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**Zaragoza Life Project: Creation, management and promotion of Green Infrastructure of Zaragoza (Spain). LIFE12 ENV/ES/000567**

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**Introduction**

The City Hall of Zaragoza turned out to be beneficiary in the year 2012 of a European LIFE project called Life Zaragoza Natural.

The general objective of the project is to protect, enhance, value, know and bring the Green Infrastructure (GI) of Zaragoza to the attention of the public, which includes Natura 2000 spaces (Sites of Community Importance (SCIs) and Special Protection Areas (SPAs)) as well as the Green Belt and other natural spaces of municipal interest to be considered of great uniqueness on European scale due to both its contiguity and proximity to a large city and its extraordinary state of conservation.

This main objective is considered as a continuation of biodiversity management and environmental improvement policies held by Zaragoza City Council. It is considered as an opportunity for employment (according to "green economy" guidelines and the current economic crisis).

Zaragoza is one of the largest municipal districts of Spain (nearly 1.000 Km<sup>2</sup>) Its peculiar location characterized by the passage of three rivers in a semi-desert area provides the existence of exceptional natural heritage, with the coexistence of multiple landscapes. The biodiversity of approximately 40% of the municipal area is important to be preserved and is therefore protected both on Europe level, Natura 2000, and on national level.

In addition, Zaragoza has an extensive network of parks, gardens and green areas which has taken a quantum and qualitative leap in the last decade in their green areas from having 3.200.000m<sup>2</sup> to having over 8.270.000m<sup>2</sup>.

Meanwhile, the General Urban Management Plan of Zaragoza establishes a classification system based on soil classification techniques (urban land, building land and undeveloped land) and rating as well as the regulation of uses, conditions for the protection and management of undeveloped land, generic or special. This is the first of instruments for the protection of natural values of the municipality. 52.000 hectares are urban protected as special undeveloped land.

Zaragoza structures its natural wealth around three elements:

1. The Blue Matrix: The Ebro river and its tributaries the Gállego river and the Huerva river (57 km), wetlands, ponds, ravines, irrigation canals (87 km) and channels (Canal Imperial de Aragón: 53 Km).
2. The Green Matrix: Natura 2000, unique spaces and green urban scene. The surface of forest areas with natural vegetation and open spaces represent 43.55% of the surface in the municipality.
3. The connection networks: the green belt of Zaragoza, the rural road network

This natural wealth is even greater when considering its existence at the gates of a large European city of 700.000 inhabitants.

In today's cities, natural spaces are part of the suburban environment, subject to a number of problems such as fragmentation, loss of connectivity, presence of invasive species of flora and fauna, speculative urban development pressure or loss of traditional uses of soil (simplification of agricultural land and loss of the traditional vegetable garden).

A general degradation accompanying peri-urban areas, converted into the sump of the negative externalities of urban metabolism: dumping sites, extraction of aggregates, erosion and deforestation.

Zaragoza is no exception to this general trend, the natural environment has undergone significant attacks over the years, and also by its physical characteristics (climate, soil) it is particularly sensitive to the loss of soil and biodiversity associated with climate change.

Finally, but very important, the other major problem affecting natural areas in Zaragoza is the ignorance or disregard the Zaragoza citizens feel towards the environment that surrounds them.

### **Background/Literature Review**

Although the idea of the Green Infrastructure is gaining importance and a special feature early in the twenty-first century, this structuring and integrating vision had already precedents of great interest in the early twentieth century, when landscape architect Frederick Law Olmsted, creator of the Central Park project for the city of New York, said (1903): *"regardless the size or design of a park, this by itself cannot provide the benefits given by nature as a whole to the population, for which a system of interconnected parks around the neighbourhoods should be thought of."* (Benedict and McMahon, 2006)

Temporarily, there is a plurality of definitions of the concept of the GI that have been developed in recent years. More recently, this concept has been promoted by the European Commission as the evidence of the declaration of Natura 2000 protection is not sufficient to guarantee the conservation of natural areas and European biodiversity, thus making it necessary to act on the whole itself and ensure connection between the spaces.

However, the concept and the associated strategies are, in fact, still in the process of defining and developing. Existing experiences focus on specific aspects of the functioning of the Green Infrastructure and specifically, the Life Building up Europe's Green Infrastructure (European Commission, 2010) shows projects that focus on the connection between habitats, between species, restoration, adaptation to climate change, and integration into spatial planning.

Most recently in Spain, Law 42/2007 Natural Heritage and Biodiversity, legally regulates the concept of the GI and establishes, in order to ensure ecological connectivity and restoration of Spanish territory, a mandate for developing a State Strategy of the Green Infrastructure within three years.

### Goals and objectives

The main objectives of the project can be summarized as follows:

- **Provide Legal and Nature Protection** to Zaragoza's GI.
- **Enhancement of its Environmental Status**, through specific and demonstrative interventions, as well as technical projects.
- **Enhancement of its Connectivity and Coherence** through the green matrix and the blue matrix, both within and outside the urban centre, and between them, taking advantage of the Green Belts as ecological corridors.
- **Increasing the Knowledge Scale** and improving the appreciation of the natural areas surrounding Zaragoza on behalf of the citizens of Zaragoza.
- **Transforming the surroundings of Zaragoza in a tourist resource**, under the European environmental policy so as to promote "green economy", and quality tourism.

### Method

The European project addresses the achievement of its goals and objectives through a scheme of work that necessarily starts from the definition of the GI of Zaragoza, essential core of the initiative, and simultaneously addresses both urban planning actions such as improvement of the knowledge basis of the elements that structure the green and blue matrices and demonstrative actions of intervention, both space restore as improved connectivity.

Finally, a series of cross-cutting actions concerning dissemination, communication, education and tourist resources assemble the project around three guiding principles of the policy of sustainability: environment, society and economy.

The actions of the project can be summarized as follows:

- **Administrative and legal actions** aimed to legally protect the GI of Zaragoza (up to now non-existing as such and unrelated).
- **Territorial custody actions.** Network creation processes of territorial custody, in line with the existing ones in other European places.
- **Green employment promotion actions.** Specific activities to value the cultural heritage and development of the promotion and action plan aimed to nature tourism.
- **Connectivity enhancement actions.** These actions will include signposting of paths and tracks between the SCIs and wetlands, as well as river corridors to connectivity of the intra- and extra-urban green infrastructures through signalisation and recovery of paths and tracks.
- **Enhancement actions of good environment status.** These actions will include **different documents as environmental studies** that allows to increase the knowledge base of the very GI elements, forest **management plans** or highly demonstrative actions to enhance forest biodiversity and to give support to conservation of steppe fauna

## Results

The main expected results of the project can be summarised in:

- All GI and steppes of Zaragoza will be protected against new urban planning.
- Restoration of eight natural areas (24 hectares), including the Gallego river course, the Huerva river course, the steppe biome, the Torrero Hills.
- Refurbishment and signposting of 59 kilometres of tracks in the green rings, 8 of them inside the urban centre connecting the city parks, and giving coherence to the natural spaces of Zaragoza.
- Territorial custody agreements with farmers for over 3.000 hectares.
- Printing 25.000 leaflets and guides to promote the natural heritage
- Attendance to at least three specialised fairs so as to generate a new kind of tourism in the city.
- The citizens of Zaragoza will know and appreciate its singularities and values of its natural heritage by means of conferences, guided visits, fairs, exhibitions, books, and contests...
- The experience will be shared with other European cities.

As an example, the impact of the Life actions will suppose, according to the indicators of the Local Agenda 21 Zaragoza, that the network of corridors for public use estimated at a total of 301.38 km will be increased by 59 km, that's to say, an increase of 16%.

Two urban green areas in an area of 21,050 m<sup>2</sup> are also rehabilitated and brought in connection, and a natural area is restored putting a river stretch of the river Gállego of 95,300 m<sup>2</sup> in connectivity.

Also, the project will contribute to climate change mitigation. A minimum of 5.683 Tons of CO<sub>2</sub>, the amount of regenerated/restored hectares, will be fixed along the project life, due to new tree plantations.

## Discussion

The Life Natural Zaragoza was designed with the intention of promoting a new comprehensive environmental management tool in the context of spatial planning, an action which is the cornerstone of the European project.

One of the first challenges was, given the lack of definition of the Green Infrastructure which is still currently being produced, designing an executive instrument, in accordance and integrated with policies of urban and regional planning in Zaragoza.

The territorial peculiarity of Zaragoza, with a model of compact city whose metropolis only represents 9% of the municipal area, incorporates a first degree of difficulty when addressing the planning of the Green Infrastructure: the scale of work. It has a vast and plural natural heritage that goes far beyond the traditional scope of urban planning.

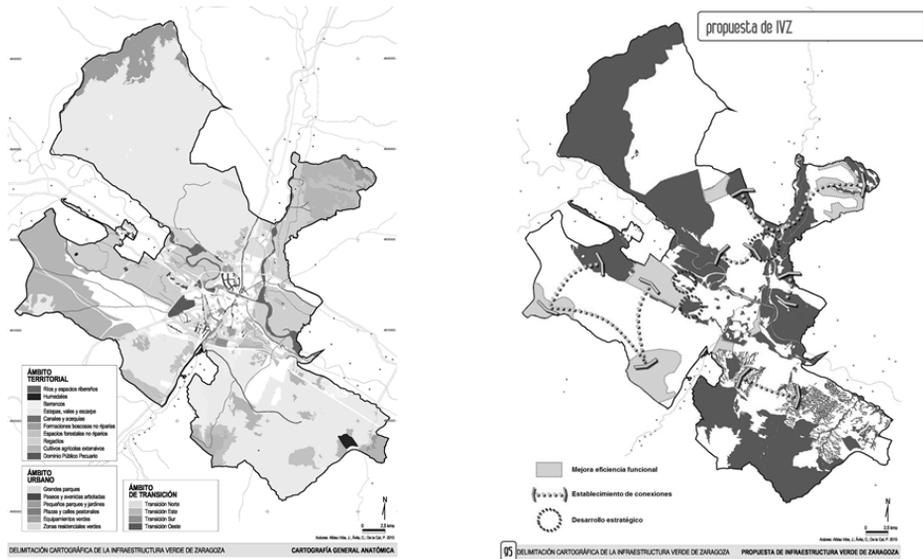
Furthermore, interfaces between city and country should be solved efficiently, generating mixed brinks of contact between the agricultural-natural connection and the urban one, considering as well that such transition zones in the outskirts of the consolidated city are intended for urban development housing and its viability compromised by the real estate recession. In most cases, they are subject to environmental degradation processes.

Within the framework of the European project, a multidisciplinary team has established a first reference document which, using a GIS, creates a mapping tool of element definition of the GI of Zaragoza in three different areas: territorial, transition and urban. Although this tool proposes a methodology for qualitative assessment of the GI, we must work on a second phase of approach to the establishment of an objective and quantitative procedure which considers, among others, the ecosystem services.

With regard to planning and legal measures of the project, we must resolve and agree with the municipal planning how the GI is integrated into the General

Urban Management Plan of Zaragoza. In any case, we start from the figures of protection already provided in the current planning facilitating the political and social consensus.

In parallel, work enforceability of improving and restoring the connectivity of spaces is developed, which is based in most cases on studies and existing projects thus facilitating our selection of the areas of intervention and techniques to be used.



**Figure 1 and 2. Map of Ecosystems and proposal of the GI of Zaragoza**

Finally, dissemination measures and job creation within the framework of green or environmental tourism are being developed with greater intensity in the last implementation period of the project through education and communication activities towards different social sectors: schoolchildren, young people, the elderly and entrepreneurs, in addition to involving tourism services of the municipalities in promoting the GI of Zaragoza.

## Conclusion

The European Project Life Natural Zaragoza differs from other initiatives of definition and creation of GI because of the significant fact of having financial support from a European financial instrument.

However, the economic stimulus which supposes the European commitment to a project of these characteristics, in the case of Zaragoza, has highlighted the difficulties of solvency in its realisation, both economic and technical.

The project is ambitious and aims to not only identify and legally protect the GI of Zaragoza, but also accompany this planning challenge with numerous enforcement actions as well as working with the social and economic aspects of the proposal.

Zaragoza City Hall is no stranger to the general economic crisis, from which particularly the Spanish public sector suffers, with a progressive loss of not only economic resources, but also material and human resources. Therefore, undertaking a project of this magnitude becomes more than just a professional challenge.

Moreover, given the still limited practical experience in the management of GI, the European project submitted to the European Commission in 2012 possibly should have been focused almost exclusively on developing the work of defining and creating the GI of Zaragoza, leaving its development and practical realisation to posterior implementation phases.

However, it should not be forgotten that this initiative represents a turning point and development in the municipal environmental and spatial planning, which will establish the work basis and the criteria of the policies and challenges to undertake in a near future.

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