SECTOR DIALOGUES EUROPEAN UNION BRAZIL

POLICIES, INSTRUMENTS, AND EXPERIENCES WITH URBAN ENVIRONMENTAL MANAGEMENT IN **BRAZIL** AND IN THE **EUROPEAN UNION**

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European Union-Brazil Sector Dialogues Support Facility

POLICIES, INSTRUMENTS, AND EXPERIENCES WITH URBAN ENVIRONMENTAL MANAGEMENT IN **BRAZIL** AND IN THE **EUROPEAN UNION**

The Brazilian experience across these cities: Teresina (Piauí), Extrema (Minas Gerais), Toledo (Paraná), Brotas (São Paulo), and Formigueiro (Rio Grande do Sul); and the European Union experience in: Ljubljana, Capital City of Slovenia; Vitoria-Gasteiz, Capital city of the Province of Álava, in Spain; and Copenhagen, Capital city of Denmark.

Brasília, May
2016.

Summary

The authors are solely, and fully responsible for the opinions featured herein, and do not necessarily represent the standpoints of the Brazilian Administration, and of the European Committee.

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Introduction

On its 8th Call, the Brazil - European Union (BR-EU) Sector Dialogues Support Facility – as to Action MMAA0013, features as one of its purposes to present successful public policies' experiences in the area of Urban Environmental Management in Brazil and in the European Union. This goal aims to establish parameters, or examples for the construction of public policies that the Ministry of the Environment (MMA), and the Ministry of the Cities[1] (MCidades) intend to undertake.

The examples featured herein have been chosen during the initial meeting held at the MMA premises. Attending said meeting were representatives from the Water resources and Urban Environment Office (SRHU) of the MMA, the Accessibility and Urban Programs National Office (SNAPU) of the MCidades, and Senior Experts – local and external - on urban and environmental planning, who have drafted this report.

To determine these examples, they

1. The urban environmental management is one of the possible action lines within the scope of the BR-EU Sector Dialogues Support Facility. The MCidades partners with the MMA in the MMAA0013 Action, but is not institutionally liable for the project.

chose 3 themes each city performed in urban environmental management, or at least endeavoured to improve the local (or municipal) environmental performance. Chosen themes were as follows:

- Water bodies referring to: lakes, lagoons, wetlands or lowlands, rivers and coastal zones, and the mechanisms adopted to protect them;
- The vegetative cover, which corresponds to forest areas and/or on a green surface, located within urban area, and urban sprawl of public or private property. The theme regards the types or forms of vegetation, either from natural or man-made origin that covers a certain area or plot of land, and that will also include green areas comprising arboreal zones, such as urban squares and parks;
- The environmental zoning (ZA) is a local planning instrument specifically focused on the environment. It provides a baseline, strategic goals, and a monitoring and assessment system. This consists in outlining environmental zones, assigning usages and compatible activities, in accordance with each ones' characteristics (potentials and restrictions), aimed at the sustainable use of the natural resources, and at the balance of the existing ecosystems. Therefore, this instrument is grounded on a meticulous and integrated analysis of the city or the metropolitan area, considering the impacts resulting from anthropic actions, as well as the environment support capability. In the Brazilian cases, the ZA is part of the National Policy for the Environment (1981), and of the Cities Statute (2001). In the latter, it stands as an urban policy instrument.

Particularly, three aspects were considered: (i) the existence of a regulatory framework enabling to ensure the perenniality of the investments made on the chosen themes; (ii) control mechanisms, and the social participation on the actions undertaken; and, (iii) mechanisms for monitoring and evaluating the policies and/or actions undertaken.

The Brazilian examples derive either from projects of the entire municipal area – one of the cases of the "Environmental Zoning" theme – or of part of the city, on the water bodies and vegetative cover themes. They were: (i) The North Lagoons Program, in Teresina/Piauí; (ii) The "Water Conservative" Project, in Extrema/Minas Gerais; (iii) The Environmental Preservation, and Urban Parks'[2] Implementation Program, in Toledo/Paraná; and, (iv) the Environmental Zonings, in Brotas/São Paulo, and in Formigueiro/Rio Grande do Sul.

2. The IDB (Inter-American Development Bank) funded the Program within the PROCIDADES (Pro-Cities) scope. The PROCIDADES is intended for medium-sized cities, and for regional Capital Cities with up to 2 million inhabitants. It emerged aiming at funding the social infrastructure planned across the respective Directive Plans.

In the Brazilian case, this report found relevant factors each analysed city worked on to provide a meaningful contribution to improve the environmental quality. The aforementioned factors will be introduced in specific chapters herein, and they are summarized in the Table below:

Table 1 - Brazilian cities and relevant urban environmental management factors

City	Relevant factors
Teresina, Piauí: North Lagoons Program	Regeneration of the area with low-income population facing major environmental problems; Control of the Parnaíba River floods; Valuing the urban space, and improving public spaces by the water.
Extrema, Minas Gerais: Water Farms	Control the urban sprawl and speculation (small ranch-houses for recreational purposes) and protection of the fountain-heads that supply São Paulo; Proposal for the maintenance of the Atlantic Forest area through environmental services' incentives; Design of projects for greenspaces with the participation of civil society.
Toledo, Paraná: Urban Parks Preservation Program	Control of the urban sprawl through green zones, and parks; Handling of the environmental preservation integrated to the urban planning; Valuing the central square of the city, as a contrasting element of the quality in urban spaces.
Brotas, São Paulo: Environmental Zoning	Protection of the natural resources of the city, aimed at the tourism development; Nurturing the economic development by valuing adventure-tourism initiatives; Capture external financial resources to fund the environmental protection.
Formigueiro, Rio Grande do Sul: Environmental Zoning	Identification of Permanent Preservation Areas (APP), and the environmental protection strategies; Identification of the environmental frailness and the intensity of rural land plots' usage; Participation of the State agency (SEMA - Secretaria do Meio Ambiente [Environment Office]) in the environmental zoning.

Source: Ribas, Otto (2016).

The criterion used to choose the European cities came from cities awarded with the EGCA (*European Green Capital Award*). The EGCA is a tool for policies that the European Committee adopts to tackle environmental issues across urban areas, which are numerous these days, in addition to planning and implementing solutions. Since two thirds of Europeans live in cities, Administrations and Local Authorities are strongly present in the citizens' lives. Therefore, it falls on them to offer the necessary commitment, and innovation to tackle, and solve many of those problems.

In the European case, the cities chosen were: (i) Vitoria-Gasteiz, which stands out for the management of the water bodies in that city; (ii) Ljubljana, with a keen interest on green zones' management; and, (iii) Copenhagen, which has a role-model for environmental zoning in place. Regarding this situation, this report found three relevant factors each analysed city worked on to provide a meaningful contribution to improve the environmental quality. The aforementioned factors will be introduced in specific chapters herein, and they are summarized in the Table below:

Table 2 - European cities and relevant urban environmental management factors

City	Relevant factors
Vitoria-Gasteiz, Spain: management of water bodies	Contact with Nature through a compact urban area; Recovery of lowlands or wetlands; Institutionalization of the environmental planning.
Ljubljana, Slovenia: green zones management	Creation of a system of greenspaces spread across the city; Holding the green areas in mind as an urban regeneration tool; Design of projects for greenspaces with the participation of civil society.
Copenhagen, Denmark: environmental zoning	Planning continuity through the "Finger Plan"* (metropolitan development plan); Participation of the country's Ministry of the Environment in the space occupancy planning; Alignment between the local plan and the "Finger Plan" priorities.

* The "Finger Plan" is an Urban Development Plan implemented by the Copenhagen (Denmark) local administration, started in 1947, aimed at controlling the metropolitan area growth of the town.

Source: Vaggione, Pablo (2015).

This Report has been split into two parts: the first one reports on the Brazilian examples, while the second one on the European Union's.

Finally, it is worth to emphasize that, in the MMAA0013 Action of the BR-EU Sector Dialogues Support Facility, given budgetary restrictions, there were no technical visits planned for the five Brazilian cities, whose experiences were studied. Consequently, it was not possible to inspect them *in loco*, get a *feedback* from the local administrations, nor make a deeper evaluation of the results obtained.

Part I
Successful cases in Brazil

1. The challenges to design an urban environmental management in Brazil

Brazilian urbanization efforts have been demanding from the parties – whose role lie on the social production of the space – the acquisition of new knowledge, perspectives, and practices matching the demands posed by the contemporary sociospatial dynamics, in addition to the need of connecting the different dimensions involved in the urban phenomenon.

The urbanization process has been featuring as a major challenge for the ideas surrounding the concept of sustainable development. This concept should not be taken as a final condition for the "ecological balance", but rather as a process: a transition for an increasing rationality, governed by a cultural project transcending the biophysical, economic, or political dimensions – regardless of involving all of them. (TUDELA, 1996)

Such challenge could translate into a major question: Is there a line of thinking defending the need to preserve natural resources, while keeping an open range of options for future generations – which has been defined as sustainable development – to absorb the urbanization, with a radical, and irreversible human interference on the natural landscape?

In the urban spatial management and planning field, if the question posed is pertinent, then, it is possible to identify the proper tools for a management that promotes an inclusive environmental dimension.

The current instruments, procedures, and practices adopted for the urban soil management in Brazil have been proving to be fragile in handling the urban environment problems. In many cases, that favours the depletion of natural resources, and the occurrence of informal occupancy structures, thus aggravating the urban population poverty conditions, while making public and private actions difficult, and causing diseconomies.

The defended measure is that, by understanding the environmental dimension of the urbanization process, it will be possible to organize the convergence among the available tools to unfold the effective urban environmental management.

1.1. Cross-disciplinary approach need for an actual urban environmental management

Understanding the urban environmental issues requires cross-disciplinary studies to connect different perspectives, aimed at obtaining an integrated knowledge on such complex problem. However, this is not a matter of learning new things, but rather to think differently about the problems identified, sharing specific concepts and methodologies so new concepts and methodologies – addressing the problems under a holistic view, can be built.

On this same line, there are trends of thought that seek to identify physical, and metaphysical implications in the nature transformation process by humans – which has invariably improved the criticism on the urbanization process. On the other hand, this rhetoric rarely translates into actual actions.

In turn, these aspects are also inherent to the sustainable development concept, which presupposes the need for a global view on the environmental issues analysis. As Tudela (1996) warned us, "the difficulty to translate the requirements – as derived from the need for an increasing rationality in the development processes – into clear workable terms has become an obstacle to the understanding on the sustainable development concept." As the author sees it, there is an emerging weariness resulting from the difficulty to incorporate a concept whose inclusion into the debate, and into practice has proven arduous.

Under these conditions, the analysis of the sustainability concept within the urban space requires a translation into practical terms, which recognizes that the incorporation of this concept into the urban environmental management will only occur from sector-specific clippings of reality.

The main axle of these clippings would lie between social practices, and the urban environment relation. That is, the major issue would be to identify what to protect it from, while defining what should remain, what is to be transformed, and the boundaries of

such transformation. In this case, one of the conditions for the concept to be applied would be a change to the conduct patterns – life style-related attitudes, consumption, and space usage, and occupancy. Finally, it would be necessary a transformation on the population's daily routine and conduct towards the environment.

The approaches on the urban environmental management should be grounded on the principle that it is, in essence, a strictly social matter, and, as such, it should be regarded, above all, as a political agreement, which addressees what should be maintained and what can be regarded as a variable. This is precisely why the participation of representatives from several disciplines is justifiable, so the environmental matter can be analysed in its entire diversity and complexity. As Raynaut, and Zanoni (1994) put it, "the necessary cooperation among disciplines gains density across the social practice, which is intended to intervene into reality, and challenge the complexity of the field where they operate".

Finally, the proposal of integration between the sustainability concept, and the social practices through a cross-disciplinary approach is a scientific challenge, which requires a diligent work in making questions, articulating concepts, and defining methodologies.

The Brazilian biomes' size and diversity; the level of resilience of the biodiversity; the vulnerability of the soil to erosion processes; the sensitivity of the superficial, and underground water bodies to contamination, among other aspects, cannot be considered as secondary elements of the urbanization process, nor as exclusively decisive. Between these two polarities, there certainly is room for action – a middle way, in which the management of the territory should balance losses and gains. For a sustainable development within the urban area to happen, it will be necessary to configure it as a social pact. In this pact, both environmental and social losses will be negotiated, and they will agree on agents, and their corresponding participation in the costs for the collective well-being.

The environmental management of the urban space will be performed based on the definition of policies, and instruments backed by the territory special features, by the social demands, and by the pacts agreed among the different social actors.

1.2. Evaluation of the urban management instruments in face of the challenge to build sustainability

The suitability of the normative, and legal basis supporting the urban management in Brazil is a key challenge in achieving the goal of a sustainable city. This includes the benefits' sharing, the direct and indirect costs generated by real estate agents, public and private institutions, and individuals, resulting from the urbanization process.

As to the urban policy – due to more pragmatic than ideological reasons, mostly resulting from the tax war, and from the frailness of the instruments, and actions in the housing field (sic), and in compliance with the demands from all sorts of urban infrastructure, the attention has been focusing on the institutional, and normative Framework, especially for the planning instruments, usage and control management of Brazilian urban soil. (World Bank, 1991)

The management of urban areas' land use, whose approach has been traditionally based on a long-term, finite plan that, once legally adopted, sets a detailed regulation system for usage and control, has served as base for the investments on urban infrastructure, and services of the public sector. The development model widely adopted in the post-war period is reflected in most emerging economies, i.e., the economic planning by the State[3].

Particularly, in Brazil, the conventional approach to planning has been proving inadequate to cope with the needs posed by the urban dynamics. Evidence of said inadequateness lies in that most of the urban growth has been taking place out of the planning game rules. The proliferation of informal business and residential developments prevail within urban areas. The informal settlements provide for their own needs of utilities (clandestine), and urban equipment to service the poorest families.

In some cities, Brazilian urban growth dynamics is beyond the grasp of any conventional planning actions one intends to undertake. Across border areas, for instance, the urban population growth index is impressive – even considering a dramatic reduction to the population growth index in the country. In some cities, or urban sprawls across Middle-West, and North Regions, the growth indexes still reach levels similar to the those from the 70's – when the country experienced the largest urbanization index in its history.

In face of these facts, there has been critics concerning the urban planning systems focused on physical-based land use plans. The successes, and failures achieved with similar planning serve as input to assess its rationality, and effectiveness. Such assessment

3. The economic planning by the State is that in which only the State elaborates plans for the economic activities' development. This includes, the urban development, the investments in infrastructure, etc. Starting in the 2000's, Brazil has been sharing this responsibility with the private sector through instruments as: concessions, public-private partnerships, outsourcing, consortium-based operations, among others.

becomes even more necessary and urgent due to the impacts of two worldwide trends: i) the adjustment of the urbanization standards to new sustainability concepts; and, ii) the resulting need for innovative policies and techniques in the urban planning process, involving all urban dimensions, and the different social strata.

The urban management derives from a technical benchmark to a realistic view, which can be viewed more like a process than as a State target activity. As cities expand, so do the complex relations between strictly urban activities, and other activities within their influence area. Therefore, it is necessary to have adequate policies, and techniques to manage the different dimensions of the urban phenomenon, which includes the relations between the activities, and the space.

1.3. Traditional urban management: approach, and limitations

In Brazil, there is an emerging critic towards the instruments for urban soil management, and the planning system pointing out to the absence of socio-economic, and environmental concerns in the elaboration of urban policies, as well as the cost-benefit evaluation of the approved interventions. In addition, the instruments are allegedly over-restrictive, and inflexible to cope with the urban dynamics.

Moreover, there is a broad perception, along with widespread arguments based on the evaluation of the effectiveness of conventional instruments for urban planning, which provide for the lack of adequate theoretical basis, and analysis methodologies to learn about the city upon elaboration of planning, and formulation, sizing, and application of their key instruments.

It is argued that the conventional planning – based on static and restrictive plans that do not cope with the social and economic dynamics of the city – becomes anachronistic, and neither reaches nor responds to the actual needs of the city and its population. Therefore, it should be subject to rewriting and improvement. (CLARK, 1994)

It has been noted that the regulations, involving standards of urban soil division into land plots, and of infrastructure, have not endeavoured to suit the socio-economic conditions of the population. Mostly, its definition is not based by the environmental conditions of the urbanization.

The main critics to the conventional urban planning process could be described as follows: (i) Centralization; (ii) excessive bureaucracy; (iii) shortfall; (iv) institutional fragmentation; and (v) lack of coordination with sectoral, socio-economic and financial strategies for urban and macroeconomic development.

Mostly, the planning has been under-valued, since it has been a useless exercise, irrelevant for the practical needs of urban managers, and citizens themselves. It is not by accident that the activity has been eliminated from the political agenda of governors, and from society for a long time. Its resumption has been occurring within another paradigm, as an attempt to mitigate these disadvantages.

Concerning the critics to the adopted models, the concept of planning, and management instruments for the urban soil is a key element for public policies' implementation. Without the proper cognisance of the future urban structure of the city, it is extremely difficult for decision-makers to choose what would be most effective in the funds allocation scale. Overall, the cost of wrong decisions on urban development is much higher than in any other area. This is especially due to its long-term nature, since the initial decisions cannot be quickly adjusted or corrected. Furthermore, decisions made at a later time, which could interact with the prior ones, could cause adverse effects.

Most studies concerning the urban theme have focused on critics to the negative environmental impacts from the conventional regulation of the urban land use and control. With a propositional approach, it has been essentially guided towards issues concerning urban poverty-related patterns, aimed at improving the life style conditions of the populations. Therefore, what can be verified is that the cognisance on sustainability, as stated in the arguments on the urban matter, has been taken by equality, and the democratic management. These are certainly essential aspects of the sustainability, but they do not fully expend it.

1.4. The urgency for urban environmental management

The rules guiding the actions for the new approaches take into account some principles upon defining the urban soil planning instruments and management, such as: equality, efficiency, and effectiveness, flexibility, and participation. These principles are the supporting base for the urban planning and management for the drafting of an urban environmental management[4].

Equality: This refers to the need of renewing the institutions, and reviewing

4. This is how the author sees it. However, it is worth pointing out that the MMA is elaborating the Federal Strategy for Urban Environmental Management.

the instruments, so its operation, and application does not contribute to the segregation of the poor urban population. Instead of having the law, and the management being used to support and maintain an urban system split between a legal, and an illegal city, they should be used to make it easier to integrate lower-income urban areas into the legal city.

Efficiency and **Effectiveness**: Involve the capability of administering, and applying the urban management instruments, and the public actions to reach the goals set by public policies; furthermore, it includes a cost-benefit relation. However, the costs of the system should not be allowed to grow at the same rate as the costs of the development control. On the contrary, they should be linked to easily identifiable benefits. The procedures should be simple, so they can be understood across the different segments, and performed within short-term, and without bureaucracy.

Flexibility: Refers to the capability of the institutions, and instruments to accommodate changes, and growth – two key characteristics of the urbanization process. The land use planning should be flexible, and adjustable – it should apply to urbanization alternatives (standards), and possible scenarios, instead of being restrictive like a strait jacket, and should act more like a strategic planning than as a directive plan. Flexibility encompasses innovation, and the efforts to encourage such innovation.

Participation: It is represented by the involvement of the organized civil society, and the production sector in the planning system, and in the urban environmental management. Participation encompasses the community qualification and self-confidence development, and requires a management system with clear instruments for each one of the targets of the urban environmental policy. It includes, in addition, transparency in the administration, since without transparency, and predictability, the population cannot plan for their own future.

In practical terms, however, there may have conflicts as to the announced principles. Equality, for instance, not always can be mediated with efficiency. On the other hand, conflict solution is a key part of the decision making process. The participation principle, in turn, requires a period of involvement that, at times, jeopardizes or delays the decision making (efficiency). Flexibility does not apply in areas with public interest for preservation – e.g., historical sites, and the full protection of Conservation Units (UC).

With these principles, the target to pursue in the urban environmental management lies in the improvement and development of instruments engaged in sustainability.

The different planning approaches, as mentioned above, more than discharging the instruments, have been adjusting, and adding new intervention tools, and regulation of the different dimensions of the urban phenomenon.

1.5. The Statute of the City: the instruments and how they apply to the urban environmental management

The Statute of the City (Federal Law no. 10.257/2001) is the most relevant law on urban matters in the Country. As a result, it encompasses a set of technical and social movement claims, aimed at controlling the urban soil, and setting a Legal Framework for conflicting issues across Brazilian urban areas. The general scope of the statute was structured in the 80's, and the strong connotation of the social aspects inclusion is identifiable, not only given to the management centralization that prevailed in the military administration, as well as to the low visibility of the environmental matter at the time. Since the law was only enacted in 2001, when the environmental theme became relevant, new specific guidelines, and instruments for the environmental management, e.g., risk-related articles, geological stability, and the support capacity.

This law determines that the urban policy is intended to rule on the full development of the social functions of the city, and of the urban property, through 16 general guidelines. It reaffirms the Administration Authority to define the urban policy. In its 2nd chapter, it determines the instruments of this policy for compliance with the established guidelines.

The urban policy general guidelines – particularly for the Municipalities, intend to set bounds for, and to prompt in the application of the urban policy instruments, as regulated by the law. The instruments mentioned in the law (existing or new ones) should be used to comply with the general guidelines established, as per the legal terms.

In the Statute, the Directive Plan (PD) is addressed as the central element of the urban policy – as far as it concerns the determination of its scope for the entire municipality (urban, and rural areas). Most of the proposed urbanistic instruments is conditioned to its prior elaboration, particularly those related to the social function of properties. The PD should identify the areas where the instruments will be applied, thus becoming part of the municipal planning process, which includes the Multiyear

Plan (PPA), the Budgetary Guidelines, and the Annual Budget.

The General Guidelines of the Statute provide a set of intentions. Among these intentions, and based on the analysis of convergence with the environmental management, it stands out the anticipation of hearings for the local authority, and for the population interested in the process to implement the developments or in the activities that might negatively affect natural or man-made environments. However, it does not clarifies the relevance, or the value of the hearings for the decision process. The innovation in the process lies in the participation of the population of interest. Then, they can start a political opposition to defend life quality standards in certain districts – in the cases exceeding the mere legal conditions of the development on the land plot, or on the tract.

From the numberless instruments proposed in the Statute, we list below those with potential to integrate the environmental dimension within the sphere of the local authority's urban management: (i) Directive Plan; (ii) Orderliness (enforced by law) of the land use, and occupancy partitioning; (iii) Environmental zoning; (iv) Administrative Servitudes; (v) Real-estate tax, including the yearly-increasing property tax; (vi) tax, and financial incentives, and benefits; (vii) Expropriation; (viii) Environmental licensing, and the Environmental Impact Analysis – also present in the environmental laws and regulations; (ix) Creation of Conservation Units – same as prior clause; (x) Pre-emption rights; (xi) Transfer of Development Rights (TDR); and (xii) Joint urban operations[5].

The better, or the worse usage of said instruments, will depend on the local laws and regulations, which may prevent constructions including solely private gains' interests, as obtained with the "loosening" of the quality standards for developments, and infrastructure. As comments Maricato (2001), the allocation of this provision has two paths:

"*In one hand, a meticulous legislation, preceding the Statute, has made the market for popular, and legal housing infeasible. In this sense, the process of regularization of the* "*favelas*" *(slums) and illegal occupations may represent some progress.* On the other hand, countless experiences based on the reduction of the parameters for the urbanistic, and building dimensions, and criteria resulted appalling – both in terms of economic efficiency, and for the social, and environmental protection interests."

5. Depending on the municipal regulation content, the Neighbourhood Impact Study could be represented by another instrument that may integrate the environmental scope.

It is worth mentioning, additionally, the importance of the instruments for institutional coordination, and social control introduced in the Statute, which can be implemented by an urban environmental management.

The institutional coordination instruments refer to the coordination of policies within national, regional, and local spheres, affecting specifically, the land use, and the development, in addition, to the support for low-income population, and for other vulnerable groups in town. With that in mind, those fitting into this category focus exclusively on the promotion of the sustainability in their social planning (right to housing, and access to land), that is to say: (i) free of charge technical and legal assistance for less privileged social groups; (ii) establishment of Special Zones of Social Interest (ZEIS); (iii) *usucapio* of urban properties; (iv) special usage grant for housing purposes; and, (v) land title regularization.

Concerning social control, the instruments refer to mechanisms allowing for the public participation, and the legitimation of the management actions, or in other words: (i) public policy joint committee agencies, within national, state, and local spheres; (ii) debates, public hearings and consultations; (iii) conferences on urban interest-related subjects across all three levels of the Administration; and, (iv) legislative bills and plans, and urban development projects arising out of popular initiatives. These instruments, planned in the aforementioned Statute, interact with the goals for the environmental quality improvement.

1.5.1. Improvement of the environmental quality across cities

The MMAA0013 Action aims to provide successful examples to help create strategic information for the decision making process that defines the urban environmental management.

In this process, the inclusion of the environmental dimension occurred through restrictive legal aspects that address some physical conditions – such as keeping the occupations at a distance from brooks, and lakes, and prohibiting settlements in land plots across steep slopes.

Therefore, we can verify that the instruments, procedures, and practices adopted for the urban soil management have been proving to be limited to handle the urban environment problems. In many cases, that favours the depletion of natural resources, and the occurrence of informal occupancy

structures, thus aggravating the urban population poverty conditions, while making public and private actions difficult, and causing diseconomies. In this context, it is essential to understand the environmental dimension of the urbanization process, in order to organize the convergence among the tools available to unfold the effective urban environmental management within the urban space. Thus, it has been observed that topics relating to equality, and the democratic management prevail in the urban sustainability speech. These are certainly essential aspects of the sustainability, but they do not fully expend it.

To build and improve the environmental quality of the urban space, the management should innovate in the implementation of said instruments. It can be verified, in addition, that several of the instruments featured herein have a high potential to introduce improvements in the environmental quality. Widening the application scope of some instruments, and restricting the implementation of others could help improve an effective urban environmental management. (Ribas, 2003).

2. Teresina - PI

2.1. Context

Estimated population: 844,245 inhabitants (2015, IBGE – Cities);

Municipality area: 1,391.98 km²;

GDP: R$ 14,803.00 million, and R$ 17,797.00 Brazilian reais per capita[6];

HDI: 0.751[7];

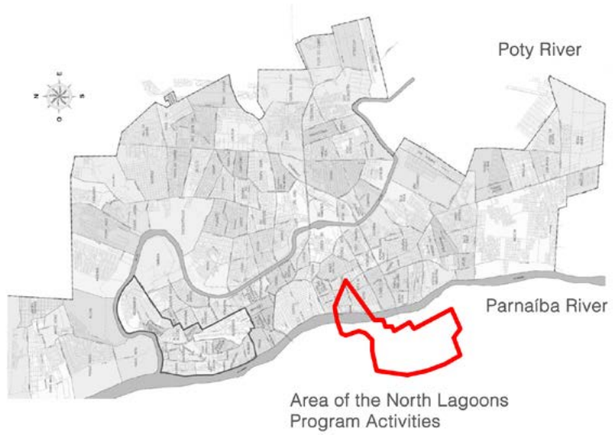
Territorial organization: The city is split into 4 Urban Development Supervisory Boards, each one comprising approximately 30 districts. The North Lagoons Program covers 13 of them[8].

Teresina, Capital city of the State of Piauí, has experienced a high population increase in the 70's, as a result of regional migrations.

Low-income population occupied mostly the North zone of the city, which comprises the lowland zones, and the natural lagoons[9].

With the urban settlement of the North zone, the region suffered a decline in terms of environmental and health quality, either as a result of the clay exploration for handicraft production (which resulted in the Lagoa dos Oleiros, for instance), or for the occupancy of the natural lagoons' banks, and launching of sewage *in natura*, and domestic waste into the water bodies.

Figure 1 – Teresina City, its districts, and the North Lagoons Program area



Source: Directive Plan of Teresina[10] (2006)

In 2004, the purpose of the Environmental Quality Improvement Program of Teresina – or the North Lagoons' Program, was to increase the environmental, urban, and socio-economic development conditions of the region known as the North Lagoons.

Prior to these interventions, the region used to be inhabited by a low-income population under precarious, and unhealthy conditions, having houses at permanent risk of flooding, and with no basic sanitation services.

After the irregular occupation, the region turned into a major environmental vulnerability context, caused by the following factors, together: (i) an outstanding dynamic of residues' disposal onto the fluvio-lacustrine plain; (ii) extensive flat floodplain area; permeable, arenaceous soils; (iv) large, shallow water bodies, interconnected by the system of lagoons. Today, there are 12 lagoons in different sizes and depth.

6. Source: IBGE – Cities, 2013.

7. Source: SEMPLAN, 2015, with 2010 information.

8. Districts in the North Lagoons Region: São Francisco, Mocambinho, Poti Velho, Olarias, Alto Alegre, Itaperu, Mafrense, São Joaquim, Nova Brasília, Aeroporto, Alvorada, Matadouro, and Acarape

9. Nowadays, over 150 thousand people live in the area. Source: RAA, 2013.

10. Also referred to as the Sustainable Development Plan of Teresina.

Figure 2 – Situation of the Lagoa do Jacaré before the Program implementation

Source: Teixeira, Marisa (2006). Environmental Evaluation Report.

Figure 3 – Start-up activities of collecting garbage disposed of into the lagoons

Source: Semplan, Teresina City Hall (2005).

Figure 4 – Occupation of the lagoons' banks prior to the North Lagoons Program

Source: Semplan, Teresina City Hall (2005).

The above-mentioned Program was conceived in 2004, and proposed a set of linked interventions. It performed the urban and environmental requalification of the area, comprising works like: (i) treatment of sewage and reinforcement of the water supply system; (ii) urban micro-drainage; (iii) urbanization of the lagoons'' banks; and, (iv) flood protection works.

In addition to the works, it endeavoured measures to strengthen community associations, and groups, improving the access of the families to childhood education, and to basic health services. It undertook measures that fostered job opportunities, income, and renovation works in shared facilities (school, health care units, and theatre).

At the time of the works, most of the lagoons were polluted. The disorderly occupation of the area reduced the system outlet capacity, thus resulting in a flood that dislodged approximately 2,000 families.

Figure 5 – 2004's Flooding of the area.

Source: Semplan, Teresina City Hall (2005).

The lagoons interfaced with one another through channels. During the rainy period, the water level was raised due to the argillaceous soil, tending to empty out through evaporation in the following months. When the lagoons were empty, the population would occupy part of the inundation band with precarious housing.

The factors considered as relevant to improve the urban environmental quality of the "North Lagoons" region were summarized into three aspects:

- Regeneration of the area with low-income population facing major environmental problems;
- Control of the Parnaíba River floods;
- Valuing the urban space, and improving public spaces by the water.

2.2. Relevant factors

2.2.1. Regeneration of the area with low-income population facing major environmental problems

The North Lagoons Program was designed in two parts. As can be seen in the Figure below, the 1st part (accomplished) promoted the urban regeneration, and the partial environmental requalification of the Lagoa Cabrinha, and Lagoa Lourival. The 2nd part is underway, and aims to extend the improvements, and the works to the entire North region, encompassing all of the lagoons, thus benefiting the inhabitants living under the most vulnerable economic conditions in the city[11].

11. The 2nd part of the North Lagoons Program had its loan approved by the Federal Administration in 2016, and the estimated term for conclusion is of 5 years, that is, in 2020. The loan was obtained before the World Bank, but should be approved by the International Affairs Office of the Ministry of Planning, Budget, and Management.

Figure 6 – Depolluting of the lagoons and partial urban and environmental requalification (Parnaíba River, in the back)

Source: Semplan, Teresina City Hall (2005).

These were the results from the 1st phase implementation: (i) de-polluting of 2 lagoons, recovery, and implementation of green areas; (ii) improvement to the population's self-steam, and optimistic perspectives for the future; (iii) creation of leisure-focused spaces, with the implementation of a linear park (postcard of the town); (iv) valuing of cultural spaces; (v) improvement to

vehicles' traffic flow, and construction of cycle lanes; (vi) appreciation of real estate property; (vii) small businesses, and corporate interests' uprising; (viii) improvement of water quality, and the return of wild fauna's species to the location.

A material fact to emphasize lies in that, before the program implementations, the residential plots had their back parts facing the lagoon, and after it, many houses had their main *façades* turned to the lagoons, and the public space was valued.

The institutional capabilities of Teresina City Hall have been improving to deal with themes of urban and environmental requalification, land title regularization, and families' resettling. This allowed the city hall to access funding before the Federal Administration for sanitation, macro-drainage, and housing programs

2.2.2. Control of the Parnaíba River floods

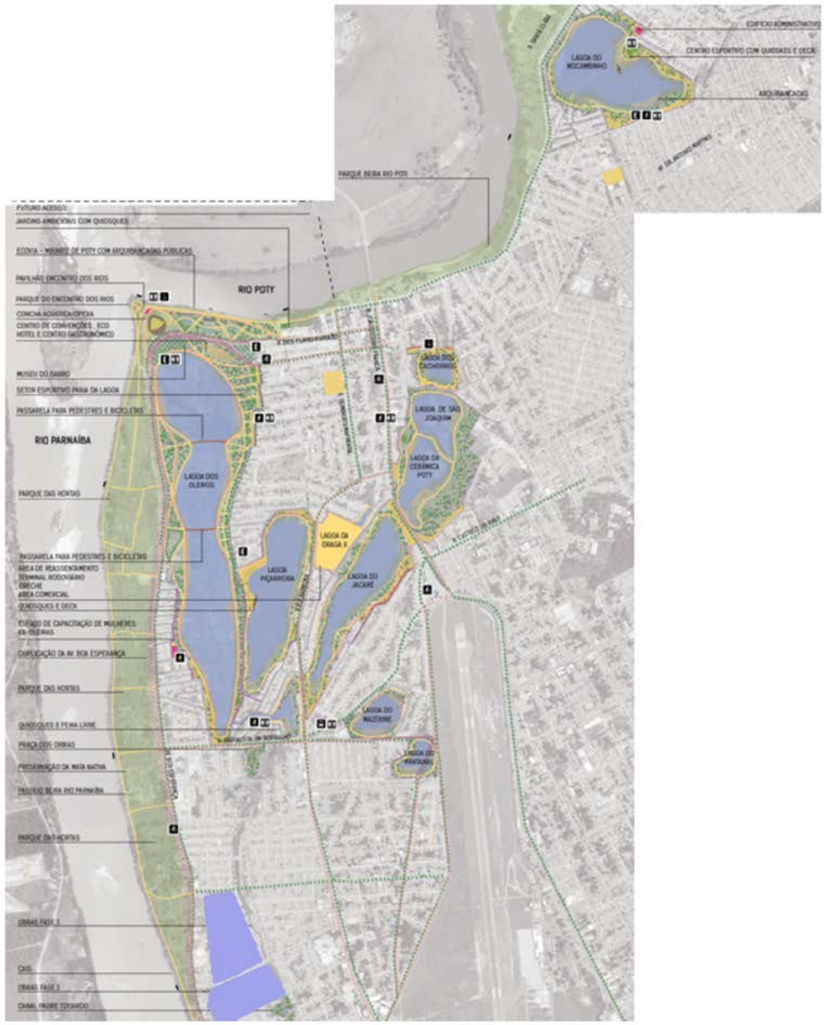
Figure 7 – Overview of the lagoons with Poty River (in the back), and Parnaíba River (on the upper left-hand corner)

Source: City Hall of Teresina. 2005.

One of the purposes of the Program was to control the flooding occurrence in the North zone of the town. To do that, they undertook technical studies for micro and macro-drainage that might interface the lagoons, reinforcing an existing dike, and installing a booster pumps' station for the excess water.

Tucci and Souza, in their study named: "Controle de Inundações e Manutenção dos Níveis das Lagoas Norte: Simulações Hidrológicas e Hidráulicas dos Cenários de Inundações (2010)" (Flooding Control, and Maintenance of the North Lagoons' Levels: Hydrological and Hydraulic Simulations of the Flooding Scenarios) reviewed the global macro-drainage system of the North Lagoons region, simulating scenarios throughout the years when interventions were made in the 1st part of the Program, and where others will be performed in the 2nd part.

Figure 8 – System of Lagoons of the Program, and the planned urbanistic interventions.



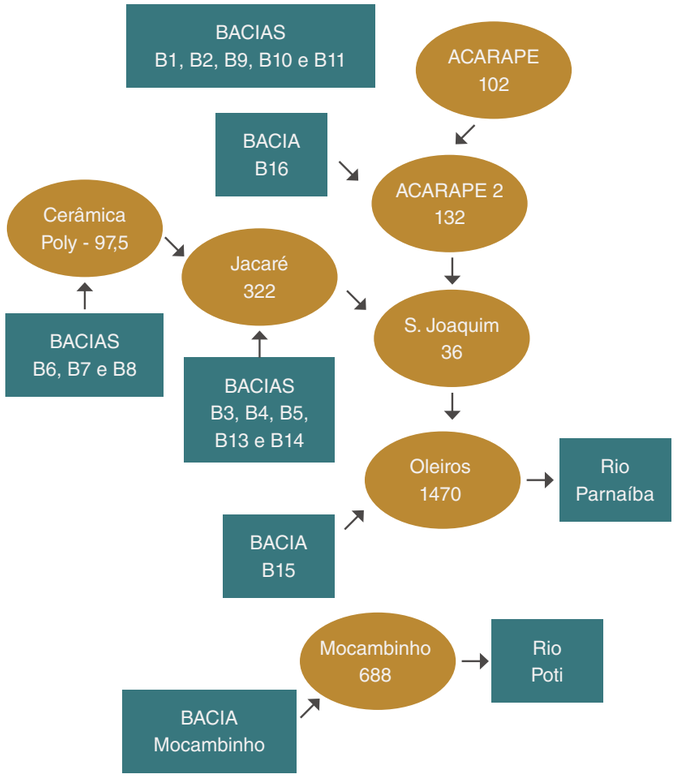
Source: Master Plan, Consórcio Teresina Sustentável, 2014.

The studies were intended to simulate, and forecast flooding conditions within a 25-year perspective. In the lagoon system, they studied several scenarios.

The most favourable operating scenario of the system complied with the objectives to: avoid flooding; maintaining lagoons' levels throughout the entire year; enabling an appropriate recreational environment; and avoiding the occupation of flooding areas.

In addition to the flood conditions' scenarios, they also reviewed scenarios for the drought period. In some lagoons, the maintenance of the levels is nearly permanent (Acarapé II, Piçarreiras, Pantanal, and Mazerine).

Figure 9 – Interconnection system of the lagoons and their respective volumes (in 1000m3) for the 56 m elevation.



Source: Tucci, and Souza, 2010.

The technical drainage studies recommended to keep the existing lagoons at 55 m' elevation. For the drought periods – when this level is not met, they recommended pumping water from the Parnaíba River to maintain the reflecting water of the lagoons. This decision is essentially based on the urban-landscaping concept – function that the lagoons will nurture, including the implementation of the tourism cluster in the North.

2.2.3. Valuing the urban space, and improving public spaces by the water

The Program interventions were highly complex, cross-disciplinary, and strongly inter-related. Therefore, they required several studies to be carried out: urbanistic, sanitary engineering, and social-environmental studies so that projects could be designed in an integrated manner. During the performance of Phase 1, the major problems faced related to hiring basic, and executive projects separately, without the necessary connection.

The urbanistic, and landscaping concept endeavoured to promote compatible economic activities that might enable the fund-raising for linear parks' independent management in the future. Interventions like this (requalification of degraded urban areas) bring up various benefits for the population, among which: improvement of the resident population's self-steam; access to essential quality utilities; increase of safety sensation; stimulation of the local economy; inserting people in the formal work market; and, appreciation of real estate properties. The negative aspects fell on the need to resettle some families, aiming to promote full access to the lagoons, and implement the shared facilities.

Figure 10 – Situation before the intervention

Figure 11 – Situation after the intervention

Source: Semplan, 2009.

2.3. Legal Framework

The Program performance fell to the Municipal Planning Office. However, it was necessary to connect it with other local agencies, given its cross-sectoral complexity.

The Program got the municipal urbanistic, and environmental licensing for the urban requalification (considered as having a local impact), and the state licensing for the sanitation infrastructure works. In addition, the environmental licensing was reviewed by the Municipal Council for the Environment.

Furthermore, during the program development it was possible to update the Municipal Directive Plan, which was outdated; perform the Sanitation Plan (mandatory, as per Federal Law), the Urban Drainage Directive plan (PDDUr), and the Urban Transportation, and Mobility Directive plan (PDTU) of Teresina[12]. Other beneficial actions could also be carried out, among which stand out:

- Institutional improvement of the City Hall, especially as to the Planning and Finances' Offices, with improvement to the management, and increase in the local income;
- Raising of funds before the Federal Administration for new investments in the town, for the sanitation, and urban mobility areas, as a result of the PDDUr, and the PDTU;
- Uprising of small businesses, and corporate interest in the area, in addition to the appreciation of real estate property in the region;
- Road mobility: improvement of vehicles' traffic flow, and construction of cycle lanes;
- Revamping of cultural spaces of the city, restored with project funds.

12. As per the City Statute (Federal Law no. 10.257/2001), the Transportation Plan is mandatory for cities with over 500 thousand inhabitants (article 41, 2nd paragraph).

2.4. Social control and participation

In compliance with the World Bank warranties, the participation of the affected community was mandatory since the beginning of the projects' development. They created a Committee comprising Dwellers that would be affected by the works; they were ensured that their homes would be built close to the intervention area. The community participated in the detailing phase of the projects, and in the performance phase, which ensured a higher quality, and better feedback on the interventions.

The community participation process, along with the Program interventions allowed for the increase in the level of awareness on the urban space, and on the importance of the lagoons as a public space aimed at controlling the floods. By the end of the projects, they held a Public consultation with the participation of the affected dwellers, and representatives from the Urban and Environment Development Councils.

2.5. Evaluation

Overall, it is considered that the North Lagoons Program's investments for Phase 1 met their key objectives, that is: (i) improvement of the life quality of the population living in the North zone; and (ii) improvement to the lagoons' water quality, and to the public space.

A study named "The Baseline of the Program", aimed to carry out researches across the intervention, resettling areas, and one control area (within the same conditions of the population affected by the intervention).

The research fieldwork involved a total of 1,603 dwellers, and it covered physical, social, behavioural, economic, and environmental aspects of a quantitatively objective nature (plot of land area, number of dwellers, monthly income, last power utility bill charges, and level of education), in addition to opinions with a qualitative content, offering space for subjectivity (security level of the district, expectations for the family in the next few years, interest in participating in community actions, and opinion on various topics).

The research results and impacts from the families' resettling action showed that the Program:

- Improved the sociability among the families;
- Promoted housing acquisition;
- Allowed the area to be flood-free;
- Improved life conditions;
- Raised the per capita income; and,
- Improved the local economic activity.

Moreover, it can be inferred that the interventions promoted a broad urbanistic and human environment regeneration of the region, with important, and significant reflections on the social, and economic areas of the region, and of the city. Likewise, there was the empowerment of the affected communities.

Given the complexity of the proposed interventions, it is necessary to carry out further monitoring, and evaluation of the works and actions undertaken.

Regarding The Teresina experience, as reported – although featuring as a successful case in the study performed by the Local Senior Expert, there

are some exceptions to point out. The report emphatically affirms that the environmental component of the interventions were considered in the first phase of the North Lagoons Program. However, since the interventions' location is typified by lowland zones, and natural lagoons, some of these locations were used in the past for clay extraction, on which they failed to report the concern with the biota, and the ecosystems' services involved. And, after the presentation and discussion on the experience, during the International Seminar held between May 12, and 13, 2016, in Brasília, the conclusion is that they were more focused on public health, landscaping, and infrastructure aspects, than in environmental ones. The expectation is that the context developed in this first phase be widened in terms of environmental issues for the other phases planned for the program. The widening of the context was confirmed by the Teresina City Hall representative, as a basic requisite for the actions to continue.

3. Extrema – MG, and the Water Conservation Project

3.1. Context

Estimated population: 33,082 inhabitants (2015, IBGE – Cities);

Municipality area: 244.58 km^2;

GDP: R$ 1.97 million, and R$ 68,951.91 Brazilian reais per capita[13];

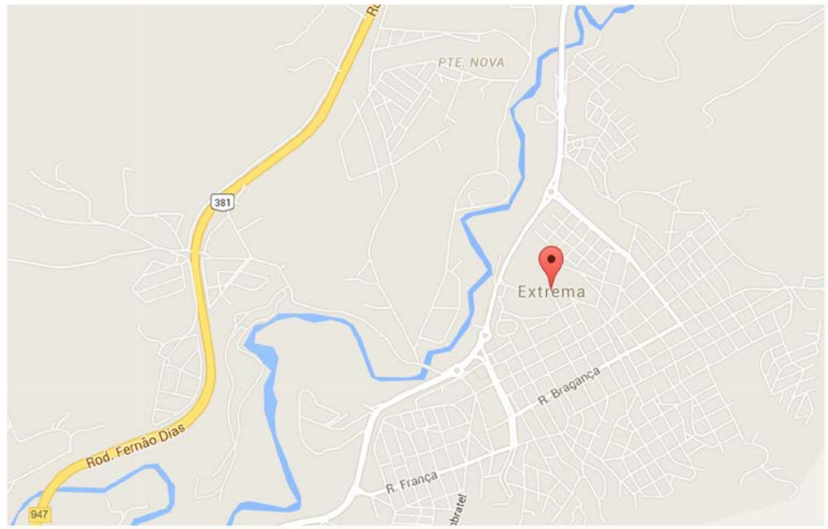
HDI: 0.732[14];

Territorial characteristics: The city lies at 910 m high, within the Atlantic Forest biome. Given its location, and drainage system, the city feeds up the fountain-heads of São Paulo, Capital city.

The city of Extrema is located at the South Ridge of the Mantiqueira Mountain Range. Its waters constitute one of the main supply fountain-heads of the Cantareira System, built to supply São Paulo's Metropolitan area, in addition to a set of others towns belonging to Piracicaba River basin. After performing the Local Agenda 21, in 2005, it was possible to assign funds from the city's PPA to the Environmental Services Program, later referred to Waters Conservation Project.

13. Source: IBGE – Cities, 2013.
14. Source: City Hall of Extrema, 2014.

Figure 12 – Urban site of Extrema, and the Jaguari River.



Source: Directive Plan of Extrema – MG, 2013.

The Water Conservation Project officially started with the enacting of Local Law n. 2100, dated December 21, 2005, and became the first local Brazilian Law regulating the payment for environmental services related to water protection. The law authorizes the City Hall to provide rural properties' owners with financial support.

The Municipal law proposed joining the population income increase to the conservation of the ecosystems, and to the sustainable usage of natural resources.

Linked to the Water Conservation Project, the conceptual foundation of the Law determines the payment for the compliance with pre-set targets. The payment is performed for a minimum period of four years. The local law also defined a reference amount to be paid to those joining the project, set at 100 UFEX (Unidades Fiscais de Extrema [Fiscal Unit fee of Extrema]), which represents R$226.00 in 2016 per hectare/year, and also defined that such expenses would be deducted from the city's budgetary sums.

The Water Conservation Project is voluntary, being supported by the compliance with the targets, while being flexible as to the handling manner to be adopted.

The main objectives of the Water Conservation Project are: (i) spreading out the concept of integrated handling of the vegetation, the soil, and the water from the Jaguari River's hydrographic basin; (ii) ensuring the socio-economic, and environmental sustainability of the implemented handling practices through financial incentives to rural property owners; increasing the vegetative cover across hydrographic sub-basins, and implementing micro-ecological corridors; and, (iv) reducing the rural diffuse pollution levels resulting from sedimentation, and eutrophication processes, and from practices put in place due to the absence of environmental sanitation.

3.2. Relevant factors

3.2.1. Control the urban sprawl and speculation (small ranch-houses for recreational purposes), and protect the fountain-heads that supply São Paulo

Because of the proximity to São Paulo Capital city (approximately 100 km), Extrema has been suffering with the real estate speculation, as a result of an increased demand for recreational small ranch-houses (land plots with approx. 2 ha), typified by Atlantic Forest covering, watercourses, and water falls within the rural area. The Figure below was taken from a Real State Agency website, that trades land plots in Extrema – in this specific case, the property is being sold for R$ 600 thousand, and has a 3.2 ha area.

Figure 13 – Ranch for sale in Extrema

Source: In Web site "Achou Mudou" – http://extrema.achoumudou.com.br/62898/chacara-em-extrema-mg, accessed on January, 2016.

In that sense, the Water Conservation Project did contribute to reduce the real estate speculation process in the city, by compensating for environmental services in rural areas.

3.2.2. Proposal for the maintenance of the Atlantic Forest area through incentives for environmental services

The Water Conservation Project became financially sustainable when the ANA (National Water Agency) executed an agreement with the City, on December 2010, for the actions' maintenance, and continuity. Said agreement was intended to deploy conservationists practices of the soil across Salto River sub-basin, aiming to adjust the adjacent roads in environmental terms, and to increase the amount and quality of water though control actions for erosive processes within this project.

Since this is a priority region for water production, as indicated in the Water Resources Plan for Piracicaba, Capivari,

and Jundiaí Rivers' Hydrographic basin, water, and soil conservation works at the Jaguari Hydrographic basin are extremely relevant for the Cantareira System's sustainability.

The Cantareira System is the largest of the systems managed by SABESP (Cia. De Saneamento de São Paulo), which is intended to collect and treat water for Greater São Paulo, and one of the largest of the world. It is used to supply 8.8 million people with water. It comprises 6 dams, and 1 pumping station to surpass the physical barrier of the Cantareira Mountain Range. This system draws the attention for the distance between its structure and the urban core it serves, and also for its extensive drainage area, going up to the South of Minas Gerais State (in Extrema).

Figure 14 – Cantareira Supply System, and the contribution of Extrema (Minas Gerais).

Source: http://site.sabesp.com.br/site/imprensa/noticias-detalhe.aspx?secaoId=66&id=2918, accessed in December 2016.

The success in protecting the Atlantic Forest was certainly one of the positive, and relevant results of the Water Conservation Project. This gave the project international visibility, and it has been praised several times.

In 2014 alone, the Water Conservation Project planted 250 thousand trees, totalling 754,153 from its beginning. According to the Local Environment Office, approximately 500 springs have already been reclaimed, within a 7,300 thousand ha area, protected by 187.5 thousand m of fencing.

3.2.3. Design of projects for greenspaces with the participation of civil society

Before the implementation of this Project, the city hall put together their Local Agenda 21, based on principles and actions that defended the maintenance of the rural area's forests, the protection of the water quality, and the disincentive to the disorderly urban sprawl across the rural area.

Figure 15 – Community discusses the Local Agenda 21, and the concept of compensation for environmental services

Source: Water Conservation, ANA (2010).

This project sought to associate the environmental education to its actions – both for the city, and for visitors, welcoming over 500 Brazilian and foreign representatives.

3.3. Legal Framework

The Water Conservation Project was drafted in compliance with the Municipal Directive Plan, and it also resulted from the population's aspirations, and desires, as expressed in the Extrema Agenda 21. The Agenda 21 was carried out between 2003, and 2004 with support from Minas Gerais State Environment Office. Participating in its activities were: (i) representatives from segments of the organized society; (ii) the local business community – businessmen, service providers, industry owners, and farmers; and (iii) the Local Administration.

Standing out among the main strategies described in the Agenda 21 of Extrema, there are:

a. Action line no. 4: "Prioritization of tourism as a sustainable development strategy";

b. Objective no. 3: "Promote land usage and occupancy planning";

c. Concerning the water resources, it affirms that "the Jaguari River is strategic for the city's development", and also for the Cantareira System. Therefore, it is necessary to invest in the improvement of its water's quantity and quality;

d. Tourism development is an alternate form of sustainable development of the municipality;

e. "The State of Minas Gerais has been working towards the decentralization of the environmental management. The City could start structuring its management guided by new instruments, such as those of an economic nature. While a water producer, and holder of major Conservation Units, Extrema's situation may **call for environmental services** rendered to other cities, so as to get financial resources for its own environmental management's continuous improvement."

3.4. Social control and participation

Performing this Project was only possible due to the participation of the title holders of rural properties (farmers), who became aware of the importance to preserve the Atlantic Forest, instead of lotting-out their properties. Furthermore, the project established partnerships, and responsibilities before organizations, and institutions, as described in the following Table:

Table 3 – Institutions, and organizations participating in the Water Conservation Project, and their respective responsibilities

Entities participating in the Project	Responsibilities
City Hall of Extrema	Administrative, and Technical Management; Compensation for environmental services; Technical assistance; Mapping of the properties; Project management;
Secretaria Estadual de Meio Ambiente e Desenvolvimento Sustentável – SEMAD (State Office for the Environment, and Sustainable Development), and Instituto Estadual de Florestas – IED (State Institute of Forestry)	Consumables for fencing, and farm inputs; Equipment, and vehicles; Compensation for environmental services; Support provided for the Command, and Control process; Technical support;
Agência Nacional de Águas - ANA (National Water Agency)	Technical support; Water quality monitoring; Soil conservation;
The Nature Conservancy - TNC	Planting Actions Funding; Maintenance, and fencing of the areas; Biodiversity Monitoring; Technical support for the community;
SOS Mata Atlântica	Supply of native trees' saplings; Technical support;
Consortium PCJ - Consortium for the Piracicaba, Capivari, and Jundiaí (PCJ) Rivers' Hydrographic Basins*	The Executive Projects to recover the fountain-heads are funded through the funds collected from water usage;
Melhoramentos Papéis	Poles**, and native trees' saplings;

*The Hydrographic Basins Consortia are civil organization of water resources, as provided for in the National Law for Water resources (Federal Law no. 9,443, dated January 8, 1997), aimed at managing, and disciplining the use, and the consumption of water resources from a certain hydrographic basin. The Consortium for the Piracicaba, Capivari, and Jundiaí Rivers' Basins is a non-profit association of private law, comprising municipalities, and companies, whose purpose is to recover the fountain-heads within their area range.

** The Poles are concrete, wooden, or stone piles used to build fences. These piles are attached perpendicularly to the soil, and then screens, wires, wooden plates, and other materials are tied to them to build the fence.

Source: ANA (2010). Water Conservation.

3.5. Evaluation

The 24 years-long administrative continuity of Extrema surely explains how they managed to develop the Water Conservation Project, and pay for environmental services, thus resulting in the local hydric network quality, and quantity maintenance.

This project results from the Extrema's population desire. In their Local Agenda 21, they defended the maintenance of the Atlantic Forest biome over the urban sprawl. According to the Extrema Agenda 21, the continuous construction of recreational small ranch-houses would lead to deforestation, and to the depletion of the city's water bodies.

4. Toledo – PR

4.1. Context[15]

Estimated population. 132,077 inhabitants (2015, IBGE – Cities);

Municipality area. 1,196.99 km^2;

GDP. R$ 3,956.56 million, and R$ 30,826.17 Brazilian reais per capita[16];

HDI. 0.827[17];

15. The article about Toledo relied on the effective cooperation of Professor Maria do Carmo Bezerra, who evaluated the Program on behalf of the Inter-American Bank.

16. Source: IBGE – Cities, 2013.

17. Source: City Hall of Toledo, 2015.

Territorial organization. Toledo has been separated from Foz de Iguaçú city in 1951. Nowadays, the city comprises 70 district**s**.

Toledo offers a great life style, with high social indicator levels in education, health, and safety, so reflected on their Human Development Index. This reality also encompasses a structure of social inequalities, which is lower than that prevailing in other Brazilian cities.

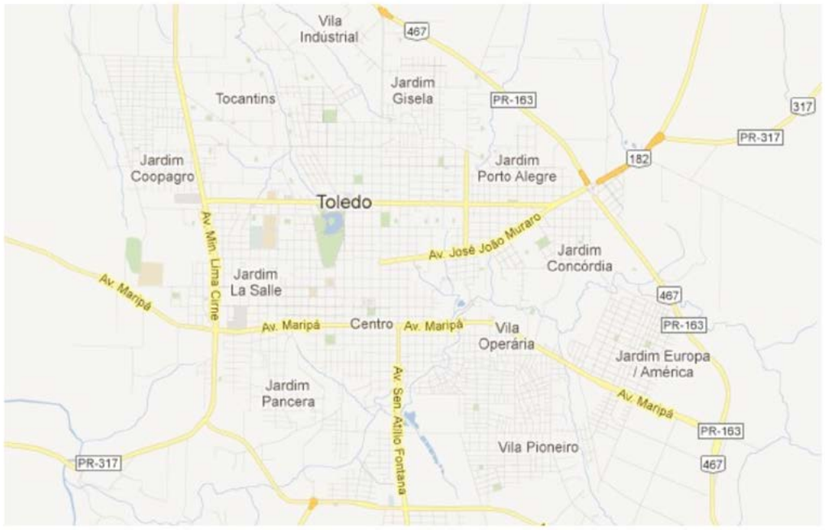
The urban structure of Toledo features a central area, contraposed by Praça Willy Barth, by which side runs the most important streets crossing the town in the North-South direction – areas with the largest urbanization. Moving west, the City has a secondary vector of urban occupation, while on the East side lies the areas crossed by the Toledo River, the Sadia industrial complex, the workers' districts, up to the limit of the Road.

The urban centre of Toledo is the most important business, and services' area of the town, which spreads farther North from down town. Down-town area serves multiple purposes, including residential, which makes it dynamic in different times, and days of the week.

The city growth towards the North direction has occurred about 30 years ago, with the road system's extension, and the sanitation works on the brooks' springs of Marreco, and Panambi, where they created the Diva Pain Barth lake, and Park. Nowadays, this area encompasses large-sized business services' centres, shopping centres, and high-level dwellings, besides the city hall's administration complex. This new centre-focused configuration has boosted up the real estate market towards verticality, and the demographic density of the region, whose landscaping comes with a Lake, a Park, and a large Aquarium, along the Panambi brook rivulet's banks.

The challenge here was to find an approach to integrate the environmental preservation, and the booming cities. The greatest challenge to preserve the environmental areas within the urban network was to avoid their occupancy for degrading purposes, without mistakenly think about the preservation, properly saying, as an urban usage. The whole idea of preservation associated to doing nothing, within areas under strong pressure for urbanization, and without the due urbanistic control has often been leading to environmental degradation.

Figure 16 – Urban Structure of Toledo, Paraná



Source: Urban Directive Plan, City Hall of Toledo, 2006.

Figure 17 - Downtown area, with Diva Barth Square in the centre.

Source: Bezerra, MC (2013). Technical Notes KNL IDB-TN-523, BID, Washington, DC.

4.2. Relevant factors

4.2.1 Control of the urban sprawl through green zones, and parks

The interventions in Toledo unfolded as an innovative case due to the approach of structuring the urban sprawl with green areas, while looking forward to match the environmental preservation with the popular need for leisure areas. At the time, they defined the following work premise:

“Investing in environmental preservation projects within urban areas – as long as they fit into the urban planning strategy, improve the compliance with the population’s needs as to the promotion of sustainability” (Consultation Letter for the Intervention Proposal).

Therefore, aiming to control the urban sprawl, while improving the environmental quality is what the City Hall of Toledo called the “Road Park” project, which derived from actions implemented back in the 80’s, upon the creation of the lake, and the park. The idea reproduces the well-succeeded experience of creating new centres through green areas.

Figure 18 – Road Park Proposal, structuring the urban growth

Source: Bezerra, MC (2013). Technical Notes KNL IDB-TN-523, BID, Washington, DC.

The Directive plan identified the Panambi, and the Marreco rivulets’ banks as priorities for the implementation of the “Road Park” project, which anticipated for that part to build a public access for the watercourses, and their respective recovery – which demands dates back to the 80’s.

The proposal could establish the convergence between environmental, and urban policies. Concerning the environmental policies, the linear park project aimed to create ecological corridors between the APPs (Permanent Preservation Areas), by preserving riparian forests, preventing land sliding, and the silting up of the watercourses.

As an urban planning action, the Panambi Rivulet’s Linear Park represented the connection between the urban consolidated area, and the North Perimeter Park, set by the edge of the city’s sprawl zone. The intervention included the conservation, and the recovery of springs, building of tracks to be shared with bicycles, public lighting, sports’ premises, springs’ protection works, and the proper treatment of the rainwater drainage that flow into the brook.

Figure 19 – Part of the Panambi Rivulet Linear Park

Source: Management Unit of the Toledo Pro-Cities Project, 2011.

Recovering and requalifying the urban space along the East band of the Panambi brook – area that has already been apportioned, and partially occupied – aims to reverse the treatment of the "land plots' back sides" of the area, so as to integrate them to the city life. From an environmental preservation standpoint, the area was degraded with all of the irregular businesses, and houses, empty lots, and polluting companies. The proposal fosters the environmental preservation of urban APPs, while it creates other leisure options.

4.2.2. Handling the Environmental Preservation integrated to the urban planning

The city has a fluvial system comprising 4 main hydrographic basins. The areas in the vicinities of rivers, and brooks across said basins are classified as APPs, that is, they are not likely to be occupied by the Urban Directive plan (PDU) of the City, dated 2006.

The PDU classifies the green corridors by the rivers banks as Special Occupation Zone (ZOE) to ensure the preservation, and protection of exceptionally beautiful landscape areas. In addition to its recovery, the PDU motivates endeavours of cultural, and entertainment activities at the ZOE, by the creation of parks, and leisure areas allowing a greater integration between citizens, and the environment.

Figure 20 – Preservation Areas with landscaping that integrates leisure to environmental protection.

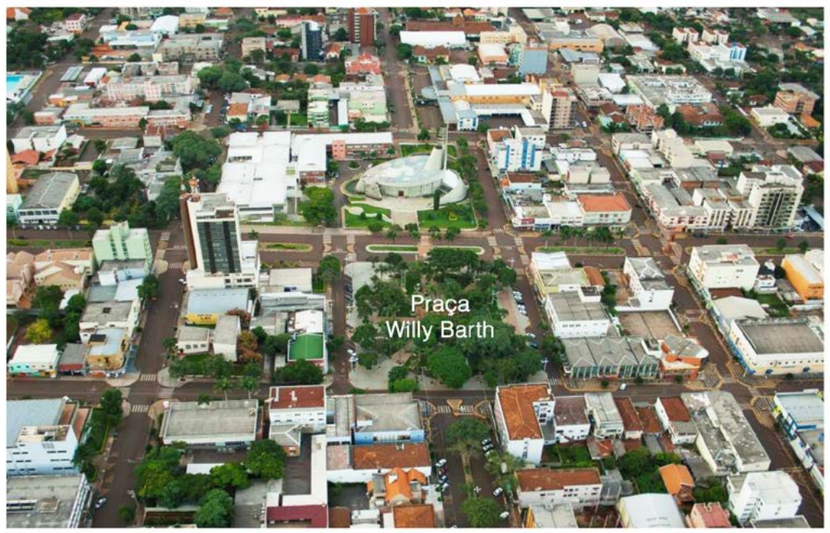
Source: BID (2008). Programa de Desarrollo Socioeconómico Sostenible del Municipio de Toledo (BR-L1085), Propuesta de Préstamo (Sustainable Socio-economic Development Program of Toledo (BR-L1085), Loan Proposal), Washington DC.

4.2.3. Valuing the Central Square of the city, as a contrasting element of the quality in urban spaces

The city's central square (Praça Willy Barth) is a public space of historical relevance for its inhabitants. Reinstating it does contribute with the preservation of the city's memory.

The initial development of Toledo commenced from that square, and so it remained up to the 80's, when Diva Barth Lake, and Park were created. At the same time, these were in response to the sanitation need to fight the proliferation of mosquitoes, and to structure the North Sector. With the elongation of the lanes, and city hall's public agencies' transfer, this sector organized the sprawl, thus becoming the area with the greatest appreciation of real estate property of the town.

Figure 21 – Partial Overview of City Centre, with Praça Willy Barth



Source: Toledo City Hall, 2010.

The various complaints recorded throughout the years resulted in the elaboration of a regeneration project for the square, and the centre of the city. By the square, there is also a "Topedalando" station, which consists of a sustainable urban mobility program for small distances, to be crossed on bicycles – totally free-of-charge and available for the general population, and for visitors – against registration.

4.3. Legal Framework

As a result of this Program, they reviewed the city's Directive plan, which in turn, presented guidelines for the following areas:

- Environmental sanitation – "Local Agenda 21";
- Housing Offer Policy;
- Economic-ecological zoning – Management per Hydrographic Basin;
- Transportation, and Urban Mobility Policy;
- Land use, and occupancy rationalization – Macro-zoning;
- Democratic Management – with participation of the population;
- Urban environmental management;
- Urban Afforestation Plan.

The following guidelines for urban environmental management stand out:

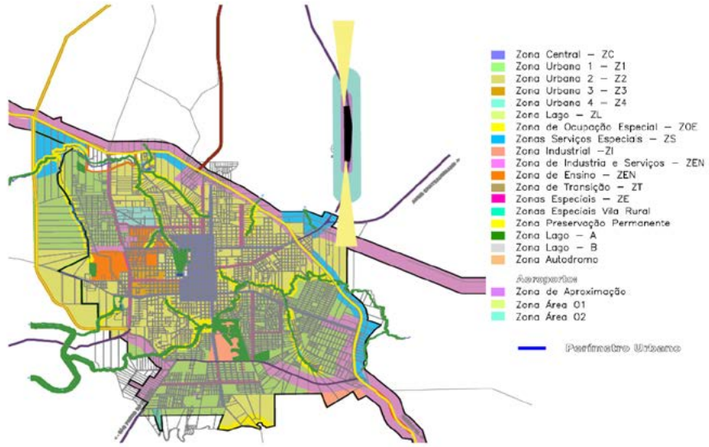
- Motivate the Cultural Heritage preservation – its festivities, and traditions;
- Promote the recovery of the riparian forests, as well as to control water pollutio[18];
- Develop a systematic for associated environmental protection[19]
- Valuing the natural, and urban elements as benchmarks for the natural, and cultural landscaping quality, with emphasis on the Local Lake, and the Ecological Parks.

Another newness was the creation of the Directive Plan Development, and Monitoring Council.

18. The Directive Plan of Toledo does not have parameters for such guideline.

19. The idea of an associated environmental protection refers to the need to include the various segments of Toledo's community, that is: the Local Public Administration, civil associations, and the corporate sector.

Figure 22 – Urban zoning of the Directive Plan of Toledo



Source: Directive Plan of Toledo, 2010.

4.4. Social control and participation

Making both the preservation, and the usage of the urban greenspaces compatible was an integral part of the territorial planning process, which considered the local urban dynamics. However, that was not an exclusively technical decision making, as the urban environmental quality undergoes the local community value judgement, which the usage, and preservation goals require the participation of all segments of the population.

All interventions, and especially the Square Project, commenced with a Call for a Public Hearing, which defined the creation of an"architectural projects' competitive selection", in order to show the needs in the space regeneration. The winning project was detailed for implementation with resources from the loan. The proposal anticipated the removal of trees, the implementation of a new paving, leisure equipment, lighting, and removal of toilets[20]. They outlined spaces for the elderly, for children, and for fitness activities, in addition to a parking area. They also erected a memorial, a bust, and a statue of Monteiro Lobato (writer), thus valuing the cultural heritage.

20. They toilets were removed at the population's request, since they served as shelter for the homeless, did not undergo any maintenance, and no longer served the people – that felt unsafe, and did not use them for the lack of hygiene. The provision of new toilets fell to the local traders established around the square, who volunteered to offer the service for the population.

Figure 23 – Central Square after the interventions

Source: Management Unit of the Pro-Cities Project, 2010.

The proposal to remove trees was a major point for debate among the different segments of the local society. Various meetings were necessary among the local administration technicians, dwellers, and traders before they reached the consensus of sacrificing some trees to improve the space quality. The standing of keeping the trees prevailed among those people not directly involved in the area's problems.

Willy Barth's revamping was accomplished by the end of 2007. In January 2011, they ran an opinion survey with dwellers of the city, which revealed 83% of respondents perceived the renovation works as positive, pointing out that the space became prettier, and safer, while reinforcing its attraction role in the central area of Toledo.

4.5. Evaluation

Understanding the interventions' definition process, with emphasis on the project, and on the construction works became essential to select the lessons learned to connect the different players involved, i.e., the planners, the community, and the corporate group (real estate property, and trade), and their respective roles, as to: (i) the green areas' usage strategies in the city's urban planning; (ii) the population's role in the urban planning actions, and in the implementation of the green areas; (iii) the corporate sector standpoint on the urban planning actions, and on the green areas' implementation.

The program showed that the "intervention intended for the environmental preservation, and the green areas' implementation, when connected to the urban planning strategies, are no longer mere construction works as an end in itself to dress up with a structuring sense of the city landscape, and of the solution of its problems" (Bezerra, 2013).

5. Brotas – SP

5.1. Context

Estimated population. 23,419 inhabitants (2015, IBGE – Cities);

Municipality area. 1,101.37 km²;

GDP. R$ 527.25 million, and R$ 22,964.88 Brazilian reais per capita[21];

HDI. 0.740[22];

Territorial organization. The city is within the central area of the State, and has a small urban area.

The City of Brotas is in the Central region of São Paulo State, being regarded as

21. Source: IBGE – Cities, 2013.

22. Source: Deepask. http://www.deepask.com/goes?page=brotas/SP-Veja-o-IDH-Municipal---indice-de-desenvolvimento-humano---do-seu-municipio, accessed in October 2015.

one of the most economically developed areas of the country. The region is filled with natural beauty scenarios, and it has been an Ecological tourism, and an Adventure-tourism pole for the South-East, South, and Middle-West population of Brazil.

In the past, the city was linked to the agricultural development, especially in the coffee production. Today, the economic basis of the town focuses on tourism, which has led to the implementation of the Environmental Zoning (ZA), ultimately intended to ensure the permanence of the touristic activity focusing on the environmental preservation.

The main natural heritage of Brotas lies on its relief (Basaltic Cuestas[23]), covered in forests, watercourses with many water falls – among which the Jacaré Pepira River stands out as one of the few rivers still unpolluted in the State.

23. In Geology, Cuesta refers to a type of relief, comprising, hills, and asymmetrical slope mounts, that is, smooth on one side, and steep on the other. The Basaltic Cuestas refer to the cliffs of the plains, and plateaus, composed of volcanic rocks from the Mesozoic Era.

Figure 24 – Overview of Jacaré Pepira River, in Brotas

Source: http://viagem.uol.com.br/album/guia/brotas_album.htm, accessed on November 2016.

Therefore, the proposed ZA was not intended to organize the urban activities, but rather the rural ones – which is an innovative way to use this instrument[24]. Notwithstanding the fact that the City Statute determines that the Directive Plan should comprise all of the territory of the City, in small, and medium-sized Brazilian cities there is a trend to limit the environmental zoning and usages to urban spaces.

Brotas ZA proposal emerged from the opportunity generated with the construction of SP-225 Road (Eng. Paulo Nilo Romano Road). As an environmental compensation for the negative effects caused by the construction of the road, the State Environment Office, in partnership with the local administration, required the elaboration of this study, as carried out in 2006 by Fator Ambiental Engenharia.

In the last decades, different zoning approaches have been used in Brazil. As per Del Prette (2000), the zoning performed relate to two traditions, one referring to the urban land use regulation, and the other one to the Agricultural Zoning. The first type – based on the determination of special zones for the various activities, to keep the residential areas away from potential disturbances, and inconveniences – is the source for the "Zoning Law", and has a regulatory nature. As to the second tradition, "Agricultural Zoning", it is intended only to indicate capabilities, as per the different productive rural activities, not by imposing land use rules, but rather helping in the decision making (RANIERI et al). 2005).

As to the ZA, understanding it as an instrument for territorial planning is unquestionable. Therefore, this is an instrument that should include the environmental dimension within the territorial planning scope, so human activities to be developed in certain spaces are feasible, considering environmental aspects, and not only the economic, or social ones.

Pursuant to the methodology proposed for Brotas' ZA, the land was evaluated based on its capabilities in terms of economic development, from the environmental sensitiveness of the areas, thus creating the concept of "environmental feasibility". The procedures adopted to build this instrument for Brotas were: (i) definition of the topics to be evaluated; (ii) definition of the relevant environmental factors; (iii) definition of the decision criteria; (iv) integration of the information; and (v) results' consolidation, and presentation.

24. Upon elaboration of their Directive Plans, many cities resolve that the Urban Usage Zoning overlaps, and encompasses the Environmental |Zoning – which is the case in Colatina, Espírito Santos, for instance.

5.2. Relevant factors

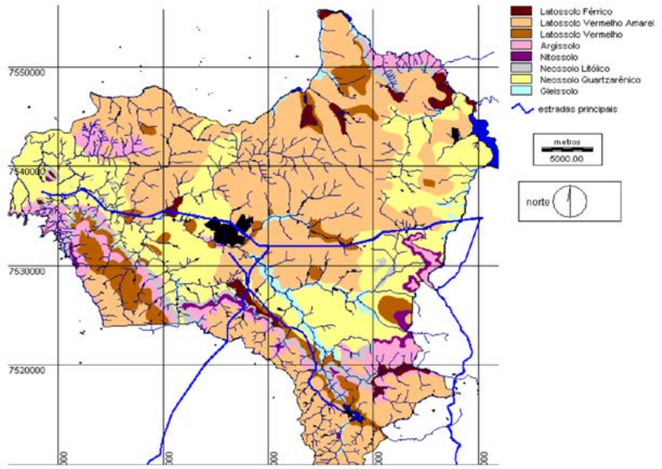
5.2.1. Protect the natural resources of the city, aiming to develop tourism

The methodological strategy adopted by the Brotas ZA was to check the relevant environmental factors, that is to say: (i) Soils and their erosion sensitiveness; (ii) the geological formations; (iii) the declivities; and, (iv) the urban, and rural land use.

Based on field, and office surveys, they used the SIG (Sistemas de Informações Geográficas [Geographic Information Systems]) tools, along with satellite, and aerial photographs to identify the most sensitive areas to be protected. This task helped identify potential areas for preservation, the APPs, and the slopes susceptible to erosion – based on a combination among geological formations, soil type, and declivity.

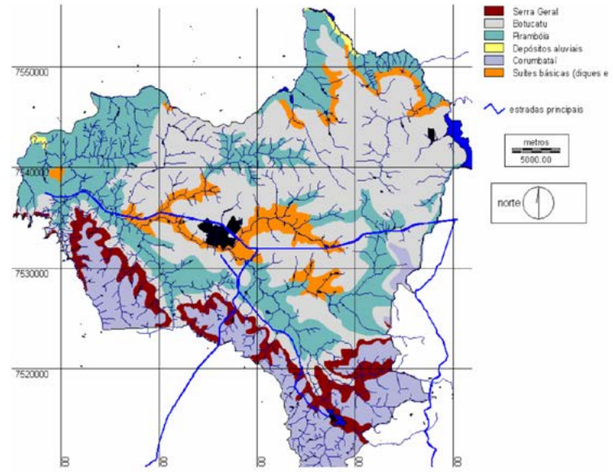
The best preserved rural areas were identified within the "land use" category. Starting from that, it was possible to identify the relevant sites for preservation, and for leisure, as well as unpolluted water resources. As an example, the following Figures illustrate the relevant environmental factors' mapping.

Figure 25 – Map of the Soils



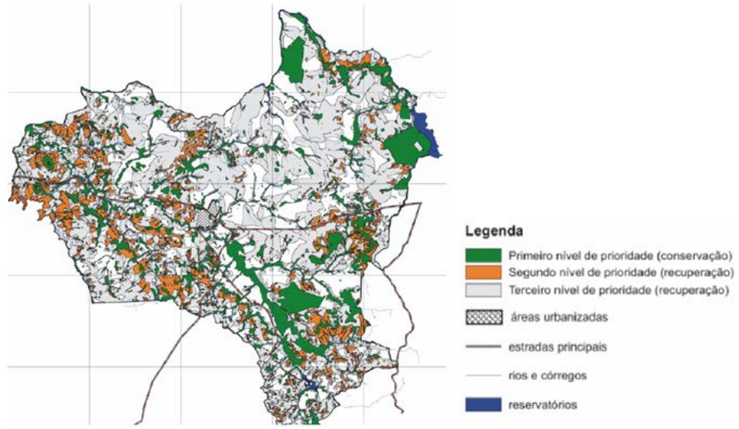
Source: Fator Ambiental (2006) [Environmental Factor]. Brotas' Environmental Zoning.

Figure 26 – Geological Formations Map



Source: Source: Fator Ambiental (2006) [Environmental Factor]. Brotas' Environmental Zoning.

Figure 27 – Native vegetation conservation and recovery priority Areas

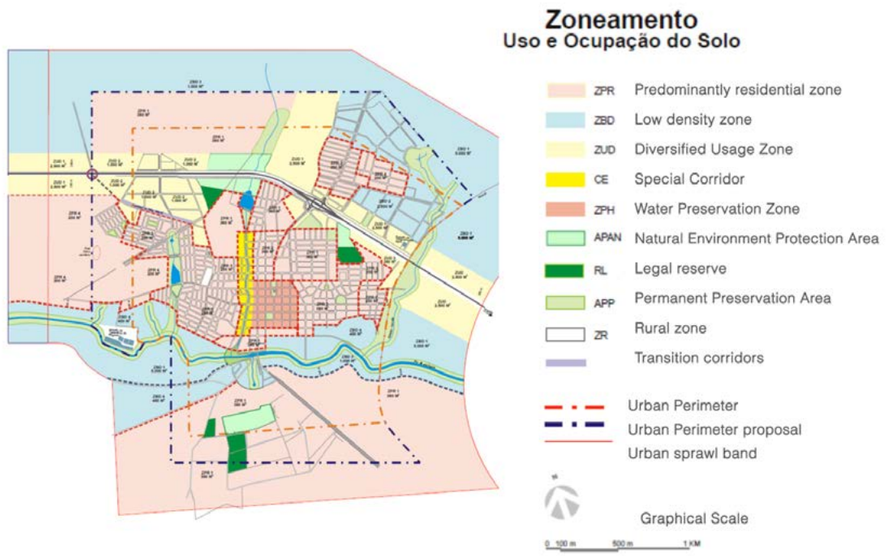


Source: Fator Ambiental (2006) [Environmental Factor]. Environmental Zoning of Brotas – SP.

5.2.2. Nurturing the economic development by valuing adventure-tourism

The touristic services of the city are delimited, offering support with restaurants, banks, and shops. The activities of service rendering have increased a great deal, and will continue to grow, especially along the streets and avenues near the Jacaré Pepira River. Another factor that contributes to the location of the activities is the older buildings' presence, which allows for a reinstating with accommodation, recreation, and leisure activities.

Figure 28 – Usage zoning of Brotas – SP.



Source: Directive Plan of Brotas – SP, 2006.

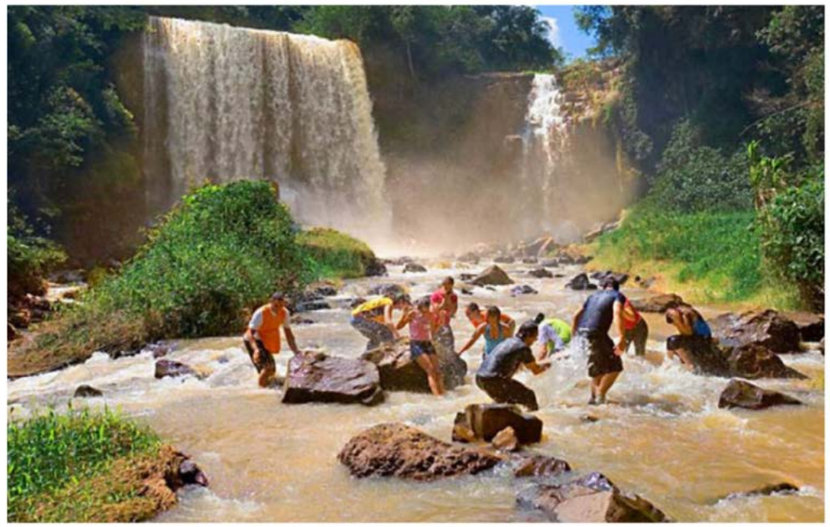
5.2.3. Capturing external financial resources to fund the environmental protection

The tourism emerged in Brotas thanks to its ecological potential, which allowed for radical sports practice in the wild, segment of the Adventure-Tourism in which the city intends to stand out nationally. Its landscaping also invites for contemplation tourism, along with the rural tourism growth.

Brotas is a small town. It was founded on the income of minor rural producers. At a certain point in time, they started welcoming visitors from many different places, who fled there in search of sports practice across the city's rapids, and hillsides. This is when the city started engaging in a second activity – service rendering.

For the past 15 years, business and rural property owners have been seeing tourism growth as an opportunity to supplement their income. In addition to that, tourism alone is responsible for awakening the local concern as to the conservation, and preservation of the environment, as this is the major attraction.

Figure 29 – Overview of one of Brotas' water falls.



Source: http://www.estalagembrotas.com.br/brotas.php, accessed on January 2016.

Before being regarded a touristic city, Brotas had no tour agencies there, the restaurants were insufficient in number, and in quality, the accommodations were limited to simpler inns intended for businessmen, and travellers. Besides that, there were no structured, and equipped leisure areas. It was only in 1993, when isolated initiatives to organize the activity took place, having the tourism draw the Public Authorities' attention. The commercial activity started noticing a differentiated demand, and the touristic establishments increased their offers, and extended their structure.

The Tour trade (adventure-tour agencies, inns and hotels, food and beverages commerce) is at the central area, and a low-importance part is at the Patrimônio district, and in the rural area.

5.3. Legal Framework

One of the key aspects to consider is that the ZA promoted the elaboration of a Directive Plan – which was limited to the urban area only. The elaboration of the PDU, and the ZA were supplementary phases of the urban environmental management of the city, since these instruments were applied in an integrated, and harmonious manner.

5.4. Social control and participation

After running surveys, Public Authorities, and the society added the ZA proposal to the decision process[25], involving the environmental dimension into the management process, to enable the evaluation of the environmental, and economic dynamics' performance of the city. Furthermore, the zoning designers created a qualification training for civil servants, and the organized society – through their local councils, so everyone could follow-up on the planning process

Figure 30 – Qualification training for Brotas' Environmental Zoning

Source: Fator Ambiental (2006) [Environmental Factor]. Environmental Zoning of Brotas – SP.

Therefore, the organized society, the business community, and the government participation started since the ZA elaboration process started. The local administration endeavoured to identify major social groups, and to invite them over to participate in the process.

25. The Environmental Zoning supports the urbanistic, and environmental licensing decisions.

5.5. Evaluation

The tourism activity enabled NGOs to step forward, aiming to create sustainable development programs, in addition to attracting investors, and entrepreneurs willing to work in the city, specially coming from other cities of the State. Economy experienced growth by the service rendering, creating job positions, and income for the local population.

It is worth emphasizing the de tourism economy growth gave rise to real estate enterprises' proposals (anticipated for in the City's Directive Plan). However, said proposals are contrary to the protection of city's architectonic heritage, which is under government trust, and, as such restricted the elevation of the buildings' standard, thus holding historical buildings' *façades* harmless.

The touristic activity caused positive, and negative impacts on Brotas. Overall, the positive results prevailed, since the ZA stimulated the reduction of the negative effects through economic incentives, and the local environmental, and architectural heritage protection strategies. During interactive events, population's representative ratified the definition of the economic benefits, and the protection strategies.

Across the rural area, there were deep economic changes in terms of activity, and income deriving from the Ecotourism growth. The key issue to keep in mind for further reflection remits to the nature of the preservation actions to be undertaken – both in the urban, and rural areas.

6. Formigueiro – RS

6.1. Context

Estimated population. 7,014 inhabitants (2015, IBGE – Cities);

Municipality area. 580.03 km²;

GDP. R$ 132.64 million, and R$ 18,567.54 Brazilian reais per capita[26];

HDI. 0.682[27];

Territorial organization. The city is predominantly rural, and comprises only 8 districts.

Formigueiro city does not have a Directive Plan, but it does have a Sanitation, and Environmental Zoning Plan – regarded as an environmental management instrument, i.e., for environmental licensing support. So much so, that its elaboration had the approval of Rio Grande do Sul State Environment Office. The survey focused on the usage conflicts, and on the identification of environmentally sensitive areas. To perform the ZA, they used the following criteria:

- Permanent Preservation Areas (APP);
- Natural Resources' Recovery Areas (land usage conflict areas); and,
- Frailness levels of Natural Environments.

26. Source: IBGE – Cities, 2013.

27. Source: Deepask. http://www.deepask.com/goes?page=formigueir/RS-Veja-o-IDH-Municipal---indice-de-desenvolvimento-humano---do-seu-municipio, accessed on October 2015.

Figure 31 – Image of Formigueiro - RS

Source: Radio Jornal Integração.

http://www.radiojornalintegracao.com.br/noticias.php?cod=353, accessed on January 2016.

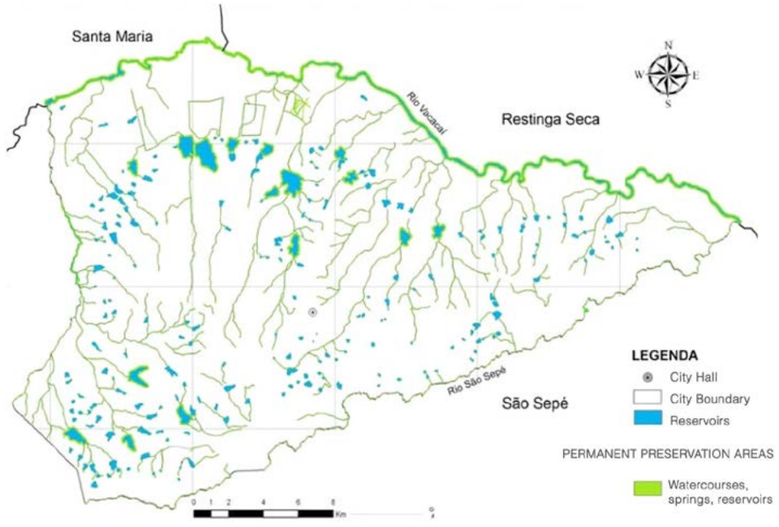
6.2. Relevant factors

6.2.1 Identification of Permanent Preservation Areas (APP), and the environmental protection strategies

Concerning Formigueiro ZA, the adopted premise was the identification of conflicts, and not to set up mediation links between economic, and environmental dimensions. To do that, the zoning proposal identified the APPs to restrain the usage, and occupancy of those areas, even if they were of environmental or public interest.

"Determining the location of the APPs (Permanent Preservation Areas) is important both from an ecological, and a handling perspective. Restricting the agriculture occupancy across areas playing a screening role is a key decision for handling purposes".

Figure 32 – Identification Map of the Permanent Preservation Areas of Formigueiro



Source: Plural Ambiental (2009). Environmental Zoning.

Emphasis should be made in that, upon delimiting the APPs, the zoning could not identify the springs, but found dams built by farmers.

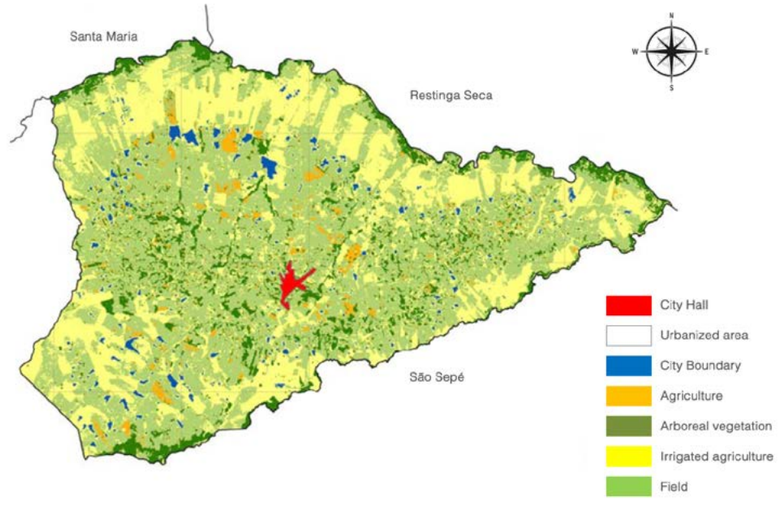
6.2.2. Identification of the environmental frailness and the intensity of rural land plots' usage

The areas under "improper usage", i.e., in disagreement with the environmental laws and regulations, were verified through geoprocessing techniques, by crossing the information plans between the APPs, and the land systems.

While disregarding other relevant environmental factors (e.g., protected surfaces, area of endemic fauna), this methodology does not engage in identifying areas of interest for conservation or preservation purposes.

The ZA proposal only quantified, and measured the restrictions of usage, while it disregarded the usage for environmental protection. Finally, the proposed zoning identified the "recovery areas of natural resources", since, as per the laws and regulations in force, these should be held harmless from anthropic actions, i.e., free from economic exploration.

Figure 33 – Identification of the areas with usage, and occupancy restrictions



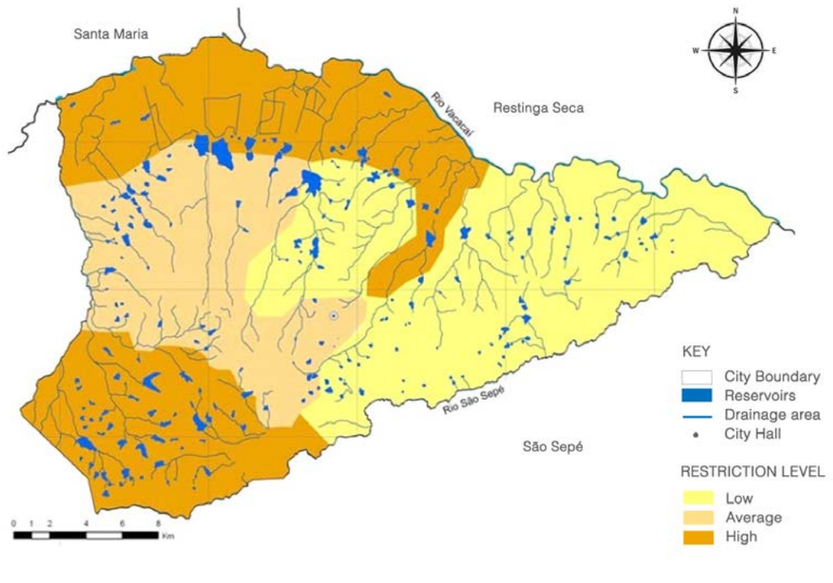
Source: Plural Ambiental (2009). Environmental Zoning.

6.2.3. Participation of the State agency (SEMA - Secretaria do Meio Ambiente [Environment Office]) in the environmental zoning

The Rio Grande do Sul State's Environment and Development Office supported the ZA elaboration for Formigueiro, aiming to support the environmental licensing. Therefore, the zoning guidelines focused only on the APP, and physical features' topics (declivity, soils, and land usage), thus resulting in usage restriction levels.

The proposal presented did not establish a connection to the intensity of the existing usage, and, therefore, did not progress over the support capability (resilience, and resistance) of the existing usages. As a result, the proposed ZA restrained to identify the "Restriction Zones", becoming an optimal instrument for the environmental licensing, but not connecting with the idea of an urban environmental management.

Figure 34 – City Environmental Zoning Map.



Source: Plural Ambiental (2009). Environmental Zoning.

6.3. Legal Framework

As mentioned, Formigueiro does not have a Directive Plan. As a result, the only planning instrument of the city is the Environmental Zoning, which has not yet turned into a regulatory instrument, but 'it's rather a technical reference material for the environmental management.

6.4. Social control and participation

Since it is a small town, with less than 8,000 inhabitants, the discussions on the Sanitation Plan were held below a fig tree shade. However, there is no material attesting the participation of the community in the Environmental Zoning elaboration.

6.5. Evaluation

As it is the case, this type of management for land use and occupancy set in the Formigueiro's ZA proves that restrictive environmental laws and regulations, linked to the planning conception, but disconnected from the social dynamics, and the power games may become ineffective to protect natural resources of public interest, since the appropriation of rural spaces occurs in a harmful manner for the environment, thus causing negative consequences, to be paid/suffered by citizens.

In this context, the Environmental Zoning without the community participation is a void document of purely technical nature, without legitimacy, whose guidelines the population does not recognize.

The Formigueiro experience, as reported – although featuring as a successful case in the study performed by the Local Senior Expert, has some exceptions to point out. The current Administration of the city was invited to present their view on the City's Environmental Zoning – performed in 2009 (which led to an expert to study the experience) during the International Seminar on Urban environmental management, held in Brasília between May 12 and13, 2016. They declined of the invitation, though. This certainly hindered the merit evaluation of the experience.

Part II
Successful Cases in the European Union

7. Vitoria-Gasteiz

7.1. Context

European Green Capital 2012, Vitoria-Gasteiz is regarded as one of the best cities to live in Spain. This is a medium-sized city, and its historical centre is set on a plain, having the Montes Altos de Vitoria as its main elevation. The environmental quality of the region is one of its main attractions.

Vitoria-Gasteiz has a good distribution of greenspaces within its urban structure, in a way that it is possible to get to green leisure areas from any spot of the residential area within a maximum 250 m, i.e., within a 2.5 min. walking distance. Actually, the green area per capita is of 14.2 m^2, totalling approximately 3 million m^2 of urban green zones, which is a remarkable rate, as per the conventional urbanistic parameters.

The wetlands are the most relevant environmental attractions of the city, and their recovery process is a source of civic pride. Having areas of considerable size, and ecological richness just a couple of minutes away from the urban centre reinforces the traditional relation between the city, and the natural environment.

The key-factors that qualify Vitoria-Gasteiz as having a good urban environmental quality, could be summarized as follows:

- Contact with Nature through a compact urban area;
- Recovery of wetlands;
- Institutionalization of the environmental planning.

7.2. Key-factors

7.2.1. Contact with Nature through a compact urban area

Vitoria-Gasteiz succeed in maintaining a relevant non-urbanized soil reserve thanks to a policy historically typified by growth restraints, and by its compact urban area, where 81% of the population lives within a 1,500 m radius from the central area. This feature enables the city to have forested surfaces of 8,417 ha, or 30.4% of its total area – 91% of that area corresponds to native green covering, and 9% to man-planted green covering. The main species forming the forests of the city are the broadleaf trees. There is a network comprising small, and medium-sized greenspaces within the urban area, equally distributed, and very well-cared for. This grants 100% of Vitoria-Gasteiz inhabitants with access to a public green zone close to home. There are 130,000 trees across the streets of the town.

The city's territory is formed by concentric circles. Around this compact urban core forming the city, properly saying, lies the Green Belt. This ring is circled by another one, with a broad agricultural plain, and a native vegetation, mountains and forests forming a third ring up in higher lands. These rings contribute for the quality of both natural, and man-made landscaping, generating a visual, and physical contact in Vitoria-Gasteiz.

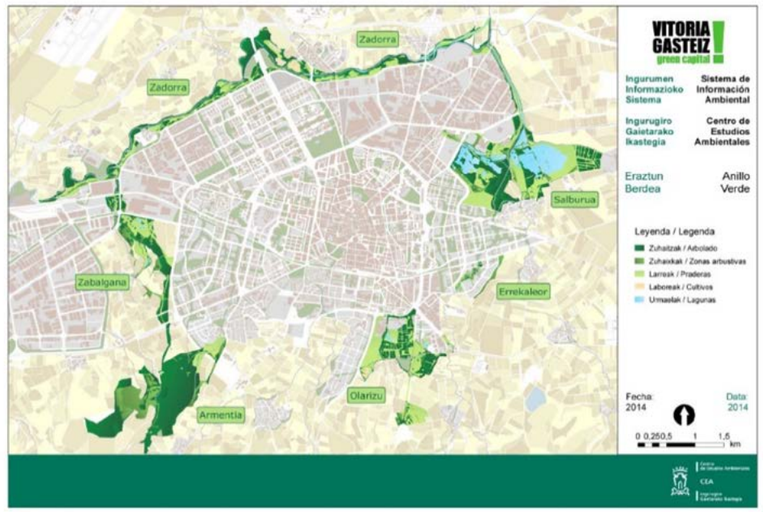
The Green Belt of Vitoria-Gasteiz

The Green Belt is a large infrastructure with over 600 ha. It comprises 6 greenspaces, created through the recovery of degraded areas. The ring-based concept, which connects with the naturalistic tradition of the town, and the people's daily usage of their immediate environment is partly due to the philosophy of the General Project for Land Use, dated 1985. This project includes strategies that connect the urban perimeter to the protection of the natural surroundings. Its creation, as fostered by the local administration, counted on the support and financing from regional, and national governments, as well as from the European Union. The project implementation started in 1992, with the construction works of the first parts forming the ring, and progressed throughout the following years, until it was ultimately integrated (in 1999) into the 2000 General Project for Land Use.

The Green Belt consolidates two large areas of wild soil, to the East, and to the West of the central nucleus, corresponding to the Salburua, and Zabalgana zones. These zones interconnect with one another through a system of corridors with 33 km of green paths for pedestrians, and 90 km of cycle lanes. In this pathway, there are the Zadorra Linear Park, on the North; the Olarizu Park, on the South-East; and, the Armentia Forest, on the South-West direction. The latter is an ecologic corridor between the city, and the Mounts of Vitoria.

The transition between the first, and the second green rings is immediate, and is typified by a broad valley named Esplanada Alavesa. The use in this zone is predominantly agricultural, having hills covered in natural vegetation, watercourses, and lowlands. This area also encompasses the airport, an industrial zone, and the rural nucleus. The third ring is formed by an alpine relief, featuring forestal landscaping, agriculture and grains silos' usage, with the Badaya and Arrato Mountain Ranges, on the North-east, and the Vitoria Mounts, on the South. The ecological value of the Vitoria Mounts is highly recognized, and, because of that it has been included in the Natura 2000 network.

Figure 35 - The Green Belt of Vitoria-Gasteiz



Source: City Hall of Vitoria.

The Green Belt concentrates most of the investments and actions on nature, and on protection to biodiversity from the Agenda 21 Environmental Action Plan. It emerges as a response to the degradation in immediate area surrounding the urban centre. The interventions are based on the application of ecological recovery techniques. The result is a set of peri-urban parks of high environmental, and landscaping value, strategically integrated over ecological corridors, which interface nature to urban sphere effectively. Partially due to the Green Belt, the vegetative cover of Vitoria has doubled since 1974, and now it is spread out homogeneously across the town. Some of the functions and benefits of the Green Belt are as follows:

- Protection, and increase of biodiversity and landscaping;
- Aquifer contamination reduction;
- Control the watercourses, and reduce floods' events;
- Conservation, and rational use of natural resources;
- Improvement of the urban development quality;
- Creation of leisure, and tourism spaces;
- Job opportunities;
- Increase of awareness, and civic responsibility as to environmental topics.

The green system of urban boundaries is complemented by hundreds of greenspaces in town, and small urban gardens, open to the public 24 hours a day. These public gardens occupy 1,091 ha, which represents 32.67 % of the urban area. Together, they form a biodiversity network, encompassing 381 different species of trees, and over 12 thousand types of shrubby plants. Through said public gardens, the urban landscape integrates visually, and ecologically to the landscapes from the peri-urban areas.

7.2.2. Recovery of wetlands

The recovery of the Salburua marshes, and the fluvial ecosystem of Zadorra River, undertaken by the local administration, had a key role in the recent evolution of the environmental conditions in Vitoria-Gasteiz, starting from the blue infrastructure concept. Salburua, which is within the peri-urban zone, only 5 km far from the urban centre, originated as an Aquifer during the Quaternary Period. During the XX century, they built drainage channels to open arable lands, which nearly led to its extinction. The recovery process of the area started back in the 90's, and was surrounded by a major importance, given its magnificence, and for the approach based on the adoption of natural solutions. They changed the usual handling of floods, which often affected the city, structured from physical

construction works (channelling, and construction of slopes) aimed at less aggressive interventions, adopting water bodies as protection instruments.

The Salburua marshes sprawl across a 206 ha area, with brooks, and rapids. Salburua is the longest, and best conserved Aquifer recharge system of the Elbro River, the main river of Spain. As such, it has a key role in keeping the hydrologic balance within a broad land unit. Its flora comprises a significant, well-preserved riparian forest, and an oak forest, which are the last specimens in the Álava region. The aquatic fauna includes a large variety of non-vertebrate animals (with at least two endemic species), as well as a set of dragon flies at risk of extinction. As to amphibious, and reptiles, there are "the spring water turtles of Salburua", native of the region, and one amphibious living in the sub-forest, and which is at risk of extinction in the Iberian Peninsula. It is strategically set within the main migration routes of thousands of birds of Europe, which provides them with feeding, and resting conditions on their migration route west. It is an exceptional sanctuary for species at danger of extinction. Except for the deer – introduced to the area to control the vegetation growth, the animals living in the marshes are native.

Figure 36 - The Salburua Wetlands

Source: Vitoria Gasteiz Capital Europeia

The waters of the Arcaute play a key hydrologic role to fight flooding of the Vitoria-Gasteiz urban area, as they are like a control dam for 100 years floods return period. Its contribution is also relevant to improve the waters' quality. The springs of the Zadorra River – the largest river of the Vitoria-Gasteiz region, features regional scale importance, since they imprint a valuable colour, and shape richness to the landscape across the agricultural zones. In addition to the contribution of the river in the water outflow control, the forests alongside it shelter animal, and vegetable species of high ecologic value, which are at risk of extinction. The Zadorra is also the habitat of the European Mink (*mustela lutreola*), species that is at severe risk. These areas are also of major relevance as refuge, and pasture for fauna displacement.

Salburua has 9 km long pathways across the park, making it a location the inhabitants visit a lot. In July 2009, they opened the Visitors Centre at the Salburua wetlands, and the Green Belt, making it a recreational, and educational space. This Centre is intended to increase the environmental awareness among visitors, in addition to enabling the appreciation of the ecologic relevance of the wetlands, and of the Green Belt. The activities offered at the Centre include seminars, conferences, workshops, temporary exhibits, and also guided track-tours,

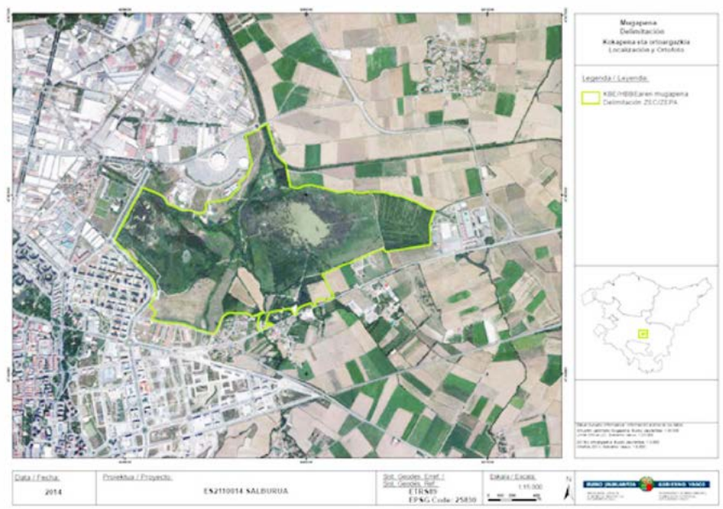
and rental of bicycles and telescopes. Salburua has become an internationally renowned city. Since 2000, it has been entered in the Wetlands Convention (The Ramsar Convention), as a wetland of international relevance. The Centre was considered as Location of Community Interest within the European Natura 2000 Network.

Figure 37 - Atari Centre

Source: Vitoria Gasteiz Capital Europeia

Salburua is settled within a plain zone close to the urban centre. West to the wetlands, there is an urban district by the same name, so assigned (together with the Zabalgana) by the General Project for Urban Land Use (2000), as a sprawling area for the city. Increasing the impermeable area, as a result of the urbanization of parts of the Salburua green areas, could impose changes to the ecologic system, and, therefore, reduce the wetland area capacity to control the flooding incidence. To protect the soil from an urbanization process, a protection perimeter was set, and, in 2015, the Basque Government proclaimed Salburua, and Zabalgana region as Special Conservation Zone (ZEC), and Salburua also as a Special zone for Birds Protection (ZEPA). The Salburua protection instrument is still being drafted, following the principles established by the European Committee. Delimiting the ZEC/ZEP zones is intended to maintain, and to re-establish the natural types of habitats for wild fauna, and flora species of community interest.

Figure 38 - Salburua Special Conservation Zone



Source: Local administration of Vitoria-Gasteiz

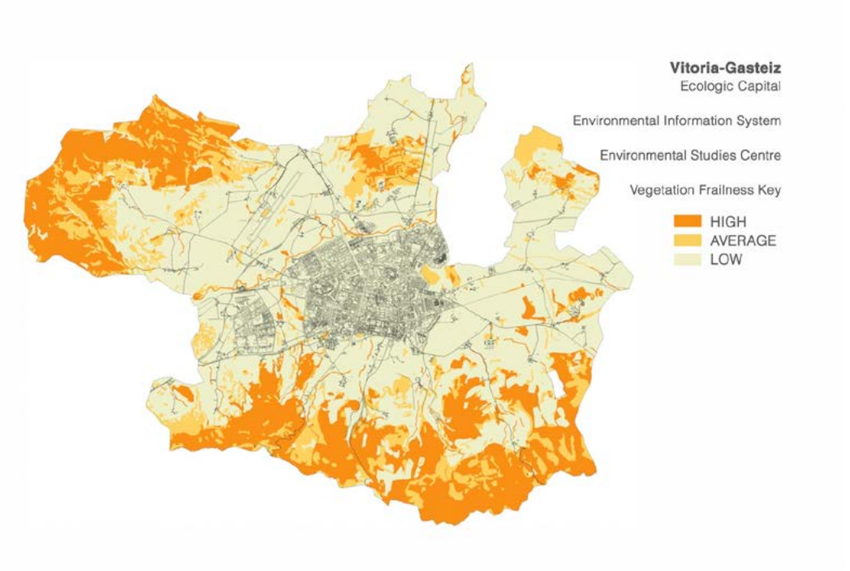
Likewise, the General Project for Urban Land Use had its writing reviewed, as it proposed a low density for Salburua, and Zabalgana (approximately 45 inhabitants/ha). The low demographic density compels to occupation, and to destroy natural soil even further. In addition, it increases its urbanization, and maintenance costs, discourages the emergence of local trade, makes public transportation difficult, causes under-used urban empty spaces, increases distances – which brings uneasiness to citizens, emptying out the streets, and discouraging commuting by walk. The Design review prioritizes the use of previously urbanized areas, thus the demographic density moves from 75 to 81 inhabitants/ha. The review reduces the number of single-family dwellings, and introduces the modality of "taxed housing" to service citizens who are not included in the VPO (Viviendas de Protección [Subsidized Owner-occupancy Dwellings]) Program, nor are included in the overall real-estate property market. The proposed review also enlarges the local Green Zones, instead of relying on the general system's green areas.

Concerning the water bodies' management, the city also succeeded in improving the urban waste water quality, which are poured out into the Zadorra River, after treatment at the Wastewater treatment plant (ETE), managed by the Águas Municipais de Vitoria-Gasteiz S.A. (AMVISA) – Local private company. AMVISA is intended to render utility services for the full water cycle, including supply (collection, storage, treatment, and distribution of drinking water), and sanitation (collection, transportation over the sewage network systems, treatment, reuse of waste water, and treatment of the resulting mud, and residues). All water originated from the Vitoria-Gasteiz sewage system is channelled, and driven up to the ETE. At the station, the water is treated for all contaminants that may impact the ecologic balance of the rivers or the people. Controlling the losses, the technological advances, and the public awareness resulted in a 20% reduction to the per capita water consumption between 2001, and 2009. Non-potable water reuse, and application – especially for the green zones irrigation, and cleaning of public spaces – are other priorities of the water bodies' management.

7.2.3. Institutionalization of the environmental planning

Over three decades of experience in the Environmental Planning was determinant for Vitoria-Gasteiz to reach the current favourable conditions. In 1995, the city subscribed the Charter of European Cities & Towns towards Sustainability, as well as the Aalborg, Denmark, in addition to implementing its Local Agenda 21. This was the first Spanish Province Capital to adopt the Agenda 21, in 1998. Working in a crosswise manner, the technicians from the local departments of Land and Urban Planning, Environmental Health and Consumption, Environment, Sports, Social Assistance, and the Environmental Studies Centre, among others, undertook the review and analysis of the local policies undergoing implementation related to the sustainable development. Since then, countless entities, and initiatives institutionalized the environmental planning in the sustainable development Framework. The paragraphs below describe the most important initiatives.

Figure 39 - Information mapping example



Founded in 1995, the Environmental Studies Centre (CEA) works in partnership with the Environment Office to survey the relation between the city and the environment, carrying out studies, plans, and education programs, and dissemination. The Local Observatory of Sustainability, established within the CEA, works as an aggregation agent, following the environmental agendas set forth by the Basque Strategy for Sustainable Development and of the Ministry of the Environment.

7.2.4. Role: Environmental Atlas

The Urban Landscape Unit, created by the Local administration in 2002, undertakes the planning, maintenance, and management of the city's green zones, and greenspaces. Its roles include:

- Maintenance, improvement, and conservation of parks, gardens, forested boulevards, side-walk plants, *jardinières*, and other greenspaces in town;
- Elaboration of green areas' Aesthetic, and functional revamping;
- Performance of renovation, and landscape improvement works at current gardened zones;
- Sustainable management of the greenspaces of the city;
- Elaboration of the local rules for the green zones;
- Establishment of the design, composition, and construction criteria for the green zones of the city;
- Coordination of projects, and procedures for the handling of urban parks, and greenspaces integrating the Green Belt;
- Elaboration of environmental indicators for the Local Agenda 21, directly connected to their capabilities, and roles.

The Unit implemented a set of rules to regulate the urban biodiversity, the recreation across the green zones, handling and protection of trees, and the creation of green zones on new allotments. Examples of specific actions developed by the Unit include:

- The creation of the "Jardim Secreto de Água" (Secret Garden of Water) (3,100 m^2), as an example of sustainable landscaping, with bushes, and green spaces with low water consumption;
- The revamping of the Arriaga lagoons, where there are man-planted trees' specimen, and native shrubbery, strategically distributed to provide non-vertebrate species with shelter. The grass planted there is a mix of native seeds, which require less watering, and attract insect, and non-vertebrate species, which, in turn, attract birds. The colour mix is visually attractive, and results in a large number of visitors to the area.

7.3. Legal Framework

The institutional competences are split among the 5 levels of the political-administrative organization, which are overlaid in the Vitoria-Gasteiz territory. The European Union determines the sustainability, and environment topics from the mandatory compliance rules. The State also undertakes responsibility for environmental topics (air quality, land uses, water and power, or major transportation networks). The Autonomous Community (Regional Government) is the entity with jurisdiction over the environment, urbanism, housing, social inclusion, culture, and consumption topics. The Provincial Council determines the budget for social projects, economic activity or management of residues, among others. The Local Administration jurisdiction encompasses the urbanistic planning, the elaboration of the Agenda 21, and other local plans. The most important instrument for the urban development is the General Project for Urban Land Use (PGOU).

The PGOU is a legal rule that governs the usage of the soil, and building constructions, defines "which" activities can be developed, "where", and "in what quantity", as well as the owners' rights, and obligations. Its approval follows a specific procedure, regulated by law, and its content is also regulated. The 2000 version of the PGOU, currently in force, is basically a sprawl plan that exceeds the demographic horizon of 300,000 inhabitants.

7.4. Social control and Participation

The 2002-2007 Action Plan promotes the elaboration of active awareness programs, and the involvement of the civic organizations (district and teachers associations, schools, high-schools, overall citizens, and industry) across the city's environmental projects. This participation promotes a remarkable public engagement with the environmental resources. The environmental community association was essential for the success of the goals (since 1996, over 12,000 students, and hundreds of people have been participating in the campaign "Adopt a tree, and grow with it", by planting over 40,000 trees, and shrubs). Within the scope of the European Green Capital project, the awareness campaign "Green inside, Green outside" raised a strong civic pride sense. The jury recognized the key role of citizenship in promoting the changes for a further environmental awareness in the city.

In the Local Agenda 21 (2000) Framework, they created the Environment Sectoral Board to facilitate the civic participation in the Agenda. This Board has representatives from 40 social, and institutional groups of the city.

Within the scope of the sustainability indicators, as prepared by the Observatory of Sustainability (2009) during the Environmental Diagnosis, they opened up spaces for the participation of the society in the analysis of the standpoints of politicians, decision-makers, entities, and civic organizations, experts and professionals, economic agents, and of those interested and engaged in the sustainability study. The goal was to enrich the technical diagnosis with insight from the society. Three participative events were held: 2 workshops, and 1 journey for reflection. In the beginning of the process, a group of stakeholders was summoned for the workshop, "Possible futures for Vitoria-Gasteiz", which resulted in strategic lines used in the diagnostics.

In total, the number of participants in the various events reached 60 people, and they were assisted by the Observers of the United Nations Environment Program (UNEP).

The Environmental Studies Centre (CEA) undertook the representation of the city within the socialization process to elaborate the Sustainable Mobility Plan within the school community, enabling for the access, and interchange with local concessionaires, besides supporting, and coordinating the diagnostic of the Plan.

7.5. Evaluation

In 1998, the Local Agenda 21 was approved by a local plenary session agreement. The agenda had a system of 21 indicators, representing the sustainability status of 10 thematic areas for evaluation, and communication on the local environmental conditions. Since then, every year they publish a news-bulletin encompassing the review of those indicators. The 2002-2007 Environmental Action Plan, approved the Local Council, and by the Environmental Sectoral Board, describes the concrete actions to be adopted in the period towards reaching the sustainability goals undertaken in each of the thematic areas identified in the Local Agenda 21. The system of indicators has been updated (May/2004) with a review, and broadening of the monitoring system consisting of 35 indicators.

The indicators proposed by the Sustainability Observatory (2009) joined aspects related with the native, and rural environmental theme, encompassing 7 cross-cutting indicators, 142 sectoral indicators, and 51 intersectoral indicators. According to the Observatory, "… the indicators were created as a step in the creation of a tool for the monitoring, and frequent follow-up on the sustainability status, and on the environmental conditions of the city". Table 4 shows the indicators related to natural and rural environment.

Table 4 - Chosen indicators proposed by the Sustainability Observatory

GEO VITORIA-GASTEIZ – LIST OF SUSTAINABILITY BASIC INDICATORS							
			INTERSECTORAL RELATIONS				
			Natural and rural environment	Urban environment	Mobility	Society and economy	Urban Metabolism
1. SYNTETHIC INDICATOR OF URBAN SUSTAINABILITY			A	B	C	D	E
ALL SECTORS		ECOLOGIC FOOTPRINT ECOLOGIC FOOTPRINT	■	■	■	■	■
2. CROSS-CUTTING INDICATORS			A	B	C	D	E
ALL SECTORS		Position of Vitoria-Gasteiz in the most recent official ranking of the cities by quality life, as performed in the period	■	■	■	■	■
		Greenhouse Effect Gases' emission	■	■	■	■	■
		Expenses with environment	■	■	■	■	■
		Level of compliance with environmental rules	■	■	■	■	■
		Environmental Impact Evaluation	■	■	■	■	■
		Agenda 21 Activities	■	■	■	■	■
3. SECTORAL AND INTERSECTORAL INDICATORS							
3A NATURAL AND RURAL ENVIRONMENT			A	B	C	D	E
SECTORAL INDICATORS	Natural environment	Reduction of vegetative cover	■				
		Vegetative cover	■				
		Conservation status of the biodiversity for Vitoria-Gasteiz (index of birds' affluence)	■				
		Species at risk	■				
	Rural environment	Local agricultural lands engaged in ecologic cultivation	■	■			
		Use of fertilizers in agriculture	■				
		Agricultural land (SAU)	■				
		Agricultural exploration	■				
		Grains exploration	■				
		Certified management of forests	■				

INTERSECTORAL INDICATORS	Protected land against total area of the city	■	■			
	Fallow area, potentially contaminated	■	■			
	Artificial and urbanizationing soil	■	■			
	Land use by activity	■	■		■	
	Ecologic conditions of rivers	■				■
	Ecologic conditions of wetlands	■				■
	Ecologic conditions of water (BMWP [Biological monitoring working party] index)	■				■
	Organic charge dumped by the city into Zadorra River	■	■			■
	Nitrates in the Quaternary Aquifer	■				■
	Investments on environmental recovery	■			■	■
	Water, and power consumption in agriculture	■	■			■
	Micro-climate changes	■	■			■
	Investments on green zones	■	■			
	Rural-urban balance	■	■		■	
	Development of the number of farms and job opportunities in agriculture, and grain production	■			■	
	School participation in environment-related educational activities organized by the Vitoria-Gasteiz Local administration	■			■	
	Number of environmental NGOs	■			■	
	Companies with Environmental Plans (EMAS, ISO 14001, etc.)	■	■		■	

Source: Observatório da Sustentabilidade (2009) [Sustainability Observatory]

8. Ljubljana

8.1. Context

Ljubljana is the European Green Capital 2016. The centre of the city lies along the Ljubljanica River. Regardless of large top-notch buildings, Ljubljana historical centre remains intact.

Population. 282,994 inhabitants (2012). Approximately 120,000 people live in the adjacent cities, and daily commute to/from Ljubljana to work or study;

Area. 275 km^2;

GDP. EUR 13.185 billion; EUR 24.649 per capita;

Local administration Budget. EUR 408 million (2010);

Territorial organization. The city is split into 17 districts, represented by District Councils

Nearly 75% of all the Ljubljana area has vegetative cover, thus resulting in a high index of green area per capita. It should be considered that this condition benefits from existing natural, and topographical conditions of the city area, and also from the implementation of urban development policies, which have identified green spaces as a catalyst for the urban revitalization, created as Slovenia entered into the European Union. Over 20% of the city area is protected, which the native vegetative cover percentage of the suburbs is of 46%. Between 2008 and 2012, 40 ha of new parks were created, and approximately 2,000 trees planted.

The essential factors to reach the urban environmental quality of Ljubljana could be summarized as follows:

- Creation of a system of greenspaces spread across the city;
- Usage of the green areas as an urban revitalization tool;
- Design of projects for greenspaces with the participation of civil society.

8.2. Key-factors

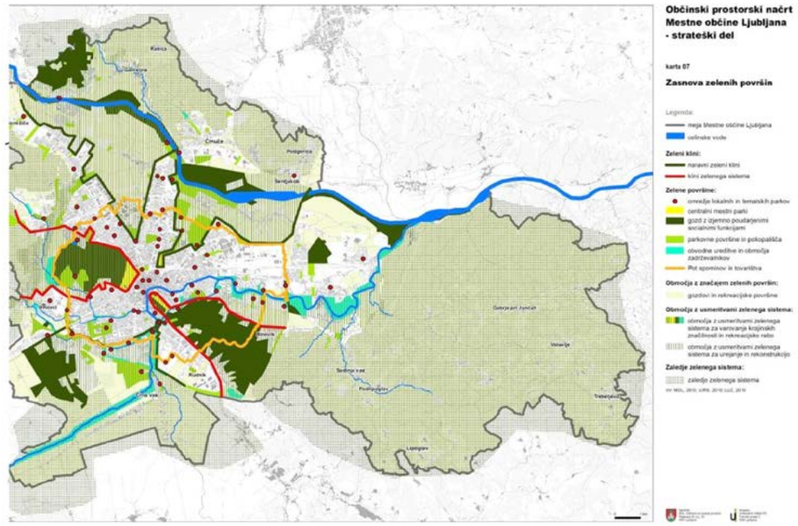
8.2.1. Creation of a system of greenspaces spread across the city

Ljubljana has had a notoriously green identity, thanks to the constant visual presence, the proximity, and easy access to greenspaces and natural sites, from any spot in town. Its 127 km^2 of green area represent nearly half of the City's administrative territory. The growth vision of the plan prioritizes: the urban development within the boundaries of the existing urban structure; the use of empty spaces, and the recovery of degraded areas; and, the concentration of new allotments along the main corridors of transportation, and access

to the city. This land use concept, along with the natural conditions of a major part of the land – an alpine region, it has historically turned little attractive for the urban development, which contributed to the high proportion of green areas across the entire city.

The spatial distribution of the green areas can be found across all residential areas of the town, in a 300 m radius from public green zones. Concerning the quantity indicators, Ljubljana counts on approximately 550 m^2 of public green areas per inhabitant, considering the urban perimeter. This calculation includes the natural spaces of the suburbs (water bodies, forests, and agricultural zones). There are 106 m^2 of green area per inhabitant, 66 m^2 of which are for public usage.

Figure 40 - Greenspaces of Ljubljana



Source: Spatial Planning of Ljubljana

Chart 5 – Translation of legend on Figure 40

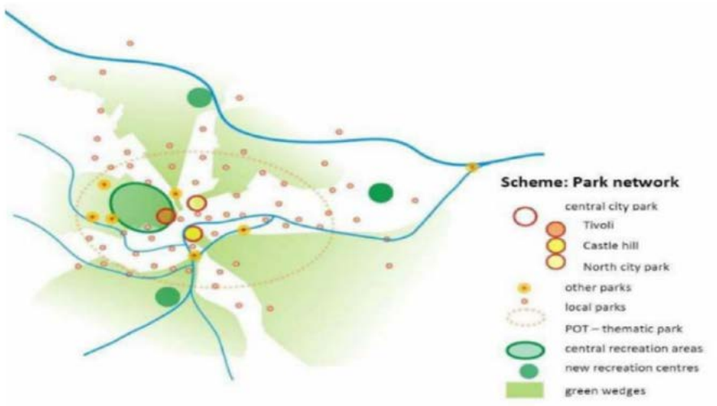
Obcinski prostorski nacrt Mestne obcine Ljubljana - strateski del	Local Land Planning of the Ljubljana Local administration – Strategic Part
Zasnova zelenih povrsin	Green Zones Concept
Meja Mestne obcine Ljubljana	Boundaries of Ljubljana City Municipality
Celinske vode	Rivers and water bodies
Zeleni klini	Green basins
Naravani zeleni klini	Natural green basins
Klini zelenga sistema	Green wedges' system
Zelene povrsine	Green Zones
Omrezje lokalnih in tematskih parkov	Thematic, and local parks' network
Centrailni mestni parki	Central parks of the city
Gozd z izjemno poudarjenimi socialnimi funkcijamo	Forest with recreational activities
Parkovne povrsine in pokopalisca	Parks, and cemeteries
Obvodne ureditve in obmocja zadrzevalnikov	Riparian zones' regulation, and reservoirs
Pot spominov in tovaristva	Memories, and Friendship Path
Obmocja z znacajem zelenih povrsin	Areas typified as green zones
Gozdovi in rekreacijske povrsine	Forests, and leisure zones
Obmocja z usmeritvami zelenga sistema	Areas with guidelines from the Green System
Obmocja z usmeritvami zelenga sistema va varovanje krajinskih znacilnosti in rekreacijsko rabo	Areas with guidelines from the green system to protect the landscape features – recreational usage
Obmocja z usmeritvamizelenega sistema za urejanje in rekonstrukcijo	Areas with guidelines from the green system for improvement, and rebuilding
Zaledje zelenega sistema	Inner green System

Nearly 81% of the green area comprises water bodies, forests, and agricultural zones in the suburban area of the town, being the larger-sized areas within the historical centre. This metropolitan scale green zones reach the consolidated urban area through open greenspaces, in basin-shaped (or wedge-like), among the urbanized land areas, and through the watercourses' corridors crossing the city.

The main idea of the system is to preserve the five green basins, interconnected by circular, and cross-cutting green rings, and by a network of parks. The green basins step into the centre of the city, and connect to the rural zone in the metropolitan region. They are especially important for the city, from a functional and ecologic perspective, since they create micro-climates that enable the ventilation of the city, while create natural corridors of major influence on the citizens' quality of life. Each one of the basins has its own meaning, and, therefore, the plan intends to keep their respective features. Regardless of the urban growth, the fertile areas not only were not reduced (between 2008 and 2012), but had a light increase. In 2010, 1,400 ha of forests were protected by their assignment as special usage area, thus being recognized for their valuable contribution to the natural system, and for the capture of CO_2.

The watercourses, the channel, and some brooks are an important part of the green system of the city. They also belong in a system that creates public spaces on urbanized zones.

Figure 41 –Greenspaces' scheme of Ljubljana



Source: Šašek Divjak, M (2008)

The set-up of a network of neighbourhood parks is important to improve the quality of life. The Tivoli, the Grajski, and the Navje Parts – at the North of the town– have been designed as urban scale parks. Other important greenspaces are the Koseški Bajer, the Špica port, the parts by the junction of the Sava and the Ljubljanica Rivers, and the central parks of Roznik, and Šišenski hrib.

The urban nucleus encompasses 19% of the green areas (parks, gardens, children's playgrounds, and countless interstitial greenspaces among the buildings). In the centre of the city, the greenspaces are smaller, being 75% of them smaller than 200 m^2. Being reduced in size is also an advantage, as it allows greenspaces to be spread across the urban area, thus increasing their proximity, and becoming accessible for citizens –most of them are within a 5 minutes' walk.

From the total greenspaces in the urban nucleus, 96% are for public usage, regardless of being or not a public property. The city devotes special attention to the creation of playgrounds. Besides maintaining 240 parks, the local plan rule requires the installation of games for kids on new residential projects.

8.2.2. Considering the green areas as an urban recovery tool

The city development model focus on the urban regeneration. Therefore, 83% of the development is driven towards the reuse of urbanized soil. That includes degraded, and unused areas, such as old military headquarters, abandoned industrial zones, obsolete landfills, as well as the improvement of slums, and squatted areas.

Ljubljana average population density is of approximately 300 inhabitants/ha, considering only urbanized lands, or 100 inhabitants/ha, considering the entire administrative area. Such density, typical of compact European cities – although optimizing the infrastructure, and the services costs per capita, requires an assertive strategy aimed at the urban growth, given the high value of the land plots.

An example of link between greenspaces, and the urban regeneration is the reinstating of the Ljubljanica River banks, project that was awarded with the 2012 European Prize for Urban Public Spaces. The public space and the pedestrians' zone in the centre of the city were extended up to the river banks (construction of 4 new walking bridges for pedestrians and cyclers, new berths,

paved zones, and stairways that lead to the watercourse). This infrastructure is complemented with cultural, and socialization activities ("Under the trees library", the interpretative and educational installations; and business and leisure centres with passenger docks, restaurants, and tour boats' terminals, among other services).

The city accomplished the first phase of the regeneration of the Sava River hard standings (encompasses 20 ha of degraded zones). They demolished various illegal structures, which used to occupy the river banks, and tracks, sports and leisure areas were installed in their place. Five new parks with 40 ha land – which structure a new system along with the new sports centre – were built on the degraded areas, and the abandoned industrial zones (flooding area by the rivers).

The Green Belt, or the Memories and Friendship Route is a linear public space shaped as a circle around the urban nucleus. This belt works as the spine of the green system of the city, as it interfaces with various parks and green basins. It is 34 km long, with 166 ha of green areas, sheltering 7,000 trees, resting areas, monuments, and other features of urban interest inside. This space has a symbolic value, since it encompasses an old barrier built by the occupation forces during World War II. The urban design, and the Green Belt equipment (fitness stations, and *cross-country ski tracks*) allow residents to enjoy the installation during Winter, and Summer time. It is also a space for public festivities, such as the Ljubljana Independence day, attended by approximately 30,000 people.

Figure 42 - Green Belt of Ljubljana

Source: Ljubljana Tourism (2010)

8.2.3. Boosting up projects for greenspaces with the participation of civil society

The Ljubljana Local administration supports public space projects developed by the NGOs, and by the local community aimed at improving the conditions of life across the districts. In the past decade, the interest of the NGOs in cooperating actively with the city planners, as well as in participating in the projects' performance.

Concerning the project, the NGOs can cooperate in the preliminary phase, and in the coordination of greenspaces' projects, as well as in their implementation. The preliminary phase of the project engages the actors, and prepare them up to the participative process. If the initiative is related with land owned by the Local Administration at a specific district, the local construction work departments, and the residents interact to approve the development of the zone.

An example of district local scaling: two non-profit cultural organization transformed an abandoned land plot into a community kitchen-garden, with the help of residents.

Another relevant issue to be solved is the accounting by the project owners, since the Local Administration cannot undertake the responsibility for the projects with a defective accounting. In cases like this, not always the NGOs can properly represent everyone affected in the region where the project is taking place, which gives rise to legitimacy inquiries.

8.3. Legal Framework

Ljubljana adopts planning levels. The Ministry of the Environment, and spatial planning is responsible for the Spatial Plan (nation-wide), and it also coordinates the Regional Plans, and those intervening with various cities. The Local Administrations are responsible for the Spatial Plans (local scope).

In Ljubljana, the Urban Planning Department establishes the urbanistic rules, while the Environment Department handles the environment issues at a strategic level. The Business, and Traffic Activities' Department, along with the Development Projects' Office are responsible for the execution.

"2025 Ljubljana Sustainable Vision", adopted in 2007, is a strategic document that describes three development pillars for the town: "The ideal city", i.e., reaching the optimal city size to live, to work, and to have leisure time in; "the sustainable city" for the conservation of the city, and the region's natural and urban environment; and, "the Slovenian metropolis", which signals the competitive European capital nature. This document provides information on the various planning instruments of the city:

- Local Spatial Plan;
- 2007-2013 Environmental Protection Program (2014-2020 revised version);
- 2020 Action Plan for Sustainable Energy;
- 2020 Sustainable Mobility Plan;
- 2020 Electro-mobility Strategy.

The Spatial Plan is the framework that rules the Ljubljana land. This is the most important planning instrument to determine greenspaces, as it determines, maintains, and develops the green structure of the town. Urban greenspaces are considered multifunctional, and are also responsible for the mitigation of other urban pressures.

Among the 2010 Spatial Plan purposes, there are:

- Organizing, and preserving green basins, which join the city centre with the urban suburbs, and are essential parts of the metropolitan structure;
- Establishing connections among the different greenspaces and open spaces into an integrated system of green areas;
- Ensuring the access to green areas by distributing it among citizens in an equidistant manner;
- Defining the water bodies' banks as special elements of the green areas' system;
- Ensuring the ecologic quality of the urban surrounding;
- Recovering green zones that were deteriorated by the urbanization process.

Two factors of the urbanistic standards have been outlined to keep the current proportion between the land occupied by open spaces and green zones, and the urbanized land, as follows:

- The green land factor is the proportion of soil with vegetative cover on the total land of the parcel intended for the construction of non-residential buildings. In the central zone of the city, the soil surface with vegetative cover can only be replaced with paved areas if the entrepreneur or owner implements a square or a multi-purpose area;
- The open land factor is the soil surface with no construction work on it, related with the total land of the area intended for building construction. At least 50% of the land plots will have vegetative cover, and 50% maximum will comprise of paved areas.

The application of these factors is aimed at consolidating the soil with vegetative cover, and controlling the excessive impermeable cover, or constructed soil area.

The Ljubljana Urban Regional Development Agency, founded in 2002, promotes the sustainable development of the 26 cities of the region. The agency's role is to prepare the regional development programs, and identify a list of eligible priority projects to be funded by the European Union.

The target of the regional development strategy is to develop a metropolitan area, interspersed with natural spaces, thus enabling it to reach competitiveness along with the improvement of quality of life. To accomplish such goal, the main activities of this agency are:

- Develop the relationship between public and private sectors (local, regional, national, and international scope), aimed at promoting development initiatives, and improving the regional coordination;
- Speed up the regional development, the programs' planning, and execution in an integrated manner;

- Obtain national or international financial support.

The infrastructure and services' sectoral plans are a means for the metropolitan and regional coordination. The city has an 87.32% stake at the Ljubljana Public Consortium (JHL), which includes power generation and distribution companies, the public transportation system, the solid residues' management, the supply, and the waste water management. These companies have the capabilities to implement the city's vision on the metropolitan area. For instance, with the aid of neighbour cities, Ljubljana has been improving public transportation connections with the construction – for 2017 – of 23 stations with garages, which will promote the quick run-off of the main lanes of access to the city.

In addition, and using the strategy to develop and promote tourism 2012-2016 for the Slovenia centre, a metropolitan focus on sustainable tourism has been promoted, in which the conservation of the rural surrounding, and the greenspaces management are indispensable assets.

The elaboration by the Local administration Environment Protection Department of the Integrated Program for the Environment started in 2004, in compliance with the National Law of Environment Protection, and in consonance with the National Program of Environmental Action. That Program, intended for the protection of the nature, and green lands defined the following specific objectives:

- To preserve the biodiversity, and the natural value, they have set measures such as the creation of a handling plan for some parks, a monitoring system for nature preservation, and the preparation of proposals for the recovery of degraded areas, among others;
- To preserve and create new green zones open to public access, as well as their proper management, they undertook actions, e.g., the acquisition of land plots, and soil by the city, the adequate creation of new public parks and forested sidewalks, the definition of monitoring systems for greenspaces, as well as educational programs on the value of greenspaces' conservation.

As to the funds to develop these plans, the Environment Protection Department has allocated EUR 1.3 million for 2010 budget, which corresponds to 0.3% of the Local Administration budget. Since 2006, there has been a periodic floating in the budget, ranging from 0.2 to 1.5%, depending on the projects to be performed. The Environment Protection Department's funds are mostly used for the protection of underground water, the air and soil, and natural resources' quality monitoring, the elimination of the asbestos, and illegal landfill on city-owned properties, public awareness and the preparation of strategic documents relating to the environment protection.

Table 6- Local budget

Year	Local budget (EUR)	Environment Department (EUR)	%
2010	408,672,845.00	1,312,981.00	0.3%
2009	294,036,126.00	4,149,833.00	1.4%
2008	294,601,603.00	627,028.00	0.2%
2007	226,819,927.00	3,456,178.00	1.5%
2006	224,240,465.00	396,388.00	0.2%

Source: Ljubljana City Profile, (2011)

The Environment Protection Department's resources for public spaces-related works are complemented with funds from the Commercial and Traffic Activities' Department, which has been allocating funds for the pedestrian zones in the centre of the city, revamping of the streets to appease the traffic, building of bridges, walking bridges and parks, as well as for the regular yearly maintenance of the green areas, and public pedestrians' zones.

The city's Supervision Council controls the allocation of the funds. This Council comprises five commissions, and fourteen committees, which propose, debate, and adopt measures. Sustainability is a cross-cutting agenda. The work of eleven out of the fourteen committees relates to the sustainable development.

8.4. Social control and Participation

Ljubljana has implemented two advisory agencies for the Local Administration – the Public Spaces' Council (CEP), and the Advisory Council for the Vice-Mayor on Public Spaces and Traffic (CAVEPT). The CEP has an advisory role, establishing cross-cutting links with the technicians from the various areas of operation. It is responsible for promoting the best practices related to green areas, and other public spaces management actions, and it also has authority to support decision-making on the spatial planning. The CAVEPT is an operational agency that includes representatives from the various public administration departments, from utilities and concessionaires of services

that pertain to planning, maintenance, and revamping of the green zones, and open spaces in town. This Advisory Council improves the coordination among the actors, promoting the interchange of information, knowledge, and experiences.

Table 7 - Participation in the Plans - Phases of the Process

PRELIMINARY INSTITUTIONAL INQUIRY	PUBLIC INQUIRY	DRAFT PREPARATION	PUBLIC DISCUSSION AND ADOPTION	IMPLEMENTATION
• Mayor; • Council; • City Municipality; • Project Managing Group;	• Public hearing to launch the project; • Description of the process; • Systematic contribution by a form available for the NGOs, the Civic Associations, etc.;	• Focus groups; • Diagnostics; • Vision and principles; • Scenarios, options, and priorities;	• Thematic presentations; • Focus groups; • Exhibits; • Public hearings; • Systematization of the actors' opinions; '• Plan feedback;	• Satisfaction research; • Follow-up meetings

Source: Kempen (2014)

To elaborate the Environment Protection Program (2014-2020), the Local administration has created a participation space, which included the elaboration phase of a draft proposal by the various actors (citizens representing public opinion, professionals of the town and of the public administration, non-governmental organizations, industry, and professional and academic associations). The elaboration of the document counted on the participation of 162 people. Through workshops, presentations, round-tables, exhibits, and public debates, these actors could connect between the vision and the principles, with the respective priorities and measures. In two awareness-raising workshops, the participants drafted a strategic list, selecting priorities. After these activities, another four thematic workshops were held, during which participants proposed targets, and measures to be implemented.

The contributions were processed, and then a draft was elaborated by the Environment Protection Department. Before the Local administration implemented it, though, a presentation was made for the public. The participants of the last workshop revised the objectives registered, and proposed the respective measures. In addition to that, an on-line platform was created to receive the proposals – within the program framework called "You are Ljubljana"!

Table 8 - Strategic, and operational objectives from the participative process

STRATEGIC OBJECTIVES (OS)	OPERATIONAL OBJECTIVES (OO)
OS1: Long-term protection of water springs	OO1: Improve the quality of drinking water fountains;
	OO2: Achieve balance between usage and recharge of underground water in the long run;
	OO3: Improve the ecologic condition of top waters;
OS2: Natural Environment Protection	OO1: Conserve and improve the biodiversity condition;
	OO2: Establish an integral system to manage natural characteristics, and protected areas effectively;
	OO3: Establish a full green system for Ljubljana, and its effective management;
OS3: Urban Afforestation, and Local Empowerment	OO1: Establish an integrated focus to ensure the local empowerment;
	OO2: Increase the amount of land ready for agricultural production, and improve its quality;
	OO3: Develop an effective urban afforestation network;
	OO4: Stimulate, and foster ecologic food consumption.
SO4: Ljubljana stands as an example of the good practice in terms of integrating, and promoting the sustainable life, and work of the city	OO1: Establish an effective system to supervise the application of the PP, activate, and raise the level of awareness of the target groups, and habit change;
	OO2: Create an invigorating environment for new green jobs, and ecologic innovation to be developed;
	OO3: Ensure that the city's administration, the public companies and institutions become role models for the sustainable development.

Source: City Municipality of Ljubljana

Soon after the Program was approved, the Local administration published a Catalogue of Information of Interest for Environment Protection. Through this catalogue they disseminate full information on laws and regulations, and the relevant information on which institutions are responsible to solve, especially environmental problems. This initiative is complemented with the dissemination, among youngsters, of the environmental issues that are faced every day, and how they can contribute with their solution.

Table 9 - Elaboration phases of the Environment Integrated Program

PHASES OF THE PROCESS	RESPONSIBILITY	PUBLIC CONTRIBUTION
Preliminary preparations		
Decision to perform the Program	Mayor, the Local administration	
Formation of a work group	Environment Protection Department	
Assignment of work groups	Proposed by the Department and ratified by the Mayor	
Decision to perform advisory services	Proposed by the Department and ratified by the Mayor	
Public participation		
Public participation plan	Proposed by the Department and ratified by the Project Group	
Creation of a web page, and advertisement on the participation process	Department	
Designation of the Advisory Group	Proposed by the Work Group and ratified by the Mayor	•
Elaboration of the Draft Program		
Diagnostics, and trends	Elaborated by the Department	•
Vision and principles	Advisory Group	•
Priorities	Advisory Group	•
Measures	Advisory Group	•
Elaboration of a draft document	Advisory Group	•
Public hearing, and implementation of the program		
Public hearing	Department	•
Implementation of the Program	City Municipality Administration	•
Implementation		
Monitoring of the Program Implementation	Department and Advisory Group	•
Evaluation, and adjustment of the Program	Department and Advisory Group	•

Source: Recommendations from the Ministry of the Environment and Spatial Planning for the local environmental programs' elaboration. Obtained from the candidacy of Ljubljana to Green Capital

Other spaces for participation related with the environmental theme include:

- The Citizen Initiative Section, with support from professionals, allows residents to set a fluent dialogue, and support the solution to various problems and initiatives.
- The European Union project framework "Mobilising citizens for vital cities" (CIVITAS ELAN). The City Municipality government, as coordinator, established a process for the public participation, with 130 events, from which they could present contributions for the electro-mobility strategy.

8.5. Evaluation

Ljubljana has performed an inventory on the vegetation, registered the species, and over 168 types of habitats, and ecosystems. Based on this inventory, over 1,200 ha of natural value were protected by rule. The vegetative land occupies 45% of the total land entered into the protection zones, especially on the alpine parts of the city, and by the marshes. Shrubby vegetation (beeches, pine trees, red pine trees, and oak trees) was conserved. Among non-forest species, the marshes as especially important, as well as the long moist meadows, and intermittent marshes.

A comparison on the city's vegetative cover (periods of 1998 to 2002, and 2007 to 2009) indicates that this cover has increased in the central area of the city. Since 2010, they implemented or renewed 40 ha of green zones. In the past three years, over 2,000 trees were planted in the city along the main roads, and parks.

The evaluations on the sustainability impact of the policies proposed are in the mandatory environmental reports, and strategic documents. Motivated by their candidacy to the European Union Green Capital Awards, the Local administration published a summary table with the environmental measure's effectiveness. All indicators' results were positive. There has been reduction in the presence of particulate matter by 44 to 58%, power consumption reduction, increase in the percentage of renewable sources, and also reduction of water consumption per capita, among other indexes.

Table 10 - Summary of the environmental actions effectiveness

TOPIC	CHANGES FROM 2003 TO 2012
CO_2 / SO_2 / Particulate Matter – PM 10	
CO_2 (µg/m³) Annual Average emission at the Ljubljana Bezigrad Station	44% Reduction
SO_2 (µg/m³) Maximum daily emission at the Ljubljana Bezigrad Station	58% Reduction
PM10 (µg/m³) Maximum daily emission at the Ljubljana Bezigrad Station	44% Reduction
Emissions of CO_2	27% Reduction
Connection of the Ljubljana buildings to the heating system by district, ad natural gas systems	
Power consumption	26% Reduction
Power efficiency	
Solar panels-generated power (2007-2012)	15% Increase
Residues (2007-2012)	
Organic residues collected	141% Increase
Number of containers for organic residues	37% Increase
Residues collected from selective collection	148% Increase
Number of selective waste collection points	67% Increase
Hazardous residues collected	85% Increase
Residues collected at recycling plants	46% Increase
Gross residues	29% Reduction
Percentage of separated residues	22% Increase
Waste water (2004-2012)	
Amount of treated waste water	1.825% Increase
Percentage of buildings connected to the sewage system	18% Increase
Water (1991-2011)	
Per capita water consumption (Ljubljana, and the five adjacent municipalities)	37% Reduction
Transportation	
Use of transportation system with shared bicycles (2012-2013)	164% Increase
Pedestrian areas in the centre of the city (2007-2013)	616% Increase
Passengers of the train system	4% Increase
Bus system reach	43% Increase
Increase of passengers of public transportation after the integrated fee introduction (2009-2012)	29% Increase
Distance from bus stops – 500 m	93% to 95% Increase
Distance from bus stops – 300 m	88% to 92% Increase

Source: Candidacy of Ljubljana to the Green European Capital Awards

9. Copenhagen

9.1. Context

Copenhagen metropolitan area is a land interspersed with green areas sprawling across the borders of the cities integrating it. It is hard to think of Copenhagen, Green European Capital for 2014, developing as one of the most vital and green cities of Europe without a Directive Plan guiding its urban growth, and allowing investments on infrastructure to be made.

The Urban Development Guide of Copenhagen has been the Finger Plan. For decades, this spatial plan has been influenced by the land use model that preserves natural areas, and green-spaces (the "fingers" of the Plan), by forbidding the construction on such areas, and concentrating the urban development across corridors with collective transportation available.

Population. 541,989 inhabitants (2011);

Area. 74.4 km^2;

GDP. EUR 45,000 million; EUR 38,000 per capita;

Local administration Budget. EUR 6,600 million;

Territorial organization. The city is split into 10 districts, and its metropolitan area comprises 3 municipalities, besides Copenhagen.

The key factor for continuity of the planning models was that the metropolitan area's cities acted as partakers from the beginning, since they were consulted for the elaboration of the Directive Plan (Finger Plan). As years passed, the urbanization "fingers" became broader, and, therefore, they are larger than those originally anticipated over 6 decades ago. Nonetheless, the Plan succeeded in absorbing the population growth of the town, and its urban structure remains as a highly functional model to date. The Finger Plan verified that the elements that structure the landscape may induce the cooperation among the cities of the region, which limits the urban sprawl.

The Ministry of the Environment of the Denmark Administration is responsible to set the planning guidelines for the metropolitan area of Copenhagen, aimed at ensuring a comprehensive and integrated focus for development. Furthermore, the Ministry undertakes the role of instructor for the application of the guidelines anticipated in the Finger Plan for the Local Plans. It is a moderator role, relevant to guide the actors across the metropolitan area towards a shared development model. The local administrations are responsible to regulate on the land use, within the municipality scope, with legally binding guidelines.

The key-factors to ensure the urban environmental quality of Copenhagen could be summarized as follows:

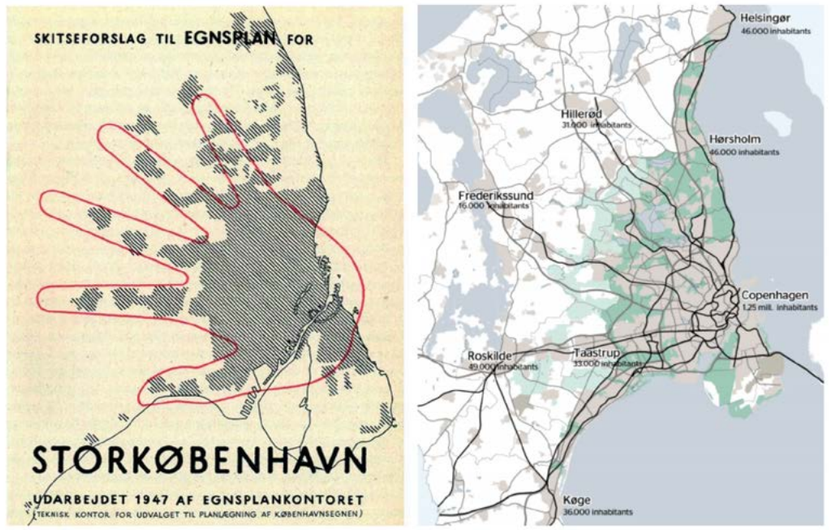
- Continuity of the Planning supported by the Finger Plan;
- Participation of the Ministry of the Environment in the spatial planning;
- Alignment between the Local Plans and the Finger Plan's priorities.

9.2. Key-factors

9.2.1. Continuity of the Planning through the Finger Plan

As with other compact medieval cities, until the industrial revolution, Copenhagen growth followed the pattern of concentric rings, thus resulting in a metropolitan area from the centre to the suburbs. The post-war recovery of the centre was replaced by an urban disperse development model, occupying broad extensions of land, beyond the central area. By the 20's, the inclusion of the districts established around the urban area demonstrated a well-defined spatial intention. As a result of the lack of control, the peripheral areas grew without infrastructure. Since the job opportunities, and services remained in the centre, there was a significant increase to daily commuting, which contributed for traffic jams, reduction in productivity, and the increase in the utilities services' costs per capita. Due to the demographic growth, and to an increasingly higher soil occupancy/inhabitant, it has become more difficult to have access to green areas, and to broaden the agricultural areas.

Figure 43 - 1947 Finger Plan, and the current urban configuration of Copenhagen



Source: Ministry of the Environment of Denmark (2015).

The green belts' concept had been implemented on cities victimised by epidemics (cholera, and yellow fever), and it is one of the foundations for the "Garden City" movement from the early XX century. The movement proposed a system of cities with controlled sizing, with broad green zones spread as satellites to a larger urban area, which would unite by roads, and rail roads.

The purpose of the Greater Copenhagen Regional Proposal-Plan Project's was to control the uncontrolled and disperse sprawl. According to the mentioned plan, prepared by the Danish Institute of Urban Planning (1947), the urban growth would concentrate along five corridors, or "fingers", on which there would be the suburban districts, while the Copenhagen Centre, the "hand palm" would remain as the main centre of the urban system. The corridors would be structured by radial lines of suburban trains, connecting the peripheral districts to the central area. Each corridor would encompass new allotments to shelter a population of 10,000 inhabitants, business centres, schools, and other facilities for daily needs, created around the transportation stations (trains). The basins between the fingers should remain as green areas.

Figure 44 - Green basins in the urban area

Source: Ministry of the Environment of Denmark (2015).

One of the most remarkable features of the Finger Plan is its capacity to engage in a clear spatial vision: the urban development would concentrate on the "fingers", while the space between them would remain as green areas. Its dissemination caused a broad acceptance, and appropriation by the civil society, which was essential to have its influence to last over 60 years.

During that period, the Ministry of the Environment played a decisive role to maintain the principles set on the plan. Many administrative amendments changed the institutional structure

of Greater Copenhagen, and, as a consequence, various entities undertook the planning. All of the entities, and the planning instruments they produced, have ratified and strengthened the Finger Plan role as a guiding path for the land usage planning. Regardless of the amendments made throughout the years, such as the creation of a 4th green belt around the city, and the adjustment to the land use along the corridors, the continuity of this plan enabled for public investments' decisions to reinforce the planning concept, thus making it possible to create conditions for private companies to move in that same direction.

The Copenhagen Directive Plan (1960) introduced, for the first time, the multi-centrality concept on the metropolitan area. By 1967, the cities of Copenhagen, and Frederisksberg, along with the counties of Copenhagen, Frederiksborg, and Koskild created a Regional Planning Council with representatives from their respective local authorities. It fell to the Council to develop a Regional Plan for the Copenhagen metropolitan area, which draft was presented in 1973.

In 1984, the Regional Council of Planning became the Council of the Greater Copenhagen. By force of law, this Council was assigned with the authority for planning the metropolitan area. Concerning the decentralization process of 1970, it granted authorities to Local administration, the Municipality Plans being subject to the plan developed by the Council. The cities from Greater Copenhagen included the conservation of the green basins to their local regulations, and kept the basic principle of coordination between the land use planning, and of the transportation on their local plans. The Regional Plan (1989) adjusted the polycentric network structure through investments on infrastructure to reinforce the connections.

Starting on 1990, the coordination of the metropolitan area planning became a responsibility of the Ministry of the Environment. The authority to establish urbanistic rules remained with the cities of Copenhagen, and Frederiksberg, and the three counties from the metropolitan area. From 2000 to 2007, they implemented the Development Council of the Capital City to undertake the land planning across Copenhagen metropolitan area, when the Ministry of the Environment updated the Finger Plan. The plan stands as a national guideline, while local authorities are responsible to apply such principles to the local plans and regulations.

9.2.2. Participation of the Ministry of the Environment in the land planning process

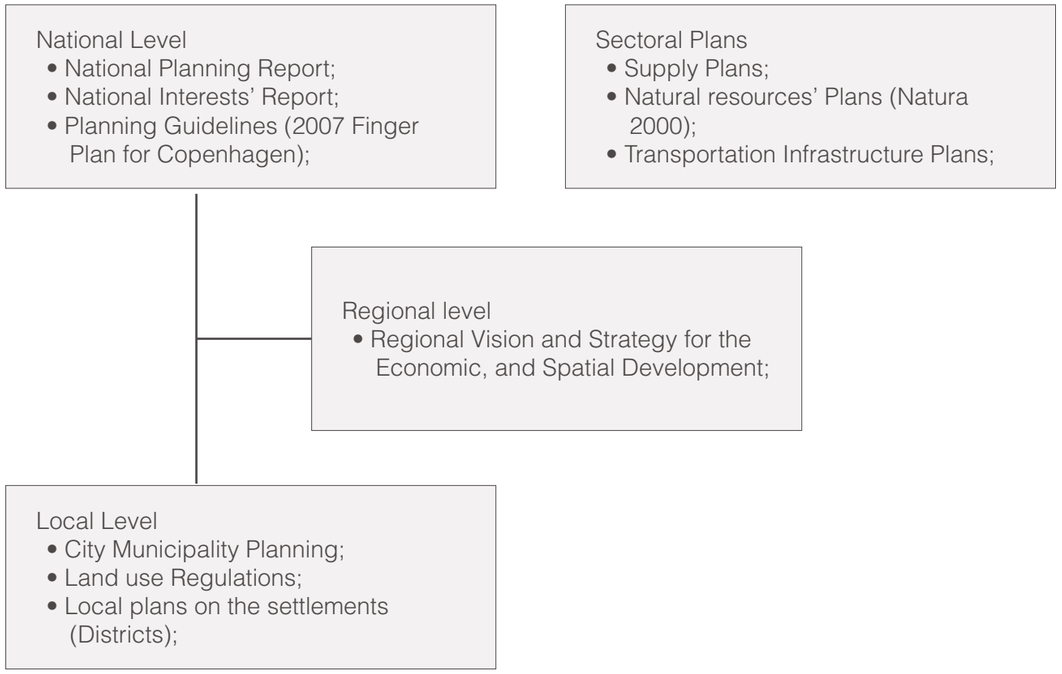
The local administrative reform (2005) has changed the land management significantly in Denmark. Before the reform, the administration authority for spatial planning purposes, which included the land use regulation, was shared among the three administrative levels: the national administration, the counties, and the municipalities. After the reform, this authority started being shared between the national administration, and the 271 municipalities (existing before 1998). Fourteen counties have been abolished, and the five regions were restructured.

Concerning Copenhagen, the guidelines from the Ministry of the Environment are intended to consolidate the city's profile as a green capital. For this Ministry, the metropolitan structure was adjusted in the corridors to refrain the disperse urban sprawl, by defining land use rules, and conditions that promote the construction of urban development areas around transportation stations. The guidelines refer to the agglomerations as urban centres, district centres, and of secondary level.

The metropolitan area planning is intended to ensure there are soil reserves for future transportation infrastructure, and for urban services' networks integrated to various municipalities, as well as to delimit the natural protection areas, and monitor the impacts caused by the development. Concerning other guidelines, the local planning for the metropolitan area of Copenhagen should ensure that:

- The development and revitalization of the central nucleus occur within the existing urban area, with emphasis on public transportation services;
- The urban development and the new urban functions across the peripheral region (the corridors or "fingers) will be performed in accordance with the existing or the planned infrastructure, and, particularly, with opportunities to strengthen the public transportation system;
- The green basins will not be areas for construction works, nor will be used to implement enterprises, or recreational-focused infrastructures;
- The urban development of the remaining metropolitan area, with a local character, should consider the relation with the existing local centres.

Figure 45 - Spatial Planning System



Source: Ministry of the Environment of Denmark (2015).

The guides are conveyed through the following documents:

- National Planning Report, as presented by the Ministry of the Environment after each election for the parliament;
- National Interests' Report, as published by the Ministry of the Environment every four years;
- Guidelines that lead the Local Administration Planning, the land use regulations, the administration of the districts and rural zones, and the incorporation of environmental considerations (areas that should be protected, handling of landscape within the local planning, and the evaluation of the environmental impact, among other things).

The Ministry of the Environment is responsible for coordinating, and ensuring that the national interests are safeguarded within the local planning.

The Planning Act, effective throughout the country, establishes the general principles, and the reference framework that will apply to municipalities, and their local planning, so the local plan does not opposes the general plan.

City Municipality Planning

The Planning Act determines that each city should draft a Local Plan to encompass a 12-year period. Based on a general diagnostic on the development, the local plan shall regulate, among other things:

- A general structure describing the overall route towards the city's development;
- The detailed structure for the local plans' content, including specific areas of the municipality;
- Guidelines for land use, and other regulations, such as:
  - The creation of urban zones, and cottages' zones;
  - The construction parameters for the different zones (residential, commercial, institutional, utilities, and urban revitalization areas, etc.);
  - The details of the commercial structure (clearances, usable index, and maximum height allowed for shops);
  - The construction parameters for the transportation installations, the technical installations, and trade and industrial zones, with special attention to pollution levels' control;
  - The construction parameters for leisure areas, and for other recreational areas;
  - The administration of agricultural interest areas;
  - The assignment of areas for reforestation, and the areas that are improper for reforestation;
  - The construction parameters for the lowlands;
  - The construction parameters for natural reserves with special interest, of the areas with ecological potential for natural reserves, and potential ecological corridors;
  - The preservation of landscaping assets, and the delimitation of zones with remarkable, and valuable features;
  - The preservation of the geological assets, including the creation of zones with a special geological value;
  - The designation of the uses for watercourses, lakes, coastal waters, as well as the land use across coastal zones.

It falls to the Minister the obligation to oppose to local plans if they are not compatible with the national plans. He may request the local authority to prepare a plan with specific content. He is also responsible for objecting on behalf of other ministries, besides on his own. The Minister authority is granted to the Danish Nature Agency. If the plan within the Copenhagen metropolitan area conflicts with the Finger Plan, the Danish Nature Agency will oppose to it, which shall not be approved until the municipality, and the Agency reach an agreement. Under special circumstances, the Minister can undertake some of the capabilities granted to the local planning authorities, and solve the conflicts related to the planning. This alternative is seldom adopted, and it is only applied when the national interests overlay the local ones.

The Minister acts as an arbitrator among the municipalities of the Copenhagen Metropolitan Area. The latter can pose objections to the plans' proposals from any other cities of the metropolitan area. That is, the cities are entitled to oppose to a neighbour city's plan, if that is considered harmful for the local development. In this case, the disputes resolution falls to the Ministry of the Environment.

Figure 46 – Nordhavn Area

Source: Nordhavn Program (2009).

9.2.3. Definition of priorities between the Local Plan and the Finger Plan (Metropolitan Plan)

Demographic statistics estimate that Copenhagen will have 14 million inhabitants by 2025. Therefore, the housing and services' offer should increase accordingly to cope with such demographic growth. This fact shall create pressures on the land use, which may imply in reducing the green areas. Likewise, the Nature Protection Act (2009), which protects Copenhagen's registered parks and natural spaces has committed not to reduce greenspaces.

The strategy of increasing the urbanization area is focused on reusing abandoned, underused, or contaminated land plots. As such, the urban development shall concentrate on areas occupied by industries, ports, railways, warehouses, among others, and not by the urbanization of the green areas. According to this strategy, the soil offer shall get to the market, following a sequence that ensures the maximum use of urbanized soils, before they are converted into new areas. In the long run, that means the land plots identified as reusable can be used for recreational, cultural, and sports purposes. As an example, we could mention the artificial beach premises in Refshaleøen, and the cultural facilities in Carlsberg. To that end, it was performed a mapping of the land available for repurpose, until they can make an in-depth analysis on the soil contamination levels.

The local urbanistic rule promotes the development of mixed usage of land, combining housing with other urban functions (employment locations, stores, and institutions). The population density adjusts to the availability of public transportation, recreation opportunities, and other relevant factors for the urban environment, and for the residents' daily lives. The percentage of housing spaces available (60 m^2 for each 100 m^2 of housing for new multi-family buildings) enables the access to the green areas in the surroundings. The rule indicates that the parking space for private vehicles should be in the underground, and cannot use surface space. The existing housing, the relation of patios, the demolition of garages, and parking spaces on surface land will become opportunities for new green areas.

The integration between the public transportation system and the spatial planning is a legacy from the "Finger Plan". The suburban railways are the spine of the plan. Trains transport over 350 thousand passengers every day. The railways are complemented by two

subway lines that cover the central area of the town. Half of the daily commuting in Copenhagen is made by train, and by subway. The bus network operates mainly in the central zone, while 2 lines of harbour buses complete the network. All transportation modal use a common system of fees and tickets, which makes the Intermodal system easier.

Figure 47 - Suburban train system

Source: DSB

The Copenhagen decision to adopt non-motorized transportation modal has been planned since the 1960. Back then, the increase of vehicle traffic in the central nucleus caused traffic jams on the narrow streets with medieval outlining. The local authority decided (1962) to forbid the circulation of motor vehicles, establishing a zone for pedestrians on the main trade street in the centre, and on the adjacent streets, and squares. The pedestrian area has a significant length, besides being the oldest and longest in the world. The improvement to the interconnections of the pedestrian ways joining the green areas of the town is a project intended to motivate more people to walk and to use the parks, and natural spaces of the town.

Figure 48 - Stroget in 1954, and nowadays

Source: Copenhagen files

Bicycles have a key role in the Copenhagen bet to use non-motorized transportation means. Every day, 45% of the citizens commute to/from work or college by bike. The cycle lanes network is separated from vehicle lanes or counts on their own signalling systems to increase bikers' safety.

The Finger Plan original proposal of using green areas as a system, has positively influenced the open spaces' management. The revision of the Plan (2007) is contemporary to the document "Eco-Metropole Vision", adopted by the local administration. This vision positions Copenhagen as the Capital city with the best environment of the world, connecting with four general themes. One of them (called "A Green and Blue Capital City") establishes, as overall targets, to enable citizens with easy access to green zones, and to allow them to use these green areas for longer periods of time.

Figure 49 - Aerial view of the green basin

Source: University of Copenhagen

Within the boundaries under Copenhagen administration there are approximately 2,260 ha of spaces open to the public. These include parks, gardens, natural areas, small parks, sports facilities, watercourses (spring), and lakes across the green zones. Not all public spaces are owned or are under the municipality management. The green zones of the town represent approximately 25% of its total area, and, on average, every citizen has 42.4 m^2 of green zone at their disposal. Approximately 80% of Copenhagen inhabitants live within 300 m from a green zone. The city also has approximately 92 km of coastline, and 14.7 km of open watercourses.

In 2004, Copenhagen published a document with policies specifically addressed to parks, known as "Green Copenhagen". The policy is intended to ensure that there will be land reserved for natural areas, afforested areas, parks, and green belts in the future. On the other hand, it sets quality requirements, prioritizes the allocation of financial resources, and the protection of the natural assets that constitute the "green capital" of the city. This strategic document was reflected in a set of concrete action plans, in order to ensure the easy and safe access of citizens to the green areas, to the leisure spaces, and to physical activities in the open.

In 2008, the city developed the program "Space to play", which consists in a deep revision on the 125 parks for children of the town. In 2011, 90 out of the 125 parks were revamped. From these, 23 playgrounds counted on pedagogic experts so that kids' activities were safe, instructive, and fun. In 2009, they published the Action Plan for the creation of "pocket parks", the increase of the number of trees, and the improvement to the green areas' quality. The "pocket parks" are areas with 5,000 m^2 or smaller. An analysis identified the possibilities of creating these types of parks within densely populated urban areas, by leveraging underused spaces between buildings, and infrastructure systems, at corners, and local squares. The objective of the Action Plan, within a 5 years' perspective, is to create fourteen pocket parks, and plant 3,000 trees. Continuing with the Action plan, in 2010 the local administration developed an ambitious plan called "Copenhagen Going Green", whose goal was to plant 100,000 new trees in Copenhagen before 2025. Since 2010, 13,850 trees have been planted, and six pocket parks created.

The strategy of creating pocket parks has been accomplished with the renovation of the Fælledparken, which is the most visited park in town. This park was created by the beginning of the XX century, and has 50 ha. Its renovation was performed (2009) through the mobilization of 21 million dollars in donations from individuals and corporation for a management fund. The renovation included the installation of artificial sports' fields, new playgrounds, and a new roller-skating arena for.

The planning rules emphasized some of the following recommendations: maintenance of the green areas; increase of afforested areas; and introduction of green rooftops on buildings, in compliance with the Plan of Adaptation to Climate Changes. Copenhagen environmental management supports the objectives for CO_2 emissions reduction by 20% in 2015. The municipal administration undertook a leadership role, and a role model in achieving these targets. It has defined, in addition, the reduction by 20% in all activities, construction works and emissions of the city.

One of the most powerful ways to lead the fight against climate changes is the establishment of sustainable acquisitions. The application of the budget of the city – which is of 12 billion euros – in a sensible manner towards the environmental challenges puts the municipal administration in a position to minimize the environmental impacts, and to influence the markets to adopt environmentally-friendlier business policies. In 2011, the municipal administration adopted a new procurement policy, which included the European Union definition for the

green public procurement. The city uses the environmental considerations as evaluation parameters on all bidding processes for products, and services. When complying with the green procurement policy, the city can influence suppliers and manufacturers, as well as support the development of products that promote a more respectful relationship with the environment. The City Municipality aims that all of its environmental management actions to be certified by the ISO 14.001 standard. Therefore, Copenhagen will be able to become the first capital city of the world where all administrative institutions and units are regulated under a certified system of environmental management.

9.3. Legal Framework

Denmark's planning hierarchy has been simplified for the metropolitan region, moving from a three levels system to another with two levels, while the municipalities became responsible for nearly all legally-binding planning.

The Planning Act (2007) grants to the Ministry of the Environment the responsibility to prepare a national guideline of planning for the Copenhagen metropolitan area, including the urban nucleus, the peripheral corridors, and the green basins. Said responsibility has been anticipated in the Finger Plan of 2007, and in the 2013 version. The municipalities are responsible to perform the urbanistic rules, in accordance with the guidelines set forth in the Finger Plan framework, and the Ministry should make sure the municipalities follow the fundamental principles of the city's general structure.

The national planning guidelines are issued by the Ministry of the Environment as a rule with binding nature. Following a top to bottom system, the cities are, therefore, compelled to abide by the guidelines' provisions. The municipal and the project planning should be in accordance with the national planning guidelines. Otherwise, such plans would be vetoed by the State, without possibility of implementation.

The land classification specified in the planning guidelines (Finger Plan) is set forth on the Planning Act, as follows:

- Urbanized zone (urban and "fingers" nucleus);
- Protected green zones (green basins between the "fingers") for recreational usage, and nature conservation areas;
- Rural zones (smaller and other types of cities, used for agriculture and forestry).

Following this general land use classification, municipalities have the mandate, and the authority to perform more detailed classifications within their own plans – always, and if they comply with the national planning interests. This means, primarily, that the urbanized zone can be split across the different types of land use needed. On protected green zones, the municipal planning possibilities are quite limited, since the inclusion of new recreational usages, with sports and leisure installations, is forbidden. In Copenhagen, the Zoning Code rules the following:

- Land use: residential, commercial, institutional, mixed usage, commercial port zones, industrial, infrastructure, utilities, etc.;
- Construction density, by usage indexes of the allotments that, overall, vary between 0.4 and 1.85, except for some specific areas;
- Height of the buildings, overall ranging from 10 to 30 m, except for specific areas;
- Free area rate, ranging from 30 to 100% of the gross build up area for housing, ranging from 10 to 20% for commercial usage;
- Necessary number of parking lots for vehicles, and bicycles.

Special categories (hazardous industries, and power production and distribution), as well as certain infrastructure systems are planned by the State. In this case, the municipal planning of land use should respect the decisions made on national level. The Finger Plan establishes the development of transportation infrastructure (railways, roads, etc.), that does not integrate the national rules for planning purposes. The transportation system is developed by a national planning, and financing process, and, in some cases, with the participation of the municipalities, as it is with the Copenhagen subway system.

The planning for the retail business areas is extremely detailed in Denmark. This means that, within the Copenhagen metropolitan region, the rules for the business types (basically split in food and other trade types), size of the store, and space - overall - for retail trade in the municipalities are implemented by a special planning rule. Every municipal plans should obey that rule.

The zoning regulates the construction of office buildings, and similar activities. Office buildings larger than 1,500 m^2 should be built less than 600 m (if they comply with additional requirements, at less than 1,000 m) from a subway or train station. In some cases, office buildings smaller than 1,500 m^2 are allowed.

9.4. Social control and Participation

The Finger Plan was originally drafted by a group of experts from the Danish Institute of Urban Planning, with support from public authorities, through a Regional Workshop of Planning, which was backed by the volunteer cooperation of three counties, twenty-

two municipalities, and other interested organizations. The workshop was funded by the Municipal City Halls, and by the Central Administration. The Finger Plan should abide by the Regional Plan's guidelines, but the Regional Workshop of Planning ended out before its Plan obtained a legal jurisdiction. Regardless the fact that the Finger Plan does not have legal effects, its influence was significant because the cities were consulted during its conception process.

The Planning Act establishes minimum rules for the public participation in the planning process at a local, regional, and national level. This Act determines that a report should be published, showing the proposal's premises before the Municipal, and Regional Development plans, the national planning guidelines, or the national report on planning are performed. Owners, neighbours, NGOs, public authorities, and other actors have, at least, 8 weeks to present their objections, comments, proposals or critics.

The municipalities have the authority to develop their own participative processes, being the consultation method, and format at their own discretion. They may create spaces to debate the strategy to be followed, and the development potential in an informal manner, before the formal planning process starts. The planning authority shall decide whether or not to distribute more material to subsidize the discussions or adopt other similar methods.

Besides the participation in the planning process, Copenhagen grants its citizens with the chance to create opportunities for usage of the parks. The City Hall works with volunteer associations to improve the greenspaces of the city. The city, in turn, allocates funds for the projects managed by these associations (local culture gardens, plantation of trees, and events to diffuse environmental topics).

9.5. Evaluation

As per the Planning Act, the elaboration of plans for each municipality within the metropolitan area should consider the results' evaluation basis for the area, overall. The Ministry of the Environment is responsible for gathering the information on the metropolitan area, and distribute them across the Local administrations, so they can elaborate their respective plans. Besides that, after each election for the Parliament, the Planning Act requires the Minister of the Environment to present a report on the National planning Status, to be used as a reference for the local planning.

At the project level, the Local administration of Copenhagen (2009) designed an evaluation tool comprising 14 categories to define the sustainable development of the city. This tool is used to assess the urban development projects with over 50 thousand m^2, for which it is mandatory to get a planning permit from the district. The fourteen sustainability categories are:

- Land use;
- Transportation;
- Power;
- Water supply;
- Material recycling management;
- Green and blue areas;
- Social diversity;
- Urban space format;
- Capacity to generate urban life;
- Historical identity;
- Space for business and services' activities;
- Projects feasibility;
- Durability of the project through time.

Since the beginning, the projects are subject to an evaluation, which places sustainability at the centre of the negotiations with the project's designers, until they are ready for occupation. The selection is not a quantitative measurement tool, but it is rather based on qualitative evaluations made by experts. The fourteen sustainability parameters comprise a control list for designers to be able to evaluate whether their projects consider the development needs of the city.

The analysis of the zone intended for a new allotment, and its neighbourhood identifies "which contributions" this new project can bring to its immediate surroundings, and "what" its neighbourhood already offers, as well as the natural and cultural existing assets, which need to be preserved. For instance, the capability of the new allotment to improve the existing mobility infrastructure; the greenspaces network has a decisive role in the evaluation of a new project.

As to the systematic monitoring of the environmental targets of the city, this is an integral part of the management system the Local administration performs, following specific goals (air quality, noise levels, residues generation, etc.). The Green Accounting of Copenhagen comprises an annual control matrix that rates the performance of the planning, and the development in terms of the achievement of the targets. The annual report includes the most important statistics, the information that the city met the established targets, and it is referred to as "Eco-Metropole – Our Vision for 2015". The evaluation allows for the identification of which type of measures should be adopted to reach the planned targets.

Part III

Comparative Tables of the Experiences

Table 11– Comparison among experiences in the protection of water bodies

CITY / PROGRAM or PROJECT	CATEGORY	INFORMATION	PURPOSE	KEY-FACTORS	Legal Framework and PARTICIPATION	EVALUATION
Teresina – PI North Lagoons Program (PLN)	Water bodies' Protection	Population (2015) 844,245 inhabitants Per capita Income R$ 17,797.00 HDI 0.751 Area 1,391.98 km²	Improve the environmental and urban conditions, and promote the social-economic development of the region known as the North Lagoons.	Regeneration of the area with low-income population facing environmental problems Control of Parnaíba River floods Valuing the urban space, and improving public spaces by the water	The PLN triggered the city planning, updating the following Plans: Directive Plan, Drainage, Transportation, etc. It involved various agencies of the administration, the society, and businessmen. Environmental licensing from the State and the Local Administration were issued.	The PLN met the target of improving life quality standards of the North Zone's dwellers. After the PLN works, a survey showed the high satisfaction level among the inhabitants of the city.
Extrema – MG Water Conservation Project (PCA)	Water bodies' Protection	Population (2015) 33,082 inhabitants Per capita Income R$ 68,951.91 HDI 0.732 Area 244.58 km²	Motivating environmental services, and the integrated handling of the soil, the water, and the forests (hillsides, and mountain tops) to improve the quality of Jaguari River.	Urban sprawl control and protection of the city's fountain-heads Maintenance of the Atlantic Forest through environmental services Development of green projects with the participation of civil society	The PCA was created as per the Local Agenda 21, and the Directive Plan. It is under the responsibility of the Office of the Environment, and counts on the support of companies, NGOs, producers, and the society.	The 24 years-long administrative continuity enabled the development of the PCA, including the payment for environmental services, thus resulting in the local water network quality, and quantity maintenance.
Vitoria-Gasteiz – ES Capital City of the Basque Country	Water bodies' Protection	Population (2013) 240,000 inhabitants Per capita Income EUR 32,000.00 HDI 0.924 Area 276.00 km²	Consolidate the wetlands of Salburua and Zabalgana, and concentrate the investments on protection of the nature and of the biodiversity	Contact with Nature through a compact urban area Recovery of lowlands or wetlands Institutionalization of the environmental planning	The Green Belt (1992) was supported by the General Project for Land Use (2000). The Local Agenda 21 (2000) created the Sectoral Board for the Environment with the participation of the citizens; it has representatives from 40 social groups and institutions of the city.	The Sustainability Observatory proposed indicators to be monitored by the Environmental Studies Centre, related to the environmental thematic: seven cross-cutting, 142 sectoral, and 51 intersectoral indicators.

Table 12 - Comparison among experiences in vegetative cover as a factor of environmental management of the city

CITY / PROGRAM or PROJECT	CATEGORY	INFORMATION	PURPOSE	KEY-FACTORS	Legal Framework and PARTICIPATION	EVALUATION
Toledo – PR Environmental Preservation Program, and Implementation of Urban Parks	Vegetative cover as a factor of Local Environmental Management	Population (2015) 132,077 inhabitants Per capita Income R$ 30,826.17 HDI 0.827 Area 1,196.99 km²	Improve the environmental quality, and control the urban sprawl, with the implementation of Parks and the Pirambi Rivulet.	Control of the urban sprawl through parks Environmental Preservation integrated to the urban planning Valuing the Central Square as a contrasting element of the quality in urban spaces	The Program regulated the urban sprawl, and revised the Directive Plan, creating sectoral guidelines. The community participated in its conception through public hearings.	The interventions intended for the environmental preservation, and the green areas' implementation, when connected to urban planning, are no longer mere construction works as an end in itself to dress up with a structuring sense of the city landscape, and of the solution of its problems.
Ljubljana – SL Capital City of Slovenia	Vegetative cover as a factor of Local Environmental Management	Population (2012) 282,994 inhabitants Per capita Income EUR 24,649.00 HDI 0.892 Area 275.00 km²	Preserve 5 basins (Sava, and Ljubljanica Rivers, the Gruber channel, and Špica, Gradaščica, and Glinščica brooks), interconnected by green rings, and by a network of parks. In 2010, 1,400 ha of forests were protected due to their valuable contribution to the natural system, and for the capture of CO_2.	Creation of a system of greenspaces spread across the city Implementation of green areas for the urban regeneration Design of projects for greenspaces with the participation of civil society	The Spatial Plan is the most relevant instrument to protect greenspaces. The Public Space Council, and the Advisory Council on Public Spaces and Traffic are responsible for the management of the green areas and other public spaces, and they handle green zones, and open spaces' planning, maintenance, and revitalization in the city.	Ljubljana performed a vegetation inventory that regulated over 1,200 ha of natural value area. The evaluations on the sustainability impact of the policies are in the mandatory environmental reports, and strategic documents.

Table 13 - Comparison among Environmental Zoning experiences

CITY / PROGRAM	CATEGORY	INFORMATION	PURPOSE	KEY-FACTORS	Legal Framework and PARTICIPATION	EVALUATION
Brotas - SP	Environmental Zoning	Population (2015) 23,419 inhabitants Per capita Income R$ 22,964.88 HDI 0.740 Area 1,101.37 km²	Organize the rural activities, and the ecotourism. It was based on relevant environmental factors – soil types and sensitiveness to erosion, geological formations, declivity, and land use.	Protection of the natural resources, aimed at tourism development Economic development by valuing adventure-tourism Capturing external financial resources to fund the environmental protection	The ZA acted on the rural area, while the Directive Plan acted on the urban area, as complementary phases of the urban environmental management process. This instrument pointed out the areas for the creation of a sanitary landfill after study on the most important environmental factors.	The rural area experienced changes derived from the ecotourism activities. However, the ZA promoted the reduction of the negative impacts thorough economic incentives, restraints to the attractions'usage, and strategies for environmental protection.
Formigueiro - RS	Environmental Zoning	Population (2015) 7,014 inhabitants Per capita Income R$ 18,567.54 HDI 0.682 Area 580.03 km²	Subsidize the environmental licensing of the rural area. It was based on the usage restriction level, and on the lands system. Relevant factors were the APPs; the areas for Environmental Recovery; and the frailness of natural environments.	Identification of Permanent Preservation Areas (APP), and the environmental protection strategies Identification of the environmental frailness and the intensity of rural land plots' usage Participation of the State Environment Office in the environmental zoning	The ZA supported the environmental licensing of the State Environment Office of Rio Grande do Sul, which guided the process performance. The city does not have a Directive Plan, but it has a Sanitation Plan. In the ZA elaboration process, there was only institutional participation.	The ZA showed that the restrictive nature, running separated from the social dynamics is ineffective in protecting the natural resources. The ZA (Environmental Zoning) thus becomes a document of purely technical nature, without legitimacy, or recognition from the population.
Copenhagen – DK Capital City of Denmark	Metropolitan / Environmental Urban Zoning	Population (2013) 562,379 inhabitants Per capita Income EUR 38,000.00 HDI 0.923 Area 74.4 km²	Preserves natural areas and greenspaces, through the prohibition of construction, and organization of the compact urban sprawl across collective transportation corridors.	Creation of greenspaces spread across the city Green areas as an urban regeneration tool Design of projects for greenspaces with the participation of civil society	The Planning Act (2007) provides guidelines for the metropolitan area, and the green basins. This law sets rules for the public participation. The civil society has 8 weeks to present their objections, comments, proposals or critics.	The projects are subject to a sustainability evaluation, based on fourteen parameters. The Green Accounting comprises an annual control matrix that rates the performance of the planning, and the achievement of the targets.

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