Challenges and Opportunities in the **Development of Sustainable Tourism Destinations.** Case Studies of Singapore and Setubal **- Extended Abstract**

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Abstract

Noticing the increasing number of tourist destinations, the changes taking place in demand and the enhancement of tourist sensitivity on issues related with quality/price and sustainability of tourist services, it is necessary an approach that looks at its development with an integrated perspective, this means with a network of tourist services in the destination.

One of the problems related with the positioning analysis with regard to its sustainability and leadership, is not always seen in a logic of network and the assessment of services does not go beyond hotels and restaurants. Thus, the central question of this dissertation is the development of approaches that carry out the assessment of services such as urban gardens or beaches, connecting them with the sustainable management designed for tourist development of a region.

The approach aims the development of a sustainable tourism network which is intended to take place in the city of Setubal. In order to have a practical reference, it is analyzed the development strategy of an international case – Singapore - that seeks to become a green and sustainable city and its development and a tourist destination.

To assess the approaches are used cases already certified by the Green Mark Scheme, initially developed for buildings and infrastructure but extended to other projects such as district projects, public spaces, shopping centers, among others, as the need for specific schemes emerge. This system allocates a performance level for construction or rehabilitation projects, according to the criteria and environmental initiatives that can work as examples for application in other cases of destinations.

Building on the best examples and practices collected, how they can be integrated in the case of Setubal, to improve services and infrastructures and identify important elements in the development of sustainable tourism with appropriate management supported by the voluntary system for the assessment of tourist destinations – LiderA. The method used involves the understanding and analysis of environmental and socio-economic aspects covered by public spaces such as urban gardens and beaches, which support and complement the tourist experience and the local community.

The study and comparison with other similar studies seek the identification of opportunities for improvement and future developments in order to create a sustainable network of services and activities and also intended to be aid in the formulation of public policies and for replication of similar initiatives.

Keywords: Sustainable tourism, challenges and opportunities, certification systems, benchmarking

1. Introduction

Travel & Tourism's impact on the economic and social development of a country can be enormous; opening it up for business, trade (about 20% of services exports) and capital investment (more than 15% as total contribution), creating jobs (around 6% of employment) and entrepreneurialism for the workforce and protecting heritage and cultural values (WTTC, 2014). To fully understand its impact, however, governments, policy makers and businesses around the world require accurate and reliable data on the impact of the sector. Data is needed to help assess policies that govern future industry development and to provide knowledge to help guide successful and sustainable investment decisions. The growing concern among national and international governments and global institutions has led to the establishment of laws and to the adoption of strategies to minimize resources consumption, conserve and preserve cultural and natural heritage and create more opportunities for local community and economy as well as greater environmental awareness. In the conference in Rio about Environment and Development (UNCED) the concept of sustainable development (SD) environmental, social, economic, political and cultural dimensions. Specifically the principals for tourism SD set by UNCED can be applied in every type of tourism and destinations, and they rely on: respect for international and national laws for environmental protection, the development must recognize and promote identity, culture and interests of host communities, optimize the use of natural resources in the services and activities involved and contribute to a healthy and productive lifestyle in harmony with nature.

Singapore has the second highest per capita income in the Asia Pacific region, after Japan, and its wealth is evident from its excellent transportation infrastructure, tightly packed skyscrapers and affluent population. Despite this, Singapore has no natural resources; it does not even have enough water for its own use. The wealth of this tiny island-state is generated primarily through labour power and by functioning within the global economic system. Not surprisingly then, Singapore is a strong proponent of free trade. The creative economy, which tourism can both support and benefit, depends less on natural resources and more on labor, services and brain power.

In the other hand, Portugal is an ideal destination to practice Nature Tourism, as it has a large variety of landscapes and high diversity of natural habitats such as mountains, estuaries, lakes, plains, among others. Setubal is located around 30 km south-east from the capital (Lisbon), on the north shore of Sado's estuary and lined by the Arrabida hills in the west. From a tourist point of view, there is great potential in different market segments and attractions: Maritime – several beaches along the coast of Arrabida allowing the practice of sport fishing and water sports; Agro forestry - where stands the Natural Park of Arrabida; Estuarine – that includes riverside potential as sporting activities like sailing and cultural nature trips related to the natural reserves of the Tagus and Sado estuaries; and Historical and Cultural - led by the historic urban centers, museums, monuments and vast heritage of industrial archeology that might be covered in a tourist program of one or two days.

1.1. Objectives

The main objectives of this thesis are the performance analysis and sustainability search modes in services and public infrastructures which support the communities in which they operate and foster the site as a

sustainable tourist destination. Particularly, examine examples of good environmental performance in public services and infrastructures of Singapore that have been certified with Green Mark Scheme developed by the Construction and Building Authority. Identification of the best practices (transferable) that in the future, can be applied in the processes of tourism development in Setubal. Application of voluntary certification system for sustainability LiderA in the case studies selected for the city of Setubal – urban parks and beaches – characterizing their main performance levels regarding environmental and social-economic indicators. As a result, critical performance issues can be identified, enhancing the implementation of retrofit actions.

1.2. Methodology

As a first approach, the methodology includes the state of the art review regarding environmental management in the tourism sector – performance and sustainability – namely concepts and assessment approaches that contribute to services and infrastructure's sustainability.

Subsequently, while analyzing the different approaches of the Green Mark system for districts, public spaces such as urban parks and beaches, and service buildings such as shopping centers, restaurants and offices; there were selected some case studies for the collection of indicators and possible sustainable practices that can set an example in developing tourist destinations. In some cases it was possible to visit and obtain data/photographs of the place, while others resulted from an extensive review of published documents and information obtained from some responsible companies.

The port and maritime sector is a sizable contributor to the Singapore economy, providing 170,000 jobs and accounting for 7% of Singapore's total gross domestic product in 2014. This makes it easy to imagine the size and complexity of port operations, as well as the pressure and impacts that can tag along with them. In this case it felt the necessary to present the development and sustainable management of both ports of Singapore and Setubal (though they don't have the same scale of contribution) as they also have an influence in the tourist sector and local community.

Regarding the case study Setubal, there were selected 3 cases of urban parks and 3 cases of beaches within the municipality to apply the LideA evaluation system and formalize an environmental performance level/classification for each case. For each tourist service, initially are made on-site visits, in order to conduct a detailed inventory of equipments, support structures and services, regarding the natural resources consumption and their contribution to the community and local economy. For the present study were accounted the environmental and social-economic aspects since its implementation to the featured use and how it contributes to the tourist experience in the present destination.

Thereafter, the performance of each tourist service is evaluated, positioning them in relation to the previous analyzed international performance indicators. Lastly, it is held a discussion of the approach, where the limitations and the potentialities are demonstrated, and are suggested recommendations for improving energy management.

2. Sustainable Tourist Destinations: challenges and opportunities - State of the Art Review

Sustainable tourism is rising: the demand for it by consumers is increasing; the travel sector is developing new "green" programs and governments and international agencies are creating new policies to encourage sustainable practices in tourism. But how can it be measured and demonstrated in a credibly way, in order to achieve consumer confidence, promote prosperity of business as well as benefits to the community while fighting false claims? Destinations are considered as complex sets of interconnected products and services constantly shifting to ensure competitiveness in the tourism market, involving an active participation of all stakeholders and parties concerned.

The total contribution of Travel & Tourism to GDP in 2014 was around 10% to Singapore and more than 15% to Portugal. This indicator reflects the economic activity generated by industries such as hotels, travel agents, airlines and other passenger transportation services. And also the activities of the restaurant and leisure industries directly supported; including wider effects (indirect and impacts) from investment, the supply chain and induced income impacts (WTTC, 2015). The number of hotels and tourist accommodation has increased on both countries to cope with the number of tourist arrivals that rises every year. Although the hospitality industry, regarding consumption of resources, has major proportions and is in urgent need of better products and environmental practices (IPQ, 2005). The services and infrastructures that support and complement the tourist experience such has transportation, public spaces and service buildings, also have to satisfy and be appropriate for the demand and can be a great contribution to boost environmental awareness and encourage good environmental practices (Viegas, 2008).

In this sense, environmental management systems (EMS) have been an important environmental policy instrument, helping the consumer in the choice of less harmful products and services to the environment and also works as marketing tool for companies to differentiate their products in the market. An EMS, when properly implemented, results in a significant reduction of impacts, regarding natural resources and energy consumption, optimizing technological processes and operations, giving priority to reused materials or highly recyclable, minimization of risks and the need for audits by other entities, improving the image to public opinion (Heras & Arana, 2010). The difficulties that can arise when or after implementation are related with legal requirements compliance (base of any EMS), awareness/internal training for the need to change habits (from top management to organization bases) and independent issues that can delay the speed of formalization and licensing (Lozano & Vallés, 2007).

Erro! A origem da referência não foi encontrada. Table 1 summarizes the EMS that were analyzed, selected by the type of application and relevance for the case studies covered by this work, with the international and national, Singaporean and Portuguese point of view: ISO 14001 international scope, Green Mark Scheme (BCA's GMS), Liderar pelo ambiente (LiderA), EarthCheck (EC3) developed by STCRC and Green Globe 21 (GG21).

Table 1 - ***Summary of the selected environmental certification systems***

Certification	Responsable entity	Description	Characterists
ISO 14001 (2004)	International Organization for Standardizatio n (ISO)	Published in 1996, is the best known standard of the ISO 14000, characterized by being the sole certifier of the series and is specific to EMSs. Is based on the PDCA cycle (Plan, Do, Check and Act) and in the scope of certification requires that organizations have implemented an EMS, comply with environmental legislation and commit to a proper environmental performance (Santos, Souza, & Barbosa, 2006). The overall purpose of this standard is to support environmental protection and prevention of pollution in balance with socioeconomic needs integrating the productive sector in optimizing the use of natural resources (IPQ, 2005; Quazi et al., 2001).	- International scope and open to all kinds of organizations; - Certification and seal award only after full compliance with the standards; -Costs considered very high for small and medium enterprises, , ranging from about 7 300€ and a maximum of 88 000€; -Very general and little specifics to hospitality reality; - 267 457 world certifications
Green Mark Scheme (GMS) (Singapura, 2005)	Building and Construction Authority (BCA)	Comprehensive certification system, launched in 2005, to assess the environmental performance of new and existing buildings and promote the design, construction and sustainable operational practices in private and public infrastructure (Low, 2011). The general evaluation criteria (about 60) for each key areas (for sustainable development) is equivalent to a specific score that in total indicate the classification that should be should be awarded. Rating scale: Certified, Gold, Gold^{PLUS} and Platium (low performance order).	- Can be applied to new or existing residential and non-residential buildings (school, infrastructures, hospitals, etc); new or existing parks, public transport systems, districts and service buildings (supermarkets, shops, offices, restaurants, etc.) - Assessment fee to certify existing buildings has a minimum of 4 000 € but the maximum is not established as it depends on the size and conditions; for new buildings the minimum is 11 000 € and the "large" dimension starts off with 19 300 € , but there are higher sizes such as shopping centers and districts that need higher investment.
LiderA (Portugal, 2005) (Liderar pelo Ambiente)	LiderA – Sustainable Assessment System	Portuguese voluntary system which aims to perform efficiently and integrated support, assessment and certification of the built environment that seeks sustainability. Its structure is based on six strands (different environmental principles) that translate into 22 areas and 43 criteria, with which the built environments are assessed according to the environmental performance they display. The performance classification is made using classes, ranging from less to more efficient respectively: G, F, E, D, C, B, A+ or A++ (M. Pinheiro, 2011).	-The current version applies to buildings and also outdoor spaces and extensive areas (blocks, neighborhoods and buildings of various scales); -The certification is only awarded for class C or higher and is valid for three years; -The system is extended to the Países Africanos de Língua Oficial Portuguesa (PALOP); -Costs of 1 500€/case with the addition of 0.3€/ft2, under certain conditions they be reduced by 50%; -More than 1 000 homes, 6 000 tourist beds and multiple projects certified.
EarhtCheck (Austrália, 1987)	Sustainable Tourism Cooperative Research Centre (STCRC)	This program helps destinations measure and monitor their environmental and social impact, and prepare and track that performance against their own targets and the performance of other communities. It also contributes to research and development of best conservation and maintenance strategies to create healthy, safe and sustainable tourist destinations (EC3, 2015). Certification range: Bronze, Silver, Gold and Platium (from lower performance to the best result)	- Applies to destinations, hotels, infrastructure, organizations, communities and services that support local tourism. Annual fee of 2 000 €. - Sustainable Destination Program is a worldwide network of destinations that am world-leading sustainability outcomes with fees from 6 000 € to 10 000 €, depending on local population. - Sustainability Challenge program for school students to manage their household sustainability online; gives them an understanding of their impact and path to sustainability
Green Globe 21 (1994)	Strategic alliance with World Travel and Tourism Council (WTTC)	Green Globe 21 certification provides certification for the sustainable operations and management of travel and tourism companies and their related supplier businesses, as well as training & education, and marketing services in 83 countries worldwide (GreenGlobe, 2013). Promotes the implementation of Agenda 21 principles based on the ISO 14001. It also maintains a global network of independent auditors who provide third party inspection and validation. 41 criteria and 337 indicators.	- Certification for hotels, resorts, convention centers, attractions, tourism businesses, health retreats and others; - Annual costs of certification that the company, business or organization has to cover are both: annual GG membership; and the initial and annual audit services.

3. Singapore - Green Mark and Study Cases

Singapore presents itself as a unique case in the study of sustainability, as it is a highly urbanized island, with a density of 7813,85 inhabitant per km^2 (that increases every year) although it happens to have limited resources and space, depending on imports to meet basic needs such as water, fuel and agricultural products(SCI, 2012). Since its independence in the 60s, Singapore has built an economy from scratch with perspective policies that have led to a sharp economic growth, resulting a GDP of 355 billion euro (SDS, 2015). For these reasons it was created and early conscious and innovative culture that allowed Singapore to become a leader on environmental and sustainable practices such as the use of rain water, desalination of salt water, solar panels techniques, efficient public transport, numerous green spaces and vertical gardens, among others. Sustainable development is seen as a way not only to improve the quality of life but also to attract more international businesses and in a real sense, to survive (Huffman, 2013).

BCA Green Mark is a green building rating supported by the National Environment Agency (NEA) and provides a comprehensive framework for assessing the overall environmental performance of new and existing buildings to promote sustainable design, construction and operations practices in buildings. For new buildings, developers and design teams are encouraged to design and construct green, sustainable buildings which can promote energy savings, water savings, healthier indoor environments as well as the adoption of more extensive greenery for their projects. As for existing buildings, the building owners and operators are encouraged to meet their sustainable operations goals and to reduce adverse impacts of their buildings on the environment and occupant health over the entire building life cycle. The assessment identifies the specific energy efficient and environment-friendly features and practices incorporated in the projects, awarding points for those which are better than normal practice. The overall assessment and point scoring will provide the environmental friendliness of design and operation, certified to have met the BCA Green Mark Platinum, $Gold^{Plus}$, Gold or Certified rating.

3.1. Best Practices and Green Mark Awards

JTC Corporation (JTC)'s CleanTech Park (CTP), the first eco-business park in Singapore, is the first development to clinch the Building and Construction Authority (BCA)'s Platinum Green Mark for Districts Award. CTP won the award for its energy-efficient infrastructure and its public amenities which can potentially help save more than 40 per cent of energy consumption and 25 per cent of potable water usage. This translates to about an annual 40 per cent of cost savings in utilities (BCA, 2012).

CTP is specially designed with a "blue network" of water bodies, including streams, bios wales and ponds. It is made possible by retaining the natural undulating topography which allows a substantial catchment area for storm water to be stored for reuse. An estimated 150,000 litres of storm water is stored yearly for sanitary flushing which accounts for the 25% of savings in potable water usage. A central Green Core (GC) has been planned as the "green lung" of the eco-business park, allowing community and visitors to enjoy the local flora and fauna. The GC was the first development in Singapore to achieve the BCA-NParks Green Mark Platinum award in the New Parks category in May 2011.

The Inter-Ministerial Committee on Sustainable Development (IMSCD) has set the target of greening 80 % of all buildings in Singapore by 2030. To achieve this target, BCA and National University of Singapore (NUS), collaborated on a research study on the valuation of Green Mark commercial properties in February 2011. The aim of the study was to evaluate whether Green Mark rated commercial buildings have an impact on commercial property valuation. NUS would also develop a valuation guideline for green commercial properties that account for the cost and benefits of newly developed and retrofitted green commercial properties.

The sample of 23 commercial properties, categorized into office, retail, hotel and mix of these uses, was studied. Each was provided with general description and also the energy consumption (before and after retrofit) and the capital expenditure for retrofit project. From the data analysis, several main findings from this empirical data set can be made. The findings provided good indications for the cost and benefit analysis of retrofitting existing commercial properties. In terms of retrofitting cost, the average cost works out to be only about 2% of current new build (see Table 2), assuming standard commercial buildings.

Table 2 - ***Comparison of retrofit costs versus new construction of offices, shops and hotels. Source: (BCA-NUS, 2011).***

	Oficces	**Shops**	**Hotels**
Retrofit total cost per m^2 (Euro)	50,6	57,24	66,92
Cost of new construction per m^2 (Euro)	2.269	2.432	2.910
Relation between cost of retrofit and new construction (%)	2.23%	2.35%	2,29%

Singapore's first retrofitted Zero Energy Building (ZEB) located at the BCA Academy is also the first existing building in Southeast Asia to be fully retrofitted with green building design features and technologies. Housing fully functioning classrooms, a library, multipurpose hall and offices, the ZEB is used as a test-bed for innovative building designs and energy efficient building solutions, especially for existing buildings (BCA-ZEB, 2014).

Retrofitted at a cost of around 6 million euro, has very energy efficient re-design of the façade and roof such as greenery systems, light shelves and sun-shading devices, other building components to reduce its energy needs. This was followed by a well conceived installation of "active" solutions such as energy efficient air-conditioning system, high efficiency lighting including motion sensors and carbon dioxide (CO2) sensors.

At the same time, natural and renewable energy are harnessed from the environment, since 1,540 m^2 of solar energy (photovoltaic) panels have been installed on ZEB's roof and other prominent areas to tap on the sun's energy. These solar panels' combined area will generate about 207,000 kWh of electricity a year – enough to supply power to 45 four - room HDB flats. The ZEB is expected to be about 40-50% more efficient than a similar office building, and although the building is connected to the grid, it is expected to generate as much electricity as it consumes over a typical year.

4. Setúbal – LiderA and Study Cases

LiderA system arises in 2005 as a result of research, consultancy and projects (conducted since 2000), leaning on the theme of sustainability in construction and built environment (LIDERA, 2013b). It aims to: 1) support the development of plans and projects seeking sustainability, 2) assess and position these performance in the design, work and operation on the search for sustainability, 3) support the management in the construction and operation phase; 4) assign the certification trademark, made through the verification by an independent assessment and 5) serve as a market distinctive tool for buildings and customers who value sustainability (LIDERA, 2013a).

LiderA in its full version includes 6 principles, which translates into 22 areas, which by their terms are subdivided into 43 criteria. To each of these criteria is assigned a relative weight percentage, and this value is weighted according to the environmental relevance of that criterion. The possible classes that can be assign to the criteria vary between G and A++, corresponding these to improvement factors in comparison to the usual level of 0 and 10 respectively. Class E is relative to the reference practice, with factor 1, and the best performance classes, besides A++ (factor 10), are A and A+ which represent improvement factors of 2 and 4, respectively. Basically the classes D, C, B, A, A+ and A++ represent improvements on the usual practice of at least 12.5%, 25%, 37.5%, 50%, 75% and 90%, respectively. That said, when a performance class is assigned to the various criteria it allows to know if the solution is sustainable or not and, after a proper balancing, perform the same logic but on the final/overall classification in analysis (M. Pinheiro, 2010).

Since the 43 criteria mode is only used in Portugal and LiderA's international version only displays 22 criteria (keeping the same areas and strands), this means that the various fields analyzed in the system can be modified and have different weights depending on the country concerned. In this sense it was developed, based on LiderA's summary presentation manual for built environments (M. Pinheiro, 2011), the adaptation of the description and the particularities that each strand, area and its criteria meets for tourist destination services.

From the latest version LiderA 2.0 a matrix was adapted so it could be more in line with what needs to be assessed in services and infrastructures that make up the destination. This only displays 21 criteria (keeping most areas and strands) being more widespread, although it shows facility to be suitable for different countries and their particular characteristics (see Figure 1).

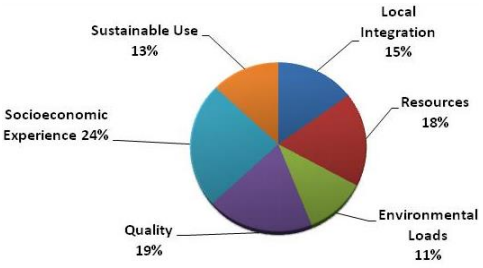

Figure 1 – Weighting by strands and changes on the version 2.0. Adapted from (M. Pinheiro, 2011)

Regarding Setubal the case studies selected are public spaces, since the system had already various examples of service buildings certified such as schools, centers for education, restaurants, shopping centers, supermarkets, among others. The case studies selected are 3 urban parks and 3 beaches that have different characteristics and performances as the assessment can demonstrate.

The concept for urban green areas should consider them to be a category consisting on tree and shrub vegetation, with free ground soil of buildings or waterproofing covers (at least 70% of the area), public

access and carry out, as much as possible, ecological functions (thermal comfort, air pollution and acoustics control, rainwater interception, and shelter to wildlife), aesthetic functions (visual and ornamental enhancement and diversification of the built environment) and leisure/recreation spaces and activities (Bargos & Matias, 2011).

Has urban parks there were analyzed: Bonfim Garden (BG), Urban Park of Albarquel (UPA) and Picnic park in Comenda (PPC). The first displays an area of 4.15 hectares, just a few meters bigger than the second UPA and the third PPC has 1,5 hectares. BG happens to be the oldest of all parks and has suffered some interventions along the years: to the irrigation system, received new urban furniture such as benches water canals and a children playground, drainage system improved and recovery of pavements. Latelly, under the Municipal Energy Optimization Plan, all the street lamps in the park to LED technology, since the most of the old ones were degraded, and it resulted in higher quality of illumination and security of the park and savings of 70% in energy consumption (as well as CO2 emissions), see Table 3.

Table 3 - *Results obtained after lighting rehabilitation of the park BG*

Components	**Before**	**After**
Average lighting level (lux)	2,9	12,8
Consumption per lamp (W)	180	42
Total power consumed (kW)	15,48	3,61
Annual energy consumption (kWh)	67 802	15 812
Equivalent CO_2 emission (kg/kWh)	29 833	6 961
Savings (annual)	-	**76 %**

UPA is the park considered to be most complete in terms of services and maintenance. It is also the most recent and resulted from the rehabilitation of an abandoned area previously occupied by a campsiteis. Has 4 main distinct areas equipped with: nautical club, a bar with terrace, a restaurant, toilets, an exhibition center, picnic area, a playground, jogging circuit and others. The lighting and water systems seem to be efficient, some interior lamps used are LEDs and the taps are water efficient as well as dual flush toilets.

The last one, PPC is located on the Coast of Arrabida Mountain, on the way from Setubal to the beaches. Is known for its picnic area that as equipments that support such as barbecues and taps, although they do not present the best state of preservation. It has an easy access and park lot but does not include measures for disabled. As well as it doesn't have any street lights and security system.

The beaches selected for assessment, located in the Blue Coast of Arrabida Mountain, are: Figueirinha, Galapinhos and Albarquel. The first is one of the most commonly used by local residents and tourist. It has a bus going from the city to the beach, in the summer months; inclusive equipments and infrastructures, a restaurant and all of the requirements achieved for the Blue Flag award. Albarquel is near by the urban park and the access has the advantage of having parking lots suitable to the usage of the beach. It has lighting stations at the entrance and main services as well as sanitary facilities. The last one, Galapinhos, is a semi natural beach with few supporting services and inclined tracks that hamper access for people with reduced mobility or families with small children.

5. Discussion of Results

Throughout the followed methodology, it is confirmed that it was possible to characterize and assess the environmental performance of diverse tourist services, based on the performance levels range (Figure 1), being accomplished the thesis main objectives.

The environmental positioning assessment by the liderA system to the parks and beaches, in Setubal, presented in the past section it was concluded that they belong in different certifiable classes as shown in the Table 4.

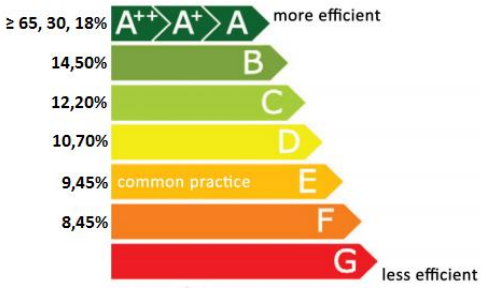

Figure 2 – Performance levels. Adapted from (M. D. Pinheiro, 2011)

Table 4 - ***Final results and environmental performance achieved by the study cases of Setubal.***

Caso de Estudo	Valor final	Classe
Bonfim Garden (BG)	18,80%	**A**
Urban Park of Albarquel (UPA)	30,24%	**A+**
Picnic Park Comenda (PPC)	11,20%	**D**
Albarquel Beach	15,93%	**B**
Figueirinha Beach	34,90%	**A+**
Galapinhos Beach	13,26%	**C**

5.1. Local Integration

According to the criteria of this strand, the improvement measures that need to be implement/strengthened are list below and can be applied in the case studies analysed:

Territorial Valorization (C1)

- ✓ Maintenance of green areas (% of area) and rehabilitation of degraded / contaminated area;
- ✓ Irrigation of the green coverage through efficient and consistent systems with the climate;
- ✓ Conservation of natural topology and minimization of excavation and land transport;
- ✓ Conducting periodic inspections (nº) and corrective action to surface erosion;

In this area, the PPC has the lowest classification and could implement measures as: improvement of green and tree cover, automatic watering and corrective measures to minimize the surface erosion. The results obtain could lead to a B or A, instead of a C in the soil area, which represents a improvement of twice as many the common practice.

Ecological Valorization (C2)

- ✓ Conducting studies to determine and quantify the biodiversity (nº) (fauna and flora) and conservation modes to interconnect habitats;
- ✓ Transfer (if necessary) species that are at risk for other created or existing environments (monitoring the adaptation thereof)

Biodiversity is one of the issues that can change with a simple human action in any service or area and the awareness about is the key difference when designing a new project or adjustments to the built environment. Having green connecting corridors between different areas can reduce the impacts and enhance the number of species that use the same space.

Landscape Valorization (C3)

Specific protective measures and proper supervision to prevent infringements and misconduct. These measures can simply be signs or information boards to warn the users to protect and conserve its landscape and heritage.

5.2. Resources

Sustainable alternatives to make this strand more efficient, can be the application of efficient equipment and operations that can resort to the use of renewable resources to reduce the energy and water load of public systems.

Energy Management (C4)

- ✓ Passive and bioclimatic solutions (solar orientation, natural ventilation, low-emissivity windows, interior and exterior awnings, reflective surfaces, natural light channels vertical or horizontal, etc.)
- ✓ Installation solar energy (solar panels on terraces) to use in the available services (restaurant or support buildings);
- ✓ Rehabilitation of public lighting system (change fixtures to LED technology or other efficient technologies)
- ✓ Movement/occupation sensors for savings in times of little use (the supports and infrastructure);

The consumption of electricity in parks and beaches is recorded on the following equipment: out outdoor lighting (roads, parking, terraces), inside (if any infrastructure and supports), artificial ventilation (if necessary) and equipment used in services or maintenance of the spaces. Regarding lighting systems, Setubal Council has been investing in the replacement for more efficient technologies, as seen in the Bonfim garden, which achieved significant savings when replaced with Led technology. All these initiatives listed above can be suited for tourist services in the case studies and improve recognition with a greater environmental performance obtained, such as A or A+.

Water Management (C5)

- ✓ Land use for irrigation and drainage of rain water, with collection and filtration systems such as bio vales or rain gardens;
- ✓ Use of rainwater for secondary uses: toilets, wash floor and outdoor;
- ✓ Efficient water features (in taps, showers, water fountains, etc.), and water consumption meter;
- ✓ Compliance with the minimum quality requirements of water for beach areas;

Again, the PMC has some equipment that can easily be replaced for efficient ones, taps and toilets that have been wasting water by letting them running or bad use. For other cases, parks and beaches, the equipment used in sanitary and services appear to be efficient and low consumption. There were no, in any case, reuse systems of rainwater that can be implemented without major associated costs and contribute to reducing the fresh water consumption of the network. Investments in this type of solution can bring various benefits to the services and raise awareness for the sustainable use of this natural resource, which is not always the case. Obtaining class A+ in this area would be possible in some of the cases evaluated, especially in the gardens by the permeable area available to them.

Materials Management (C6)

- ✓ Use of sustainable finishes and materials produced on site (preferably less than 100km);
- ✓ Choose appropriate constructive solutions and materials with high durability and strength;
- ✓ Use or reuse materials with a high recycling content;

The reuse and recycling of building materials is not always taken as hypothesis in projects in which the aesthetic look first and then sustainability. If we can start to change this attitude in the field of construction may possibly be attributed class A or A + these criteria and improve its performance.

5.3. Environmental Loads

The improvements will only be applied to effluents and waste management, since the classes obtained for atmospheric emissions were already optimal, so the focus go to other critical criteria.

Wastewater Management (C7)

- ✓ Local treatment (if possible) of rain water through biological systems and low intensity in energy and materials;
- ✓ Separative collection systems that allow separation of waste water, grey water and black water.

Waste Management (C9)

- ✓ Active plan to manage, minimize and weigh municipal waste;
- ✓ Reduce the purchase of packaging and invest in solutions recharging products (support and restoration);
- ✓ Promote the proper disposal of hazardous chemicals or materials used in maintenance;
- ✓ Provide specific locations where objects can be placed (furniture, clothing, etc.) that can be reused or renewed.

The drainage of wastewater and its purification through biological systems can allow the reuse for secondary purposes, as mentioned before. This is an improvement that would raise the performance of this criteria, in most cases. Although in some, the investment in separate sewer systems or treatment is not justified, minor adjustments to existing systems do not require large costs and could improve the maintenance and quality of spaces. Regarding solid waste, PPC has the least care for its areas and surfaces, regarding maintaining and cleaning, as it could be seen especially when the utilization rate is the highest in the summer months.

5.4. Quality (Environmental Comfort)

In this area the improvements and alternatives are related with the investments that can promote and enhance environmental awareness in the services and activities created for public spaces. The actions listed below extend to most cases and would allocate better environmental performances.

Products (C10)

Use local products and promote local business; local production of food resources, increasing the competitiveness and attractiveness of the space/destination.

Promoted values (C11) and Environment Created (C12)

- ✓ Strengthen links between new projects and other issues to ensure the benefits extend to local communities;
- ✓ Promote the participation of residents and their involvement in the management and maintenance of the rehabilitated space
- ✓ Holistic approach and signs aimed at educating residents about good environmental practices and use of space;
- ✓ Offer gardening spaces to encourage residents to plant and harvest their own species of plants and crops;
- ✓ Promote social solidarity and corporate volunteering;

Cost/quality relation (C13)

Implement services, building and areas with accessible economic activities and access to different users; create economic benefits being financially sustainable.

The UPA and the beaches of Figueirinha and Albarquel are cases that best contribute to the local market, having regional products, and great diversity of available services such as: restoration, child and youth entertainment, sports, leisure, culture and contemplation. On the other hand, there can be made major changes in the parks of Bonfim and Comenda, to increase service's supply, attract more visitors and contribute to employment, fostering community participation and dissemination of the destination.

5.5. Socioeconomic Experience

This strand, regarding tourist destination development, has great importance and contribution to both local population and tourist sector. In this sense the actions selected and listed below can get better classes in the assessment of public spaces.

Local Employment (C14)

Promote the establishment and development of economic activities, including local employment initiatives.

Environmental Interaction (C15)

Streamline sporting public spaces and revitalize cultural life; rehabilitate buildings with potential for social functions; requalify abandoned areas and leisure to strengthen sociability and the meeting of generations.

Security/Safety (C16)

- ✓ Maritime surveillance and control of traffic and parking;
- ✓ If necessary video surveillance system (infrastructures that support maintenance)
- ✓ Protection and contention measures of cliffs and cliff areas; proper lighting to the use of space.

Accessibility (C17)

- ✓ Encourage the use of public transport , improving cycle paths and public transport network;
- ✓ Covered paths and walkways to improve mobility comfort and integrate inclusive measures for disabled people;
- ✓ Reduce the distances between services and vehicle travel within the destinations.

Local dynamics (C18)

Identify relevant environmental aspects in the space in order to stimulate visitation and participation of the local population;

When considering tourist destinations, accessibility is one of the most debated and considered criteria in the environmental assessment. The number of choices of public transport and modes to travel between services, interferes with satisfaction and tourist experience. That said, it's important to turn public spaces easily accessible so they can have de desired use and contribution.

In Setubal, not all places of interest, mainly beaches and parks analysed, have access by public transport being necessary the use of private car to access them. In the summer there are in place buses that make the route from Setubal to Figueirinha, being relatively frequent and adequate. Although the access road along Arrabida coast, is limited to one direction in the summer, to facilitate the transit and parking, is not enough to meet the number of people who visit these beaches. The most effective way is to strengthen public transport and bus stops so it can be possible, for the next year, the access to the beaches and reduction of personal vehicles.

5.6. Sustainable Use

Environmental Policy (C19)

Implement environmental management system and innovate sustainable practices; policy covering all the services and operations; requalification of the beaches so they can reach Blue Flag award.

Education (C20)

Provide opportunities for learning contexts, educational activities that address both coats and marine environment; information and accessible panels to follow good environmental practices and values.

Marketing (C21)

Create networks to share of good practices and technologies between cities and towns; identify viable platforms to disseminate the destination and encourage evaluation by visitors; conduct annual surveys about public spaces and areas of improvement, made users.

The most recurrent strategy to improve bathing areas lies in improving conditions and equipment to reach the Blue Flag and Affordable Beach awards. They mean that leaders and managers are willing to achieve standards of excellence involving environmental education, quality of water, efficient management system for services and security. For parks, the environment policy that advocates should be clear and transparent for users so it can create awareness and educational campaigns involving everyone.

6. Conclusions and Future Developments

The tourism is one of the sectors with significant direct impacts on the environment impacts (such as land use and energy and water consumption), being increasingly challenged to integrate and to enhance the environmental dimension and the sustainability. This can be achieved, for example, with the substitution of equipment, the awareness of employees and users and the implementation of environmental management systems and certification. In that way, those systems may be mechanisms for efficient implementation since their adoption causes important reductions in financial costs and environmental impacts. Although these system measurements may have a longer pay-back, in the future they will end up rewarding monetary and environmentally.

In this context the thesis focuses on the analysis of tourist services and its sustainability, including specific cases in Setubal. Two of the case studies, the UPA and Figueirinha beach, obtained a solid A class that in environmental terms means an improvement of performance of two times the common practice. This, certainly the implement of improvement measures, both have potential for progression to a stable class of A+, which in turns represents a four-fold performance improvement over the usual. Many of these improvements cannot even prove high costs since they spend only relatively simple adjustments, with reduced monetary costs.

The cases that have lower ratings as environmental and socio-economic performance are those who, from the perspective of creating a sustainable tourist destination: have higher environmental impacts, lack of management plans and maintenance of spaces, little suited to basic need of the population or else, have little contribution to the economy and local community as well as for the promotion of tourist destination where in which belong.

In the case of Galapinhos beach the biggest obstacles are accessibility, safety and maintenance. The access is done by inclined tracks and one of the accesses has a slope at risk of falling blocks. Although they don't represent major impediments, since the occupancy rate is high in the summer, human pressure in a space that does not tend to have conservation measures may have consequences in the near future. Regarding safety, the lack of lighting system jeopardizes the use of the beach at night and the access stairs can lead to falls or unnecessary accidents.

With regard to parks, Bonfim garden being located in the centre of Setubal, presents itself as a preferred spaces for events and various activities. Yet the services available fall short to expectations, especially if seen old photographs of the garden, when the restaurant and fountains were in operation. This garden has great potential to expand the services that it offers making them sustainable and appealing to those who visit regularly. Currently the restaurant is not in operation and its maintenance is then scarce, mainly on the back that serves as shelter for several birds. The rehabilitation of this building would beneficial to

the space and with a sustainable approach, would not interfere with biodiversity that boasts of it. Since that have been made adjustments to improve the quality of this garden (to the accesses, bike paths, garden equipment, lamps, etc.) this step would meet these improvements and contribute to the tourism sector of Setubal.

LiderA system appears to be, according to the literature reviewed, a flexible and adaptable system to local conditions and tourist indicators, especially to access tourism enterprises, infrastructures and services, reasons that dictated as potential option to use for this study.

With interest to accomplish in the future, for covering the gaps in specific areas of the analyzed tourist services, it is important to think over:

- Analyze the resources consumption evolution of each tourist service;
- Enhance the developed models for each case study, allowing the improvement of some assumptions and the decrease of some uncertainties;
- Monitoring and reporting of environmental performance data to employees and users;
- Analyze the retrofit actions implementation, like the equipments substitution, the awareness of users and employees, the change on spaces management and maintenance and the implementation of an environmental management system;
- Evaluate the need of specialized competences of an energy and water manager, for an efficient use.

Generally it is advisable to carry out further studies of this kind, so that the general state of tourist services can be more precise, in environmental performance terms, in Setubal and throughout Portugal. In that way it would also be very useful a benchmarking study in Portugal tourist destinations industry in the scope of environmental certification, as this would provide the best practices carried out in these areas and would lead to superior environmental performances. It would still be possible to adapt this strategy to other types of public spaces and infrastructures, so all the categories could go hand in hand in the pursuit of sustainability.

Regarding the public spaces analyzed and others that want do elevate their environmental performance, it can be applied in the near future, hopefully, some actions that help the tourism sustainability. As examples we have: improve public transportation network so it can reach most places and attractions and reduce the use of private vehicles, apply include measures to the accesses and services, create more businesses and employment opportunities aware of the best practices and sustainable aspects, and maybe start a weighing campaign for wastes, preferably with detailed data on each type of waste (glass, paper, organic matter, etc.) so population can be aware of the amount generated and can publicize information about their best practices and consumptions. It is recommended that responsible authorities and private sectors remain a constant desire for improvement and optimization of its dynamics, because this attitude opens doors to responsible managers to seek new challenges and goals for improvements in the destinations performances.

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