A STRATEGY FOR BIODIVERSITY, THE LISBON CASE

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The municipality of Lisbon, with a population of 500 000 inhabitants, constitutes the core of the Lisbon's metropolitan urban area, which has about 2.5 million inhabitants.

In spite of the strong urban characteristics, the existence, in Lisbon's municipality, of a large forest park (1000 ha) and numerous others parks, gardens, street trees as well as the remnants of old farms and the fact that the city abut with the Tagus river estuary (the longest river in Iberian Peninsula), enables the occurrence of a relatively high diversity in ecosystems, flora and fauna.

Lisbon has a strong ethical responsibility as one of the ratifying councils of the "Local Agenda XXI" and as well as the host city of Lisbon's Charter for sustainable cities (Lisbon Action Plan 1996). Because of that Lisbon has the obligation to have a strategy of sustainable management, as well as a Local Agenda XXI.

Not losing sight of the objective of the Convention on Biological Diversity (CBD); the protection of native (or indigenous) biodiversity, the genetic heritage of the collections of exotic plants existing in numerous botanical gardens and the bias introduced in the landscape heritage by the presence of some of these elements, means to the city (and particularly to the city of Lisbon) an added value.

It was in such a context that, during the International Year of Biodiversity, Lisbon's City Council, in partnership with the Municipal Agency of Energy and Environment - Lisboa E-Nova, and the Institute for Nature Conservation and Biodiversity, with the financial support of EDP Foundation – Energia de Portugal S.A. as well as SIMTEJO – Saneamento Integrado dos Municipios do Tejo e Trancão S.A., took an ambitious and pioneering challenge: to increase the Urban Biodiversity by 20% until 2020.

Thus, it had been signed a Protocol of Cooperation and it was created a "Task Force" including representatives of these institutions and experts from Lisbon's University Faculty of Science, who were especially invited to join the group, which in turn produced a characterization of the starting status, in order to assess the target set for 2020.

In what concerns Portugal, Lisbon was a pioneer in establishing goals and strategies relevant to this field. Set out in Lisbon's Strategic Charter 2010/2024 and in the Council Green Plan, the Biodiversity Project Lisbon 2020 Lisbon still fits in the premises of the International Convention on Biological Diversity (CBD) and under the mechanism adopted at the 10th Conference of the Parties to the CBD the Action Plan for Cities, Local Authorities and Biodiversity 2011/2020.

The book BIODIVERSITY IN THE CITY OF LISBON, A STRATEGY FOR 2020 was edited in early 2013 and systematizes and integrates the multiple components of biodiversity in Lisbon, giving ground to the assumptions set forth in the former Protocol.

In territorial terms, due to the political and administrative framework, the Protocol will apply only to the city of Lisbon and the surrounding areas without local administration.

However, the highlight was the recognition of the importance of the urban biodiversity assessment at the Lisbon Metropolitan Area, and the Matrix of Indicators established in this field, which can work as a basis for a future application to other territorial and administrative levels.

In Lisbon we propose an adaptation of the Singaporean Matrix, taking into account our particularities. The city of Lisbon is on the border between the Mediterranean and the Atlantic, and between Africa and Eurasia, what enhances its natural biodiversity.

The natural landscape where Lisbon is settled congregates characteristics (especially the low temperature range) that make us believe that it will probably be one of the places with higher biodiversity potential in Europe.

In its outskirts, it has several areas managed under a nature conservation scope, giving it a unique value in the context of others European capitals.

Being a border ecosystem, Lisbon also holds some of the characteristics of its surrounding areas. It presents both the biodiversity of these areas and the one that result from the migratory species in their journeys, stopping and allowing more or less casual observations. In addition to this privileged situation, Lisbon was the receiving site of numerous plant species, from the most remote areas, many of which have become true *ex-libris* of the city. In part this was due to the romantic philosophy of the returning back to the wild, the nineteenth-century Naturalism and naturalist collector's approach which was dominant during the reconstruction of the city after the 1755 earthquake.

Lisbon has several botanical gardens and the old gardens also work as botanical gardens due to the diversity of exotic species occurring.

From another and broader perspective, Lisbon also has two Germoplasm facilities (Faculty of Science and Institute of Agronomy).

In terms of fauna the existence of a zoo is important too. Opened in 1884, it was the first park with fauna and flora of the Iberian Peninsula, consisting of numerous exotic species, mainly from Africa and Brazil, and it is currently one of the most extensive and diverse collections of animals (more than 360 species).

In Lisbon, Monsanto Forest Park has been purposefully managed towards naturalization. In fact, this management experience pointed that the correct land use procedures can contribute as a catalyst to the success following a development near to the primary natural sequences. However, these naturalized structures are not assumed as natural because they really result of a significant human intervention, in spite of the resemblance of the final results. This perspective reflects an internationally accepted concept that conservation is not an act of mere protection but rather a management process adapted to each specific case.

So, taking into account the available data on biodiversity and the elements already included in Lisbon's Master Plan in place, the proposed indicators reflect:

- The Ecosystem diversity: typology of land use (baseline);
- Listing of plant and animal species: namely vascular plants, fungi, mammals, birds, reptiles, amphibians, butterflies, fish, benthonic macro-invertebrates; (compiled for the period 2005-2010 and include native and exotic species);
- Places with notable features on biodiversity: either by their wealth or by the risk of losing their value;
- Land use types interesting for biodiversity: typologies of traditional use, where changes can lead to loss of biodiversity that close;
- Individuals or groups of individuals with a special interest and areas of protection: some plants (isolated or together) have, or are likely to possess protective statutes, through its classification of public interest, (Phytomonuments);
- Ecological Structure of the Municipality: from Lisbon's Master Plan, critical areas critical on sustainable development approach, which include the improvement of the quality of life of populations (which highlights the protection from natural hazards) the increasing of biodiversity values and the protection of natural, cultural, agricultural and forestry areas in the municipality, in the context of biodiversity, this proposal includes the increase of naturalized areas as well as their connection to the green corridors of the surrounding municipalities .

In Lisbon, the main task should be the development of a set of procedures, initiatives and projects between 2010 and 2020, which will focus specifically on:

a) increased the area of public green spaces through detailed Urbanization Plans and increased the green spaces area above the minimum defined in the Lisbon Master Plan (LMP) ;
b) implementation of the physical connection between the public green spaces and elimination of physical obstacles to such connections through a spatial organization in Detailed Urbanization Plans acting in the area of the structural corridors defined in the LMP. This can be reached through the implementation of new green spaces, urban open grounds, tree alignments, footpaths, cycle paths and other grounds of soft mobility (dedicated corridors for public transport corridors and trails of low speed);
c) increase the number of green spaces and area covered by their projects installed without watering systems and with dominance of indigenous species from the region and / or relevant to the growth of indigenous fauna in the city;
d) improvement of the green spaces in terms of structural and floristic diversity;
e) increase in area of protected forests;
f) increasing the number of retention/infiltration basins installed;
g) increase the total length of naturalised water courses;
h) increased of areas with gardens;
i) return to nature of watercourses and waterfront of the Tagus estuary;
j) return to nature of private and public places;
k) monitoring of the tendencies of the number of plants and animal species from preselected groups occurring in Lisbon;
l) conservation of natural areas (such as riparian ecosystems) and biotic monitoring of these ecotopes;
m) increased the awareness of all ages towards biodiversity, increasing advocacy for biodiversity, habitats and the quality of the environment in general, through behaviours reflecting environmental education for sustainable development;
n) establish paths, panels and edited information about hotspots and other values of biodiversity in Lisbon.
o) consider the biodiversity component in the management and governance of the municipality.

The Biodiversity Strategy in the Lisbon's Municipality is mainly based on:

- The knowledge of the biodiversity status is based on the matrix of indicators of Singapore, approved in 2010 in Nagoya, which enable to compare several cities including those which are currently the models for this methodology;
- The monitoring of the ecosystems characteristic in terms of flora and fauna biodiversity;
- The establishment of a Municipal Ecological Structure (MEE) within the city planning instruments, (Master Plan and Detail Urbanization Plans). Both the EEM, the mapping of environmental conditions and of natural hazards, integrates the Lisbon's Spatial Plan;

- The recognition that environmental issues do not recognize administrative boundaries and so a closer look at the biodiversity status will, in future, integrate the Lisbon Metropolitan Area. Ecosystems are always open systems;
- Increasing structural and floristic composition of green spaces and benefiting the connection between them.

These procedures should be implemented in the short term based on a Local Action Plan to be implemented by Lisbon's Municipality, involving, through protocols, a large number of entities with an interest in biodiversity and ecosystem services.