

Sustainable Development Policies in an Environment of Demographic Loss

1. Territory

The territorial scope of this communication is that corresponding to the city of Oporto, which is inserted in the north of Portugal, northwest of the Iberian Peninsula, on the western boundaries of Europe.

Port wine brand was also born on the banks of the Douro River and "drank" his name on the city where the river ends, forming the apex of the triangle trade that designates the Port Wine:

- Douro - production;
- V. N. Gaia - storage;
- Oporto - trade.



The historic center of Oporto is a World Heritage Site and home to site works that are "born" of its faculty of architecture (among which, Siza Vieira and Souto Moura), one of the most prestigious in the world - along with prestigious faculties in the areas of engineering and medicine. These factors are one of the reasons for the increased demand as a city of

heritage, culture and science.

The city of Oporto - the municipality has the same name - polarizes a metropolitan area with about 1.7 million inhabitants and is part of the NUTIII the Oporto Metropolis. The table below reveals the compared indicators of Oporto Metropolis and Oporto Municipality, according to preliminary data from the census of 2011.

	Res. Pop.			Families			Buildings		
	2001	2011	Var. (%)	2001	2011	Var.(%)	2001	2011	Var (%)
Oporto Metropolis	1.260.680	1.286.139	2,0	436.699	493.770	13,1	264.744	273.787	3,4
Oporto Municipality	263.131	237.559	-9,7	100.893	103.965	3,0	46.681	44.472	-4,7

The figure of approximately 25,000 inhabitants who abandoned residence in Oporto in the last 10 years relates to inhabitants who have moved almost exclusively to the municipalities on the outskirts of Oporto (especially to Maia and Matosinhos, in the north, and Vila Nova de Gaia, in the south of the River Douro). In these municipalities there has been a change in inter-census population inverse of Oporto, and currently they have a total population higher to the population of Oporto, and the equivalent of its population in 1991 (302.000 inhabitants).

This population loss becomes more severe when we note that from 1981 to the present day, in the last 30 years, the city of Oporto has lost about 90,000 inhabitants.

Equally troubling is the decline in the number of buildings over the last decade, around 2,200 units, as this variation can not only be read as the result of an increase in urban density by the replacement of building typologies, but also as a result of the demolition of buildings damaged by neglecting decisions and the replacement of buildings with heritage value.

This drastic decrease in population, especially affecting the middle class, has resulted in the appearance of voids in the city and it has created a significant increase of older age groups, especially in central areas, where they dominate the real estate asset value with greater economic capacity investment - in areas where the recovery and rehabilitation by the private is more fragile.

As a result, the Oporto Metropolis home-working commuting, and home-study commuting between the borders of the city of Oporto has increased, because of the services it still concentrates, with emphasis on health care, higher education and central administration.

Inevitably, this situation increases car traffic - with the consequent increase in levels of pollution - even if we take into account the investment made on the public service transportation.



Metropolitan Oporto Area

2. Conceptualization

The concept of sustainable development is still not stabilized, since the concept was created in 1987.

This concept includes different definitions taken from Amado (2009), in chronological order:

- "... sustainable development meets the needs of present generations without compromising the ability of self-development of future generations." (WCED, 1987), a definition which emphasizes the need of inter-generational commitment, without the needed context;
- "... should recognize the social and ecological factors, as well as economic factors, the base of living and nonliving resources, the advantages and disadvantages of alternative actions so long as the short term." (Garden, 1989) - a definition introducing the economic component, which is assumed to environmental and social concerns and the need to evaluate the effects of actions and the consideration of alternatives;
- "... it is understood as a form of social change that adds to traditional development objectives, with the objective of achieving ecological sustainability." (Lelé, 1991), a comprehensive definition that considers the need for a new behavior towards sustainable ecology;
- "... can be seen as a set of development programs that meet the goals of achieving human needs without violating the regenerative capacity of resources in the long term, nor the standards of environmental quality and social equity." (Bartelmus, 1994), a definition that refers to environmental and social components and is committed to intergenerational dependency.

More recently, the extent of territorial cohesion has come to "clarify" the pillars of sustainable development: social skills, environmental protection and enhancement, economic benefit and territorial cohesion. And today, it is agreed that the territorial planning is the main mechanism for implementing sustainable development policies (Amado, 2009).



The objectives of regional planning are much more than the location and the compatibility of activities with each other in a logic of urban growth and increasing importance of the activities within environmentally sensitive areas, in particular, and within general environment in the broadest sense.

They are also instruments of social impact assessment, environmental and economic actions, planned or induced a logic optimization of integrating components of sustainable development, a process of continuous consultation and participation, open and transparent.

Recent studies have shown the flexibility of territorial planning is essential to meet the objectives of sustainability (Amado, 2009), allowing decisions adjusted each time, depending on the factors involved. However, this flexibility should not only be mapped out according to the objectives of the plan and, consequently, the objectives of environmental sustainability, but it also reveals that a high level of trust is necessary to have sound administrative decisions. A too flexible planning can generate discretionary in the decision and, therefore, distrust of government action.

Flexibility in land use planning should have different levels of intensity depending on the topics or areas involved. In relation to environmental and heritage values, they must be inflexible, including conditions in planning actions. With regard to urban areas or rural activities stabilized and effectively managed they must provide a small degree of tolerance to the transformation of land use and soil.

For the remaining cover and areas affecting the restructuring of urbanized land - urban growth or finding new uses in rural land - the planning must have a high degree of flexibility and, in special situations, high intensity levels of government procedures for public participation.

This was based on the principles that drew up from a master plan of the city of Oporto. Currently, there is only plan framework and municipal decision-making support related to the processing, use and occupation.

3. Macro Scale / Strategy

A key issue of territorial planning is the consolidation of a development strategy accepted by the population and local actors in a public participation process, so that decision-making factors essential to elect the implementation of the desired development are present.

The city of Oporto apprehends only urban territory, with a remarkable level of compactness of the existing infrastructure areas, but it still is not consolidated or reveals empty spaces of significant size. Overlooking a river, water systems that "draw" the topography of the city and corridors are essential to sustainable urban development.

The urban fabric of the central area has large morphological consistency, and it closely relates to the intrinsic identity of the city, with emphasis on the historic center.

How many cities with an ocean shoreline offer evidence of socially and environmentally degraded areas and urban disparities against this background, the Oporto Master Plan established the following strategic objectives:

- Exploitation of the Oporto urban identity through the dynamic conservation of existing fabric, and the design of new fabrics and consistent skills, control of urban densities, and also the safeguarding and promotion of the built heritage and image of the City;
- Rehabilitation of public space and enhancement of ecological, environmental and landscape, through its reorganization and minimizing systemic major environmental impacts;
- Rationalization of the traffic system in order to improve intra-urban mobility, giving priority to public transportation in proper place and new modes of public transportation, with a special enhancement of the pedestrian and cycling interfaces;
- Reduction of existing urban disparities, promoting equity in the location of public investments, strengthening social and territorial cohesion, with particular emphasis on social housing intervention;
- Affirmation of the Historical Center and the Central Area as references of irreplaceable urban development of the metropolitan area, enhancing and strengthening its revitalization and animation.

In parallel, this strategy is a major factor to set behind the resident population and to attract younger generations who have migrated to the outskirts, so as to reach the necessary critical mass to the city's economy.

We thus develop a series of integrated actions on sustainable development policies aimed at strengthening social and territorial cohesion, economic development, safeguarding and improving environmental quality, adding logic of territorial competitiveness, stressing the following factors:

- The increase in per capita public green area, by consolidating the definition of systemic ecological structure;
- The reinforcement, along with the Metro system, of sustainable mobility, with the installation of cycle paths, public transportation with trams and the reduction of private motor transportation;
- The preservation and reuse of historic heritage building, with policies on urban regeneration interventions offset by new construction;
- The increase of renewable energy sources (thermal, photovoltaic and geothermal);
- Implementation of environmental and urban monitoring systems.

But being aware that the environmental issues facing the city today Oporto need to be addressed at the metropolitan scale, the municipalities of the Metropolitan Area of Oporto (AMP), even in the absence of an institution with functions of metropolitan government, implemented a series of actions that have an impact on improving environmental quality and greater efficiency of services and the economy, with emphasis on:

- central composting and incineration of metropolitan solid waste;
- light rail network;
- high network of water supply.

4. Micro Scale / Project

This study celebrates the theme of "Social and Territorial Cohesion" in the agglomeration of Oporto and stems from the evidence of a strong imbalance between urban western and eastern areas of the city, particularly caused by the construction of the railway line (on last quarter of XIX century), which resulted in a "wound" in the urban city that today is in the "healing".

In order to "weld" these issues that are being proposed, operations of urban regeneration in areas located in the surroundings of railway infrastructure, are being loaded with features of high attraction impact, so that equipment "anchors" are located in them to strengthen its structure.



Urban "wound"

The case study presented here is located at the flank of the new centrality of Antas, focusing primarily on the land occupied by the current Central Food Market and the disabled Municipal Slaughterhouse of Oporto, in the parish of Campanhã.

4.1 Historical review

The city of Oporto, throughout its history, has known different "centers" that meet different locations, due to a number of factors that resulted in different forms of settlement.

This site is directly linked to the Douro River. Oporto was born in the riverside, and the Douro has remained its economic center for many centuries. Also, on the hill of Penaventosa, for security reasons, it has been an administrative and religious center.

With the urban sprawl "led" by the Almada family (during the second half of the XVIII century), with the location of new Town Hall in Praça Nova (now Av. da Liberdade) and with the advent of the Industrial Revolution, a new economic and administrative center emerged, typical of the capitalist city of the XIX century.

The construction of D. Luis bridge, S. Bento railway station and the present building of the Town Hall, contributed to the strengthening of the central features of this site, which, together with the relocation of the commercial port, first for Gaia and later to Leixões, precipitated the decline of the economic and administrative center of the historic city Oporto.

From the 60's on, Boavista area won great vitality and gained increasing importance in the context of the city. Enjoying a clear increase of accessibility (with the construction of Arrábida bridge), free from the constrictions of the historic central area, and with a large supply of vacant land, this area stands as a counterpoint to the traditional center who until very recently concentrated almost any occupation significant to a functional city.

With the sharp low congestion and increasing accessibility to Boavista area and its surrounding areas, we have witnessed the transference of a considerable part of economic activities and the corresponding emergence of a new center, embodied in a "displacement" of investment (public and private) to this location. This situation not only contributed to the "depreciation" of the urban downtown area, but also its entire eastern area.

The construction of a new crossing bridge over of Douro river, at the end of the XX century, and the corresponding closing of Oporto beltway, not only significantly increased the accessibility to the eastern part of the city, but also opened the appetite for the many "free" terrain sites. An urban phenomenon, equivalent to that seen in Boavista area when the Arrábida bridge was constructed, has been predicted.



Centralities Plan (existent's and new)

The EURO 2004 soccer championship (benefiting of a significant amount of public and private investment) together with a new set of accessibility infrastructures that have emerged, and the proposed strategic equipment located in this area, was seen as an unprecedented intervention in this part of the city, representing an opportunity to mitigate inequalities, promoting social and territorial cohesion and balance the system of "urban places" in the city of Oporto.

4.2 What is planned for the new centrality

The process of growth and transformation of the area of Campanhã (where this new centrality is located) is not a unique case in the peripheral area of the city of Oporto. It also shows a very direct bearing on their development, which has been processed through the construction of roads, that radiate from its center, and are holding their suburbs from 'eating', gradually, the rural areas.

It is mainly from the mid-nineteenth century on that fundamental changes that affect their development have appeared, namely: the emergence of public transportation and an effective industrial boom, that promote a strong increase of the population, assuming the Campanhã railway station and Circunvalação Oporto ring as important elements in its urban structure.

Radio concentric growth model that characterized the city of Oporto until the appearance of the railway met a new dynamic from that moment on. The emergence of this urban "barrier" caused a differential urban development and unequal growth rates, depending on whether the land was located to the east or the west of the infrastructure, resulting in an urban "wound" of complex resolution.

4.2.1 Antas Detailed Plan

With the growth of cities, the old stadiums and other plots that date of its construction were located in remote areas They have benefited from a strategic centrality to the rebalancing of the city, and they have become highly desirable for real estate, enhancing, through this aspect, the generation of capital funds for modernization and for the viability of corporations sports.

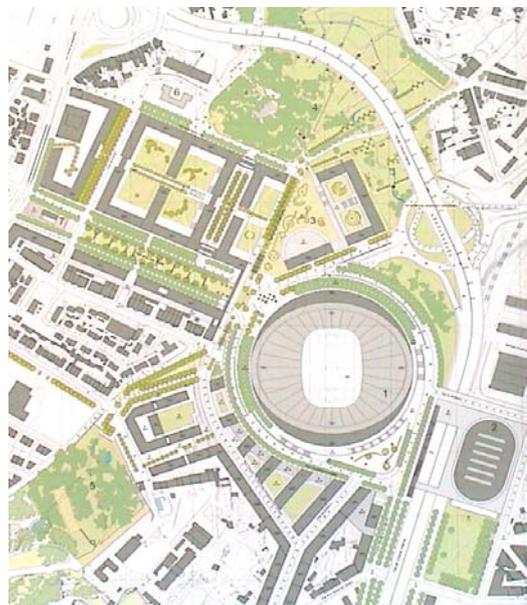
The organization of the European 2004 in Portugal, in addition to having been taken as an event of great importance for the development of various sectors of our economy (construction, tourism, etc.), provided the opportunity to rehabilitate, from the urban and environmental point of view, some "depressed" areas of Oporto city, and eventually function as the opportunity to work together and make this operation viable for renewal in the short / medium term.

In this sense, Porto municipality commissioned Arch. Manuel Salgado to the preparation of the Antas Detailed Plan. Their proposal includes the following main interventions:

- a new stadium with a capacity of 50,000 seats, which is not only a venue for soccer practice, but also an entertainment center encompassing a wide variety of sports, culture, leisure and trade in equipment that make it an attractive town, in daily use;
- a shopping center, which has created a dynamic effect in the area where it operates, contributing indelibly to its transformation and renewal;
- the creation of two urban parks (Antas and S. Roque);
- an avenue to structure a predominantly residential area, housing and still some trade and services;
- a ring road surrounding the new stadium, for which they proposed mixed-use buildings, which contribute to the vitality of this urban site;
- a school and health equipment in the home stretch of Alameda;
- the location, near the new stadium, of a subway station;
- and also the construction of a multipurpose pavilion, near Oporto beltway.



FC Oporto Stadium



Summary Plan

4.2.2 Avenue April 25 Detailed Plan

This plan (designed by Arch.^o Patrício Martins) focuses on the level of road infra-structure of the area between some structuring axes and Campanhã railway station.

The proposal, served to support the construction of the new Alameda April 25, connects two squares (with a distance of 1.2 km) and allows an urban structure in a vast amount of land "forgotten" in this city area.

In addition to links to other existing urban fabric, are of particular importance to establishing the Oporto beltway and the new Antas Stadium.



Summary Plan

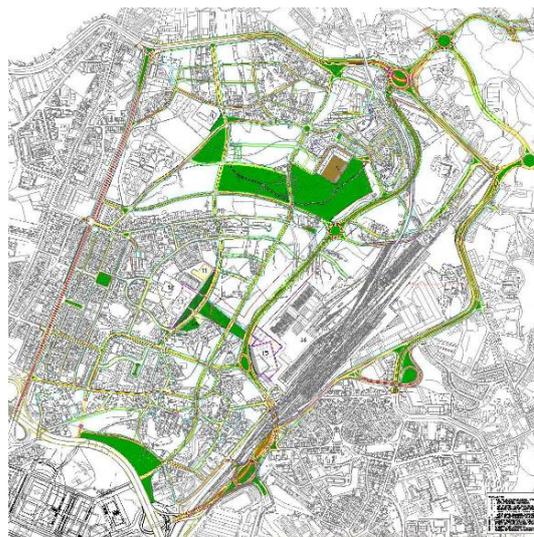
4.2.3 Contumil Urban Study

Designed by Arch.º Manuel Fernandes Sá, arises from the need to reconcile previous studies prepared for the site with the urban infrastructures of the whole area, between the Circunvalação ring road (north), Contumil railway (the East), Oporto beltway (south) and Fernão de Magalhães Av. (the West), due to urban pressure that is felt here.

The analysis of the site concluded that it should propose a set of new roads that will allow the development of this area of the city (which is in significant transformation), supported by a new structuring axis that connects the ring to the node of Antas in the Oporto beltway.

The appearance of this pathway has allowed not only to create an alternative to the existing Avenue, already pretty congested, but also improved the land to build the crossing.

Thus, we were able to ensure a homogeneous occupation, conveniently framed in terms of urbanity, as opposed to what was previously expected, which translated into an intervention piecemeal, without any concern for matching between the solutions and high disregard for environmental values and assets that exist there. In addition to this new axis road, which will support a set of investments that will qualify the entire area in question, new roads were also proposed, aimed at creating better conditions to build in an area in need of a city deep urban renewal operation.



Summary Plan

4.2.4 Cartes Urban Study

This study, developed by the CMP, emerges from the need to combine the design of new road infrastructure that runs through this area (Cartes Av.) with a set of interventions that were already planned for their neighborhoods, including: playgrounds and municipal swimming pools, new fire station, sports pavilion, and cost-controlled housing.

In this sense, a set of new roads has been proposed, on the local level, which will create better conditions of access to existing buildings such as those provided for in this area.

The fact that it enables a quick and easy connection between the area of Campanhã and the node of Antas (at Oporto beltway) gives the Avenue a crucial importance for the development of this entire valley, putting a final end to the isolation that this area has been voted to from the construction of Circunvalação ring road.



Summary Plan

4.3 Proposal

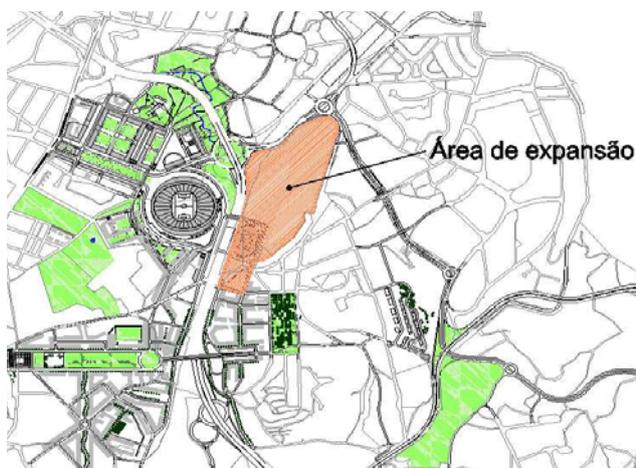
4.3.1 Development trends

Considering the accessibility of this new center, it will be natural that, after these investments, demand will exceed the available supply, particularly in terms of relocation of tertiary activities.

On the other hand, a commitment to a policy of social and territorial cohesion points to the urgent need to retrain some of the most disadvantaged areas of the city, requiring a thorough process of urban regeneration.

As in the case of the Oporto, these areas are located mainly along the railway line and since, in the vicinity of the new centrality of Antas, we find two large parcels of misfits with uses of the actual needs of the area of the city, food market (which causes many problems) and the slaughterhouse of Oporto (already disabled), it is logical to consider that its expansion should be done to east, occupying the land where these structures are currently located.

Although it is a plan that will focus on a relatively small geographic area, it is intended that it should not be limited to a simple exercise of the local environment, but that this structure should clearly be central to a supra-municipal scope, whose relevance goes beyond this dimension.



Expansion Area

The proximity to the future TGV station of Oporto, which has excellent road accessibility (via Oporto beltway) and the fact it is anticipated that in this area two metro line will cross, shall make this an area of strong centrality, with excellent functions are located with a strong attraction factor.

After analyzing the assumptions in question, the expected impacts can be divided into three different levels:

- Proximity to the level of the radical changes that will check the site, both with respect to urban infrastructure (roads and building) as the physical structure (land use) and social structures (attracting new residents and creating a high number of jobs), which cause a strong attraction to the area in question;
- in the city, both in the city center (where the "diversion" of public and private investment for this new center will experience negative effects in terms of renewal of housing stock and the revitalization of traditional commerce) and in its periphery;
- and its "crown" metropolitan area, the level of impact that will bring other central emerging sites, taking advantage of its accessibility maximized (through a set of new road infrastructure and the metro area) and the effect of "kneecap" squeegee railway that is powered on this site.

4.3.2 Objectives for the Detail Plan

An urban intervention of this nature, beyond the obvious physical and social changes that will necessarily follow, should contribute indelibly to the regeneration of public space and to design a new image of the city.

The intervention area that we now want to study, which has an approximate size of 15ha, including the land occupied by the aforementioned plus an industrial unit, located next to S. Roque da Lameira street.

This area is particularly important due to the fact that, in terms of accessibility and transportation system, it is an area strategically important to the city and the agglomeration of Oporto, by virtue of having three major corridors of penetration.

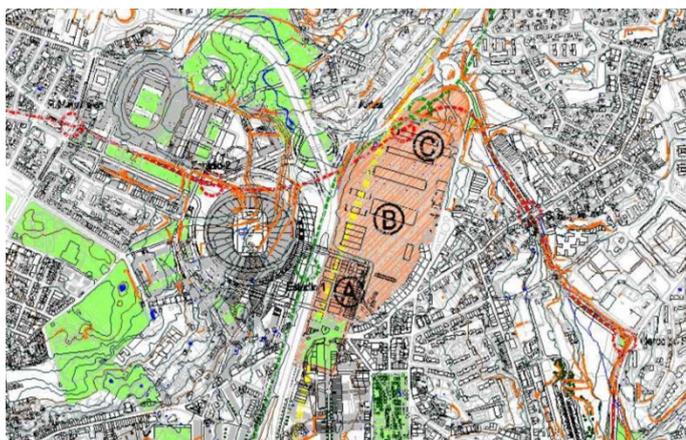
The "challenge" that now throws passes for ensuring a good connection between this Plan and the Detailed plans, studies and projects planned for this area, we should respect the following principles:

- integrate the city with a considerable amount of land, situated east of the central project of Antas, underused or whose current uses are not the ones who value the set where they fall;
- structure an urban area, seeking the renewal process will contribute to "sew" the surrounding urban networks through the new public spaces and creating new road structure, strengthening the assertion of this new center;
- mitigate the barrier effect of Oporto beltway and the railroad, creating conditions to "weld" the entire city, making better connections to urban surroundings;
- locate this site equipment with strong ability to attract and service the center area, which contribute to accentuating its centrality;
- establish a diversified structure of public spaces, focusing on new equipments;
- improve accessibility and circulation in the area of intervention, taking advantage of the new road network to improve the link between the urban areas that currently suffer from important discontinuities.

4.3.3 Programmatic Intent

Considering the area of available land and excellent accessibility that it will have, it was understood that, for this site, you should propose an "ambitious" program that meet some of the gaps that the city of Oporto has on the level of strategic equipment.

In this context, it is proposed to build a Convention Centre and a Business Centre, which will serve as elements able to retrain and resize the urban city of Oporto, creating conditions to "catalyze" public and private initiatives around a city project dynamic and active:



- **Congress Palace** - the lack of a device with these features in Oporto requires that, for example, the drawing for the European Football Championship held in Portugal in 2004, was made on the premises of Euro Park (in Santa Maria da Feira) and not in the city of Oporto, as originally scheduled. Indeed, there are a number of significant events, including meetings at the highest level (European Union, NATO, OECD, etc.), that can't be implemented in this city because there are no conditions necessary for this purpose.

- **Business Centre** - due to changes resulting from regional integration, national and international city and the metropolitan area of Oporto, makes Oporto the most important "entry" in the Peninsular Northwest, making it essential to develop policies for compliance, consultation and coordination at local, regional and global levels, to strengthen and consolidate the European and Atlantic dimension of Oporto, extending its weight and influence internationally.

In this sense, it is important that the city of Oporto has a highly qualified service center, as well as excellent accessibility, combining, in one place, the services and resources (human and technical) to carry out large international business.

The possibility of building a project with these characteristics in the intervention area of this plan, is particularly important because not only will contribute significantly to the process of urban regeneration in the area east of the city, but primarily because it works as the "mainstay" of all financial this program.

It is intended that the Detailed Plan will eventually be reset to give the land available a diversified structure of public spaces and an effective redesign of the urban surroundings, ensuring linkage with the nearest urban structures, the insertion of new transport infrastructures, allowing accessibility and movement throughout the area.

In parallel, taking into account the basic assumptions that should guide this work, as far as energy efficiency and sustainability of buildings is concerned, one should invest in:

- Promoting the concept of sustainable architecture understood in a broad sense, encompassing, besides the constructive component, the components of energy, water management, waste and promotion of sustainable mobility;
- Creating an exhibit space with the best practices on sustainable architecture, useful and educative;
- Promoting the involvement of different partners, in different areas, can contribute to building a cohesive whole and represent the best that can be done in terms of sustainability of buildings.

The main targets that must be the genesis of the study of "green buildings" that will be proposed, for this area, are:

- Self-sufficiency in energy through efficiency and utilization of renewable resources;
- Neutral emissions of greenhouse gases;
- Self-sufficiency in resources for non-potable water through efficient use, use of rainwater runoff and waste water recycling;
- Recycle at least 90% of waste generated during rehabilitation and operation;
- Good indoor air quality;
- Good acoustic performance;
- Excellent framework in terms of mobility.

Since a plan must be "made for people" and it "must be done with people," the mechanisms of public participation should be assumed as an evaluation criterion to consider, and that should always be present throughout the process.

Indeed, the relevance of the proposed program for this site, which clearly has major supra-municipal "forces" to which the plan has a "visibility" higher than has been customary in the planning process and should therefore find, is the best way to promote public discussion, so that the debate is constructed as a learning process, which withdraws as much knowledge as possible to achieve a "consensus building".

References:

- AMADO, Miguel Pires (2009), **Planeamento Urbano Sustentável**, Caleidoscópio, Casal de Cambra
- BARTELMUS, P. (1994), **Environmental Growth and Development**, Routledge, London
- C. M. PORTO (2006), **Plano Director Municipal da Cidade do Oporto**, CM Oporto
- FIDÉLIS, Nogueira, T. e Pinho, P. (1997), **Desenvolvimento Ambientalmente Sustentável - Perspectivas Teóricas sobre a Contribuição do Planeamento Territorial e da Avaliação de Impacte Ambiental**, Actas da V Conferência sobre a Qualidade do Ambiente, Universidade de Aveiro
- GARGEN, J. (1989), **Decision Making for Sustainable Development, Selected Approaches to Environmental Assessment and Management**, in Environmental Impact Assessment Review, Vol. 9
- LELÉ, S. (1991), **Sustainable Development: A Critical Review**, in World Development, Vol. 19, UK
- WCED (1987), **Our Common Future, World Common Future**, World Commission for the Environmental Development, Oxford University Press, UK
- ALVES, Joaquim Ferreira - **O Oporto na época dos Almadas**, 1988
- ASCHER, François - **Metapólis, Acerca do futuro da cidade**, 1998
- DOMINGUES, Álvaro - **O confronto entre duas escalas urbanas: Projecto da Área Central do Pólo II da Universidade do Oporto - Programa Base**, 2000
- FERNANDES, J. M. Gomes - **Centro Histórico do Oporto, dar futuro ao nosso passado**, 1989
- MARQUES, Hélder; FERNANDES, J. A. Rio; MARTINS, Luís Paulo - **Oporto, percursos nos espaços e memórias**, 1990
- PEREIRA DE OLIVEIRA, J. M. - **O Espaço Urbano do Oporto, condições naturais e desenvolvimento**, Instituto de Alta Cultura, 1973
- REBELO DA COSTA - **Descrição Topográfica e História da Cidade do Oporto**
- SALGADO, Manuel - **Proposta do Plano de Pormenor das Antas**, 2000
- PATRÍCIO MARTINS, Jorge - **Estudo Prévio do Plano de Pormenor Flores / Corujeira**
- **Estudos Urbanísticos de Contumil e da Alameda de Cartes / Falcão**
- T.I.S. - **Estudo de Calibragem do Sistema de Circulação e Tráfego na Envolvente do Futuro Estádio das Antas**, 2000
- **Decreto-Lei n.º 380/99, de 22 de Setembro**

Dinis Machado, J. e Lameiras, J. A., Portugal

“Sustainable Development Policies in an Environment of Demographic Loss”