

Green Infrastructure in the City: The role of urban and periurban natural spaces

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Urban Green Spaces. Facilities or infrastructure?

José Fariña Tojo, Professor of Urban and Regional Planning of the Polytechnic University of Madrid

1. INTRODUCTION

The establishment of urban green spaces in Spanish planning EMERGES as AN OBLIGATION FOR urban PLANNERS and are considered as "endowments". The LAND ACT 1956 conceived the open spaces system as a "green area" and a minimum reservation module of 10% of the whole area was reserved for such spaces. Then there was the discussion of whether it was of public use and domain, or only of public use, etc.... but that is not relevant for the question I want to raise. The important thing is that green areas were considered within the same range of "things" as a cultural centre, a shop or a car park.

In general, this conception of green spaces in urban areas has continued both IN doctrine and IN public opinion through the successive amendments to planning laws in almost all regions. However, it is not the only way to understand GREEN SPACES IN OUR CITIES. Anyway I prefer to talk about uncemented spaces rather than about green spaces as the term "green space" is usually associated with trees and grass. And the term "open spaces" includes urban areas such as squares or streets, which not in all cases can be considered as green areas or nature areas.

2. GREEN AND GREY INFRASTRUCTURES

In 1999 the U.S. Forest Service, conservation organizations and other federal agencies, institutionalized the term Green Infrastructure with the idea of creating an interconnected network of natural areas to be displayed as the electricity or the communications infrastructures networks do. This concept of network is in the term origin and still remains in its current CONCEPTION. But the idea has evolved since then and now it is RATHER understood as any natural system that supports life BY making possible ecological processes, wildlife conservation and resources preservation.

It is evident that nature is the main element for urban areas existence. Primarily the urban system creates a different and more demanding order than the one of nature, which implies the need to get rid of entropy by transferring it to the natural environment so that it assimilates it. Therefore, from a systemic point of view, a city would not be possible without nature. However, the role of the infrastructure to which we are referring is less abstract and refers to specific aspects of the city running. And it is precisely in the periurban areas where this understanding of the term "the green" (with quotes) as infrastructure, can be appreciated. Because it is in the nature purest areas, where this function is diluted in the more support general one of urban areas possible existence and therefore it is more specifically associated TO a network.

This way of bringing it up, as natural environment versus built environment, has led some authors to oppose the so-called green infrastructure to a hypothetical grey infrastructure comprising the whole artificial networks shaping the urbanization. Without reaching those great abstract concepts and focusing on the specific case of cities, a change in the concept of green since the early years of urban planning to the present can be detected. It seems beyond doubt that "the green" understood as nature, plays a key role in enabling the mere existence of urbanization. The strange thing is that, at first, the concept was closely linked to the parks, which from the point of view of conservation, have a certain part of "equipment" in the sense that they can be justified BY citizens ENJOYMENT.

If we focus on periurban areas, what we are referring to when we think on "the green" (I insist on the quotes) as an infrastructure? If we come back to the definition of the RAE (Spanish Royal Academy) "set of elements or services that are considered necessary for the creation and operation of any organization", WE COULD try to find those elements or aspects of the green which would serve to operate the concrete and specific elements OF THE city. Although later ON I will be focusing in some main functions of "THE GREEN" in urban areas - periurban areas for example - and in order to get to know what we are talking about, I would like to quote some ones: hydrologic regulation by controlling water runoff; soil erosion and flooding; ensuring flora

continuity and availability; provision OF mobility spaces and others for the survival of wildlife by increasing biodiversity; CO² sink and other polluting elements; and many others of which the green belt of Vitoria is a paradigmatic example.

These infrastructure functions in the periurban areas should not make us forget the fact that those areas also have AN EVIDENT GREEN EQUIPMENT FUNCTION. That means providing citizens with spaces dedicated to leisure, socialization, physical exercise or contact with nature. IT COULD BE SAID that in these areas the vital ecological function in the less anthropised land of the territory gives way (even while still having a great importance) to its function as infrastructure and equipment. So a certain gradation which should be reflected in the management of these areas COULD BE SEEN: in the less anthropised areas, the priority should be ecological vocation and in the areas close to the city this vocation should be shared with the infrastructure and equipment function as explained above.

3. GREEN INFRASTRUCTURE IN URBAN AREAS

However if we enter the most urbanised areas of the city, we could question whether, actually, this infrastructure function is so important to be considered and which is the place of the ecological one, as the equipment vocation of the "green areas" (always in quotes, i.e. prevention) seems to be a priority, including - as stated before - from the legal point of view. I think it would be appropriate to analyze some paradigmatic examples which could help understand its meaning.

Anyone involved in bioclimatic issues in the city knows that urban microclimate - in all instances - is characterized by harsh contrasts in just a few meters. The same applies to the relative humidity of air in an area that allows evapotranspiration versus another which is totally cemented. Or with the wind speed in narrow streets due to the Venturi effect. In all those cases, "the green", the introduction of nature into the city can help control the microclimate. It is a clear example of the vocation of "infrastructure" in certain urban "green areas". But the effects are not limited to the control of the microclimate. It is better to slow down the phenomenon of the "heat island" in cities (in certain climates). Examples could be multiplied. Several examples could be mentioned in order to explain that urban green areas are not only to provide citizens with spaces dedicated to leisure, socialization, physical exercise or contact with nature, but are also necessary so that the city run more efficiently.

Now I would like to raise the issue of health and city planning as the physical and mental benefits that a proper distribution of green areas in the city brings, should be known by all those who are in charge of planning the city and, of course, citizen collectives. Thus, consideration of green areas as necessary equipment in the city is essential. But it turns out that health also responds to the vocation of the green areas as infrastructure. It is widely known the ability of tree leaves to fix certain kinds of air pollution by cleaning the air so it is much more economical than scrubbing towers placed in certain polluted places like tunnels. And of course, the ability of the soil to absorb retains, filter and purify water. I could go on with countless examples of how green areas considered as a city infrastructure can help achieve certain effects in a much more economical way than using complicated and sophisticated technologies that are not only a waste money but also an ecological loss.

It is obvious that the concept of green infrastructure I've developed along this brief exposition surpasses the initial idea of the 1999 U.S. Forest Service. I am convinced that the concept of green infrastructure in the city as the whole set of green spaces considered necessary for its operation will have to step forward sooner or later and that these functions will be considered critical and fundamental for its efficiency. But that does not mean that urban green areas forget their original vocation of equipment. Moreover, the joint consideration of both vocations acting synergistically will be crucial to the organization of the city of the future. In conclusion, I would also like to say that the ecological function that meet green areas – nor urban nor periurban - should be remembered, even symbolically, in the design and organization of urban green areas.

Inner green belt. Towards a urban green infrastructure in Vitoria-Gasteiz. European green capital beyond 2012

Luis Andrés Orive,
Director General of the Department of Environmental Strategy and Natural Environment of the Municipality of Vitoria-Gasteiz

Today, it is widely accepted that the European Green Capital Award 2012 is due to structural reasons.

Great emphasis has been placed on the fact that municipal sustainable strategies have reached a high degree of consensus and have been supported, for decades, by strong social bases.

It is the major environmental award a European city can get and therefore a great source of pride for all Vitoria and Alava people, but also a great responsibility, which will test the strength of our environmental commitment.

As a result of the high level of consensus and coherent navigation in a same direction - especially since the creation of the CEA* (Center of Environmental Studies) in 1995 and the unanimously approved Agenda 21 in 1998 - many advanced ideas and projects on waste management, water planning, energy efficiency, environmental health, air pollution management or, more recently, on mobility and sustainable management of public spaces, have seen the light.

From my point of view, the managing and planning of the urban-rural relations, under the symbol of our most international reference - the Green Belt - deserve an independent chapter. The Green Belt and anything entailing it has no doubt been the one with more recognition and social significance among all sectorial working areas.

Today we know that the biogeographic framework where Vitoria-Gasteiz is located is of high ecological quality and remarkable cultural values - acquired by its condition as place of passage since immemorial times. But it is also true that 20 years ago, when the Green Belt dream began, our city's outskirts were in a poor state of environmental degradation. And what's worse, no one seemed to be sensitive to this gap.

Over the last years, multiple projects on ecological regeneration and ordinary flood control of the Zadorra river and numerous streams flowing through our city have been developed. Those successfully restored spaces on the outskirts of the city, are highly appreciated by the citizens, who enjoy them daily through the walk, the most popular sport among Victorian people.

However, some people see beyond nice lively parks. For them, the Green Belt is considered an Ecological System, a Green Infrastructure which, operating completely in a natural way, respect accurately biological cycles and spatial continuity as well as ensures connectivity among ecosystems. And all this happens... "where it most hurts", at the edges of the city and "when it most hurts"..., in times of speculative urbanism in Spain.

We must remember that through its 35 Km. of perimeter, the belt has been subjected to multiple pressures that, if carried out, could have substantially modified its nature as functional ecosystem. Courageous decision-making stopped, modified and substantially conditioned very aggressive projects which - in my opinion - if executed, could have ruined or devaluated significantly its nature and functionality.

This allows me to conclude that institutional leadership and citizen participation have been essential to get where we are.

A shared vision, open and firm, is essential to be able to progress in these "green issues" without falling into too obvious contradictions - as the road to greater sustainability in urban areas is not precisely easy. Day-to-day urban management too often proposes plans or projects based on short-term economic policies, with high consumption of natural resources often cloaking harmful alibis of the "green postcard" type.

Without this initial vision and without a favourable social and institutional context, the Zadorra river would never have been saved from a brutal riprap and concrete channelling; Salburúa would be a shopping centre, a golf course, a thematic park or all together in one place; the Zabalgana forest would be part of a large residential complex bordering another golf course and Southern Vitoria would be urbanised with a quick ring road ready to receive some more thousands of homes and several dams to be used for extensive irrigation.

A balanced and courageous decision making has brought to choose in many cases "unconventional" projects and alternatives, thanks to which, today Vitoria-Gasteiz holds a privileged position among the world's greenest cities.

"Standard" projects of hard channelling, golf courses, shopping centres, great dams, ring roads or extensive residential areas have been transformed into clean rivers, wetlands hosting endangered animal species, periurban meadows and forests, ecological vegetable gardens, natural parks... appropriated by citizens and declared as protected spaces - in several cases at international level.

Those decisions taken over the last 20 years draw the way to be followed and I understand, that even with difficulties, it is the right one. And not only because it has been universally recognised, but also because it is essentially through this open scenery and the specific developed actions, that the benefits - for our physical and mental health, for our general quality of life and for the positive impact on the economic activity of our land - can be seen.

It doesn't seem too difficult to visualize beyond 2012. The roadmap is clear. Now we need on one hand the same determination at institutional level and on another one citizen involvement and recognition to tackle it successfully. And maybe we need even in these uncertain times, building ourselves hopes up more than ever with utopian projects and ideas. Gustave Flaubert said * *we value most for our aspirations than for our actions* ...

As with the Green Belt some years ago, today we must look forward and project our hopes on new icons that can help move forward along paths, sometimes unexplored. In this times of economic and social crisis, wrapped in ecological degradation processes - complex and difficult to predict - the imaginary debate on our future in a 20 or 50-year time is complicated but appropriate. The current urban model cannot and should not evolve by keeping such a strong ecological impact. And the new territorial systems of reference will, therefore, be those which achieve a better balance between biocapacity and ecological footprint. Proposing a new model of city-territory relationship to advance according to the principles of the UNESCO MAB Programme in the Bio-Region of Central Alava, could be of great use ... and also developing a model of extensive Green Infrastructure under the symbol of the Inner Green Belt, as catalyst of the "Urban Green System".

The Green Belt is playing a very important role in urban planning by approaching the issue of physical relation between the city of Vitoria-Gasteiz and its surrounding nature. In future, regional planning should guarantee a green infrastructure system that would allow connecting the belt with their reference "supply" systems. Those circumstances should also be reflected in the territorial and urban planning as opportunities for economic and social progress - maybe with the aim of being recognised by the UNESCO as Biosphere Reserve. On another hand, the Green Belt will have to slightly enter the consolidated city to impregnate it with its values: improving biodiversity and biocapacity degrees are huge and betting for this option will certainly result in a better quality of life for all of us. It will also be a pride to leave our children a better territory that the one we found and a socio-environmental sensitivity to be used as a reference for our contemporaries.

* ("Letter to Ernest Feydeau," October 1858 - in: *On literary creation. Selected correspondence*, Madrid, Editorial Fuentetaja, 2nd edition., 2007, p. 193)

Update and news on the EU Green Infrastructure Strategy

Marco Fritz, DG Environment

1. Green Infrastructure: What is it, and why is it important?

- Green Infrastructure can be defined as a strategically designed and managed network of high quality green spaces and other environmental features – a multifunctional resource capable of delivering a wide range of benefits and services.
- Green Infrastructure includes natural and semi-natural areas, features and green spaces in rural and urban, terrestrial, freshwater, coastal and marine areas.
- Areas protected as Natura 2000 sites are at the core of Green Infrastructure – but areas outside protected sites profit from Green Infrastructure principles as well, by enhancing ecosystem health and resilience, and by contributing to biodiversity conservation and benefit human populations through the maintenance and enhancement of multiple ecosystem services.

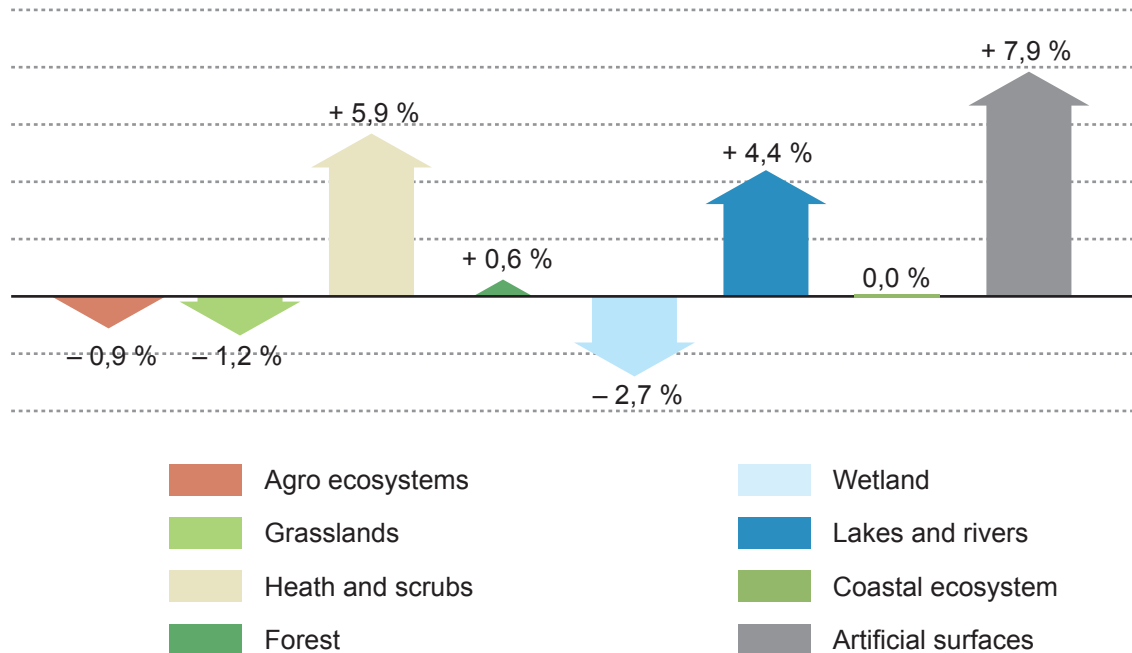
Loss of biodiversity in the EU

Europe has suffered more human-induced fragmentation than any other continent (MEA, 2001)
50% of wetlands and high-nature-value farmland gone.
40% of all European bird species have unfavourable conservation status.

Problem in urbanizing Europe: fragmentation, habitat degradation and loss.

Unsustainable land use.

Changes in ecosystems between 1990 and 2006



Unsustainable use of ecosystem goods & services

Non-sustainable way of life: Major consequences for biodiversity and ecosystem services + dependent economic and social activities:

- Species have great difficulties in dispersing, migrating or moving
- Ecosystems that are small or isolated may stop providing us with valuable services such as food, freshwater, water or climate regulation, disaster prevention etc.

Climate change mitigation and adaptation – disaster prevention

- It is impossible to solve biodiversity loss without addressing climate change
 - It is impossible to solve climate change without addressing biodiversity and related ecosystem services
- >> Ecosystems currently absorb half of anthropogenic CO² emissions and provide adaptation functions, including flood protection and disaster risk minimization

The EU Green Infrastructure Strategy :

- Response to ecosystem and habitat degradation and fragmentation mostly through land-use changes (intensification, abandonment, urban sprawl) + transport/energy infrastructure
- Consists in natural and man-made elements (such as reforestation zones, green bridges, green roofs and walls, fish migration channels, green urban areas, high nature value farmland or forest areas). Building on what is already there + restore
- Ensures efficient and sustainable use of land by integrating interacting functions or activities on the same piece of land.
- Maintains ecological coherence as essential condition for healthy ecosystems, which are vital to ensure that the functional elements of ecosystems can continue to interact, both between themselves and with their physical environment.

Examples of Green infrastructure:



Sources:
D. Smith, R. Elliott, P. Finck, M. Kulvik
Europ. Commission

Fig.1 different scales, different solutions

2. Added value of Green Infrastructure

Giving space to ecosystems and maintaining biodiversity

- strengthening the functionality of ecosystems for delivering goods and services, such as provision of clean water and air, flood retention, attractive recreational areas
- mitigating and adapting to climate change effects, for acting as barriers against erosion, and for enhancing the quality of life (health, conserving historic and cultural heritage)
- multifunctional use for greening transport and energy
- investing in restoration
- Contributing to developing a greener and sustainable economy by investing in natural solutions (relying upon ecosystem services) instead of purely technical ones
- financial investments possible, "bankable term"

Added value of an EU Green Infrastructure initiative

Maintaining or restoring key ecosystems and their services:

often cheaper to invest in ecosystem-based than purely technical solutions + new job and business opportunities

Priority to develop a framework for Green Infrastructure: initiatives to ensure delivery of EU added value, promote investments in Green Infrastructure – “unlock the potential” + give strategic frame for integration

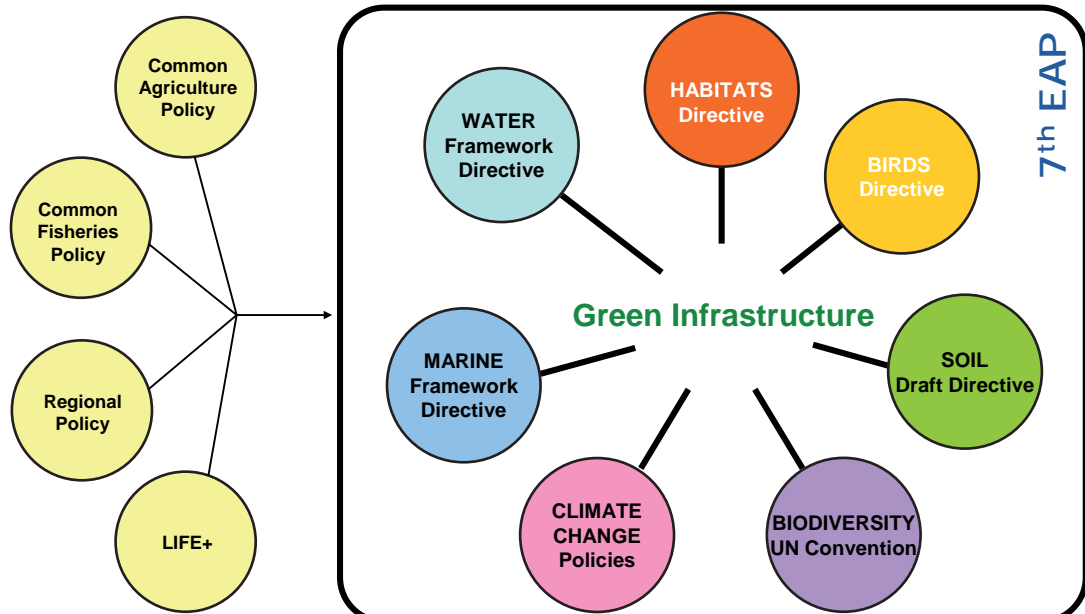
> to deliver multiple benefits beyond the biodiversity and wider environment/climate agenda – including opportunities for green economy and green jobs through restoration projects and innovation opportunities linked to 'biodiversity-positive' investments.

Tackling the spatial dimension

Spatial demands to be solved with integrated spatial planning

- promote identification of multi-purpose zones and incorporation of restoration into land use planning and policy
- sustainable land use planning needs to be integrative for being successful
- participation of citizens and stakeholders early in the planning process

3. Policy development framework for Green Infrastructure



Policy context:

- “EU2020”: smart, sustainable, inclusive growth – resource efficiency
- Policy reform – CFP, CAP and Cohesion Policy 2013
- Towards new financial perspectives 2014-2020 (cf MFF - LIFE)
- Financial crisis
- New EU Biodiversity Strategy

Green Infrastructure: integration tool

Integration of the concept and the use of Green Infrastructure in policies at EU level, which shape the use of land and its spatial patterns

- a. Nature protection and biodiversity policies
- b. Regional policies
- c. Agriculture policies
- d. Water policies
- e. Marine and coastal policies
- f. Transport and energy policies
- g. Climate change policies
- h. Urban policies
- i. Resource efficiency policies
- j. Land and soil policies

Financing

Current revision of the EU funding instruments

Non-EU funding (governments, EIB, private banks, developers and civil society)

EU Biodiversity Strategy for 2020 COM(2011)244

Our life insurance, our natural capital

HEADLINE TARGET

Halting the loss of biodiversity and the degradation of ecosystem services in the EU by 2020, and restoring them in so far as feasible, while stepping up the EU contribution to averting global biodiversity loss

Target 2: Restore ecosystems

By 2020, ecosystem services are maintained and enhanced through the establishment of Green Infrastructure and the restoration of at least 15% of degraded ecosystems.

Action 6b: The Commission will develop a Green Infrastructure Strategy by 2012 to promote the deployment of green infrastructure in the EU in urban and rural areas, ...

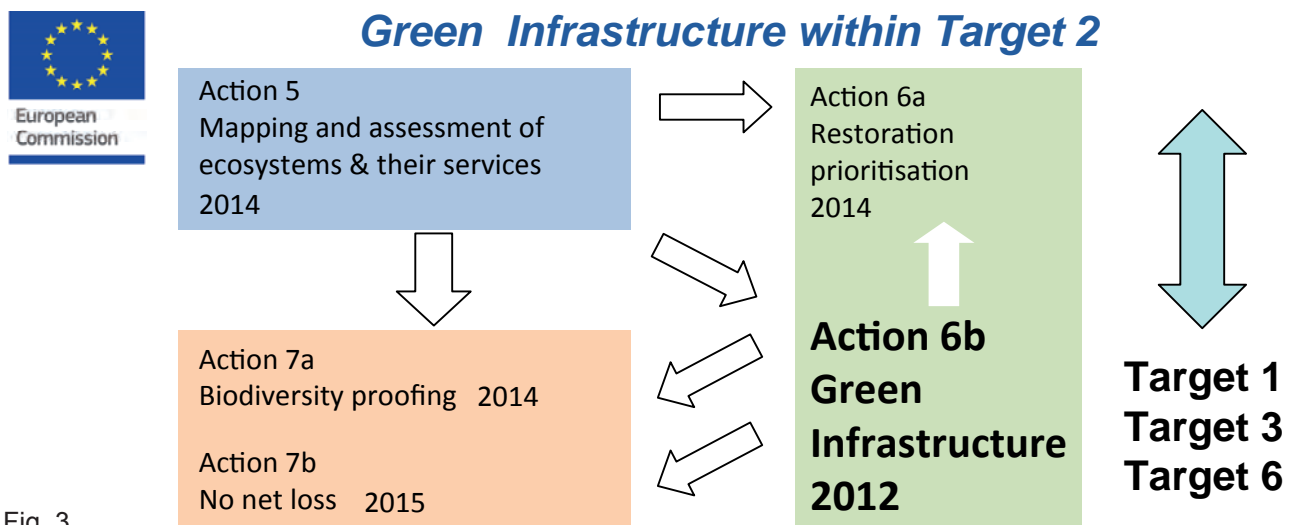


Fig. 3

4. Green Infrastructure –next steps in policy development

06/11 ENV Council conclusions

... “UNDERSCORES the importance of green infrastructure also as a contribution to further integrating biodiversity considerations into other EU policies; and WELCOMES the Commission’s commitment to develop a Green Infrastructure Strategy by 2012”

11/11 CoR discussion

underlining 2010 position of importance of Green Infrastructure

12/11 ENV Council conclusions

“ CALLS UPON the Commission to consider, within the scope of the Green Infrastructure (GI)Strategy under preparation, among others, the following issues: (a) possible scope and key components of GI; (b) possible framework for GI implementation based on existing experience, particularly in spatial planning, including coastal; (c) methodological issues related to GI, including with regard to spatial connectivity between protected areas and basic requirements

for the delivery of the necessary ecosystem services; d) options to integrate GI in existing policy instruments and importance of GI in terms of climate change adaptation; e)identifying opportunities for financing GI; f) communication and promotion of GI targeting different stakeholders and sectors, and in particular local authorities;”

05/12 EP statement

Urges the Commission to adopt a specific Green Infrastructure Strategy by 2012 at the latest, with biodiversity protection as a primary objective; (draft discussed in 03/12)

Milestones on Green Infrastructure Green Paper development (state of play 03/12)

01/12- Study results on case examples and typology, on EU-wide cost-benefit analysis of Green Infrastructure, on climate change and Natura 2000, and on the potential of ecosystem-based approaches to climate change adaptation and mitigation available

03/12 Science for Environmental Policy: special issue on Green Infrastructure and study results on NWRM

05/12 Green Week session on Green Infrastructure & water (stakeholder discussion)

09/12 Adoption of Communication on Green Infrastructure (Green Paper)

10/12 Brochure on GI ready (Explain GI COM to general public)

Green Infrastructure on ENV homepage

http://ec.europa.eu/environment/nature/ecosystems/index_en.htm

EU biodiversity strategy

http://ec.europa.eu/environment/nature/biodiversity/policy/index_en.htm

The green side of the “Silesia” metropolis

Zbigniew J. Kamiński, professor at The Silesian University of Technology in Gliwice (Poland)

Every region or city has many faces. It is obvious. There are results of examination from different sides, perspectives or points of view. This article is about the green side of the “Silesia” metropolis. The subject are green areas, water reservoirs and rivers which make the context of the variety of the everyday and weekend recreational areas of the residents of the “Silesia” metropolis but not only of them. It means a look from the perspective of the idea of international project “Periurban Parks” (in which Metropolitan Association of Upper Silesia is one of the partners), which appreciates the significance of woodlands, parks or rural areas located on the outskirts of the cities or in their direct neighborhood and provide city residents with good living conditions, serving as places of recreation and having many other social functions. It is argued that such a perspective highlights the cultural aspects of the natural and social functions of green areas in the cities. From this point of view a lot depends on our behavior, choices and decisions.

Fig. 1. Geographical location of the “Silesia” metropolis (Source: GZM)

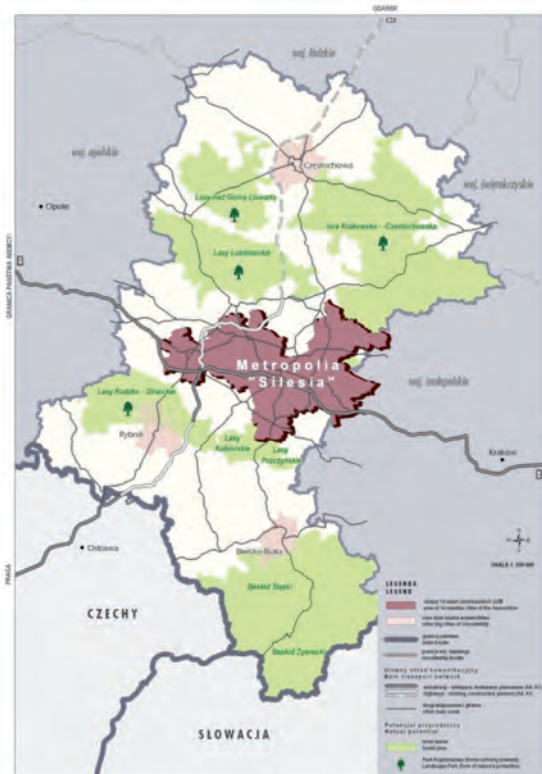


Fig.3 The “Silesia” metropolis and the green areas around (Source: GZM)



Fig. 2. Poland and the Silesian Voivodeship (Source: GZM)

The “Silesia” metropolis

The “Silesia” metropolis forms the central part of the Silesian Voivodeship – an administrative region located in the southern part of Poland, close to the Polish state boundary with the Czech Republic and with Slovakia, with the population of almost 4.5 mln people, which is over 12.0 % of the population of Poland on the area of less than 4.0 % of the Polish territory. With over 80 % of the population in the urban areas, this region is described as the most urbanized one in Poland. In the middle of this region is the “Silesia” metropolis - the most urbanized part of this very urbanized region.

A complex organization of the area consists of 14 member cities (boroughs), with the population of about 2.5 mln people, in other words 60 % of all the voivodeship population. This area is described as the Upper-Silesian Agglomeration. This urban agglomeration is a product of the two related historic processes which started during the first industrial revolution – urbanization and industrialization – which caused that the distances between the cities are constantly getting smaller and smaller. But there are great differences between the cities in the area of the “Silesia” metropolis. Katowice, as the capital city of the region, has about 300,000 inhabitants, but some cities are significantly small. In conclusion, the central part of the “Silesia” metropolis is densely populated. In other words, there are specific features of the “Silesia” metropolis:

- an old industrial region with the economy based on the hard coal, ferrous and non-ferrous metals;
- the result of restructuring process and current production with heaps, sand excavation wholes, etc; but also
- a big share of natural areas, very often being the result of land reclamation projects and adaptation of derelict industrial land for recreational purposes, which is changing a bad stereotypical image of “Silesia” metropolis created by heavy industry into nowadays more attractive image of urban parks and woodlands as places where the “Silesia” metropolis residents have ability to make the most of their lives.



Fig. 4. The green areas in the “Silesia” metropolis (1, 2, 3 are places described below)
(Source: GZM, Green side of “Silesia” metropolis full of recreation)

Natural potential of the “Silesia” metropolis – 3 examples

1. **The Silesian Park** is a large urban park (“WPKiW” is a popular abbreviation of the traditional name of this park). It is located in the very centre of the “Silesia” Metropolis, close to the border of three cities: the city of Chorzów (about 100,000 inhabitants), the city of Katowice (about 300,000 inhabitants), the city of Siemianowice (about 70,000 inhabitants). Due to this central location and the size of 620 hectares (including 100 hectares of the park green and 250 hectares of forests), this park functions as “the green lungs” of the “Silesia” metropolis.

Established in 1950’s on barrens and post-industrial heaps, and arranged with a clear architectural composition, the Silesian Park is an example of the restoration of a destroyed area to life. It is a place of social life and cultural events.

The planetarium, the ZOO, the sport stadium, the ethnographic park, the entertainment park etc., are attractions for 4 million visitors each year. These values are especially appreciated by the inhabitants of the “Millenium” housing estate in the neighborhood of the Silesian Park – the largest housing estate in Katowice (about 25,000 dwellers), established on the area of the city slums in the 1960’s. Because of this proximity attractive for developers, a high density of “Millenium” (about 12,000 dwellers per km²) is constantly increasing. This process is dangerous for the Silesian Park making it more and more isolated from the wider regional green structures of the “Silesia” metropolis.



Fig. 5. The Silesian Park seen from inside and from the “Millenium” housing estate

(Source: Author)

2. **The Valley of Three Ponds** is one of a few recreational centers located on the outskirts of the city of Katowice. This recreational centre of the area of 65,5 hectares, situated very close to the highly urbanized area, has been fit with investments in recreational infrastructure (modernized swimming pond, playgrounds, fitness zone etc.) and tied together with wider woodland area outside the “Silesia” metropolis by strolling paths (jogging, Nordic-walking, cross-country skiing in winter), cycling paths, horse-back riding paths and the route for dog runs. It is very intensely used for recreational purposes.



Fig. 6. The Valley of Three Ponds (Source: Author)

3. **The Dąbrowa Górnicza Lake District** is the complex of 4 lakes called “Pogoria” (numbered I,II, III and IV), on the northern-eastern outskirts of the “Silesia” metropolis in the city of Dąbrowa Górnicza (about 130,000 inhabitants). The lakes in fact are relicts from the industrial past of the region. They are the water reservoirs formed on flooded former sand excavation hollows. Excavations after open-cast-mining of sand are a specific form of devastation of the industrial area. Sandy bottoms and possibility to form water reservoirs made new opportunities, mainly for recreational purposes. Changed into a lake district, it completely altered the former landscape. Each of the 4 reservoirs “Pogoria” offers different type of attraction for recreation:

- “Pogoria I” (75 hectares of the water area with max. deep 11 meters) is surrounded by well-developed accommodation (hotels, hostels and clubs);
- “Pogoria II” (25 hectares of the water area with max. deep 2.5 meters) is mainly for nature lovers and anglers. It is a part of the wider ecological area established on the surface of the 40 hectares in the year 2002. Swimming and sailing is forbidden there;
- “Pogoria III” (205 hectares of the water area with max. deep 18 meters) is mainly a “silence zone” dedicated to sailing, windsurfing, bathing beach and cycling around;
- “Pogoria IV” (560 hectares of the water area with max. deep 23 meters) is in preparation. It will be the lake 8 kilometers long and 3 kilometers wide, offering many opportunities for recreational purposes.



Fig. 7. The Dąbrowa Górnicza Lake District in June 2012 (Source: Author)

Historic background

Many recreational centres of the “Silesia” metropolis, like “Pogoria” for example, were established in the 1960’s as a response to the common need to improve the living condition in this so much polluted and devastated industrial region. In that time there was also an idea to take all these recreational centers in one spatial system. The name of this system was “The Green Protective Belt”. The idea of this concept initiated in 1968 (probably based on the British model), was to take about 80 recreational centers in the system within the radius of 30 kilometers from the most urbanized areas. The basic functions of this system were protective and health functions as well as recreational functions. In general, “The Green Protective Belt” was a pattern of a complex approach to recreational functions for the cities inhabitants and revitalization of the post-industrial forms for natural and recreational functions. There was not enough willpower to continue this project in the next decades. This brave idea was repeated 50 years later in “The Concept of The Spatial Development of Poland – 2030”, approved by the Polish central government in December 2011. In this policy document it was stated that establishing green belts of the metropolitan or regional centres is obligatory. It means it was possible to learn from the past and that some experiences of the “Silesia” metropolis could be used as a model for the other metropolitan or regional centres in Poland.

Challenges

A challenge means a care of future. The problem is that there is not only one future but there are possible many futures. Mixture of different factors (social, economic, political, cultural) can cause different results in the land use, different impact on the ratio of urbanized areas to the green areas, and in the end quite different impact on the living conditions and the quality of our lives. Should we wait for what fate will put or should we try to produce desired effects? Thinking forward into the future with some hope in the possible ability of collective action to produce better conditions in the “Silesia” metropolis, it is necessary to resist pressures (mixture of different factors), which might reduce threats and enhance chances for better life. This is combined with the foresight of different scenarios of the future. Because it is possible to compare their influence on the ecological footprint and the quality of life (although it is not so simple as it may seem), it is also necessary to take into consideration the proper choice of actions oriented towards the desired future. The main question is: what should be done now for the future to be more friendly? It seems that the approach to environmental shaping should be:

- **More strategic (future orientated)**
- **More spatial (creating places in which people want to live in everyday life dimensions)**
- **More integrated (linking business, education and leisure).**

All it means the necessity of reform of spatial planning. Of course, it is easier to talk about it than implement anything, but acting more seriously towards better environment and better life should be our obligation. A part of it is correctly understood sense in people’s spatial decisions and the relationship between actions and their results. We must try to improve planning to make it more strategic, more spatial and more integrated than ever before .

Periurban Parks, Improving Environmental Conditions in Suburban Areas

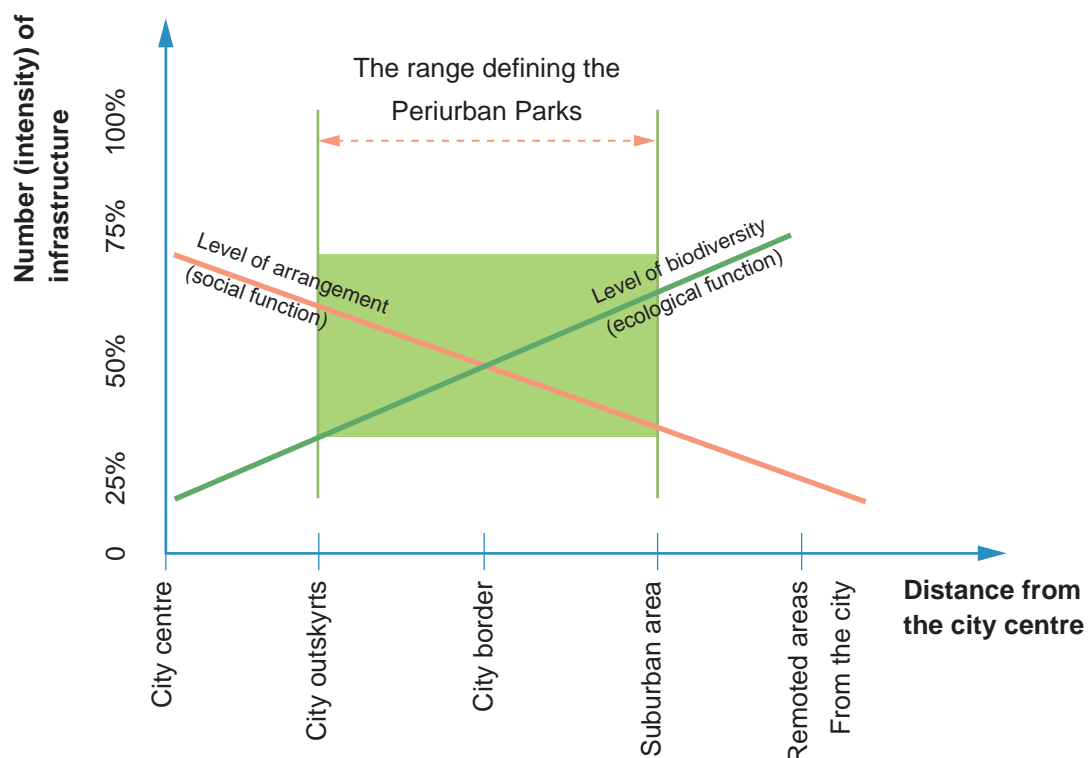
Maria Clelia Mele, Regione Toscana, leader

PERIURBAN is a regional initiative project, INTERREG IVC; which uses interregional exchange of experiences to improve policies on management of natural suburban areas. PERIURBAN focuses specifically on policy and management solutions to mitigate pressures on biodiversity. Focus on the creation and management of parks in natural suburban areas, in line with European environment policy and redevelopment in suburban areas, can impact positively on the environment and on halting biodiversity loss.

PERIURBAN brings together 14 partners from 11 EU countries. Partners all have experience in and competencies to manage suburban areas, but are at different stages in terms of developing periurban parks. While some have long promoted such parks, and currently face management and sustainability concerns, others plan for their implementation and build on different suburban management experiences. Thus, this group of partners representing regional authorities, local authorities, periurban parks and associations of parks, learn from each others' experiences in a continuous process of exchange.

www.periurbanparks.eu

Periurban spaces



Periurban spaces are transition spaces between the city and the countryside. They are located in the suburbs of urban areas or in spaces surrounded by urbanised areas with elevated concentration of man-made constructions.

Parks created in such areas have specific features and roles that distinguish them from other green/natural areas. These include:

- Distance from the urbanised area (at the core part of the city);
- The level of settlement arrangement and social function (settlement density, number of infrastructure, facilities for recreation, etc);
- The level of biodiversity (ecological values, the status of legal protection).

This is highlighted in figure 1, which presents a representation of this measurement:

Overall aim of the project

To reorient priorities of periurban parks and managing plans to deal with complex spaces that are natural or rather renaturalized areas, but can support local agricultural, as well as areas equipped for sport and recreation, restoration of monuments, the rediscovery of old roads and ancient traditions.

Create a shared vision of the meaning of an important green infrastructure as are Periurban Parks, to contrast different regulations in different countries and regions to assess in terms of time and cost how it is possible to create green connections and slow mobility, the awareness of its value to citizens through the development of educational and participatory management models.

The partners

1. Regione Toscana (IT) - Chef de file
2. FEDENATUR : European Federatio Natural & Rural, Metropolitan & Periurban spaces (ES)
3. Zografou Municipal Enterprise of Development (EL)
4. Aberdeen City Council (UK)
5. Vitosha Nature Park Directorate (BU)
6. The City of Košice (SK)
7. Regional Government of Lombardy (IT)
8. Danube-Ipoly National Park Directorate (HU)
9. Lille Metropolitan Natural Space Office (FR)
11. Czech University of Life Sciences Prague (CZ)
12. Regional Government of Andalusia (ES)
13. General Council of Seine-Saint-Denis (FR)
14. Lisbon Municipality (PT)
15. Metropolitan Association of Upper Silesia(PL)
16. Larnaca District Development Agency (CY)

Results

13 improved policies through analysis, exchange methodological work and action plans.

52 staff members with increased capacity (awareness, knowledge, skills);

4 millions of mainstream funds (Cohesion / FEDER / FSE) for pilot actions;

Long term cooperation among partners

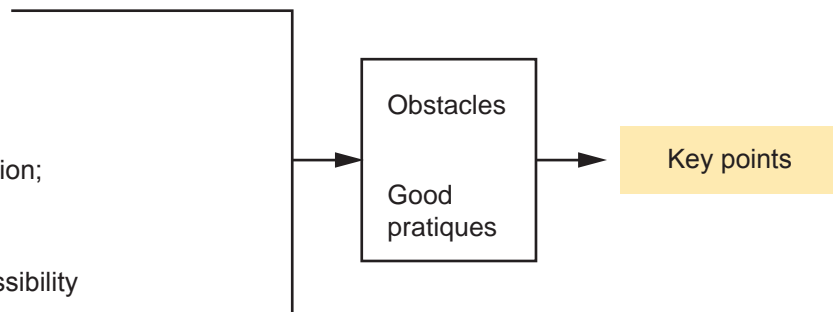
From international dialog to specific actions :

Periurban tool kit

1. Common methodology

7 thematic aspects

- Policy and Regulatory;
- Management;
- Environmental;
- Social and Communication;
- Cultural;
- Funding and Economic;
- Infrastructure and Accessibility



2. Interactive guide

Policy recommendations

- 1 Preserve natural and rural periurban areas as essential elements of the sustainable concept of a city and/or region and/or a metropolitan area
- 2 Integrate peri-urban spaces into spatial planning
- 3 Promote the creation of multifunctional peri-urban parks, capable of achieving ecological, social and economic objectives. Support and enhance existing peri-urban parks, and restore degraded ones
- 4 Put in place management structures, including constitution of a managing partnership or body and set up financial and legislative tools
- 5 Connect Periurban spaces with surrounding areas as a key part of a network of green infrastructure, to ensure that they are not islands in the metropolitan environment
- 6 Connect the Periurban park /space with urban areas to ensure accessibility for all members of the population
- 7 Promote a European periurban label that acknowledges the social, environmental and economic role of these Periurban parks/spaces in urban and metropolitan contexts.

Green Urbanism and Biophilic Cities

Timothy Beatley.
Teresa Heinz Professor of Sustainable Communities, Department of Urban and Environmental Planning, University of Virginia - School of Architecture

1.Green Urbanism

In this book it is presented a compilation of case studies written by planners and local experts in some of Europe's most innovative cities. Green Cities of Europe contains case studies of exemplary models of sustainability in urban design.

“Why study European Cities?”

There are six key components of sustainable design that has launched Europe years ahead of the rest of the world,(Fig 2) but the most important step is a shift in mindset. Times of economic hardship have lead many Americans to question the so-called ideal of “The American Dream”, defined by economic growth, personal wealth and complete independence. These traits have led to plundering the earth for resources and a complete disregard for future generations. Beatley believes a shift in mentality toward the new “European Dream” that emphasizes quality of life, sustainability and interdependence as the first key steps toward green urbanism. European cities take pride in the implementation of sustainable design practices, and cities that achieve high environmental standards are recognized and awards are given.

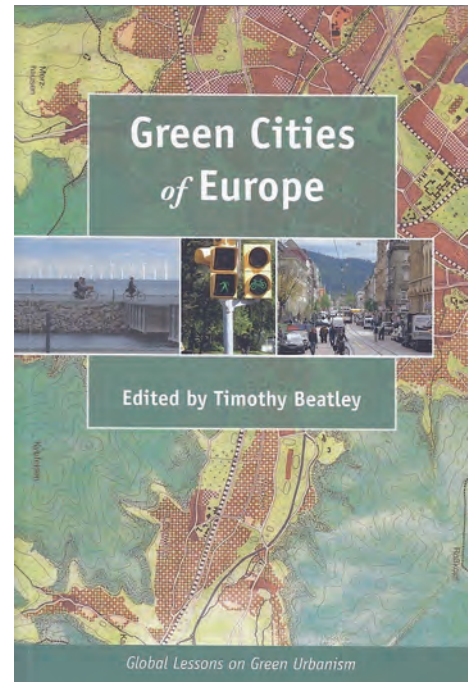


Fig.1 Green Urbanism Green Cities of Europe



Fig. 2

European innovations in sustainable mobility, walkability and bicycle infrastructure have been remarkable in the past few decades. High-speed rail systems, and comprehensive public transit systems are prominent and well utilized. The number of bike paths has multiplied ten fold in the past few years, and many streets in city centers have become pedestrian and bicycle thoroughfares. Cities such as Freiburg, Vienna, and Copenhagen have placed strong limitations on automotive traffic within the cities, at certain times restricting access all together.

Along with transit infrastructure, there is a discussion about the importance European cities place on easy access to green spaces and nature as an integral part of not only sustainable design, but also the emotional well being of many residents. In Stockholm alone, there are estimated to be over 1,000 urban parks and three large nature reserves, occupying nearly 40% of the land within the city.

Finally, there is a chapter on energy policy ideals that have become a necessary component in all European development policies. Switching to renewables has been at the forefront of all recent political campaigns and master plans for European cities. Policy makers are all aware of the need to move rapidly toward the development of a more sustainable energy source before the end of oil, and before global warming has catastrophic effects on the globe.



Fig. 3

2. Biophilic cities

We need nature in our lives more than ever today, and as more of us are living in cities it must be urban nature. Biophilic Cities are cities that contain abundant nature; they are cities that care about, seek to protect, restore and grow this nature, and that strive to foster deep connections and daily contact with the natural world. Nature is not something optional, but absolutely essential to living a happy, healthy and meaningful life.

Biophilic Cities: What Are They?

To what extent can cities and urbanized regions be said to be natural, and to provide the basic conditions for urban citizens to live a life in close contact with nature? Harvard biologist E.O. Wilson popularized the concept of biophilia. By this he meant that humans have co-evolved with nature, that we carry with us an ancient brain that needs and is deeply referential of nature and other forms of life. More specifically, Wilson describes biophilia as “the innately emotional affiliation of human beings to other living organisms. Innate means hereditary and hence part of ultimate human nature”. To Wilson, biophilia is really a “complex of learning rules” developed over thousands of years of evolution and human--environment interaction. That we need nature in

our lives is abundantly clear and the empirical evidence continues to mount. We are happiest, emotionally (and physically) healthiest, and most productive when working and living in close proximity to nature. Urban buildings that are green and natural create the conditions for more productive work, and in the case of hospitals and health care facilities the conditions for maximal healing. Schools that are awash in natural daylight are environments in which students excel and test scores show definitely this benefit. The evidence also shows that there are many ways in which urban environments can provide that access to nature, and many different forms that nature can take. It is having access to parks and natural areas close by to visit and use and trails to visit and walk along, but it is also the views of nature that we sometimes don't even pay attention to but that in innumerable ways provide visual access to nature. The nature in cities is both big and small, and varied in quality. It might take the form of a small neighborhood park, a green rooftop or vegetative wall, or a large block of forested land at city's edge. And it is also the many animals that occupy urban spaces, from birds and bats, to the invertebrates in urban soil, to larger species sometimes wolves and coyotes that frequent spaces at the edges of cities and towns. It remains an open question as to the mix of different kinds of nature, and nature experiences, that urbanites need, though clearly a diversity of opportunities is desirable.

Urbanists and city planners have special opportunities and unique obligations to advance biophilic city design, utilizing a variety of strategies and tools, applied on a number of geographical and administrative scales. The agenda is one that must extend beyond conventional urban parks, and beyond building--centric green design. It is about redefining the very essence of cities as places of wildness and of restorative nature, from rooftops to roadways to riverfronts. It is about understanding cities as places that already harbor much nature and places that can become, through bold vision and persistent practice, even greener and richer in the nature they contain.

A biophilic city is certainly partly defined by the qualities and biodiversity present and designed--into urban life, but also the many activities and lifestyle choices and patterns, the many opportunities residents have to learn about and be engaged directly in nature, and the local institutions and commitments expressed, for instance, in local government budgets and policies. What a biophilic city is or could be is an open question. As a tentative starting point I offer some of the following as key qualities of biophilic cities:

- Biophilic cities are cities of abundant nature in close proximity to large numbers of urbanites; biophilic cities are biodiverse cities, that value, protect and actively restore this biodiversity; biophilic cities are green and growing (biologically, that is) cities, organic and natureful;
- In biophilic cities, residents feel a deep affinity with the unique flora, fauna and fungi found there, and with the climate, topography, and other special qualities of place and environment that serve to define the urban home; In biophilic cities citizens can easily recognize common species of trees, flowers, insects and birds (and in turn care deeply about them);
- Biophilic cities are cities that provide abundant opportunities to be outside and to enjoy nature through strolling, hiking, bicycling, exploring; biophilic cities nudge us to spend more time amongst the trees, birds and sunlight.
- Biophilic cities are rich multisensory environments, where the sounds of nature (and other sensory experiences) are as appreciated as much as the visual or ocular experience; biophilic cities celebrate natural forms, shapes, and materials;
- Biophilic cities place importance on education about nature and biodiversity, and on providing many and varied opportunities to learn about and directly experience nature; In biophilic cities there are many opportunities to join with others in learning about, enjoying, deeply connecting with, and helping to steward over nature, whether through a nature club, organized hikes, camping in city parks, or volunteering for nature restoration projects.
- Biophilic cities invest in the social and physical infrastructure that helps to bring urbanites in closer connection and understanding of nature, whether through natural history museums, wildlife centers, school--based nature initiatives, or parks and recreation programs and projects, among many others;
- Biophilic cities are globally responsible cities that recognize the importance of actions to limit the impact of resource use on nature and biodiversity beyond their urban borders; biophilic cities take steps to actively support the conservation global nature.