was chosen because it is a hardy, low maintenance plant that adapts easily to different sites. It has minimal water requirements and persistent foliage. The ivy made up the first layer of the living fence. It was compactly mounted on top of an existing railing, which ensured that the plants grew vertically.

2) Non-invasive canes (*Phyllostachys aurea* and *Bambusa multiplex*) constitute the second level of the living fence, facilitating density and height. In our choice of species, we prioritised rapid growth while avoiding invasiveness as to limit competition with the plants in the third strata of our design.

3) The third strata was made up of plants that aligned with our premises concerning a landscape architecture that is aesthetic, recreational, sensory and has environmental benefits and/or environmental education value, such as re-connecting with nature and increasing biodiversity.

The three strata are represented in the above plan for the schoolyard (Image 2) accompanied by the names and quantities of species used (Table 1).

The plantation framework is a concept that combines genus and species with planting distance, and the final size and form of each plant.³ These relationships determine the number of specimens planted per metre squared and linear metre.

The maintenance regime proposed for the schoolyard relates to three key elements:

1) Soil – To maintain plant health, the addition of compost ensures that the plants receive the nutrients they need, and the soil is enriched over time.
2) Watering⁴ – The chosen species have low water requirements but at some points watering is required and this task must be taken over by a member of the school community.

³ Due to budget constraints, smaller plants were used and these are expected to need two years of growth in situ in order to reflect the aspirations of the design.

⁴ The school is designated as a heritage building with limited changes to the site permitted. This made it impossible to install an automatic irrigation system. However, watering responsibility was voluntarily and proudly assumed by a non-teaching member of the school staff.

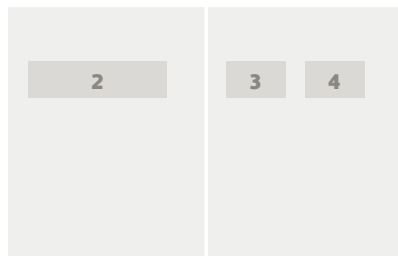


Fig. 3: Pilot living fence and garden, December 2019
Fig. 4: Cooperative members participating in training, May 2019

Fig. 5: Cooperative members and students creating living fence, November 2019



3) Pruning – The ideal final height of the living fence was determined to be no more than two metres, with a maximum width of one metre for each fence section. Therefore, the task of pruning must be assigned in order to ensure that the fence conforms to this standard for two years.

is to be mainstreamed, this must be supported by those who will in many cases fund and implement the projects. We focused on exploring the opportunities for integrating the living fences and associated activities with the *Escuelas Verdes* (Green Schools) programme. This programme has focused primarily on sustainability issues, e.g. recycling and energy efficiency, rather than on connecting to nature and understanding ecosystems. There is an opportunity here to put the ‘green’ into ‘green schools’, which would facilitate the multiplication and the normalisation of living schoolyards (and increase the social demand for environmentally committed landscape architecture). In parallel, the curriculum could be adapted to reflect increased understanding of NBS and of the many benefits of engagement with nature for both people and environment. This could potentially change the way environmental education is delivered at the primary school level so that it becomes centred on interaction with nearby nature, which children can learn to understand, appreciate and care for. We hope that this collaborative multidisciplinary approach where landscape architecture, environmental science, psychology, education and other disciplines come together will result in learning landscapes at schools across the city, sending a strong message about the presence of nature in the city and its important role in the education of children. From the perspective

With the first living fence planted between November 2019 and February 2020 (see Image 3), the analysis below presents our early findings. These are based on lessons learned in the process of planning, building and maintaining the fence as well as exploring opportunities to expand the model with additional living fences in schools throughout the urban region. Additionally, our analysis is informed by the multiple workshops, policy advocacy and dissemination activities undertaken since the 2018 launch of BRP in Buenos Aires.

EARLY RESULTS AND OBSERVATIONS

Engaging City Government: The project obtained recognition from the City Council and engaged with multiple units within the local government, most notably the Buenos Aires Ministry of Education and its sustainability education programme. We recognised the importance of working in an integrated way with policy makers. If landscape architecture is to become a force for change, and if green infrastructure

of the Sustainability Programme Coordinator of the Buenos Aires Ministry of Education and Innovation: “The Breathe project gives me hope, not only because it involves an improvement in the environment and in environmental education but also because it’s being done in a collaborative manner that generates a multiplier effect so that every one appropriates it, and implements these type of actions in their homes.”

Our **Breathe Deep Experimental Training Course** provided an opportunity for people who are working, or hoping to work, in landscaping to receive training and practical experience of creating living fences and schoolyards (see Image 4). Most of the participants were members of cooperatives, which in Argentina serve to assist people in meeting pressing needs, including skills development and access to employment. This is increasingly important when the industrial sector is changing and jobs are disappearing. In this context, facilitating access to work in an emerging green economy is vital. The training was also an important way to embed our first premise, integrating environment as a central pillar of landscape architecture, across a range of people who will be working on the ground—and sharing their practices with other cooperative members, encouraged by the organisational structures of their cooperatives and the spirit of cooperativism. While the participants were primarily motivated by developing new employment

opportunities, this did not mean that they weren’t interested in environmental issues. As expressed by one cooperative member, “The Breathe project signifies a very important link, being able to add plants to schools means more connection with nature and this is very important.” They were proud to be part of this initiative, the first of its kind in Argentina. They were also proud to have completed the training and to receive their diplomas, which for some was the first diploma they had ever received. This feeling of pride is a strong motivator for people to seek out, and to promote, projects with an environmental commitment. As another cooperative member said, “Plants are everything. The truth is my fellow cooperative members and I feel great pride in being part of this project.” Two other cooperative members have already gone on to develop, and in one case implement, green infrastructure projects. So this training facilitated appropriation of the initiative not only by the school community (schoolchildren and staff, parents, neighbours) but also by the cooperative members—and others who participated in making it e.g. local and international university students and staff (See Image 5). By making creation of the new landscape into a participatory project, the living fence and schoolyard have additional educational value.

Applied Learning with University of Buenos Aires (UBA) students involved them in research, analysis, design and



Fig. 6: Students involved in creating garden, February 2020
Fig. 7: Design students developing a design for a second school, August 2019

Fig. 8: School-children participating in environmental education workshop, October 2019

implementation of the first living fence and schoolyard in Buenos Aires (see Image 6). As in the case of the cooperative members, this activity gave students who will pursue careers in related fields an opportunity to participate and learn through an intense experience of professional practice. This exercise reflected our premises by highlighting the centrality of environmental commitment; taking an integrated multidisciplinary approach to maximise multifunctionality in the landscape; and offering students hands-on educational activities that deepened their understanding. As one of the students described, “This project has helped me to see landscape design in another way, not simply as something contemplative, but also as a way to solve the problems that cities present, to be able to convert them into healthy, and above all sustainable, places.”

Other activities with students included participation of a large group of UBA students from the various design disciplines in developing a communications tool concerning the benefits of NBS in relation to habitat and community, and particularly the use of vegetation to address the climate and biodiversity, as well as having positive effects on physical and mental health. These were entered in the 4th National Biennale of the Faculty of Architecture, Urbanism and Design.

Similarly, final year design students from different disciplines undertaking

research internships participated in studying the context and site, and then developing a design for a second school (see Image 7). They focused on creating a high quality playground for children within the living fence and schoolyard model. They also attended to functional aspects such as rainwater capture to water the vegetation, and technical specifications for play equipment, thus again demonstrating the value of a multidisciplinary approach. Some of the students that were involved in the above activities continue to engage with the BRP voluntarily thus indicating their on-going commitment to this work.

School-based activities with children and teachers: 5th year primary school-children took part in an arts-based workshop facilitated by environmental educators using art, music and games (see Image 8). The children were asked to think about how plants meet the needs of individual human beings, such as food and clothing, and also about how plants keep the planet healthy for all living things. Each child was given a potted plant to take home and care for, giving them a chance to immediately apply their heightened awareness of the importance of plants and the role of humans in appreciating and caring for them. Bringing home their own plant also opened up a potential channel for sharing their experience of the workshop with their families and hopefully leading to further discussion, and perhaps action, at home. This activity

represented a successful example of the complementary activities that can facilitate connection with nature, in this case bringing to bear other cultural elements such as art, music and play in a way that is effective for children, among others. Teachers at the school have also engaged with the initiative and offered useful input concerning the importance of speaking to children about environmental quality rather than contamination. This is an important addition to our third premise concerning educational activities—in an era of planetary environmental crisis, we must take great care not to provoke fear and despair in children (and other people) through the activities offered to them. The project has opened up new spaces for thinking and doing things differently, as noted by the Deputy Director of the school, “*The Breathe project allowed us get beyond the school walls and open ourselves to new situations and to share experiences of a type we are not used to.*”

Exchange and Collaboration:

In order to extend the network of academic and professional collaboration, UBA and the *Sociedad Central de Arquitectos* convened an international conference in Buenos Aires on green infrastructure in Latin American cities, which attracted approximately 50 participants and led to creation of a Bioremediators Network facilitating continued collaboration. Members of our team also presented at a meeting on climate change organized by *Centro*

Argentino de Arquitectos Paisajistas, and at an interdisciplinary meeting held at the *Consejo Profesional de Arquitectura y Urbanismo*. We were also invited to a forum organised on adaptation to climate change at the city council.

CONCLUDING REMARKS AND FUTURE AGENDA

We still have much to learn about living fences, from the optimum design specifications for air quality improvement to the manifold social and ecological co-benefits that this layer of vegetation enhancement yields. Whereas the former has a clear site-specific focus, which in the case of schoolyards is of critical importance to secure environmental health for children, the latter can and must accrue at multiple scales, and link as much as possible with broader networks of nature-based solutions.

The BRP’s implementation in Buenos Aires has taught us that landscape architecture plays a critical role if living fences are to live up to their potential, transforming them into activated landscapes with multifunctionality rather than simply building them as sustainability artefacts with limited remit and affordances. Furthermore, we learnt that if landscape architecture is to be put at the service of urban environmental aims, it must also be put at the explicit service of a plurality of intended beneficiaries. If effectively enrolled

and attended to, diverse communities of users and producers will also become likely advocates and place-keepers if not initiators of green infrastructure innovations such as living fences. Our three initial premises come together as a dual and concurrent care for people and the environment.

We have much exciting work ahead with living fences in Buenos Aires and beyond. We clearly need to produce clear and robust evidence from urban living lab activities to inform policy shifts and continuing governmental engagement. Additionally, we plan to explore their role in site-specific and creative pedagogies of urban environmental quality in early education. Our activities of planting and maintaining the fences will be designed as to provide as many formal and informal opportunities as possible for involving parents and broader school communities. Feedback from the initial training and ongoing engagement with the participating grassroots cooperatives will provide us a guide for future programme improvements. Businesses, professional associations and academics are some of the stakeholders we will need to build capacity and continuously assess our working assumptions. It is certainly a daunting agenda but one that is called for by the pressing needs for greening the city in any way possible and contribute to the broader transitions in urban environments to face our planet's crisis.

References

ABRUTZKY, ROSANA, LAURA DAWIDOWSKI, ANA MURGIDA, and CLAUDIA ELEONOR NATENZON. "Contaminación del aire en la Ciudad Autónoma de Buenos Aires: el riesgo de hoy o el cambio climático futuro, una falsa opción." *Ciência & Saúde Coletiva* 19 (2014): 3763-3773.

ASTBURY, JANICE and HARRIET BULKELEY. "Bringing urban living labs to communities: Enabling processes of transformation." In Simon Marvin, Harriet Bulkeley, Lindsay Mai, Kes McCormick and Yuliya Voytenko Palgan (eds.) *Urban living labs: Experimenting with city futures*. Routledge, 2018, Chapter 7.

AUYERO, JAVIER and DÉBORA A SWISTUN. *Flammable: Environmental suffering in an Argentine shantytown*. Oxford and New York: Oxford University Press, 2009.

BAXENDALE, CLAUDIA, and GUSTAVO D. BUZAI. "Modelos urbanos e infraestructura verde en ciudades de América Latina. Análisis en la ciudad de Buenos Aires." *Huellas* 23, no. 2 (2019): 79-106.

BARWISE, YENDLE, and PRASHANT KUMAR. "Designing vegetation barriers for urban air pollution abatement: a practical review for appropriate plant species selection." *npj Climate and Atmospheric Science* 3.1 (2020): 1-19.

BURDETT, RICHARD and MIGUEL KANAI. "City-building in an age of global urban transformation." In Richard Burdett and Sarah Ichioka (eds.) *Cities: People, Society, Architecture: 10th International Architecture Exhibition - Venice Biennale*, New York: Rizzoli International Publications, 2006, 3-23.

GUTIÉRREZ, RICARDO A. and FERNANDO J. ISUANI. "La emergencia del ambientalismo estatal y social en Argentina." *Revista da Administração Pública* 48, no. 2 (2014): 295-322.

GREENPEACE ARGENTINA. *Respiremos aire más limpio en Buenos Aires*. <https://www.greenpeace.org/argentina/involucrate/respiremos-aire-mas-limpio-en-buenos-aires>. 2018

HAMILTON, CLIVE. *Defiant Earth: The fate of humans in the Anthropocene*. Cambridge: Polity Press, 2017.

HEWITT, C. NICK, KIRSTI ASHWORTH, and A. ROB MACKENZIE. "Using green infrastructure to improve urban air quality (G14AQ)." *Ambio* 49, no. 1 (2020): 62-73.

HODSON, MIKE, and SIMON MARVIN. "Urbanism in the Anthropocene: Ecological urbanism or premium ecological enclaves?" *City* 14, no. 3 (2010): 298-313.

KANAI, J. MIGUEL and SETH SCHINDLER. *Peri-urban promises of connectivity: Linking project-led polycentrism to the infrastructure scramble*. *Environment and Planning A: Economy and Space*. 2019; 51(2): 302-22.

KOZAK, DANIEL, HAYLEY HENDERSON, ALEJANDRO DE CASTRO MAZARRO, DEMIÁN ROTBART, and RODOLFO ARADAS. "Blue-Green Infrastructure (BGI) in Dense Urban Watersheds. The Case of the Medrano Stream Basin (MSB) in Buenos Aires." *Sustainability* 12, no. 6 (2020): 2163.

MCHALE, MELISSA R., STEWARD TA PICKETT, OLGA BARBOSA, DAVID N. BUNN, MARY L. CADENASSO, DANIEL L. CHILDERS, MEREDITH GARTIN et al. "The new global urban realm: complex, connected, diffuse, and diverse social-ecological systems." *Sustainability* 7, no. 5 (2015): 5211-5240.

MURGIDA, ANA MARÍA, CLAUDIA F. GUEBEL, CLAUDIA E. NATENZON, and LAURA FRASCO. "El aire en la agenda pública: el caso de la Ciudad Autónoma de Buenos Aires." *Respuestas urbanas al cambio climático en América Latina*. LC/W. 563. (2013): 137-157.

PARNELL, SUSAN. "Defining a global urban development agenda." *World Development* 78 (2016): 529-540.

Perelman, Patricia and Marcon, Patricia. "Percepción del verde urbano en parques de la Ciudad de Buenos Aires." *Multequina* no. 25 (2016): 1-10

SOJA, EDWARD and MIGUEL KANAI. *The urbanization of the world*. In Neil Brenner (ed.) *Implosions/Explosions: Towards a study of planetary urbanization*. Berlin: Jovis, 2014, 142-159.

TZOULAS, KONSTANTINOS, KALEVI KORPELA, STEPHEN VENN, VESA YLI-PELKONEN, ALEKSANDRA KAZMIERCZAK, JARI NIEMELA, and PHILIP JAMES. "Promoting ecosystem and human health in urban areas using Green Infrastructure: A literature review." *Landscape and urban planning* 81, no. 3 (2007): 167-178.

VOYTENKO, YULIYA, KES MCCORMICK, JAMES EVANS, and GABRIELE SCHLIWA. "Urban living labs for sustainability and low carbon cities in Europe: Towards a research agenda." *Journal of Cleaner Production* 123 (2016): 45-54.

WORLD HEALTH ORGANISATION. "Ambient Air Pollution: A Global Assessment of Exposure and Burden of Disease." (2016).

INNOVATÍV TÁJÉPÍTÉSZET. „ÉLŐ KERÍTÉS PROJEKT” BUENOS AIRESBEN

A Breathe/Respirar (Lélegezz) projekt az iskolakertek levegőtisztaságának javítására („élő kerítések” segítségével), valamint a meglévő városi infrastruktúra zöldítéséből fakadó társadalmi és környezeti előnyök kiaknázására irányul – egyebek között a környezeti nevelés és a természetszeretet erősítése terén. A projekt megvalósítása az argentin főváros, Buenos Aires iskolaudvaraiban létrehozott Városi Élő Laboratóriumok révén történik. A kísérleti projektek keretében sor kerül: (1) az iskolai közösség (tanárok, diákok, szülők, más érintettek) bevonására; (2) az iskolaudvar kertépítészeti tervezésére és megépítésére; (3) egyéb olyan tevékenységekre, amelyek segítik a zöld fejlesztések nyújtotta előnyök minél teljesebb kiaknázását; (4) az elért környezeti és társadalmi hatások nyomon követésére; (5) és az eredmények közös elemzésére. A cikk egy kísérleti projekt kezdeti szakaszának előzetes eredményeit tárgyalja. Tekintettel arra, hogy a hatékonyságra vonatkozó eredményekre még várni kell,

a cikkben elsősorban a projekt további végrehajtása szempontjából hasznos tapasztalatokra összpontosítunk, továbbá a tájépítészetre vonatkozó, de az interdiszciplináris társadalmi-környezeti projektekkel kapcsolatos általános tanulságokat emeljük ki. Ezek egy hármass feltételrendszerbe foglalhatók: a környezet iránti elkötelezettség központi szerepe; a többfunkciós kertek témájának multidiszciplináris megközelítése; és határozott üzenetek közvetítése kertépítészeti eszközök segítségével (valamint egyéb tevékenységek révén is). Fontosnak ítéljük ezt a megközelítést, amely hozzásegíthet ahhoz, hogy a tájépítészeti szakma nagyobb szerepet tölthessen be a környezeti kihívások megoldásában.