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Report
**“Urban landscapes and climate change:
the contribution of Landscape Architects to improve the quality of life”**

Council of Europe
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Summary

Article 5 of the European Landscape Convention on “General measures” states:

“Each Party undertakes:

... b. to establish and implement landscape policies aimed at landscape protection, management and planning through the adoption of the specific measures set out in Article 6;”

Article 6 E, in particular, states that “To put landscape policies into effect, each Party undertakes to introduce instruments aimed at protecting, managing and/or planning the landscape.”

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The Report “Urban landscapes and climate change: the contribution of Landscape Architects to improve the quality of life” was by Mr Michael Oldham, in the capacity of Expert of the Council of Europe, in the framework of the Council of Europe activities for the implementation of the European Landscape Convention.

Mr Oldham is Founding President of the European Foundation for Landscape Architecture (EFLA), Honorary Member of the International Federation of Landscape architects Europe (IFLA-Europe) and Fellow of the Landscape Institute,

The Report was prepared with the contribution of the Working Group of the International Federation of Landscape Architects (IFLA) Europe, on the Council of Europe: Mrs Ana Luengo, Chair (Spain), Mr Niek Hazendonk (Netherlands), Mr Leor Lovinger (Israel), and Mrs Indra Purs (Latvia).

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The Report, which is concerned with the practice of Landscape Architecture to improve the quality of life in cities, outlines the context of climate change in terms of the science, the politics and aspirations, both in Europe and globally. It discusses how cities are changing, how their resident populations are at risk, and how Covid-19 has further complicated the situation, perhaps advancing even more urgently the need for action. It notes two major studies commissioned by the European Union, undertaken by the European Environment Agency and the Eklipe Working Group, both of which directly relate the quality of city life to landscape and the environment. Seven subject areas are examined which demonstrate the range of science, design, planning, implementation and management of landscapes in the cities of several European States.

Education at primary, secondary and higher/university level is also discussed, in relation to creating both greater awareness and improved professional expertise. The report comments on strategies relating to the importance of landscape equity and human rights, which are central values of the Council of Europe.

The report highlights opportunities and problems, and notes fundamental challenges, in order to establish a European viewpoint on the climate crisis, and the role that landscape and Landscape Architects can play.

With regard to the provisions of the European Landscape Convention concerning the establishment of means of intervention for the protection, management and/or planning of landscapes (Article 6, E), the Conference is invited :

- to take note of the Report “Urban landscapes and climate change: the contribution of landscape architects to improving the quality of life”, prepared by Mr Michael Oldham, in the capacity of Expert of the Council of Europe, in the framework of the Council of Europe activities for the implementation of the European Landscape Convention;
- to acknowledge the important contribution of the landscape architecture profession to improving the quality of life in urban areas, particularly in the context of the fight against global warming;
- to refer to its Declaration on the professional recognition of landscape architects, adopted at its 10th Council of Europe Conference on the European Landscape Convention (Council of Europe, Palais de l’Europe, Strasbourg, 6-7 May 2019), which encourages the State Parties to the European Landscape Convention: 1. to formally recognise the profession of landscape architects at national and international level; 2. to support a multidisciplinary approach to landscape, through co-operation of all relevant professions in all phases of the planning process; and 3. to increase the diversity of disciplines in the training of landscape professionals, particularly regarding science, management and planning (CEP-CDCPP (2019) 20E, item 6 and Appendix 8.1.1. and CEP-CDCPP (2019) 6E rev.).

Report
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*prepared in the framework of the Work Programme of the Council of Europe
for the implementation of the European Landscape Convention*

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3. Statement, presented by Michael Oldham on behalf of the International Federation of Landscape Architects Europe to the 8th Plenary Session of the Steering Committee for Culture, Heritage and Landscape – CDCPP (Strasbourg, 21 May 2019) [Contribution by IFLA Working Group on Climate Change following the Special Report on Global Warming of 1.5°C by the Intergovernmental Panel on Climate Change, October 2018, \[www.coe.int/en/web/cdcpp-committee/special-file-climate-change\]\(http://www.coe.int/en/web/cdcpp-committee/special-file-climate-change\)](#).

Introduction

Climate change

It is now generally accepted that one of the principal causes of climate change is directly related to the result of human activity. Indeed, the term “Anthropocene”, meaning a geological period dating from the commencement of significant human impact on Earth’s geology and ecology, but not limited to climate change, is rapidly gaining ground. Taking responsibility for our actions and modifying our activity to mitigate the worst effects is essential for the survival of mankind. As such, recognising that climate change causes overheating, pollution, decrease in biodiversity, droughts and flooding, which impact hugely on the quality of human life and morbidity, is fundamental, particularly in towns and cities.

As a preliminary response, there have been some significant global initiatives during the last quarter century. The Kyoto Protocol 1997, within the United Nations Framework for Climate Control which was signed by 192 Parties, set the first targets for the reduction in greenhouse gases. The Paris Agreement, adopted in 2015, was signed by 196 Parties. However, it is clear that the agreed targets for both are already at risk of being missed.

Nevertheless, both the European Union and the Council of Europe have undertaken scientific studies and made agreements concerning certain aspects of climate change. The Council of Europe Conference of Ministers responsible for Spatial/Regional Planning (CEMAT) noted at its Conference in Moscow in 2010 that a key issue was “the territorial impacts of climate change (negative as well as positive) on settlements, infrastructures, ecosystems, employment and regional productive systems.”¹ More recently, the Council of Europe mentioned the environment among its major human rights themes.²

Conscious of the issues at hand, the European Union has recently sponsored a number of initiatives, the most important of which is the European Green Deal. Its objectives include “striving to be the first climate-neutral continent”.³ It maps out a strategy for the next few years dealing with reducing energy demands and CO₂ emissions, renovating buildings, protecting the ozone layer and tackling biodiversity in relation to agriculture, but notably it hardly mentions towns and cities per se, how the quality of life will be compromised by climate change or what landscape measures could be employed to mitigate the problem.

Interestingly, in an article by Christopher Klein, entitled “How pandemics spurred cities to make more green space for people”, he relates in particular how cholera became one of the prime movers in the 19th century to transform cities such as London, Paris and New York. Covid-19 and future epidemic diseases, alongside climate change, may become some of the key factors in the 21st century in transforming modern cities, speeding up change, forcing a reconsideration of many aspects of urban dwelling more quickly than might otherwise have happened.⁴

Indeed, it is now impossible to simply consider climate change in relation to the future of towns and cities without also recognising the deep impact and influence on thinking that the Covid-19 pandemic

1. Council of Europe, 15th Council of Europe Conference, Council of Ministers responsible for Spatial/Regional Planning (CEMAT), 8-9 July 2010, <https://rm.coe.int/168048968d>

2. Council of Europe, www.coe.int/en/web/compass/environment

3. https://ec.europa.eu/info/strategy/priorities-2019-2024/european-green-deal_en.

4. www.history.com/news/cholera-pandemic-new-york-city-london-paris-green-space.

has had. Together, climate change and Covid-19 have brought into very sharp focus many aspects of city life, not the least of which is the relationship between the green infrastructure of cities, the quality of life and the health and well-being of the residents.

Conventional spatial and urban planning, as framed in the post-industrial revolution with the enlargement of cities throughout Europe, has proved to be flawed in that it has created cities which could be more aptly described as “collections of architectures”. A new, broader and more complex concept of what was previously understood to be a “city” has evolved as a result of social and environmental pressures. This may be the result of a creative and planned action, but it is more commonly simply the result of use, an accumulative and organic process, arising through urban or rural habits, customs and traditions. It may present as certain patterns and settlements, fragmenting and partitioning, buildings and complexes, which comprise an inseparable part of a complex heritage, of a cultural asset that is inalienable from the land that has given rise to it and to which it has also given its coherence, but remains in many respects unfit for purpose.

These apparently conflicting concepts – cultural and natural, physical and intangible, image and change – concentrate and converge in cities, creating highly idiosyncratic urban landscapes, each with their own character, values and dynamics. Future cities might well be a fusion of human and natural habitats and processes, a blending of urbanity with wilderness – native, socialised, constructed, introduced and domesticated – thus creating healthy, vibrant, alive cities, good places in which to live, work and play.

The role of landscape in cities

In this report, urban landscapes are as described by the European Landscape Convention. In the Convention, “Landscape” means an area as perceived by people, whose character is the result of the action and interaction of natural and/or human factors. This definition reflects the idea that landscapes evolve through time, as a result of being acted upon by natural forces and human beings. The concept of landscape is also recognised as being different from “the environment” as it is the perception that humans have of their environment, which is a social and cultural construct. As such, although landscape is a component of the environment, it is still important, regardless of whether it is ordinary or outstanding. The Convention applies this concept to an entire territory, including natural, rural, peri-urban and urban areas.

To achieve sustainable development based on a balanced and harmonious relationship between social needs, economic activity and the environment, landscape constitutes an important resource favourable to economic activity: thus its protection, management and planning can contribute broadly to sustainable development, whilst maintaining an important public interest role in cultural, ecological, environmental and social fields. The concern for sustainable development makes consideration of landscape essential in striking a balance between preserving the natural and cultural heritage reflecting European identity and diversity, by using it as an economic resource capable of generating employment.

Landscape is important as an essential component of the quality of life for people everywhere: in the countryside as well as in urban areas, in areas recognised as being of outstanding beauty as well as everyday areas. The Convention also tries to respond to the public’s wish to enjoy high quality landscapes and to play an active part in the development of landscapes, precisely because they are a key element of individual and social well-being.

Simply understanding the city as landscape creates the opportunity to conceptually revise current practices in urban interventions. Existing perceptions include landscape as a setting, landscape as the specific site of a cultural expression, landscape as a natural system, or landscape as a holistic entity, but in fact it is all of these, combining to create complex interrelationships. It is only when these elements are separated in the urban landscape that it becomes dysfunctional. One of the most important elements of urban planning is to bring these elements together to function collectively, both for humans and the environment.

Conventional landscape analysis suggested five almost independent gradients (presented below). However, in many areas these gradients no longer reflect what is real or what is needed. Indeed, for the urban environment to function properly, all of these elements need to be present in the city, in some form or other.

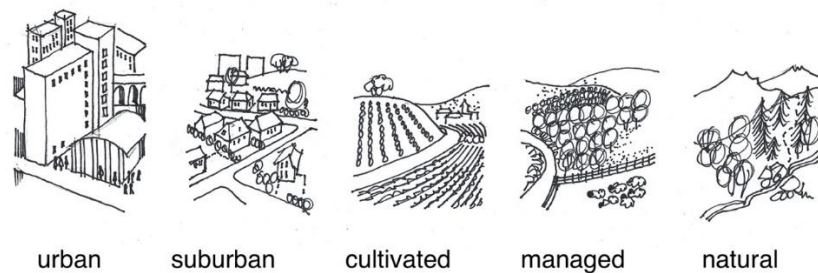


Figure 1. Landscape Gradients from Urban to Natural. © Michael Oldham

A polarised and dualist perception of humans and nature or, rather, urban-rural-natural, dictating 20th century interventions, is no longer realistic or valid.

Landscapes are perceived as the common ground of nature and culture, and humans are *part* of nature, not *apart from* nature and, as such, benefit physically and psychologically from constant contact with nature, as is shown later in this report.

1. Quality of life in towns and cities – science-based studies

At present, about half of the world's population lives in cities.⁵ In Europe, this proportion increases to over two thirds. While there has been a growing interest in the need to adapt cities in response to climate change, attitudes to city life have quite suddenly changed dramatically, as a result of Covid-19. The need to commute or not, home working, the desire for houses with gardens, indeed even the desire to escape from cities, have all come into question. There are questions whether we will ever go back to where we were before the pandemic.

Interestingly, regarding this change, there are some who argue for the development of the countryside to accommodate a potential migration from the cities, although it is likely that only the rich and privileged would be able to afford this and, if it were to happen, cities and towns would most probably gradually degrade, as finance would be diverted elsewhere. Inevitably, in any event, such a solution would be expensive, unnecessarily destructive, and place even greater pressures on agriculture, woodland and other natural areas.

5. United Nations, www.un.org/development/desa/en/news/population/2018-revision-of-world-urbanization-prospects.html

A much better solution must be to bring the countryside into urban areas, transforming, for example, some communication routes into traffic-free green/blue corridors, with community facilities including shopping, commerce, medical support, schools and recreational semi-natural open space, all within easy walking or cycling distance, or where electric, autonomous vehicles can operate more or less continuously, to assist access. Developing more self-sustainable, resilient neighbourhoods, in itself not a particularly new idea, is gaining ground. To function properly, the concept must be developed to include easily-accessible open space, giving serious consideration to natural elements.

As a simple example, reducing the need for individual personal urban transport would transform streets (which are sometimes little more than linear car parks), and would reduce CO₂ emissions and pollution at the same time. Moving pavements, escalators, telecabins and autonomous vehicles could free up streets for other purposes. As part of this process, transforming streets into attractive, multi-faceted urban areas and planting trees improves visual amenity and also helps to sequester huge amounts of CO₂, whilst providing shade and shelter, capturing unhealthy air particles, improving air quality, improving species diversity and improving natural drainage by reducing run-off. Reducing mobility in cities would reduce CO₂ generation, providing “green”, universally accessible and universally acceptable public transport systems, and is a solution which would eventually reduce the need and, if properly managed, even the desire to own a car.

Expanding and improving the cycling infrastructure would further contribute to this improvement. Many of the measures that make cities and towns more sustainable also create vitality. However, this requires a planned transition. Several cities are investing in transforming the city centre into a greener, car-free environment. It is important to understand that investing in landscape is as a key part of this change. Such investments have always been relatively cheap when compared to building and engineering and are exceptionally efficient and cost-effective, providing a resource for physical, mental and social well-being, as well as helping to combat climate change. Other cities could well take a lead from Barcelona. The European Green Deal may help in this respect, but it would be surprising if even 1% of its budget will actually be spent on landscape.

Energy-efficient buildings are important as a component of change, but in itself this is no different from replacing the internal combustion engine with an electric motor. Designing with nature, which offers a more secure future in many dimensions, is nothing new. Fifty years ago, in 1969, Ian McHarg published “Design with Nature”.⁶ This revolutionary book informed an important change in the study of Landscape Architecture. The book was not only influential academically but also informed major changes in the process of urban planning.

Unlike ten or twenty years ago, there now exists a wealth of learned, well-documented information and technical studies dealing with the importance of green urban scape and greenery for the health and well-being of city dwellers.

Report “The Urban environment”, United Kingdom’s Royal Commission on Environmental Pollution (2007)

6. McHarg, Ian, “Design with Nature”, Wiley Books now Island Press, originally published 1969.

This report “The Urban environment” stated that “health and well-being are recognised as inextricably linked with the urban environment”.⁷

Study “Landscape and well-being: a scoping study on the health-promoting impact of outdoor environments” (2010)

In a study entitled “Landscape and well-being: a scoping study on the health-promoting impact of outdoor environments”, the following summarises this link.

According to the results of the present scoping study, the relationship between landscape and health shows two main features: first, health-promoting landscapes contribute to healthy lifestyles in terms of physical activity and mental and emotional relaxation. Second, health-promoting landscapes promote the acquisition of resources for health such as social support, concentration and emotional stability.⁸

Report “Nature-based Solutions to Promote Climate Resilience in Urban Areas” (2020)

Project funded by the European Union’s Horizon 2020

On behalf of IFLA Europe, Mr Leor Lovinger contributed to the Eklipse Working Group for the preparation of a report on planning and evaluation of nature-based solutions projects. It should be noted that in just one paragraph of this detailed report of the project, there is a cornucopia of useful information and references to technical studies:

Nature-based solutions can contribute to a range of positive psychological and physiological outcomes. Studies have shown the positive effects of urban green spaces on urban residents through psychological relaxation and stress relief (Roe et al., 2013; Ward Thompson et al., 2012) and enhanced opportunities for physical activity (Sugiyama and Ward Thompson, 2007). Studies have also identified positive health associations between distance to urban green spaces and potential health benefits, suggesting that being in proximity to urban green spaces (Maas et al., 2006), and viewing greenery (Dravigne et al., 2008; Ulrich, 1984; Ulrich, 2002), has positive health effects. Additional benefits include reduced depression (Bratman et al., 2015a) and improved mental health (Hartig et al., 2014; van den Berg et al., 2015; Vries et al., 2003); reduced cardiovascular morbidity and mortality (Gascon et al., 2016; Tamosiunas et al., 2014); improved pregnancy outcomes (Dadvand et al., 2012); and reduced obesity (Kim et al., 2014) and diabetes (Maas et al., 2009). Urban green space also provides opportunities for exploratory behaviour in children and improved functioning of the immune system (Kuo, 2015; Lynch et al., 2014).⁹

7. Royal Commission on Environmental Pollution, twenty-sixth Report “The Urban Environment”, presented to Parliament by Command of Her Majesty, March 2007, Cm 7009
<https://webarchive.nationalarchives.gov.uk/20110322144101/http://www.rcep.org.uk/reports/26-urban/documents/urban-environment.pdf>

8. Andrea Abraham, Kathrin Sommerhalder, Thomas Abel, “Landscape and well-being: a scoping study on the health-promoting impact of outdoor environments”, International Journal of Public Health, 2010, vol. 55, issue 1, 59-69 www.eea.europa.eu/publications/urban-adaptation-in-europe

9. Report “Nature-based Solutions to Promote Climate Resilience in Urban Areas”, prepared by the Eklipse Expert Working Group (Affiliation: Centre for Ecology & Hydrology, Wallingford, United Kingdom), DOI: 10.13140/RG.2.2.18682.08643, February 2017.

The document explores the many dimensions of impact that result from nature-based solutions and covers matters such as air quality, green space management, urban regeneration, public health and well-being, as well as the potential for economic opportunities and green jobs. Alongside the clear positive benefits of investing in landscape and nature-based solutions it is accepted that, in addition, it is nevertheless difficult – but not impossible – to add into the equation the reduced negative impacts of dealing with ill-health, absenteeism, premature death, dereliction and criminality, which are often associated with living in a degraded environment.

Such studies also generally point to the need for swift action to radically change attitudes, as well as acknowledging that the cost of doing nothing, or postponing action, is in due course likely to be considerably higher than committing to change. This cost cannot simply be calculated on the cost of carrying out works, but the broader cost to society in terms of morbidity and the like, as well as lost opportunity. However, in committing to change there are two aspects which are fundamentally key to its success.

The first is to design and engineer change on the basis of sound decision-making. This in itself depends hugely on properly understanding the wide choices available, their long-term implications, the economics and social benefits in the broadest sense, and these can only be derived from the real expertise associated with design, planning, management, science and economics of landscape. The second is to involve the public in this process at the earliest possible stage. This requirement is now better understood: it is recognised that, as part of the necessary process, city dwellers, ordinary people, need to be informed, involved, take responsibility and take possession of change, rather than having change simply imposed upon them by local, regional or central government.

This report outlines the key areas where the specific contribution of Landscape Architects can contribute to improving the quality of life and well-being, responding to climate change and the changing needs of society in the urban and peri-urban environment. This is not to say that others are not, or should not be, involved in the process, quite the reverse. Multi-disciplinary professional groups which include planners, highway engineers, urban designers, ecologists and architects must be involved in the process, as well as economists, politicians and the general public: to achieve real long-term sustainable, resilient, structural change cannot be a building-led approach. Such an approach would inevitably be deflected, unnecessarily expensive, badly targeted and inefficient. An approach which is founded on nature-based solutions must take a holistic, synergetic view of urban life and contemporary problems of climate change, species diversity, pollution, changing working methods, and emerging technologies. This is the key to a sustainable future.

***Report “Urban adaptation in Europe: how cities and towns respond to climate change”,
European Environment Agency, 2020, No. 12***

The report presents the status quo of adaptation to climate change at the local government level, with particular focus on cities. It gives an overview of climate risks to cities, types of adaptation responses, extent of adaptation planning and actions at the local level in Europe and opportunities to scale up and speed up implementation of adaptation to climate change at the local level. This in-depth scientific

www.researchgate.net/publication/313870834_An_impact_evaluation_framework_to_support_planning_and_evaluation_of_nature-based_solutions_projects

study on climate-related impacts, effectiveness and cost-efficiency of certain adaptation measures, provides also comments on problems of local planning and governance.

It conveys a number of key messages and confirms the belief...

...that green infrastructure measures emerge as effective in addressing high-temperatures and flooding in cities, adding that, nature-based solutions may simultaneously address multiple hazards and provide co-benefits to the environment and society. Thus, their adoption should be encouraged.

At the same time, the report describes grey infrastructure measures (meaning, construction measures such as buildings, technical and transport infrastructure, dykes and other technical protection using engineering)¹⁰ which,

...while in many cases are highly effective, may not offer sufficient protection from the magnitude of future climate hazards. They should be complemented by green infrastructure and soft-adaptation measures for optimal effectiveness and cost-efficiency.¹¹

Another key message is to avoid “maladaptation”. Maladaptation describes measures that have long-term detrimental effects in themselves on other aspects of the environment. Such measures include modifying buildings to add air-conditioning, or constructing structures such as dams, and desalination plants. Maladaptation can also include planting trees and shrubs which are not adapted to the local environment and which do not contribute, but rather work against, species diversity. It should be noted that a detailed understanding of plant communities and ecosystems is an important aspect of long-term green infrastructure planning. It also needs to be recognised that green infrastructure which depends on artificial irrigation for survival, or constant maintenance such as grass cutting, is neither sustainable nor cost-effective in the long-term.

Apart from overheating, the Report cites states that “In the changing climate, the most pronounced impacts in European cities are likely to be caused by extreme weather events, such as heatwaves, heavy precipitation, flooding and droughts, but other risks including wildfires and vector-borne diseases are also on the rise”. As most European cities are located on the coast, or on rivers and waterways, it is not difficult to imagine that the costs of rectifying potential damage could be huge. Run-off can be reduced by planting trees and forests (both in urban and rural areas), permeable drainage systems, managed river systems and catchment areas, reduced development in flood plains will all contribute to reducing the risk. Nature-based solutions are low cost and effective. Grey infrastructure is expensive and too often only pushes the problem downstream, even contributing to coastal flooding when high river levels and tidal surges interact. Strategic planning for new development should take such risks into consideration.

10. Definition – European Environment Agency, 2012.

11. Urban adaptation in Europe: how cities and towns respond to climate change, European Environment Agency, 2020.

2. Landscape solutions

2.1 Role of Nature in Cities – Nature-Based Solutions (NBS)

Although nature is at the core of human existence, connections to nature often take a backseat to other interests that compete for social good and economic gain, without benefiting the community or the environment. As each successive generation becomes more urban, direct connections to nature and its benefits for mankind are reduced. In too many cities in Europe, nature is still an afterthought. Even where cities are graced with a greater representation of nature, such green spaces often feel like local, isolated pockets. A broader understanding is needed of the multiple benefits of nature when it is fully integrated into the urban fabric of towns and cities. The potential is that the health and well-being of communities and cities will benefit. Landscape Architects are engaged in the process of understanding the natural world and offer holistic and innovative visions.

As an example, in the context of nature-based solutions (NBS), a five-year European Union-funded research and innovation project, managed by Urban GreenUP, aims to develop, apply and validate a methodology for renaturing cities to mitigate the effects of climate change, improve air quality and water management and increase sustainability. The project involves a number of cities including Liverpool (UK), Valladolid (Spain) and Izmir (Turkey). Amongst other goals, the project aims for these front runner cities to retrofit, trial and monitor a range of different nature-based solutions as a way to mitigate the predicted future impacts from climate change. Multiple environmental, social and economic benefits are being monitored.

In Liverpool, a range of projects are being undertaken, including green walls, pollinator roofs, pollinator planting, tree planting, floating ecosystems and rain gardens. Similar work is also being carried out in partner cities and five global *follower* cities.¹² It is intended that these will seek to replicate the most successful projects. Below is a table showing the wide range of solutions that might be employed in other towns and cities.¹³

Arboreal Areas around urban areas	Channel re-naturalization	Compacted Pollinator's modules	Hard drainage-flood prevention	Hydroponic green façade	Natural pollinator's modules
Cool pavement	Cooling trees (species to maximize cooling effect)	Cycle-pedestrian green paths	Natural wastewater treatment	Parklets	Planting and renewal urban trees
Electro wetland	Floating gardens	Floodable park	Pollinator verges and spaces	Pollinators roof	Pollinators walls/vertical
Grassed swales and Water Retention Pounds	Green covering shelters	Green Façade with climbing plants	Rain gardens	Shade trees (species to spread canopies)	SUDs
Green fences	Green Filter area	Green Filter area	Trees Re-naturing parking	Urban Carbon Sink	Urban Catchment forestry
Green noise barriers	Green pavements – Green Parking Pavements	Green resting areas	Urban orchards	Vertical mobile garden	
Green roof	Green Shady Structures	Hard drainage pavements			

Table 1. Urban GreenUP – Range of possible NBS solutions. © Urban GreenUP

12. Chengdu, China; Ludwigsburg, Germany; Mantova, Italy; Medellin, Spain and Quy Nhon, Vietnam.

13. www.urbangreenup.eu/solutions.

In Liverpool, the pollinator planting project is especially interesting as it demonstrates a level of detailed analysis and thinking that is required to ensure that new planting schemes are tailored to particular purposes, rather than simply dealing with aesthetics. This is fundamental because the wrong selection and ill-considered combination of plant materials can be expensive, counter-productive, damaging and non-sustainable. Having clear, sustainable objectives, especially where species diversity is concerned, is an essential element of the design and planning process of projects and makes the long-term objective of efficient and economic management all the more possible.

Landscape Architects are involved in the research, science and evaluation of innovative solutions that will help to inform decision-making elsewhere. Although this project in Liverpool is small in scale, it is extremely important in helping to scientifically identify a wide range of indigenous flora and fauna and suitable soil conditions, in order to enable successful and sustainable replication.

Within the context of Europe, these experiments are being undertaken in very different areas geographically and climatically. In Izmir, for example, 50 tons of CO₂ are being absorbed each year and average summer temperatures have been reduced by 3-5°C by planting 5,000 trees, along with the creation of a 10 km-long cycle and pedestrian route. The work in Valladolid is more concerned with green infrastructure to increase biodiversity, improve air quality and citizen well-being.¹⁴

Nature-based solutions to create societal challenges inspired and supported by nature are cost-effective, and simultaneously provide environmental, social and economic benefits and help build resilience.

Such solutions bring more and more diverse nature and natural features and processes into cities Nature based solutions must benefit biodiversity and support the delivery of a range of ecosystem services.¹⁵

2.2 Blue/Green Corridors, interconnectivity for people and nature

In the publication “Nature-based solutions for climate mitigation and analysis”, commissioned by the European Union Directorate-General for Research and Innovation (Unit 3 – Climate and Planetary Boundaries), it is noted that there is a growing body of knowledge confirming that blue/green urban infrastructure can have marked effects not simply on green spaces but also on the areas that surround them. This is sometimes referred to as the “Park Cool Island” or “Green Space Cool Island Effect”.¹⁶ Greater effects in temperature reduction can be achieved in relation to the size of the space, and trees are more effective than built structures in achieving this reduction.

Such measures have been put into practice in various projects: thanks to Interreg Funding, a Blue Green City project is being implemented with the participation of Ireland via its Southern Regional Assembly; Romania via the Bucharest-Ilfov Regional Development Agency; and the Piedmont Region in Italy, in order to improve policies that promote Green Blue Infrastructure (GBI) as an integral part of a local or regional natural heritage preservation strategy. The use of a wide range of policy instruments identifying the potential barriers for adopting GBI is only one in a broad array of actions being put forward by many European cities, from the northern countries to southern and Mediterranean regions.

14. www.urbangreenup.eu/challenges/green-space-management.kl.

15. Nature-based solutions for climate mitigation, analysis of EU-funded projects, European Commission.

16. Aram, F., Higuera García, E., Solgi, E., Mansournia, S. (2019) Urban green space cooling effect in cities. Heliyon 5.



Photo 1. Malmö, Sweden. © Oopla.eu

In Malmö, Sweden, changes since the early 21st century have been transforming the once-industrial city into an eco-centre with measures which are now being presented as case studies the world over. With its harbour transformed into an eco-residential development, a joint private and public partnership with community engagement has undertaken a whole array of measures such as wind turbines, solar panels, green roofs, waste management and energy efficiency. All residential buildings include both extensive and semi-intensive roof surfaces, divided into sections of lush dry-meadow vegetation (about 70%) next to sections of lower vegetation, mainly sedum (about 30% of the roof). A growing medium depth of between 80 mm and 300 mm in different sections allows for water harvesting, which then runs off to open paving channels and canals, and from there to an extensive wetland with native wet meadow plants. This stormwater strategy reduced the development's pressure on the city's water treatment system while creating a natural environment in the area.

In Finland, the Ministry of the Environment has integrated National Urban Parks into spatial planning policies. These National Urban Parks function as ecological corridors linking city centres to surrounding areas, enabling the citizens to walk from one part of the city to another, via the parks. So far, nine Finnish cities¹⁷ have implemented National Urban Parks which contain natural areas with valuable biodiversity and cultural elements relevant to the history of the city, including parks and green areas of architectural or aesthetic significance.



*Photos 2 and 3. Hameenlinna and Porvoo National Urban Parks, Finland.
© Finnish Ministry of the Environment*

17. Hämeenlinna, Pori, Heinola, Hanko, Porvoo, Turku, Kotka, Forssa and Kuopio.

At the confluence of the Rhone and the Soane, the development of Lyon, France, with its picturesque setting beside the river, was made possible by the construction of dams and a flood mechanism that allowed the embankments to be urbanised. These also prevented citizen enjoyment of these water resources which would enhance urban liveability. Over the last 20 years, Lyon Metropole has implemented an integrated water resource management system so that the city's attention "returns" to the river and develops around its water resources. In 2001, the riverbanks were restored with grass, planting and trees, creating new habitats which have become part of a wetland network with the richest biodiversity in the region. These areas also support sustainable land use activities including natural flood areas upstream, to better protect the city from flooding. The vision is to sustain the natural water cycle in urban areas and beyond, integrating water in urban planning as a key to the preservation of the environment and a sustainable future.



*Two faces of Lyon: the historic centre of the city, and the parc, Miribel Jonage, upstream of the Rhone river.
Photo 4 © Creative Commons Attribution 4.0 International. Photo 5 © www.lyonplus.com.*

Similar urban strategies can be found elsewhere. For example, in Lisbon, Portugal, a metropolitan master plan focusing on ecological importance began in 2010. As part of the National Master plan, which includes both ecological and agricultural national reserves, the city's plan for the preservation of green areas defined a strategy for biodiversity for 2010–2020, aiming to increase urban biodiversity by 20%. The main focus relies on the conservation of natural areas, an increase in the total length of naturalised water courses, and an increase in parks and gardens and their connectivity. Already, some nine urban ecological corridors have been put in place to combat habitat fragmentation and climate change, providing soil permeability and attenuating the heat island effect. In order to monitor the success of the measures, Lisbon took part in the MAES (Mapping and Assessment of Ecosystem Services) urban pilot and acted as a city laboratory in the European Union Joint Research Centre's EnRoute project. The city was selected as the European Green Capital for the year 2020.

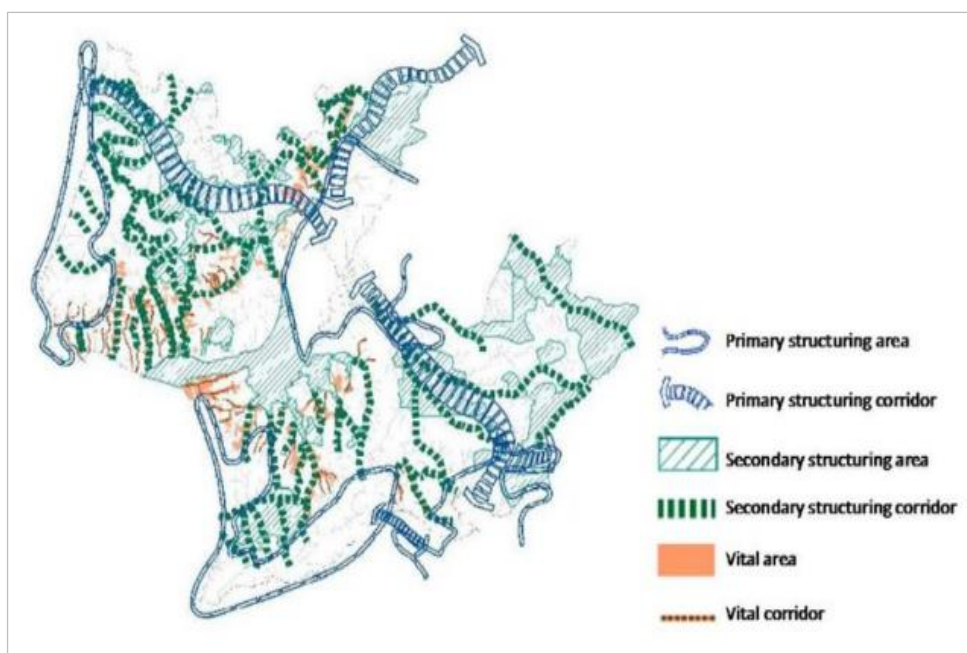


Figure 2. Lisbon's urban ecological network. © Losarcos and Romero (2010), Portugal

A good example of this concept is the Alna Environmental Park in Norway: a blue-green corridor of biodiversity, recreational opportunities and sustainable urban water management project which was undertaken by the Municipality of Oslo and the Agency for Urban Environment (Norway). This project won a special mention of the Landscape Award of the Council of Europe, for the 5th Session of the Award 2016-2017.¹⁸

As part of the Grow Green project, the city of Valencia, Spain, is planning to create a green corridor through the city by interconnecting a series of green spaces and gardens to existing green areas, in order to provide a pedestrian route for citizens. In addition, green pergolas – structures built to create shade with planting, whilst removing pollutants – will help to remove heat stress. The intention is not only to create a more comfortable environment but to use natural ventilation and wind patterns to cool the overall environment and reduce the energy demand for artificial cooling.¹⁹

Such projects, if also linked to a selection of indigenous trees and shrubs, will become important wildlife vectors, especially for birds and insects. Interlinking projects in the future provides the potential for a complex integrated network which would benefit both humans and nature.

2.3 Water management and flood prevention

Flood Prevention Landscape Project – Room at the Waal, Nijmegen, Netherlands

After serious flooding in 1995, this national project was developed to give back more space to the river Waal, in order to significantly reduce future risk. The project has become the flagship for the “Room for the river” programme. The construction of a flood relief channel to lower the water level in the main

18 <https://www.coe.int/en/web/landscape/norway>

19. Nature-Based Solutions for Climate Mitigation, Analysis of EU-funded projects, European Commission.

channel and avoid flooding has been combined with the development of an unusual central area between Nijmegen and the village of Lent on the opposite river bank.

Over the past ten years, major flood safety works have been carried out along Dutch rivers in anticipation of higher river discharges due to climate change. At Nijmegen, engineering works have been transformed into a plan that substantially improves the quality of city life. 120 ha. of a River Park has been created, consisting of a side channel, riverbanks, bridges, embankments and beaches around the newly conceived island of Veur Lent, part of which was the old river dike. This project is the most complex and comprehensive of more than 30 similar river projects in the Netherlands. Such projects demonstrate that only a multidisciplinary approach, in this case with Landscape Architects taking the lead, can combine such an enormous river safety operation with a new urban development.



Photo 6. Aerial view of Veur Lent.

© Johan Roerink / RWS, Combinatie i-Lent, Netherlands

The river Waal has been released from its straight jacket and the new island enriches the city with a park. Access to the river has also been improved. Conditions for sedimentation and erosion processes are carefully included in the design, gradually evolving to create various ecotypes and biodiversity characteristic of river landscapes. The project was developed and implemented as a Climate Change Adaptation (CCA) measure.



Figure 3. Schematic Veur Lent.

design guidelines within local developer requirements, and the testing of the Copenhagen Cloudburst Formula applicability throughout Europe, the Americas and Asia.

2.4 Public open spaces

*Rethink Athens*²⁰

This project is being undertaken by OKRA Landscape Architects (Netherlands) for the Onassis Foundation. It covers an area of 56 ha. in the centre of Athens and has been on-going since 2013. The object is to re-think Athens, focusing on re-inventing the city centre, and halting the downward spiral and continual decline that has occurred since the 1980s. Unchecked urban growth has led to a shortage of green space and traffic congestion. The air quality is terrible, and in summer the streets are unbearably hot and dusty. Regeneration of the public realm by creating a healthy and safe environment is needed to improve the daily life of Athenians. OKRA has taken contemporary ideas on climate control, reduction of vehicular movement and programming of the public realm into an integrated design proposal.

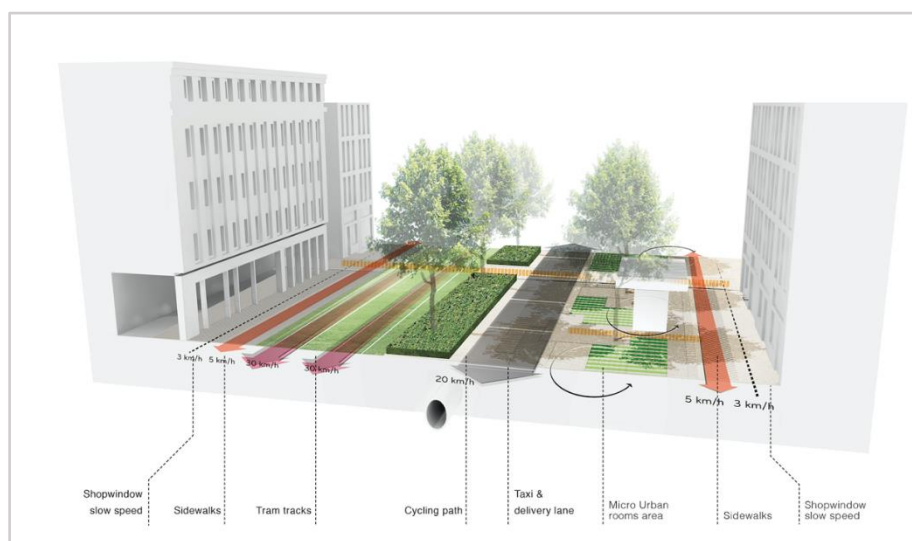


Figure 5. Final Design – Sustainable Street. © OKRA, Netherlands

Key to the regeneration of the city centre of Athens is to make it resilient and vibrant by creating a walkable city and a green framework that includes specific measures to reduce the urban heat island effects: natural cooling by greening, adapted pavements, earth cooling and maximising water storage.

Planting of over 800 trees will reduce air pollution and generate a positive impact on biodiversity. Turning the city triangle into a green framework and connecting this framework to the hills around the city will mean that mitigation of urban heat island effects will impact the metropolitan centre. The design plan is still under preparation.

20. OKRA Landscape Architects is an international award-winning firm based in Utrecht, Netherlands.



Figure 6. Schematic looking west to the Hellenic Parliament Building. © OKRA, Netherlands

2.5 Urban housing

Bon Pasteur, Strasbourg, France

The Landscape Architect for this project, Jérôme Espargiliere, who was based in Strasbourg for a time, started planning this project in 1992. The landscape concept was concerned with providing high biodiversity in a dense new housing development. Rainwater is recycled within the development and passes through planting areas before replenishing the lake. Much of the planting is native perennials, shrubs and trees and thus provides the background flora for native fauna and a balanced eco-system. Within the scheme there are 400 apartments (140 apartments per hectare), creating a housing density of 400 persons/ha.



Photo 7. Bon Pasteur, Strasbourg. © GOOGLE Streetview

The landscape budget for the project (hard and soft landscape) was 2.8 M€ and the whole development cost around 80 M€, giving landscape about 3.5% of the total budget. The client was a public/private consortium, the Local Public Company for Urban Development and Infrastructure of the Region of Strasbourg (*Société d'aménagement et d'équipement de la Région de Strasbourg*) and includes private and social housing.



Photo 8. Bon Pasteur, Strasbourg. © Google Streetview

Although the project forms a landscape extension to the nearby Orangerie Park, with pedestrian links passing between the two, a large, planted mound separates the parts visually, thus protecting and preserving the important cultural and heritage aspects of the Park.



Photo 9. Aerial View – Bon Pasteur, Strasbourg. © Jérôme Espargiliere, France

2.6 Water in cities

For centuries, it has been well understood that running water and fountains can substantially reduce local ambient temperatures. The Mogul Gardens of India employed this technique extensively and one of the prime examples in Europe is the Alhambra Palace in Granada, Spain, constructed in the 13th century. The use of water as a respite in cities in Mediterranean Europe is commonplace and part of European heritage and culture. With climate change, northern parts of Europe are increasingly experiencing warmer temperatures and there is a need to learn lessons from the south, incorporating more water features in northern cities in future projects.



Photo 10. Alhambra Palace, Granada, Spain. © Citeria, Spain

In the early nineteenth century, London chemist and cloud expert Luke Howard was the first to notice that the climate in cities is different from the area outside the city. He wrote that it is warmer in densely-populated areas of London than in rural areas outside the city, especially at night and in winter. Since then, a lot of international research has been done into the urban climate, including exploring whether urbanisation contributes to global warming. Urban buildings influence variables such as temperature, wind and precipitation. Cities are usually warmer than the surrounding countryside. They form a kind of heat island in the landscape. The difference in temperature can amount to 4°C for a city with 10,000 inhabitants and 7°C for a city with 200,000 inhabitants. Such large differences only occur during clear and windless nights.

On the other hand, it is cooler in the suburbs than the city centre. The difference in temperature between the heart of the city and the periphery mainly depends on the size of the city, the time of day and the weather conditions. The shape and structure of the city also matter. Large North American cities with tall, densely-packed skyscrapers retain more heat than European cities with the same population. Man-made heat sources such as traffic, heating and air pollution contribute to the heat, especially in winter.

With climate change, more extreme climatological circumstances arise with at least hotter summers and winters, and sometimes colder winters. Heat stress will become more and more a problem for the quality of life, especially in cities, due to this heat island effect. With this change and the prospect of increasingly warmer conditions further north, greater consideration now needs to be given to the introduction of fountains and water in cities which have previously had few. There are also other means to work with water in landscape projects. The renovation of the Halle Pajol, Paris, France, proposes an interesting way to manage rainwater. The principal allée is flanked with perennial flowerbeds and groundcover, as well as longitudinal ponds. The planted areas are watered by rain collected on the rooftop and stored in pools that become aquatic gardens. Groundcover plants, ferns, bushes, grasses, climbing plants and shrubs form a milieu and an atmosphere of forest undergrowth within the shade of the vast industrial structure.

Another example of intelligent management of water is to be found in Winnenden-Arkadien, Germany, as part of an important industrial regeneration project. A diversity of high-performance components makes this one of the world's most sustainable neighbourhoods and provides a fresh new vision for people-friendly and resource-productive suburbs. Water-sensitive urban design provides a distinctive urban character. The construction density is softened by the presence of nature in the form of generous

planting, a stunning lake at the heart of the development and a restored water course, with a recreational path and play areas integrated with newly-created water meadows.

2.7 Tree planting

The value of simply planting trees should not be underestimated. Vegetation, especially trees, absorbs CO₂ and produces oxygen in exchange. As such, carbon is temporarily or permanently withdrawn from the carbon cycle. The thermodynamics of a single tree indicate that, in addition to carbon sequestration, it can also provide a whole range of other climatic “services”. The solar energy use of an adult tree through photosynthesis is a particularly efficient process. For example, to produce approximately 1,000 litres of water evaporation, roughly 100,000 calories are withdrawn from the environment. About 5% of the radiated energy is converted into biomass and absorbs the carbon for longer. In addition, the crown of a mature tree operates as a free-standing anti-flood reservoir. In one year, such a tree can capture and evaporate 1,500 gallons of rainwater, preventing this falling on the ground and running off. Thus, mass tree planting can significantly modify a local climate.

Urban forests are one solution, but they are not a new phenomenon, nor uncommon in European cities – indeed they form part of European culture – and recognition of this has resulted in an increase in the establishment of urban forests. The ArborDay Foundation’s Tree Cities of the World programme,²¹ designed to help create more resilient and sustainable cities, includes projects in Yerevan (Armenia), Paris (France), Mantua, Milano and Turin (Italy), Dordrecht (Netherlands), Moscow (Russia), Ljubljana (Slovenia), Arroyomolinos and Madrid (Spain), Malmö (Sweden) and six cities in the United Kingdom, Camden, Ealing, Bradford, Birmingham, Welwyn-Hatfield and Barking and Dagenham.

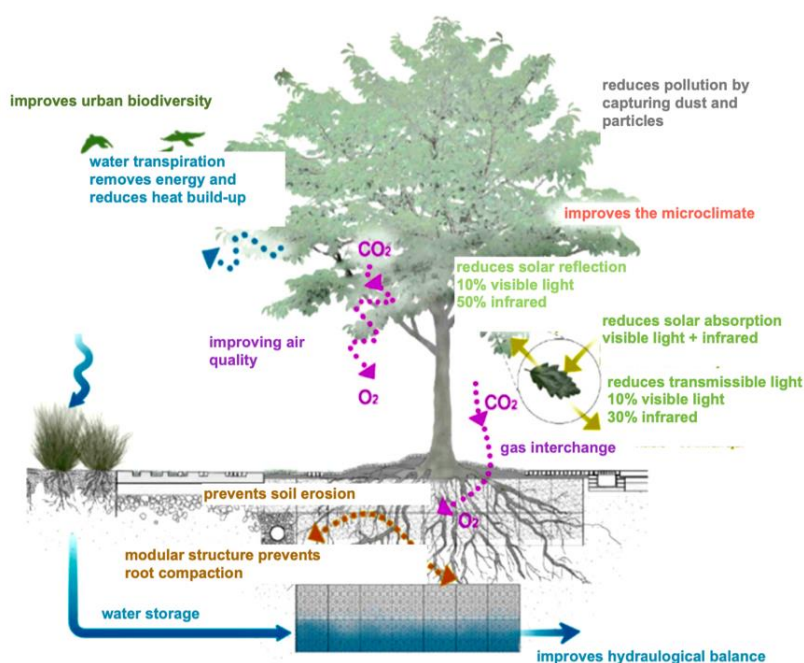


Figure 7. Thermodynamics of a tree. © IFLAEU working group. Citeria, Spain

21. <https://treecitiesoftheworld.org>

In addition, many cities have joined the effort to promote urban trees. As part of a European project to develop innovative ways to protect urban trees, the city of Porto, Portugal, is using wild mushrooms (*ectomycorrhizal*) to help care for and sustain the urban forest. In Manchester, United Kingdom, the country's third largest city by population, it is planned to plant a tree for every one of its inhabitants. The City of Trees project intends to plant 3 million new trees across Greater Manchester with a group of eco-volunteers who will be attempting to regenerate overlooked and underused areas of the city.

In Berlin, Germany, a City Tree Campaign was launched in 2012 which planted 10,000 roadside trees to add to the existing 440,000 trees. Partly funded by donations, the duties and responsibilities for this project have been shared via the project agreement made between the Senate Department for Urban Development and the Environment and the Districts of Berlin. In 2020, Turkey launched the "Breath for the Future" campaign, to boost the forests in the country, thus fighting desertification: the campaign set a new world record for planting the most saplings in an hour. Overall, more than 13 million saplings were planted in the campaign conducted simultaneously across the country.

Beside these mainly institutional projects, diverse voluntary associations exist in Europe with the principal objective of planting forests. In Belgium, Urban Forests²² projects have facilitated nearly 3,000 volunteers planting more than 37,000 trees, using mostly small plots of land, aimed at being sustainable. Tree Nation,²³ a platform that unites and links reforestation activities worldwide, and which allows for citizens, companies and horticultural companies alike to interchange services, has planted more than 7.5 million trees around the world, from Burkina Faso to sites in Portugal, Spain, Germany and Italy.

3. Learning from landscape

Ensuring that children, students, the public and landscape professionals properly understand the implications of climate change and the importance of nature to the quality of life is an essential element in changing attitudes through education.

The Europe Landscape Convention of the Council of Europe provides that its parties undertake to promote training for specialists in: landscape appraisal and operations; multidisciplinary training programmes in landscape policy, protection, management and planning, for professionals in the private and public sectors and for associations concerned; and school and university courses which, in the relevant subject areas, address the values attaching to landscapes and the issues raised by their protection, management and planning (Article 6).

Various work has been carried out by the Council of Europe to promote the implementation of these provisions. The proceedings of the 21st Council of Europe Meeting of the Workshop on "Landscape and Education" reports on some international experiences in promoting landscape education at primary,

22. [Tree-nation.com/projects](https://tree-nation.com/projects).

23. *Ibid.*

secondary and university levels.²⁴ A booklet on landscape education for primary schools has also been produced.²⁵

With regard to primary education, a competition encouraging students to design a better school environment was initiated by the United Kingdom’s Landscape Institute. The competition encouraged teachers and students to explore and better understand the school’s outdoor space. They were assisted by a volunteer Landscape Architect to re-design an aspect of the playground. Whilst the design that won the competition had the prize of funding to help implement the design, the initiative also resulted in the production of a useful guidance pack.²⁶ This simple project brought the attention of students to their surroundings at a young age, but other institutions have opened the scope of their vision towards larger settings.

Interesting examples are developed to raise youngsters’ awareness to better understand the action of humans on natural surroundings.²⁷

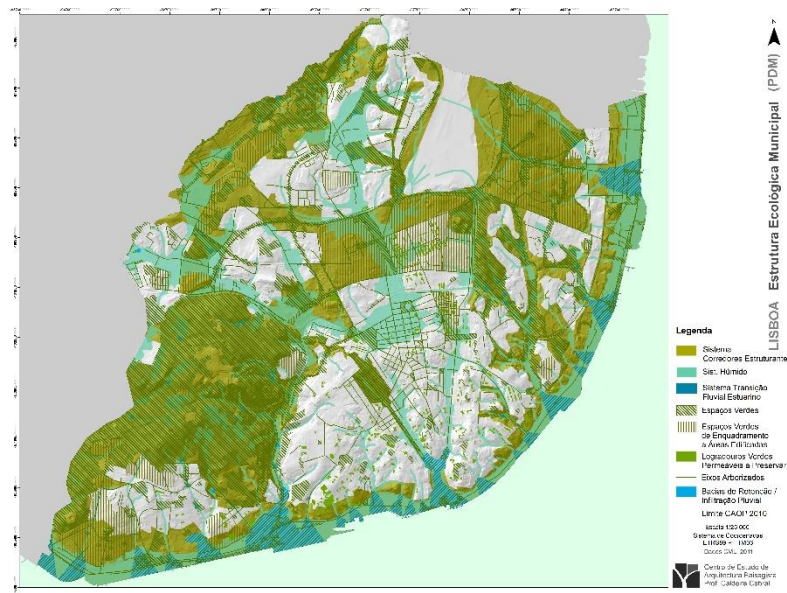


Photo 11. Lisbon Ecological Structure, Landscape Architecture Study Centre. © Prof. Caldeira Cabral

24. 21st Council of Europe Meeting of the Workshops for the implementation of the European Landscape Convention, “Landscape and Education”, Tropea, Italy, 3-5 October 2018. www.coe.int/en/web/landscape/21st. See also: Publication: Landscape education activities for primary schools, Pedagogical booklet, Council of Europe Publishing, European Spatial Planning and Landscape Series, 2021, No. 121.

25 Publication: Landscape education activities for primary schools, Pedagogical booklet, Council of Europe Publishing, European Spatial Planning and Landscape Series, 2021, No. 121. <https://rm.coe.int/council-of-europe-landscape-convention-educational-booklet-english/1680a02646>

26. <https://landscapewpstorage01.blob.core.windows.net/www-landscapeinstitute-org/2016/09/The-Playground-Project-guidance-pack.pdf>.

27. Publication “Landscape Award Alliance of the Council of Europe” (volume 1, 2008-2017), Council of Europe, Territory and Landscape Series, 2017, No. 105, Education and awareness-raising: city, territory, landscape: Generalitat of Catalonia and Landscape Observatory of Catalonia, Spain (www.catpaisatge.net/esp/materials_ctp.php); “We are making our landscape”, Slovenian Association of Landscape Architects, Slovenia; Education of children in heavily industrialised landscapes, Elementary School in the city of Most, Czech Republic. <https://rm.coe.int/european-landscape-convention-the-landscape-award-alliance-of-the-coun/168075f020>.

It is important to note that Landscape Architecture as a professional discipline has also evolved over the last fifty years. Landscape Architects are involved in: local, regional and national planning; landscape management of wetland areas to national parks, understanding the science and subtleties of biodiversity; and, most importantly, offering holistic expertise on the environmental impact in its many forms. Work in urban and peri-urban areas has been central to this work, revitalising rivers in urban areas, creating urban forests, designing traffic-free public squares, as well as converting the space between buildings from green deserts to other possible uses, including urban farms. “Much of the history of landscape architecture can be traced back to the need to create places that were beneficial for people’s health and well-being”.²⁸

With regard to higher education, in 1989 IFLA Europe established a School Recognition Panel which assesses and gives advice on landscape architecture university programmes. Changes and trends in teaching contents and methodology throughout European Schools have been implemented over the intervening thirty years to encourage climate-responsive design as an obliged discipline, in order to prepare students for present and future climate challenges.



Photo 12. View of a Blois student workshop, as portrayed in France Culture.
© Institute National des Sciences Appliquées Centre Val de Loire, France

One such school is the Higher National School of Nature and Landscape (*Ecole nationale supérieure de la nature et du paysage*) at Blois, France. Ecological transition is now a government strategy, and landscape teaching has been refocused on the perspective of environmental sciences and ecology, without leaving aside either social perspectives or heritage concepts. The need to drastically control development, as well as reducing material and energy resources, relies on the specific training of the students to be better able to master the increasing pressures on our environment.²⁹

4. Opportunities and issues

Potential

28. Public Health and Landscape, Creating healthy places, Landscape Institute Position Statement, November 2013.

29. www.letudiant.fr/educpros/veille/blois-les-batisseurs-de-paysage-au-programme-de-grantanfi-sur-france-culture.html.

There is not simply a need, but a huge, unrealised potential to improve towns and cities as places to live. In most modern cities there are today many low-quality landscapes, semi-derelict and derelict areas, including sites which have been abandoned before or after development, contaminated land and huge expanses of rank grasslands often running along roads, to separate pedestrian pavements from vehicular routes. These are opportunities without the need to even consider how cities can be structurally changed to reintroduce nature. Even a modest investment to improve outdoor spaces will glean huge results.

Finance, or rather lack of finance

Massive under-investment in landscape has been the norm for a long time. As part of a building project in many countries, the landscaping is rarely more than 1% or 2% of total developmental costs. In one of the projects shown above, Bon Pasteur, Strasbourg, the landscape budget was 3.5% of the overall cost of a very high density development project. The results speak for themselves in producing attractive, healthy living conditions where attention to detail and use of nature assists biodiversity, as well as dealing with the problems of rainwater and run-off. The development is sustainable and resilient and, in relative terms, cheap to maintain. Had this development followed the course of many, with only enough money to finance grass areas, the result would have been another urban green desert with high maintenance costs and of relatively little value to the resident population. Mowing large, useless, largely unused expanses of grass is equivalent to leaving the hot tap running: it is non-sustainable, uneconomic, species-poor and directly contributes to, rather than combatting, global warming, due to the energy input required for mowing.

Providing sufficient finance to fund good quality landscape works does save money in the long-term, and it also improves the health and quality of life for residents and combats climate change. This is fundamental if urban and peri-urban areas are going to improve, and if the countryside can be brought into towns and cities.

Human rights, the environment and landscape equity

The High-Level Conference on Environmental Protection and Human Rights held in Strasbourg on 27 February 2020 emphasised the importance of Human Rights and the Environment. The Final Declaration by the Georgian Presidency of the Committee of Ministers states that “the Council of Europe has a key role to play in mainstreaming the environmental dimension into human rights and pursue a rights-based approach to environmental protection”.³⁰

The Conference also stated, in relation to biodiversity, climate change, extinction of species, pollution of and the overall degradation of the earth’s ecosystems that ecosystems have a profound global impact on the enjoyment of human rights and require the widest possible co-operation by all the Council of Europe Member States. Landscape is, in its very essence, a physical and ecological reality, as well as a cultural and symbolic reality: it supposes the materialisation of time in a specific space where the ideals and aspirations of humans are reflected. In this sense, the appropriation of a place by humans entails – beyond the survival of the species itself – the search for a goal of cultural identity through which the place acquires its meaning, thanks to human action. Moreover, this relationship of human-nature

30 www.coe.int/en/web/human-rights-rule-of-law/final-declaration-by-the-presidency-of-the-committee-of-ministers; www.coe.int/fr/web/human-rights-rule-of-law/final-declaration-by-the-presidency-of-the-committee-of-ministers

interdependence has formed the basis of a millenary contract between the two, establishing the guarantee of security and prosperity that today is known as the welfare state. It implies an ethical responsibility on the part of humanity towards the world: it is a moral and political model present in all cultures, throughout all times.

A series of reports – including “World Conservation Strategy” (IUCN, 1980); “Our Common Future” (WCED, 1987); “Caring for the Earth” (IUCN, 1991) – culminated in the 1992 Rio de Janeiro Conference “Summit for the Earth,” organised by the United Nations. From this global perspective, it is possible to see the planetary dynamics that are taking place and to understand the fracture that exists worldwide, between what we could call a human, or artificial, economy and a natural economy.

The Council of Europe’s role in mainstreaming the environmental dimension into human rights is timelier than ever.³¹ In this sense, Landscape Architecture feels very close to these concepts. Landscape Architecture professionals include in their Code of Professional Ethics to “understand and endeavour to practice the ethical standards of the Code of Environmental Ethics”, something quite unique among similar professions.

The United Nations – UNESCO

UNESCO’s recommendation in their 2019 Report “Recommendations on Historic Urban Landscape” regards cities as a continuous palimpsest, defining urban landscapes as “the result of a historic layering of cultural and natural values and attributes, extending beyond the notion of ‘historic centre’ or ‘ensemble’ to include the broader urban context and its geographical setting.”³² The report considers the relationship between historic urban areas and the natural environment, including climate change. It encourages “strengthening the relationship by implementing ecologically-sensitive policies and practices aimed at strengthening sustainability and quality of life”. Further, it encourages new models and approaches, based on policies and practices aimed at mitigating the impacts of climate change on historic areas. The recognition of this importance is a good step forward. Furthermore, there is now an emergence of environmental ethics (UNESCO editorial: “Making peace with the earth”,³³ and Environmental ethics and international politics³⁴).

Future considerations

Further work needs to be done to help secure the conservation, development and management of urban landscapes to ensure climate resilience, perhaps as an extension of the European Green Deal or the new European Bauhaus Declaration. Some of the following measures exist in some States, but they could be applied universally:

- recognising landscapes in law, for instance in laws on climate policy: policies that can have a great impact on landscapes and cities;
- establishing and implementing landscape policies aimed at landscape protection, management and planning (in relation to combatting climate change to keep cities habitable);

31. The High-Level Conference on Environmental Protection and Human Rights, Strasbourg, 27 February 2020.

32. The UNESCO Recommendation on the Historic Urban Landscape Report of the Second Consultation on its Implementation by Member States, UNESCO World Heritage Centre, 2019.

33. Bindé J. (ed.), Making peace with the earth, Icaria Editorial y Ediciones UNESCO, Barcelona 2007.

34. Have, Henk A. M. J. Ten, Environmental Ethics and International Policy, UNESCO, Paris 2006.

- establishing procedures for the general public, local and regional authorities, and other parties (including the private sector and NGOs) to participate in defining and implementing landscape and urban policies, as climate also has to play a role in this;
- integrating landscape, especially the urban landscape, into regional and town planning policies and also into climate policy and, related to that, cultural, environmental, agricultural, social and economic policies which may have a direct or indirect impact on landscape.

Much of the action lies within the remit of regional or local authorities as prime guardians of the planning system, landscape and urban quality, but there needs to be greater public participation and involvement in the decision-making process. In order to support this process, identifying landscapes, qualitatively assessing them, defining objectives, understanding management commitments and monitoring them will be key to creating sustainable landscapes that will be resilient under climate change, through energy transition, thus improving the quality of life for people.

Conclusion

The relationship between landscape and people

All the evidence shows that the relationship between landscape and people is fundamentally important to the quality of life. This report has noted that an improved quality of life is also closely related to better health and welfare and, as such, leads to higher productivity, lower social security and health care costs, and improved economics. Healthier people are generally more content, work harder, are more sociable and less liable to criminality. Studies also show that property values are higher in areas where landscape is prominent and they improve markedly in areas which are subject to regeneration programmes where landscape investment figures significantly.

It is also now well understood that sustainable resilient solutions, selecting the right materials, the right construction techniques, the right plants and the right plant associations, with appropriate maintenance, lead to cheaper management costs, better water management, improved air quality and climate amelioration. It is also now better appreciated that there is inestimable added value in bringing the countryside into the city in terms of species diversity, not to underestimate the reduced need, and therefore the reduced cost and lower carbon footprint, of not escaping from the city simply to find nature, to be close to water, and to have a visual amenity that is not bricks and mortar, concrete, steel and glass.

That cities will evolve is evident and inevitable. What is not clear is how rapidly they will change, but the indications are that change will occur much more rapidly than anyone imagines. The first twenty years of this millennium have indicated unimaginable change in a whole variety of areas. Inevitably, there will be a tendency, especially by politicians, to be expedient in finding solutions, if only to demonstrate progress of sorts. It also seems that, while climate mitigation is starting to be seriously addressed as a self-contained issue, especially in reducing CO₂ emissions and reducing energy needs, linking this objective directly with improving the quality of life in cities is not being taken seriously. It is clear, however, that “nature-based solutions not only provide climate change adaptation potential,

but they also offer multiple benefits, in particular health and social benefits which relate to urban green space distribution in cities”.³⁵

It is important to note that the design, planning, management and science of landscape architecture has to be a sustained, long-term commitment. Simply choosing to plant a tree now will not reap its maximum benefits for decades, and choosing the wrong tree for the wrong reasons will simply be counter-productive and delay the real benefits. Whereas a finished building stands in its pristine glory and begins to degrade from that moment on, when a landscape project is complete, it is more of a nativity, with a future filled with promise as it develops. Nevertheless, it still requires a parental commitment, nurture and expert knowledge to achieve maturity and realise its full potential.

History shows us that expedient solutions are likely to be short-lived in effect – temporary, relatively ineffective, and therefore expensive. Planning for structural change rather than temporary cosmetics, with strong multi-disciplinary teams that really understand the challenges and concentrate on nature-based solutions, will lead to sustainable, resilient urban and peri-urban areas. Involving the public in the process will also help to ensure that redevelopment and regeneration are adapted to people’s real needs, rather than simply following political motivations. The way is clear for post-Covid cities to become cleaner, healthier places, where the quality of life for the inhabitants will be a net improvement and where the problems of climate change are intelligently addressed.

In broad terms, however, it needs to be both recognised and accepted that, over the years, landscape has been seriously underfunded. It has regularly been a cheap, expedient and lazy solution to seed large areas of grass, to create urban deserts. Maintaining such areas is expensive, energy consuming and environmentally damaging. Yet, in relative terms, even with the most modest funding, the beneficial effects for urban communities could be immense in combatting climate change whilst at the same time immeasurably improving the quality of life for city dwellers. Square kilometres of rank grassland simply replaced by species-rich urban forests benefiting nature, improving urban air conditions, providing shelter and visually more interesting recreation spaces would, apart from the other obvious benefits, be cheaper to maintain and less damaging to the environment.

Reasons to be optimistic



Photo 13. Champs-Élysées. © PCA- STREAM Architectes, Paris³⁶

35. European Commission, Towards an EU research and innovation policy agenda for nature-based solutions and re-naturing cities. Final Report of the Horizon 2020 Expert Group on Nature-Based Solutions and Re-Naturing Cities, 2015.

36. Video link: <https://vimeo.com/390936231>

There are reasons to be optimistic: the world has only just started to react to the grave risks of climate change and has begun to understand some of the intricate complexities of responding to the challenges. As an example of this optimism, the following project is extraordinary in its conception, but it is the kind of response that is needed, especially in the concept of “bringing the countryside into the city”.

This comprehensive plan to transform the Champs-Élysées, Paris’ most famous avenue, has been given preliminary approval, although the 250 M€ makeover will not happen before the French capital hosts the 2024 Summer Olympics. The proposal aims to turn a 1.9 km stretch of central Paris into an expansive garden. The proposal, apart from creating extensive inner-city recreation facilities, includes reducing space for vehicles, turning roads into pedestrian green areas, and creating tunnels of trees to improve air quality, provide shade and reduce heat gain.



Photo 14. Image taken from video. © PCA- STREAM Architectes

The above-mentioned European Environment Agency report the Covenant of Mayors³⁷ as a means of networking for smaller local authorities and particularly recognises a barrier to knowledge in dealing with these problems. Indeed, what the report identifies is that while the science and risks are now much better understood, and while public administration, towns and cities are beginning to react, actually understanding *how* to transform the science into projects still remains a problem. A further problem is that many local authorities are small and do not employ expert staff to assist them in the process of preparing projects for tender or selecting the right kind of consultants to undertake this kind of work. The European Union Report “Scientific evidence for policy-making”³⁸ which helps inform policy-making across Europe, could be extended to address urban adaptation issues.

The report observes:

...in some cases, information is not available, or is presented at a scale inappropriate for application in cities. In other cases, the relevant people in the local authority are unaware of the information’s existence, or unable to obtain it from national or regional authorities. Finally, city staff may not have the necessary skills or training to interpret the data (Climate Adaptation

37. www.covenantofmayors.eu

38. www.google.com/search?q=Scientific+evidence+for+policy-making&rlz=1C1GCEA_enFR858FR858&oq=Scientific+evidence+for+policy-making&aqs=chrome..69i57.1653j0j1&sourceid=chrome&ie=UTF-8

Partnership, 2018). In addition, just having access to data and information may not be enough to convince some local actors, owing to their preconceptions about the subject”.³⁹

A fundamental requirement is access to expertise to help local authorities interpret the data and help them through the process of investigating and deciding on a range of options that balance solutions with cost-effectiveness, preparing studies for public consultation, reports for obtaining funding, and strategies for implementing selected projects.

Most simply stated, it is clear that one of the most effective and cheap responses to improving the quality of life for city dwellers is simply to invest much more in landscape: plant more trees, create recreation spaces, develop car-free pedestrian and cycle routes, and create blue/green corridors as natural vectors for the benefit of all species.

The positive impacts that would accrue from all of this are clear. What is needed therefore is political commitment, possibly a cultural revolution, to give urban areas back to the people who live in them; to rescue urban areas from the autocracy of the car; to bring the countryside into towns and cities; to ensure clean air, access to water and woodland as part of an infrastructure linking neighbourhoods and; importantly in the process, to invest in the use of native species to ensure sustainability and biodiversity.

None of this is rocket science, but we do need to do better, for our children’s sakes, for humanity, for urban and peri-urban areas, to make them more habitable and, more grandly, for the future of the planet.

39. Urban adaptation in Europe: how cities and towns respond to climate change, European Environment Agency, 2020

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Appendix 1

IFLA EUROPE General Assembly

Resolution on Climate Change

London, United Kingdom, September 2018



CLIMATE CHALLENGES

Since the second half of the 20th century, variations in climate have accentuated: nowadays the change in temperature and rainfall, the rising of the sea level and the intensification of extreme episodes, such as draughts and fires, are imposing severe consequences on biodiversity and people's way of life, not only on our continent but worldwide. In this scenario of change and uncertainty in which variables are yet developing, it becomes imperative to traduce *Climate Challenges* into a vision for designing, planning and managing our landscapes as they will be a fundamental resource for the welfare of future generations.

The undersigned, as representatives of the 34 National Associations of the European Region of the International Federation of Landscape architects, having considered the Resolution on *Climate Challenges* at our General Assembly in London, United Kingdom in 2018, wish to contribute to the prevention and resolution of these concerns.

We therefore make the following statement:

WE BELIEVE

Landscape is resilient – it aims at stabilising changes favourably for the quality of life of populations.

Nature is distributive – it manages its resources widely so as to create solidarity-based societies.

Recognising that climate change is now perceptible throughout Europe and that it will have a repercussion in the environment at a quicker pace than climatic variations in the past. It will transform biogeographical areas and therefore the conditions for the maintenance of biodiversity, accelerating desertification and provoking decisive transformations in the ways people inhabit and manage their territories.

Understanding that natural resources on which societies rely for their survival are being continually eroded. The loss of biodiversity is the result of human activities due to excessive exploitation: the destruction and fragmentation of natural habitats, the impact of exotic species and mass extinctions pose major threats to the degradation of ecosystems.

Conscious that landscape has become subject of an accumulative degradation of environmental values which is having collateral effects on the life quality of human communities in the short and long run. Climate change will influence the destiny of the world in the 21st century and will be one of the biggest challenges of future generations.

Aware that climate change has transcended scientific circles and is easily observed by all citizens, present in the public realm as it has become a source of conservation throughout Europe. It is now evident for all the dimensions and scale of climate change, and the fragility of our landscapes as the ancestral relations human communities had with nature have been progressively modified.

WE URGE

the Council of Europe, the European Union and all IFLA Europe Member States to promote landscape in their decision-making, developing a holistic vision regarding cultural, social, political, environmental, and economic balance beyond political borders, thus:

Evaluating the manifestations and scale of climatic change and its potential impacts so as to take strategical decisions which will allow not only to anticipate future crises but to develop ways of living favourable to the preservation and the development of the quality of life of populations affected by climate disruptions,

Advocating the integration of environmental parameters in decision-making, conferring upon it paramount importance as the rates of ecosystem deterioration outpaces our ability to manage them; increasing the efforts of the administration to limit climate change so that it becomes a priority in political agendas,

Promoting the promulgation of legislation in favour of environmental and landscape protection and conservation which will include financial tools and managerial systems so that a more flexible and holistic management of its changes and evolution can be established, capable to cope with new climatic manifestations as well as reasserting collective interests,

Mobilising public debates and raising public awareness via environmental knowledge so as to activate an indispensable change in society, which will have to maintain and manage landscape and territories with radically different ethical and material concepts,

Developing new ways of living for human societies, drawing from local traditions for energy efficient landscapes and ecological integrity, as nature based strategical sustainable development is capable of deflecting climate change,

Recognising the importance of the environmental dimension in the design and planning of our landscapes – be they urban or rural –, requiring professionals and administrations alike to integrate climate challenges into their projects.

Following further international and European texts on the matter such as:

- *Århus Convention* (UN Economic Commission for Europe, 1998)

- *European Union*
- *Bern Convention* (Council of Europe, Bern, 1979)
- *European Landscape Convention* (Council of Europe, Florence, 2000)

Appendix 2

International Labour Organization International Standard Classification of Occupations (ISCO 08)

The definition of the profession of Landscape Architect for the International Standard Classification of Occupations, compiled by the International Labour Organization in 2012, was the subject of a further study carried out in 2017.⁴⁰ This study incorporates the ILO ISCO 08 International Standard Classification of Occupations' global definition of the profession of a Landscape Architect (2162) and further develops it.

Note: the definition is undergoing review and change to reflect the widening scope of the work of Landscape architects.

Landscape architects conduct research, analyse and realise the potential of the landscape at all stages, scales and contexts of the development process, including policy development and planning; site inspections and feasibility studies; strategic visioning, planning and review; master planning and spatial design; preparation and implementation of detailed design and its long-term management, maintenance and rehabilitation.

The tasks include:

- co-ordination of policies affecting the landscape at a national, international, regional and sub-regional level;
- consultation with clients, management and other stakeholders, including national governments, regarding proposed legislation and policy; changes to the planning process; and type, style and size of proposed buildings, parks, sports facilities, roads and other open spaces;
- preparation of planning guidance, codes, environmental and visual impact assessments, guidelines and detailed landscape strategies about implementation, management, maintenance, conservation and rehabilitation;
- research to develop or improve theories, technologies and practices in the arts and sciences of landscape architecture, including the philosophy, theory, practice and pedagogy of design;
- raising of aspirations for quality environments through demonstration of excellence and public engagement;
- connection of spatial strategies and visions to specific proposals, through the planning and consultation processes, acting as expert witnesses at public inquiries, leading, co-ordinating, mediating and contributing to multidisciplinary design teams;
- research and analysis of site and community data, geographical and ecological features, landforms, soils, vegetation, hydrology, visual characteristics and human-made structures, formulating land use, development recommendations and environmental impact statements;
- research and design feasibility studies, strategic reviews and master plans, technical and economic plans for urban regeneration and city building, infrastructure works and reclamation, the renewal of transport systems, climate adaptation and mitigation, the siting and planning of new towns, roads, power stations, national pipelines and utilities, the development of strategies for tourism, recreation,

40. A comparative analysis and merging ILO-EFLA-ECLAS Documents, Bruschi C., 2017.

agriculture, forestry, conservation and heritage, and the design of ecological, economically and socially sound urban, sub-urban, peripheral, rural and wilderness environments;

- preparing reports, site plans, working drawings, specifications and cost estimates, location and details of proposals, including ground modelling, structures, vegetation and access, landscape management and maintenance plans for new and existing landscape designs and features;
- preparation of schematic and detailed design proposals and appropriate documentation for the implementation of site-specific proposals for open spaces, both public and private, including communication of the proposals for specification, costing and construction, with due regard to costs, function, quality, existing legal, technical and advisory standards and regulations;
- specifications and contract documents, and project supervision, co-ordination, moderation, mediation and implementation, ensuring compliance with regulations and quality standards;
- undertaking planning, design, restoration, management and maintenance of cultural and historic landscapes, parks, sites and gardens.⁴¹

41. Luengo, Williams and Van den Bossche (2018).

Appendix 3

**Statement presented by Michael Oldham
on behalf of the International Federation of Landscape Architects Europe
to the 8th Plenary Session of the Steering Committee for Culture, Heritage and Landscape –
CDCPP (Strasbourg, 21 May 2019)**

*Contribution by IFLA Working Group on Climate Change
following the Special Report on Global Warming of 1.5 °C by
the Intergovernmental Panel on Climate Change, October 2018*

www.coe.int/en/web/cdcpp-committee/special-file-climate-change

Landscape architects understand that our greatest contributions to ensuring a prosperous future are vested in the creation of human societies characterised by an enhanced capacity for resilience, a willingness to transform to a better state, and a commitment to ensuring the long-term sustainability of environments, cultures and well-being. Together with allied planning and design professionals, natural scientists, sociologists and economists, we will continue to advocate for innovative approaches to low carbon community development and management, and for the protection and enhancement of natural systems with emphasis on the integration of the natural environment into human communities through blue/green infrastructure projects and an enhanced urban canopy. We can and must do our part locally, nationally and internationally.

How such a broad statement can be put into action is not immediately clear, but I will give you two simple examples: this Council of Europe building, the Palais de l'Europe and its grounds, and a choice of trees. I am not actually suggesting any change, but I want to use this as an example because it is one that we can all visualise easily, and it deals with climate change, biodiversity and depletion of species. In addition, it represents the basic, simple but important choices we need to make at ground level.

On the southwest side of this building is a large area of grass. At present it is regularly mown, contributing positively to the carbon footprint of the building. As an area of grass, it is scenic but does nothing in the summer to protect the building from high temperatures, nor in the winter from low temperatures. If this area of land were planted with trees, these buildings would be cooler in the summer, warmer in the winter and cost less to maintain. The carbon footprint would be lower, a reduction of air particles would also occur, producing oxygen rather than CO₂ and, if this were a building in the UK and the trees planted were oak (*Quercus robur*) they would provide a living habitat for over 500 other species; if they were sycamore (*Acer pseudoplatanus*), fewer than 50 species; and if they were maritime pine (*Pinus maritima*), less than 10 species. We have choices to make, but they need to be made intelligently and we need to understand the significance and consequences of the choices we make. The effects of these changes for one building may be small, but city-wide such changes can be significant. Cities will change significantly over the next few decades, providing huge opportunities for reinvesting in blue/green infrastructure. This blue/green realm is the core of landscape architecture and the above example is no more than the tip of an iceberg of knowledge. Working together, we can achieve great things: isolated we can do nothing. IFLA Europe is committed to working closely with the Council of Europe and especially the European Landscape Convention.