SUSTAINABLE CIVIL ENGINEERING AND HOSPITALITY

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Resumo: Diante da formação de novos conceitos e da conscientização, tanto popular como institucional, a sustentabilidade vai ganhando corpo e se consolidando em numerosas frentes. O turismo e a hotelaria através de estudos e do tempo harmonizam-se de forma a descobrir e promover, dentro de seu âmbito, novas formas de pensar e descobrir soluções.
O objetivo deste artigo foi o de propor e estabelecer uma reflexão sobre qual seria a melhor certificação a ser utilizada em prédios verdes brasileiros tendo como referencial cinco tipos de certificações utilizadas internacionalmente em empreendimentos verdes que relevam a dimensão da sustentabilidade. É necessário que as empresas de construção civil juntamente com a rede hoteleira tenham um modelo para verificar o impacto de uma construção verde no turismo, na hospedagem e seu reflexo nos stakeholders. Entendemos que não existe uma certificação ideal no tangente aos prédios verdes hoteleiros, por isso a relevância desse artigo no sentido de propor uma reflexão quanto a uma metodologia de certificação verde que atenda aos requisitos de um país tropical, como é o caso do Brasil.

Palavras-chave: Turismo, Hotelaria, Engenharia Civil, Sustentabilidade

Abstract: Before the formation of new concepts and awareness, both popular as institutional, sustainability is solidifying and consolidating itself on numerous fronts. The tourism and hospitality have made efforts to harmonize tendencies in a way to promote and consolidate this trend as a solution. The aim of this paper was to propose and establish a reflection on what would be the best means of certification to be installed within Brazilian green buildings as the best reference to suit our nation. There are five types of certificates used internationally in green projects that underline the sustainability dimension. It is necessary that construction companies along with the hotel chains have a model to assess the impact of a green building in tourism, accommodation and its impact on stakeholders. We understand that there is not an ideal certification for green hotel buildings, so the relevance of this article to propose a reflection about the methodology of a green certificate that meets the requirements of a tropical country such as Brazil.

Keywords: Tourism, Hospitality, Civil Engineering, Sustainability

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1. INTRODUCTION

The subject Sustainability has provided challenges to researchers that have been looking for new and better suited innovational ideas on the subject also in differentiated, constant and methodical ways, as well as logical matters of connection between the topics. The obstacle appears when being faced with the necessity of adopting practices that connects the subject with means of production.

The searches for new methodologies to be employed in distinct areas as Tourism and Civil Engineering have directed the researchers to think and behave according to the specificities of the areas aforementioned.

The topic is quite complicated, because the possibilities that determine limits are politically complex in economic and ecological terms, with no perspective of success by conventional methods. The increased use of natural resources leads to a high risk to the physical conditions for life on Earth, in favor of a capitalist ideology of production and an already environmentally untenable consumption of the world's resources. The use of natural resources of the planet in a way disassociated from the concerns of the world´s reserves and to consume that level that affects future generations, increasing the growing expectations on consumers of the countries, shows a path of no return for perennial natural resources, health of the planet and the individuals who lives on it.

However, within this diversity and complexity there is an area of consensus. The status quo of what is not sustainable in the long term and consequently unable to achieve should be changed. Individuals, communities and organizations should invest in the development and implementation of alternative and more innovative strategies from more sustainable tactics and mechanisms.

Understanding the increase development of natural resources leads to risks of the physical conditions for life on Earth. The need for innovative projects related to production systems in line with the requirements of the sustainability, the objective of this paper was to propose and establish a reflection around which would be the best certification to be used in Brazilian green buildings using as reference five types of certifications used internationally in green projects that reveal the sustainability dimension.

Anchoring the discussion are references from authors such as Bartholo (2005), Lima (2007) Irving (2005) e Casado, (2010), from which the landscape of sustainability has evolved during the decades 70´s 80´s and the 90´s establishing a situation where three main factors were observed, in the 70's existed the need of public environmentalism, where governments have responsibilities in the implementation of public policies aimed at sustainability. Then in the 80's we saw the increase of the business sector in the use of targets and adequacy of industrial parks, finally in the 90's were the emergency beyond the concern about environmental impact on lifestyle and societies consume.

Furthermore, we search to present evidences that corroborate for a greater reflection on the proposal subject. Although there is a question pervading the business actions: can principles of sustainability be applied on day by day of business on their operating practices?

Today, we understand the planet as our planned learning environment, teaching men straightly, presenting a mirror to our behavior, belief systems and values. The Earth is showing us which of our ways of past and present are now unsustainable, from waste and trivial consumerism to the continuous increases in quarterly corporate profits and the fantasies of unlimited growth of GDP.

Mister noted that the tourism industry is directly responsible for 5% of greenhouse gases that cause global

warming! To understand the magnitude of these numbers should be emphasized that the tourism industry uses energy in many activities – from transportation to the final destination, in accommodation establishments and host of other tourist activities. As in many other sectors of the economy, tourism employs a considerable amount of energy based on fossil fuels, with a minimum of energy generated by renewable sources.

Given this perspective, the tourism industry is closely linked to climate changes, once it involves the movement of people from their homes to other destinations including new accommodation and maintenance of local people who are working within the hotel, hostel and lodge´s or involved in tourist activities tourism is directly involved with climate change.

This study is justified by the absence of studies that establish links between sustainability, tourism and green building certifications. Thus it becomes relevant as a starting point for further studies about the subject and beyond the possible contribution resulting from the partnership academy and the market.

This article is the result of readings on books and periodicals, searches based on papers from Capes, participation and discussions in congresses held on the period of February 2010 and March 2011. Resulting from this interest in the area was designed and created the Research Group in Business Management, Tourism and Sustainable Development (Gestão Empresarial, Turismo e Desenvolvimento Sustentável – GETDS).

It was organized into topics in order to enable a greater understanding by the reader. Initially consists of an introduction presenting the objectives, justification and theme. Then the theory establishes common thread among the topic sustainability, models and types of certification. Later, we discuss issues related to sustainable construction and hospitality, concluding with final remarks and references used.

2. METHODOLOGY

Given the social and economic impact that construction has on Brazil and its importance to the country's growth can be seen that over the years this industry has been the focus of debate on environmental, social, cultural and more recently sustainability. Issues that underlie in these elements are significant and important from the phases of design planning and construction. Such as the choice of land for the project, the project design, choice of materials and hiring qualified and competent workers to interact in new developments.

Thus the question emerges, How to reduce the impact on the environment due to the construction of buildings for the Brazilian hotel industry? The answer to the question is the adoption of best practices aimed at sustainability aspects in the development of projects. The search for systems that can mitigate the impact of construction activity on the environment have promoted actions related to the development of integrating practices to reduce consumption of energy, water and the recycling of construction waste appropriately. The environmental agenda of today´s world gains strength when the press, government and society seek the implementation of ways to construct and source materials for Green Buildings, including the use of certain tools to classify the said buildings as sustainable. The market is being pressured by society because the consumer believes that the Brazilian environment must be sustained and seeks to adopt practices and certification schemes put in place within other ¨developed greener¨ countries in order to meet requirements indicated by final consumers.

In this tangle of "good intentions" the Academy joins the above authorities investing in research that might provide "best practices" and new models of certification.

The research method corresponds to the various practices and techniques used by the researcher to answer the inferences he/she has of reality.

From the point of view of its nature as the present study comprises an applied research that has the purpose of generating knowledge for practical application and direct solution of specific problems for a more advanced list of rating systems for green buildings, those mostly used in the circle of construction within Brazilian hospitality.

From the point of view of its purpose this can be considered descriptive because they seek to describe reality on the criteria used for certification. We need to identify common features between them and their main differences in order to present the facts on this subject.

From when the literature review was made possible through a bibliometric study to get the concepts of sustainable development, tourism and sustainability through study allowing greater involvement in international research concerning methods for assessing sustainability.

Throughout the thesis we have assessed methodologies considered most appropriate to its purpose. In reaching this result, we used **the criteria presented** by Aulicino (2008), namely: methodologies already applied with internationally available literature also methodologies that consider in their evaluation aspects related to the building and its surroundings, availability and ease of access to material literature and the structure of the method i.e. worksheets, checklist, criteria and weightings, etc..

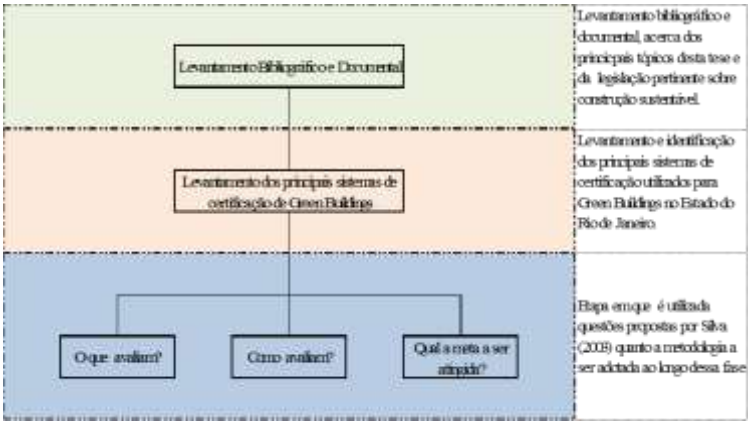

Figure 2 - Methodology
Source: Authors' elaboration

Based on these criteria the following methodologies were discarded. CASBEE, Japanese method that identifies only criteria related to building and does not extend to its surroundings, or better, allowing differentiation between indicators relevant to the urban area such as the neighborhood. Green Star and Nabers, both of Australia, However both methods are specific to Australian businesses. Despite the ease of insertion of the data requested by the methodology, the same is not liable to be applied to the Brazilian reality because data such as stresses Aulicino (2008) must be Australian. Thus, among the tools for assessing the sustainability of buildings we highlight three more relevance in the Brazilian context namely: Building Research Establishment Environmental Assessment Method - BREEAM -; Leadership in Energy and Environmental Desing - LEED-ND (USA); AQUA Certification

3. THE TERM SUSTAINABILITY

The term itself is characterized by a continuous process, once it involves less effort to those that provide competitive advantages in the short and long term.

In 1972, Stockholm, it was designed the Stockholm Declaration. Known as the Stockholm Conference, it created a document resolution with 26 principles and eight proclamations presenting for the first time, the concept of sustainability.

Later, in 1987, there was a meeting organized by UN that would be considered a regarding reference point about sustainability, the World Commission on Environment and Development. In this occasion was elaborated the Brundtland Report, also known as Our Common Future. Through

this report came the first widespread concept of Sustainable Development. Unlike 1972, where the concept of sustainability had a focus only on the environment (proclamation nº 2) this report brought forward the idea of development with the environment "development which aims at meeting the needs of the present generation without compromising the ability of future generations to meet their own needs."

After five years, 172 governments gathered in the city of Rio de Janeiro, where the United Nations Conference on Environment and Development (UNCED) was held, better known as the Earth Summit. A document known as Agenda 21 was written as a symbol for sustainable development.

The Agenda is accompanied by a number of other documents related to the work of the Commission of Sustainable Development. At the same meeting there were four signed agreements that would erect the Agenda 21, namely: the Rio Declaration, with 27 principles aimed at environmental protection and sustainable development; Declaration of Principles on the Use of Forests, convention on Biological Diversity and Convention on Climate Changes. During the Eco-92, also known as the Earth Summit, various segments of society participated directly in the preparation of Agenda 21. At that time it was possible to recognize the participation of civil society meaning nongovernmental organizations, Heads of State and official representatives of the various segments that drove the UN after several international commissions, to approve the Earth Charter in 2002.

Other documents were prepared during this period. Noteworthy, a book-report "Changing course: a global business perspective on development and environment" developed by entrepreneurs and executives from 28 countries who founded the World Business Council of Sustainable Development, the WBSCD. It was created in Brazil the Brazilian Council for Sustainable Development (Conselho Empresarial Brasileiro para o Desenvolvimento Sustentável – *CEBDS*).

In 1991, the business sector prepared under the International Chamber of Commerce a document entitled Business Charter of Sustainable Development which encouraged the adoption of management practices that would improve new strategies of economic progress. In 2001 Camargo mentions that the Business Charter deems necessary that awareness by businesses about the existence of a common goal between the economic development and environmental issues when considering present and future generations.

In the business scenario many leaders have realized and proved that investing in stocks and projects with adherence to sustainability generates a significant return to the institutions and leaves a positive mark of a company's ethically compromise.

In this sense, exemplifies Bartholo (2005), that firms absorbed the concept of sustainability to include simultaneously perspectives on economic growth, environmental protection, social equity, the political-institutional-cultural dimension and space-land sustainability.

Most companies that reported favorably in 1992 with the principles contained in the Charter for Sustainable Development did not understand clearly the core of sustainable development. At that time there was an erroneous thought that sustainable development could be taken as a kind of green business. However, this dimension reflects fleeing situations of everyday life, such as environmental pollution control but reflects the ability to develop new practices that can mitigate the carbon footprint on the planet. Sustainable economic practices interacting with antagonistic situations that passes between ethics and the environment.

The concept of sustainability must be understood as a fundamental principle in the reformulation of the national tourism planning. This planning should aim at traditional tripod of sustainability,

environmental, socio-cultural and economic. This fact is well described by George Smith, as reproduced below:

This search for balance between what is socially desirable, economically viable and ecologically sustainable development is usually described in terms of so-called "triple bottom line", which brings together the environmental, social and economic sustainable development (Bichta, 2003).

The concept of sustainable development should be applied to any type of hotel, from the mass tourism and its major resorts to that one developed on a small scale, such as hostels and lodging and especially in environmentally fragile places, unique ecosystems and nature conservation.

Shortly after the launch of Agenda 21, the World Council of Industry Travel & Tourism Council (WTTC), the World Tourism Organization (WTO) and the Earth Council joined forces to develop an action plan for tourism. That effort resulted in Agenda 21 FOR THE Travel Industry and Tourism, published by the WTO in 1994.

In the economic scenario, the hospitality segment is included in the tourism sector, occupying an important position in the global economy. Data taken from the Brazilian Tourism Institute (Instituto Brasileiro de Turismo – EMBRATUR) indicate that this segment is second only to oil industry, being an activity that moves annually, US$ 4 trillion and approximately 280 million jobs worldwide.

Many of the impacts from the tourism industry are the result of the construction phase of the hotel facilities and later of its operation.

Globally, some programs to mitigate the negative impacts of the tourism industry were implemented such as: British Airways Holidays (Caribbean), Certification for Sustainable Tourism, GREEN GLOBE, Green Key (Denmark), HAC Green Leaf (Canada), HVS EcoServices (Americas) and Touristic Union International (Germany).

However, there is a question pervading the business actions: can principles of sustainability be applied on a day by day of business on their operating practices?

The Guests of Nature Program inspired on the project developed by the International Hotel Environment Initiative (England) is represented in a policy that inspires a set of actions designed to provide the qualification of personnel, project implementation and certification of hotels and similar, in relation to the improvement of their social and environmental responsibilities (Bohdanowicz et al, 2005). Seeking to minimize negative impacts of the tourism industry it is expected to reduce consumption of natural resources such as water. Some everyday actions such as not changing the towels daily can result in a significant water savings. The exchange of bulbs for those that consume less energy and longer life contributes to the reduced consumption of natural resources. Actions designed to take advantage of rainfall, concern about waste production, disposal of solid and liquid waste are simple, but with great multiplier effect by promoting a change of attitude from guests, vendors, workers from the entire supply chain sector.

Currently, the most modern buildings are covered with thick glass designed to control the solar intensity. The concern with items related to sustainability has led to an Israeli company the idea of returning of filtered sunlight through the system Photovoltaic Glass Unit, known as PVGU. This fact is recent, which leads us to believe in a brighter future in terms of reducing energy use, because by building integrated photovoltaic glass units this mechanism serves both to control heat gain and to generate electricity. As news on the website linked Jetson Green, the Israeli company is testing these in a story of the Willis Tower in Chicago, USA. With over this initiative, buildings will be designed around this new energy source.

And certainly, the buildings of the hotel chain will benefit from the discovery.

4. FEATURING SOME CERTIFICATION MODELS

In a global level, the growth of tourism demonstrates its importance in social and economic aspects. A study by the World Travel & Tourism Council, in partnership with Oxford University, presents evidence that tourism will represent 3.3% (R$ 129.6 billion) of the Brazilian GDP. The information indicates that the sector will account for 2.8 million jobs in 2011 (2.9% of the country) and 3.5 million in 2021. Only investments in Brazil will reach R$ 4.7 billion and the number of foreigners in the country will be in the order of five million representing the entry of R$ 12.5 billion in the Brazilian economy.

Tourism stands out as one of the main providers of development. However, as one of the largest sectors by the increase of their activities, Tourism contributes significantly to natural resources degradation.

These estimates have triggered actions and cooperative models aimed at reducing the impact from the indiscriminate use of natural resources.

According to estimates by the United Nations (UN), the international hospitality sector accounts for 21% of emissions of carbon dioxide generated by the tourism industry. However, some actions can already be observed: the Hilton hotel chain (over 3,500 hotels) developed a unique system that measures the consumption of energy, water and waste besides CO_2 emissions in their entire hotel network. Started in 2009 the results can already be seen, the hospitable 1,300 units that were part of the pilot project provided a saving of enough water to fill 650 Olympic swimming pools, CO_2 reduction was equivalent to 34,865 fewer cars circulating throughout the world and a considerable saving of energy equivalent to lighting 5,700 homes for one year (Alvarez, 2011).

In this scenario, cooperation agendas have been established between the following agencies, the European Agency for Competitiveness and Innovation, World Tourism Organization (WTO) / United Nations Environment Program (UNEP), International Hotel and Restaurant Association, the French Agency Energy Management and the European Renewable Energy Council (EREC).

Despite these efforts, the WTO data shows that the growth of economic activity generated by the tourism industry tends to project an unpleasant scenario. It is estimated that in 2035 the level of greenhouse gas emissions generated by the tourism industry will reach a level of 130% more than the current. Therefore, it urges the creation and implementation of innovative models capable of mitigating practices and attracts new actions related to sustainability in the hotel network.

The integration of domestic enterprises in the global market boosted to technological development more attention to quality processes and products with added value. Adding to the factors, a new worldwide awareness grows, faced to the prospect of reduction in the planet's natural resources, around the expectation for innovative actions that can reduce greenhouse gases and products considered harmful to the environment that cause damage directly to the population health such as heavy metals, organochlorines and others, may have limited its use. In this context, is already a common sense that previously adopted unsustainable models needs now deep reflections and requires rapid and creative solutions. How to drive these sector organizations to pave their future in a sustainable manner in accordance with the changing needs of the planet? In Hospitality, which are the seals that determine its green certification? Questions and misinformation on the part of those involved is certainly an indication of a need to research and disseminate the results towards a change in the current scenario.

The purpose of this paper is to present some existing models of certification to be used by the Brazilian hotel chain. The main question elected is about the green buildings.

In this regard, five world-renowned certifications were outlined to begin a discussion: which one of them would be the best to be recommended for introduction into Brazilian hospitality?

Building Research Establishment Environmental Assessment Method - BREEAM

The first and best known evaluation system of environmental performance is the Building Research Establishment Environmental Assessment Method (BREEAM), United Kingdom. This system assigns a performance certificate directed to the building marketing and indirectly designers and entrepreneurs. When it comes to building the new version of BREEAM it is more flexible and is valid throughout the life of a building. It consists of three modules namely, design and acquisition, buildings and their issues and also solutions to problems. When it wants to be evaluated by this governing body, it is required to undergo an assessment by BRE. This assessment is usually performed in the design phase. Buildings are rated on a scale of: adequate, good, very good and excellent. These classifications depend on the number of credits that are assigned. For each environmental issue there are a number of credits available, totaling 100 credits. For example, 15 credits are available depending on the amount of CO_2 emissions related to energy consumed during operation of the building. This meaning projects that have low energy consumption regardless of what is already acceptable by law, receive an extra credit. The interest of this certificate is the concern of changing people's behavior towards the environment. Assessors after certifying a building, seek for evidences that the projectors / residents really understood what the certification means.

High Environmental Quality - AQUA Certification

The AQUA (*Alta Qualidade Ambiental* – High Environmental Quality), developed in a partnership between the Carlos Alberto Vanzolini Foundation, the Production Engineering Department from Polytechnic University of São Paulo and the Centre Scientifique et Technique du Bâtiment (CSTB), a French institute considered a global benchmark for research in construction. It has specific application for residential buildings, hotels, buildings in use and others. The certificate is divided into two sections to assess the reference of the Enterprise Management System and the reference of the Environmental Quality of the building.

The AQUA seal provides 14 items that must be met by rating: good, superior and excellent. At the first level Eco-construction, these are the categories Category 1: Relationship building with its surroundings Category 2: Integrated choose of products, systems and construction processes Category 3: Construction site with low environmental impact Category 4: Energy Management Category 5: Water Management; Category 6: Management of waste from the use and operation of the building and Category 7: Maintenance – Permanence of environmental performance. The next stage is Comfort: Category 8: Hydrothermal comfort Category 9: Acoustic comfort Category 10: Visual comfort and Category 11: Olfactory comfort. Finishing with the Health stage: Category 12: Health environments quality Category 13: Health air quality and Category 14: Sanitary water quality.

Leadership in Energy and Environmental Desing - LEED-ND (USA)

The Green Building Council of Brazil (GBCB) began operations in June 2007. Affiliate of the World Green Building Council (WGBC), the GBCB stared operations in March of that year. It is a non-governmental organization structured as result of the union of several segments of several different organizations that aim to stimulate and drive the adoption of sustainable development practices arising from actions developed by the market, disseminating them to society.

At the time of construction of a building emerge harmful moments to the atmosphere such as the consumption of materials with high embodied energy, material consumption with high CO_2 emissions, production and transportation of rubble, large moving of sand and transportation of materials. Not to mention that for every produced ton of cement it expels around 600 kg of CO_2 into the atmosphere, for each produced ton of steel there is 2500 of CO_2 expelled in the atmosphere and 5% of direct CO_2 emissions of the planet is generated by CC and another 25% indirect.

With that thought and purpose its partners including the hotel network aim to reduce the negative impacts caused by the current construction to the environment. The certification scheme adopted by WGBC is the LEED Certification that evaluates sustainable deploying, water conservation, energy efficiency, materials and resources, indoor environmental quality of the building and other certified items.

News linked to New York Times had an article discussing greener options of the hospitality industry by noting that many tourist resorts were seeking for certification from the United States Green Building of Council's Leadership in Energy and Environmental Design (*Liderança em Energia e Ambiente Design* – LEED). To achieve the green seal, the building needs to get assessed in five key areas of human and environmental health: local sustainable development, water savings, energy efficiency, materials used, the selection and indoor environmental quality. It also includes a system of credits. There are four levels of LEED Certification: bronze, silver, gold and platinum.

Each credit punctuates the level of the seal to be acquired. From water economic, permitting the landscape to different situations aimed at conserving energy overall.

Widespread among the American hotel chain there are few green buildings on the hotel network in Brazil. Some aspects are shown to be difficult to Brazilian adaptation, reason why the ACQUA seal was developed by Engineering of the University of São Paulo. However, LEED certification is an international knowledge and it ensures broad understanding about the seal of approval. The LEED can be used in various types of construction. Till today, only two Brazilian buildings received LEED certification. One is a branch of Banco Real in Cotia, São Paulo. The other one is a subsidiary of Delboni Auriemo lab opened in the district of Santana, in São Paulo (Hicks, 2008). The score has the following distribution: 14 points for Sustainable Sites, 5 points for Efficiency Use of Water, 17 points for Energy and Atmosphere, 13 points for Materials and Resources, 15 points for Indoor Environmental Quality, 5 points for Innovation and Design Process. The certificated development must initially take points between 26-32 > 40% of the total points ranked according to the following score: 33-38 points (Silver), 39-51 points (Gold) and 52-69 points (Platinum).

5. SUSTAINABLE CIVIL ENGINEERING AND HOSPITALITY

With the formation of new concepts, popular and institutional awareness, the sustainability is solidifying and consolidating on numerous fronts. Through studies and time tourism and hospitality are

harmonized with the common trend and go with one another in their own scope, finding ways to promote the consolidation of the recent thinking and find solutions. This is not a rule of course and there are many organizations that do not bother to adhere to the changes, clinging to an old model of production that is believed to be the one that brings more profit.

The notion that tourism is not only an economic activity but something that can change a society – for better or for worse – increasingly permits the views of researches and entrepreneurs. They must conduct the activity in a way that is environmentally, socially, economically sustainable and vital to the quality of individual and enterprises involved. The hospitality is a classic example of tourist development and how they cover different areas of reach.

Tourism is an important element in the economy and this is reflected in a particularly incisive way in coastal regions, as is the case of Rio de Janeiro, one of the most popular destinations for foreign tourists. In 1990 tourism in Brazil had only 0.24% of the total flow of tourism in the world and it was a reflection of the crisis in the country and image deterioration, mainly caused by violence in the city. Once past this stage tourism has grown to occupy the fifth place in the export list of the country surpassing coffee and soybeans. On the opposite direction of growth there are the problems says Bertha K. Becker towards to the question about de-development or not about a national policy to tourism.

The city of Rio de Janeiro may be emblematic for the demonstration of the importance of adding quality to the tourism product. When it is said that Rio has a natural vocation for tourism, it cannot be denied. Elements such as the climate, topography, culture and people provide the perfect setting for different segments. However, the city grew without planning and with tourism was not different, the simplistic thought on profit spoke louder that the need to measure what was being done. The results are logical paradoxes for management. It is not understandable, for example, that how come a luxury hotel in Rio de Janeiro, which serves a public that enjoys the natural assets of the city, casts a big shadow on the beach where is located, in midsummer.

In the middle of last century, it has intensified what is called mass tourism, which it becomes necessary to deploy infrastructure in large quantities. For this there is the inevitable alteration of the environment, often with an ecological imbalance, social disruption and property damage. Carvalho, et al (2008) classifies these consequences as self-flagellation that generates the "death" of tourist activity of the city. Mass tourism is closely linked to beach tourism, and was widely practiced in Rio de Janeiro, with particular emphasis in Copacabana.

The following season brings the alternative tourism in search of new less saturated destinations, and the concern for the environment, distributed by NGOs and organizations such as Greenpeace. This brought factors that gave birth to a generation more aware, therefore more conscious tourists. The WTO realizes that, from the 80s, the trend is the dominance of the search for sports, cultural tourism, rural and travels to primitive parts of Asia and Africa, for example, areas that will be, in theory, tuned with the environment (social, economic and natural environment) and with the local reality (Carvalho, et al, 2008).

Even in time of awareness there are still problems that tourism will have to work to solve. The activity has the intrinsic need to build a structural network around itself. In other words, for tourism to be possible it needs to work around these basic factors. One of the greatest obstacles for harmonization of tourism with sustainability in this sense would be the civil construction. It is necessary for accommodation, food, transport and leisure. The structural

construction represents the most often greatest impact within the destinations where tourism is installed.

In addition to the appropriation of large areas, the civil construction involves some aspects that are difficult to resolve. It is the largest consumer of natural resources, generates waste and pollutes the air. As stated by Gomes (2003), the construction industry is the human activity with the greatest impact on the environment. The magnitude of the social and economic impact within the sector has a strategic way in global character, as a potential driver for the care of sustainable development goals. The highly urbanized environments those with more buildings are also facing consequences such as floods, lack of space to deposit wastes, resulting in inadequate disposal, poor air quality, among others obstacles typical of nowadays large cities. The government action is very important, not only in control of this aspect but also as agent. The technological advancement and awareness increases the number of new proposals and new ways to reduce impacts often significantly. However it is necessary that a responsible manager be predisposed to accept changes in their design, they often mean higher costs.

Given this demand searching for new solutions, consulting firms are formed to support professionals interested in knowing the possible strategies in the search for sustainability. Among the most common are renewable energy generation, water reuse, rational use of water and recycling. Dias (2002) analyzes the operating cost and environmental advantages of these measures and others, always getting positive results. Then the author describes the experience in a hotel chain where the guests were asked if they would mind the possibility of the hotel making some changes in their routine, such as use a towel more than once and use liquid soap rather than individual. Guests choose to protect the environment most of the time, and the final question, 95% of guests prefer to stay in a hotel committed to a policy of environmental preservation. So, according to the author the adoption of cleaner technologies in the hospitality industry means a lot in the process of introducing sustainable solutions to achieve sustainable tourism in Brazil.

The surveyed hotel chain seeks to apply ways to be sustainable in relation to the environment, employees and visitors and thus building a product of credibility and quality. The example can be followed by individual managers who may also use other successful proposals. The Green Building concept for example, shows to have a great potential of applicability in sustainable tourism and hospitality because the activity requires a basic infrastructure that usually requires buildings and ownership of spaces, and the design is based on achieving a sustainable harmony of structure and surroundings, whether natural or constructed.

6. CONCLUDING REMARKS

Countries and organizations have sought to adapt to a world of globalized and highly competitive business, a world that has highlighted the need for companies to seek alternative and creative ways to thrive. Several issues have been raised and a great emphasis is given to the competitiveness of enterprises in network and supply chains in which they operate. The mobilization around preservation of the planet signals the conviction that its understanding is fundamental to business success.

Realizing this fact, the purpose of this paper was to lead to professionals of tourism, engineers and stakeholders (Carvalho, Nolasco, & Cseko, 2008) a more deep reflection of the knowledge on green buildings, applied to the national hotel industry in order to highlight the positive aspects of this practice, as well as presenting opportunities for green certification to the world of tourism. The Green Building concept, for example shows to have a great potential of

applicability in sustainable tourism and hospitality because the activity requires a basic infrastructure that usually requires buildings and ownership of spaces, and the design is based on achieving a sustainable harmony of structure and surroundings, whether natural or constructed.

Dated November 25, 2010, the Complementary Law No. 108 presents urban parameters and rules of use establishing support to the emergence of new Housing Units in the city of Rio de Janeiro, aimed at achieving the 2014 World Cup and the 2016 Olympic and Paralympic Games. The Article No. 8 makes clear the concern about the aspect of sustainable buildings: *"... the buildings for the hosting services should observe factors that characterizes it as a sustainable construction: construction scheduling sustainably; exploitation of available natural resources for ventilation and lighting; solar heating; photovoltaic power generation efficiency in situations to be defined; water management and economics; waste comfort; quality of air and indoor environment; thermal and acoustic comfort; rational use of materials; and use of technologies and products that do not harm the environment."*

Article No.15 stresses that all the necessary conditions should ensure the protection of environmental and cultural heritage. In this sense, it is important a rapprochement between sustainability, hospitality, civil engineering and environment.

It is also relevant that the construction companies, along with the hotel chain, develops a model for assessing the impact of a green building to the tourism, hospitality and its reflection on stakeholders. As any other innovation requires a preparation, it is important that the parties will be involved in the generation and consumption of information that will reflect the condition of research and findings about green buildings, studies that presents analysis of indicators of financial benefits and business opportunities arising from sustainable construction.

We understand that there is no ideal certification for green buildings. In this sense, we are working on building a model that brings together indicators of sustainability of existing certification models that can be applied to green projects, in this specific case in the hotel industry but considering the aspects of a tropical country such as Brazil.

In this sense there is the urgency of researching on the topic. Researches that will bring together academy, society and the market in order to preserve our most precious asset: Planet Earth.

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