Online promotion of the values of sustainable development in national parks

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Abstract: *Information and communication technologies (ICT) and geospatial technologies (GT) give support to manage protected areas, like national parks, while enhancing the visitors' experience. This study identifies some crucial tools employed to promote a sustainable development of tourism activities in pioneers' national parks. A literature review and a website analysis of five parks (Yellowstone National Park, Royal National Park, Banff National Park, Tongariro National Park, and Kruger National Park), recognized as world tourism destinations, were conducted. Those parks' websites have been mapped, being drawn a final comparison with the Itatiaia National Park website, in Brazil. As core results, the five parks present a qualified content, such as maps in high-resolution, warning messages in real time based on GT, and virtual tours. In turn, the Itatiaia National Park website is just a consultation portal, and it needs to be improved to subsidize the tourist experience.*

Key words: *Online promotion; national parks; sustainable development; Information and communication technologies; geospatial technologies.*

Promoción en línea de los valores del desarrollo sostenible en los parques nacionales

Resumen: *Las tecnologías de la información y la comunicación (TIC) y tecnologías geoespaciales (TG) ofrecen soporte para gestionar áreas protegidas, como los parques nacionales, además de optimizar la experiencia de los visitantes. Este estudio identifica algunas herramientas cruciales empleadas para promover el desarrollo sostenible de las actividades turísticas en parques nacionales pioneros. Se realizó una revisión de la literatura y un análisis del sitio web de cinco parques (Yellowstone National Park, Royal National Park, Banff National Park, Tongariro National Park y Kruger National Park), reconocidos como destinos turísticos a nivel mundial. Los sitios web de esos parques fueron mapeados, a fin de hacer una comparación final con el sitio web del Parque Nacional de Itatiaia, en Brasil. Como resultados, los cinco parques presentan un contenido calificado, como mapas en alta resolución, mensajes de advertencia en tiempo real basados en TG y recorridos virtuales. A su vez, el sitio web del Parque Nacional de Itatiaia es sólo un portal de consulta, y necesita ser mejorado para subsidiar la experiencia turística.*

Palabras clave: *Promoción en línea; parques nacionales; desarrollo sostenible; tecnologías de la información y la comunicación; tecnologías geoespaciales.*

1. Introduction

Information and communication technologies (ICT), as well as geospatial technologies (GT), have emerged as important tools to support the development of sustainable tourism (Ali and Frew, 2014), especially in natural regions. Also, tourists are increasingly interested in obtaining information concerning geographical space to maximize their experiences such as in national parks (Atembe and Akbar, 2014). Even during the travel planning, searching for information on the Internet can be considered as an essential component of the trip experience (Pan and Fesenmaier, 2006; Xiang and Fesenmaier, 2006; Xiang and Gretzel, 2010; Xiang et alii, 2015a; Xiang et alii, 2015b). Similarly, destinations grounded in nature can benefit from the adoption of technological gadgets in their administration, focusing on the tourism growth in a sustainable manner (Ali and Frew, 2014).

With the use of different technologies, the decision-making process to visit a destination has become dependent on the information quality and ICT available. For instance, websites, social media, sharing sites, mobile applications, and GT, as global positioning system (GPS) and geographic information system (GIS), may help in this process. Travelers are progressively looking more closely for a comprehensive view of the geographical zone and tourism attractions surrounding to optimize the vacation. Then, all the pertinent data should be accessed online and, furthermore, on the official websites of travel destinations. Besides, since the accumulative use of mobile technologies by travelers (Lamsfus et alii, 2015; Xiang et alii, 2015b) and the fact that they have a variety of mental semantic models regarding a destination (Pan and Fesenmaier, 2006), mobile applications and geo tools are indispensable in this context.

Concerning natural areas, relevant recreation and conservation information on national parks can be represented on their websites (Tsai et alii, 2010), to instruct visitors on how to diminish negative impacts reinforced by online marketing strategies. Therefore, ICT and GT can be helpful in travel planning and contribute to a value-added tourist experience (Prahalad and Ramaswamy, 2004; Ali and Frew, 2014). Indeed, the appropriate use of technologies may raise the number of visitors and promote the socioeconomic advance, generating income for local communities. At the same time, it supports managers and communities in decision-making for the proper development of destinations.

Founded in this scenario, the goal of this study is to identify ICT and GT more involved in promoting values covered on the notion of sustainable development in tourism activities in national parks, from an online marketing perspective. The research underlines the importance of national parks encourages

tourist visits, but in a controlled mode. Methodologically, this work was driven by a literature review and a comparison website analysis of pioneers' national parks known as global tourism destinations: Yellowstone National Park (United States of America-USA), Royal National Park (Australia), Banff National Park (Canada), Tongariro National Park (New Zealand), and Kruger National Park (South Africa). The examination focused on seven categories: Tourism - local information; Park - basic information; Services; Multimedia features; Marketing and commercialization; Navigability; and Interactivity, adapted from models recommended by Nechita et alii (2014), and by Tsai et alii (2010). After the preliminary investigation of the five websites, a final comparison with the first park established in Brazil was executed, the Itatiaia National Park, to evaluate the application of ICT and GT.

2. Destination marketing

One of the critical roles of destination management organizations (DMO) has been to develop the overall marketing strategies. The planning of marketing actions signifies a high priority for a DMO and must be done professionally, moreover, due to the expensive costs associated with marketing campaign and promotions. "Making the right choices of which markets to target and how to communicate the most effectively are of paramount importance" (Morrison, 2013: 8). Additionally, with the dissemination of ICT, DMO should continue producing online promotional stratagems to excel in a competitive and complex market, to consolidate the destination's brand and image. Electronic promotion of tourism destinations (e-destinations) is fundamental to raise the visibility in the context of digital tourism or e-tourism. No wonder some DMO have invested in their online presence (Buhalis and Wagner, 2013) via mobile or fixed Internet access, understood as central to distribute information related to the sector successfully.

Many authors emphasize the significance of the Internet usage, search engine, social media, websites and other tools for travel planning as vital information sources for travelers and online marketing strategies (Pan and Fesenmaier, 2006; Xiang and Fesenmaier, 2006; Xiang and Gretzel, 2010; Xiang *et alii*, 2015b). Mainly from the possibility of voyagers disclose some destinations through social media and other Web 2.0 resources (Bowen, 2015), promotion and focus on best practices for interacting with consumers have become a necessity for destination managers, marketers, and other decision-makers and operators. Also, some studies demonstrate that search is a crucial mode of communication, providing opportunities for persuasive contact with travelers (Xiang and Fesenmaier, 2006;

Xiang and Gretzel, 2010; Fesenmaier *et alii*, 2010), being vital in promoting sustainable tourism and approaches for web design (Pan and Fesenmaier, 2006; Xiang and Fesenmaier, 2006).

GT or geographic information technologies are specialized in dealing with geo-referenced data, whose acquisition serves as the storage and manipulation, data analysis to display and output, applied in various areas (DiBiase *et alii*, 2006), including tourism. It provides access to geospatial information through digital representations, like maps and tools for interacting with these illustrations (Favier and Schee, 2014). The most common types of spatial technologies are GPS, GIS and web-based geographic information systems (WebGIS). Hence, there are websites to display interactive maps and digital globes, such as Google Earth, and remote sensing (RS) (Chang and Caneday, 2011; Favier and Schee, 2014; Baker *et alii*, 2015).

Nowadays, GT are part of everyday life using mobile devices; when people can access information on maps with navigation and guidance services. Some GT allow the handling of a vast amount of spatial data and enable sightseers to find online qualified travel information (Wei, 2011). In the tourism field, it has several studies addressing technologies like GPS and GIS to evaluate the spatiotemporal tourists' behavior (Grinberger *et alii*, 2014). Another application related to tourism market (Supak *et alii*, 2015) is based on RS or GIS to verify impacts on the land cover of local communities (Boori *et alii*, 2015). Already the usage of the travel geographic information system (TGIS) has been executed considering much of travel information and data founded on geographical attributes, conducting tourism information management (Wei, 2011).

In national parks, these devices can contribute to the decision-making process by managers and local communities to market analysis and visitation frequency (Supak *et alii*, 2015). According to Eagles and McCool (2002), outdoor experience or outdoor recreation in parks has occasionally been at the forefront of social change, and relaxation means a sporting event with considerable physical activity. In this setting, the definition of trails aims to provide a pleasant, safe and enjoyable experience for visitors (Snyder *et alii*, 2008). The tracks are still used to manage outdoor recreation and to ensure that activities are conducted in harmony with the environment (NTO, 2012). Thereby, the planning of the paths (Xiang, 1996) and the production of maps with initial information about them are vital. For plans with information and guidance, GIS seems an exciting tool to generate databases and integrate information for the park administration controls over its attractions. The GIS method can improve the trail alignment planning for hiking practices (Xiang, 1996). Therefore, to ponder on the tools that can be used in the trail management is also central.

All new spatial technologies, favored by innovative computer programs, become excellent mapping tools (Sayre *et alii*, 2003). It also works for various spatial analyses, subsidizing to park management objectives. GIS consists of a set of computer systems designed to store and to process geographic information, divided into five sub-systems: data input, data pre-processing, data storage and management, spatial analysis, and data output (Wei, 2011). There are plentiful utilities such as the organization of information in databases, processing of this information through logical operations, and even making maps in an automated way (Longley *et alii*, 2011). Burrough and McDonnell (2010) describe a GIS, as a set of tools for collecting, storing, retrieving, processing and display of spatial data related to the real world. Furthermore, its applicability to the Internet has developed rapidly in recent years (Longley *et alii*, 2011), whose propagation appears to be of tremendous value for travelers visiting natural areas with awareness and responsibility.

3. National parks as tourism destinations

The concept of sustainable development becomes imperative in the context of tourism causing changes in the way of thinking the market, being discussed by world leaders, governments, entrepreneurs and other actors, to guide marketing strategies and initiatives to sponsor sustainable tourism. At first, specialists concentrated on understanding the complex relationship between tourism with the environment and sustainable development (Pearce, 1989; Hall and Jenkins, 1995; Butler, 1999; Farrell and Twining-Ward, 2004). In turn, the term sustainable development had received several interpretations over the years, which influence the formulation of national and international policies (Mebratu, 1998). The explanation of the Brundtland report titled "Our Common Future," by the World Commission on Environment and Development (WCED) in 1987, was the first to highlight the incompatibility between sustainable development and the patterns of production and consumption in force. Making it central to the policy of governments, international agencies, and private companies. Then, sustainable development is defined as "development that meets the needs of the present without compromising the ability of future generations to meet their own needs" (WCED, 1987: 43).

In the tourism sector, numerous attempts were made to delineate the idea of sustainable tourism (Eber, 1992; Butler, 1993; WTO, 1993; Wall, 1996; Swarbrooke, 1998), regarding the World Tourism Organization designation (WTO, 1993: 7): "Tourism which meets the needs of present tourists and host regions while protecting and enhancing the opportunity for the future."

It proposes a manner to maintain tourism as a sustainable competitive activity, but since the national parks are nature destinations, it is necessary to make use of environmental resources by anticipating potential impacts and minimizing threats.

To Swarbrooke (1998), for the management of sustainable tourism to be successful, it is essential to maintain a balanced relationship among the three dimensions of sustainable tourism. They are the natural environment; the economic life of communities and businesses; and the social aspects of tourism, regarding its impact on host cultures and tourists. Thus, ICT and GT emerge as tools to assist the process of administration and communication, spreading the meaning of sustainability for local communities and sightseers.

National parks, stated by alternative activities, especially ecotourism, are in vulnerable areas and end up having difficulties in keeping the sustainable development. The actions, tourists, and infrastructure, even small, always cause environmental, cultural, social and economic impacts that need to be remedied and managed. For this reason, concerning sustainable development, no matter how utopian the concept seems, it is compulsory to try to minimize damage to nature and seek alternatives concentrated on sustainability, i.e., the maintenance and conservation of ecosystems, as well as the appreciation of local customs.

The first protected area established as a national park in the world was the Yellowstone National Park in the USA in 1872. This initiative represents a milestone and has served as inspiration for the emergence of other parks in Australia, Canada, and New Zealand (Frost and Hall, 2009). The national parks have been the best popular type of protected areas that usually goals to preserve and conserve the fauna, flora, and the beautiful landscape while providing recreational experiences for visitors. Ecotourism can be considered one of the focal varieties of sustainable tourism in national parks, in which it gives an ample status to biodiversity conservation and sustainable use of resources for tourism (Swarbrooke, 1998). Since the beginning of the debates on ecotourism and sustainability, issues were addressed on their importance for tourism and local development (Zambrano *et alii*, 2010).

Tourism has become a leading component of national parks attracting more tourists. According to the National Park Service - NPS (2015), 68.93 million people visited national parks in the USA in 2014, for example. National recreation areas such as parks received about 45.22 million visitors, and the Yellowstone National Park amounted to around 3.51 million in 2014. As noted by Eagles and McCool (2002), parks provide new experiences for visitors that are more valuable than memories. Nonetheless, tourists require facilities and services

like transport, accommodation, food, recreation, safety and information to be accommodated comfortably. Typically, amenities may include visitor centers, roads, campgrounds, stores, water, trails, and viewpoints. On the other hand, tourists, frequent visitors or not, need to access qualified information online to guide them in natural protected areas. Meanwhile, they must follow conduct rules and be aware of its implication.

Besides, tourists are becoming more adventurous, dynamic and willing to connect with nature (Lindberg and Hawkins, 2005). They want to visit parks to know and admire the natural environment. Consequently, tourist stays should take place in a structured way. In the Brazilian parks, there are management plans that aim to define the areas of visitation and guidelines for orderly the activity. Public-use areas are projected for the leisure and tourism events, predetermined zoning of the park, part of the management plan. Public-use trails can be treated as tourist attractions, which are part of the geographical territory of natural areas. Thus, pondered tourism and leisure as facilitators in the parks (Marion and Leung, 2001), these activities end up bringing economic and social benefits to protected areas and the surrounding community, contributing to the safeguarding of natural and cultural heritage (Bushell and Eagles, 2007).

4. Research methods

The study presents a qualitative approach, to endorse the fundamental relationship between the online marketing promotion, characterized by an extensive involvement of ICT and GT, and the visitors' behavior in natural areas, most national parks, to guarantee their sustainable development. From a technical appraisal, technological advances allow the tourism sector to use new technologies for the improvement of sustainable development of activities, also the creation of meaningful tourist experience (Prahalad and Ramaswamy, 2004; Ali and Frew, 2014). Concerning GT as part of the ICT-based tools (Neuhofer, 2014), this research accentuates the need of using technologies for planning, management, and administration of tourism activities in national parks. Likewise, providing travel information (Wei, 2011) through the web-based communication (Nechita *et alii*, 2014). Precisely, information richness plays a predominant role in determining website quality (Tsai *et alii*, 2010).

After the literature review phase, to afford theoretical background to the proposed theme and support the procedure of website analysis, the national parks were selected. The research objects are the websites of five pioneers' national parks with high relevance as tourism destinations worldwide, besides the pioneer park in Brazil, to enhance its nature-based destination (Table 1).

Table 1. Foundation and managers of the parks.

National Park	Country	Foundation	Managed by
Yellowstone National Park	United States	1872	National Park Service
Royal National Park	Australia	1879	NSW National Parks and Wildlife Service
Banff National Park	Canada	1885	Parks Canada
Tongariro National Park	New Zealand	1894	Department of Conservation - Te Papa Atawbai
Kruger National Park	South Africa	1898	South African National Parks
Itatiaia National Park	Brazil	1937	Chico Mendes Institute for Biodiversity Conservation

Source: Authors' elaboration

With the intention to carry out a comparison of national parks websites, it was considered the models proposed by Nechita *et alii* (2014). The authors delineated a set of 36 variables for the evaluation of national parks websites divided into five categories (Tourism details and travel aid; Visual, textual information and presentation style; Navigation and interactivity; Advertising; and Social media). Combined with the technique applied by Tsai *et alii* (2010), who considered ten criteria for a qualitative website analysis (Navigability; Speed; Links; Relevancy; Richness; Currency; Attractiveness; Security, Personalization, and Responsiveness).

A model with seven categories was outlined for this research, founded on those two techniques (Tsai *et alii*, 2010; Nechita *et alii*, 2014): Tourism - local information; Park - basic information; Services; Multimedia features; Marketing and commercialization; Navigability; and Interactivity, embracing 60 variables (Table 2).

Table 2. Categories and variables.

Categories	Variables	Categories	Variables
Tourism - Local Information	· Access to the destination · Getting around · Brochure map and web map of the region · Weather forecast	*Multimedia features*	· Audio tour · Downloadable files · Photos and animated Images · Online games · Videos · Live Webcams · Virtual tours
Park - Basic Information	· Information about attractions, guided tours, and services · Entrance fees · Current conditions · Operating Hours and Seasons · Guidebook with general rules and wildlife caregivers · Contact information · History and Culture · Map of attractions and other web maps · Accessibility · Calendar of events · Environmental education · Research and science · Sustainability · Newsletter · RSS Feeds	*Marketing and Commercialization*	· Market segment · Contacts with tour operating companies · Book, Tickets purchasing and payment terms · Lodging booking system
		Navigability	· Easy to navigate · Easy to find relevant information · More than one language · Search engine · Page layout · Updated information · Sitemap/ Site Index · Website loading speed · Frequently Asked Questions (FAQ) · Links to other related websites · Code access/login · Web page type · Responsive site to mobile devices
Services	· Visitor Centers · Museums · Restaurants · Accommodation · Campgrounds · Dressing rooms and toilets · Stores · Parking · Transportation	*Interactivity*	· Blog · Discussion forum · Online forms · User rating and comments · Survey · Mobile application · Social media profile · TripAdvisor

Source: Authors' elaboration

Initially, a first website analysis concentrated on the five national parks. Subsequently, a final comparison with the first park established in Brazil, the Itatiaia National Park, was accomplished to evaluate the application of ICT and GT on its website, alleged the requirement of improving the web content and the quality of information to aid people to visit natural areas responsibly. Table 3 shows the links to the national parks' websites.

Table 3. National parks' official websites examined.

National Park	Website
Yellowstone National Park	http://www.nps.gov/yell
Royal National Park	http://www.nationalparks.nsw.gov.au/visit-a-park/parks/Royal-National-Park
Banff National Park	http://www.pc.gc.ca/eng/pn-np/ab/banff/index.aspx
Tongariro National Park	http://www.doc.govt.nz/parks-and-recreation/places-to-go/central-north-island/places/tongariro-national-park/
Kruger National Park	http://www.sanparks.org/parks/kruger/
Itatiaia National Park	http://www.icmbio.gov.br/parnaitatiaia/

Source: Authors' elaboration

According to the Chico Mendes Institute for Biodiversity Conservation - ICMBio (2015), Brazil, currently, has 71 national parks. They are part of the National Protected Areas System, made up of 12 categories of preservation units (PU), named as natural areas for protection, to accommodate the diverse habitats and ecosystems (Brazil, 2000). National parks are PU of Integral Protection category and managed by the ICMBio, allied to the Ministry of Environment. The first territory instituted as a park in Brazil, was the Itatiaia National Park, in Rio de Janeiro, being prioritized the protection of natural areas and valued for tourism and leisure services, with trails and scenic landscapes for contemplation (Santos and Hermman, 2000).

To emphasize the position of all selected countries, Lu and Nepal (2009) have done a study to determine which nations devoted to research on sustainable tourism were leaders in scientific production in the "Journal of Sustainable Tourism" in 1993. It stands out that most articles focused on USA, Canada, Australia, and New Zealand. South Africa was mentioned to a lesser extent, and as a significant theme appears destination/tourism products, with subtopics related to tourism impacts, sustainability, development, and visitors' behavior and planning.

5. Results

As explained in the methodological topic, there was a preliminary website analysis of the top five pioneers' national parks around the world, to observe the contribution of ICT and GT in promoting the values of sustainable development via online marketing strategies. In general, online contents of the parks show a right level of information. Conversely, some of them explore the potentiality of different tools, by the followed examination.

5.1 Tourism - local information

There is basic information on how to Get around, and still mentioning nearby attractions, such as Yellowstone National Park, that is essential for the making-decision since people can extend their stay, enlightening the trip experience.

As a complementary material, Brochure map and Web map of the region are vital to open a zone not yet known. However, given the prominence of the issue, it was surprisingly not to be offered information from the Royal National Park website itself. It has external links containing maps and other information on nearby towns and village surrounded by the park. Other indispensable data for the visitors are connected to the Weather forecast, presented by the five parks, even the use of external links, adopted by the Tongariro National Park.

5.2 Park - basic information

Talking about the parks, attention on essential content to guide the travelers is dominant, beginning with Information linked to attractions, tours, and services. As well as on Entrance fees with discounts to different age ranges, and Operating Hours and Seasons, with some recommendations associated with the best period to go there. In turn, about Guidebook with general rules, regulations, permits, safety, environmental and wildlife caregivers and tips, the wealth of detail impresses in variety, covering standards of conduct because it is an environmentally protected area. Also, they disclose practical advice as essential accessories and severe issues such as Malaria disease adverted on the Kruger National Park's page.

On Current conditions, although it has been covered by the parks, worth accentuating the work of the Tongariro National Park managers. On the home page of the New Zealand park appears a message in red color indicating a signal of warning, to notify on Volcanic alert on Mount Ruapehu followed by the date of the report. To obtain more information on Mount Ruapehu Crater Climb, the user can click on some suggested websites, for example, the GeoNet page to find details related to the status of Ruapehu and the alert levels to inform both people and employees of the aviation industry. Besides, it is possible to observe the seismic activity over the last 24 hours and the most recent images from the Ruapehu cameras. A similar alert mechanism is applied by the Royal National Park, called Local alerts on the home page, and by the Yellowstone National Park, in a discreet manner named Alert in the top menu of the website. A typical example of an effective contribution based on the adoption of GT in national parks.

All the websites provide a diversity of contact information to facilitate the communication between tourists and parks team, likewise, telephone number, fax number, postal address, and e-mail. Other data available refer to History and Culture, emphasizing characteristic of a natural and cultural heritage globally-recognized by the UNESCO World Heritage as the case of the Royal National Park. Also, Map of attractions, circuits and trails and other web maps are very well distributed on the five websites, with a high point to the Kruger National Park, which offers the GPS coordinates.

Delivering information concerning Accessibility, useful to appraise how people with disabilities, wheelchairs or with visual impairments, could act during visits are essential to any destination. Those national parks have intended to implement some facilities, but it does not always under the accessibility standards because of the difficulties of dealing with natural spaces, as the case of Yellowstone, whose managers seek to make the park as accessible as possible. There are some facilities on the App like audio-described sites and visual aids, also on the website announces about services like wheelchair rental, self-guiding trails accessible, newspapers in a braille edition and many other things in a Guidebook with some information on audio and maps with all visitor facilities available. Nothing was easily found on the Banff website. Instead of Kruger, that has excellent materials, including photos of accessibility activities, services, and accommodation.

Calendar of events and schedule of activities is another resource with a minimum level of employment, released by the Banff National Park and the Yellowstone National Park. On the other hand, subjects in Environmental Education, Research, and Science, presenting the ongoing projects and still opportunities for researchers, students, and volunteers are accessible, as well as topics of Sustainability, followed up with explanations on conservation management, and fauna and flora. Furthermore, most websites disclose additional information to visitors via an electronic newsletter, and no one works with RSS Feeds.

5.3 Services

Related to the Services category, there is a serious effort into providing several data about distinct facilities in most instances: Visitor Centers, restaurants, accommodation, campgrounds, dressing rooms and toilets, stores, parking, and transportation. And cultural options like museums are available in rare cases, such as Yellowstone and Banff parks.

5.4 Multimedia Features

About Multimedia Features, the management of tools has been predominantly disappointing. Only the Yellowstone National Park adopts Audio tour in the format of audio postcards with descriptions of the site and still employs the application of Live Webcams. Again, comment on elements likewise Live Webcams, they are also explored by the Kruger National Park, which even offers Virtual tours and a kind of an Online Game, through fun quizzes created by the users. Finally, Downloadable files, for example, brochures, maps, rules and guidelines, and Photos and animated images are broadly diffused as promotion strategies of the parks.

5.5 Marketing and Commercialization

From the perspective of marketing strategies, a good action plan for online promotion through the website is imperative when it comes to global destinations. About market segmentation, only the African park pays singular attention to select groups and offers accommodation of a very high standard, called Luxury Lodges.

Further, all websites disclose data concerning Contacts of tourism companies/ tour operating as a solution to speed up purchase processes. Talking about Book, Tickets purchasing and payment terms, Yellowstone, Banff, and Kruger have these well-developed mechanisms. Already citing Lodging booking system, Kruger presents quite a lot of alternatives to help travelers in their decision-making, through topics such as check availability, tariffs, promotions, booking periods, and discounts. In the Tongariro case, it is presented external websites to conclude these procedures.

5.6 Navigability

In general, parks websites are Easy to navigate, and it is relatively Easy to find relevant information about them. Sometimes, what it seems problematic is the quantity of information available on the same page, in the context of Yellowstone. Some websites include versions in different languages to reach a broader audience, like French, German, Italian, Portuguese and Spanish, besides the original text in English, as the African park. Beyond the English edition, the Banff National Park offers content in French, already Yellowstone has material in Spanish, but there are still some brochures produced in Japanese, Chinese, Korean, and French.

Another crucial item to facilitate finding information is the Search engine, present in all websites examined. A Page layout very well designed is a considerable

advantage to guide the searching, the five websites have a right and clear content distribution with a white background, leaving open the possibility of integrating colorful images in banners and photos around the pages.

A concrete online marketing stratagem can be measured by the presence of Updated information since it is a way to perceive a compromise with the public expectation. Fortunately, all the parks websites, grasp this goal with the release of the news, calendar of events and mainly through the sending of alert messages in risk situations.

Thinking about usability, the Sitemap/Site Index acts as a valuable tool to shorten some steps and make the processes of searching for accurate information and novelties the most direct. Considering the Website loading speed, overall, they provide a quick connection and delivery. Nevertheless, it is an aspect entirely dependent on the quality and speed of the Internet connection of each person.

A traditional and useful function is the FAQ, designed to elucidate in advance doubts or questions of tourists, which can be worked to strengthen the principles of the fact that is a natural area. In this line of thought, to enhance the philosophies of sustainable development via the tourism activities, the park managers divulge several Links to other organizations and related websites, to widen the propagation of the knowledge about it. On the content personalization, the Code access/login is beneficial, but it has not been utilized by the parks, in the Kruger's example this option attaches to online bookings.

On the set of variables, Web Page Type is an important feature to associate the park with the respective administrator. In this situation, three parks exhibit the governmental indicator with the corresponding abbreviation Gov. The Banff National Park shows the mark of the Parks Canada Agency linked to the government of Canada. The exception is the Kruger that indicates its domain functions for an organization. The websites of the Yellowstone, Tongariro, and Kruger are all Responsive to mobile devices, just become a little slow displaying maps and images. Royal is too, but some photos are cut off on the home page that does not compromise their viewing on smaller screens. Finally, Banff's page is not suitable for access by mobile devices.

5.7 Interactivity

All parks have accounts on diverse social media platforms, especially, on Facebook, Twitter, YouTube, and Instagram. It stands Yellowstone again for presenting besides those above, Flickr and Periscope, as well as two applications for mobile devices: NPS Yellowstone National Park App and Geyser App, all mentioned on the website. Both Tongariro and Kruger have accounts on Pinterest, and Kruger also a LinkedIn profile.

There are few opportunities to keep in contact with parks staff, via online forms and by a Discussion forum, such as Kruger. In turn, Tongariro points out, for the creation of a Blog, and a space dedicated to User rating and comments when visitors are invited to tell about their recent visit filling an online form. The use of Survey is also available on the pages of Tongariro and Royal. As a negative surprise, no park alludes to the travel-sharing site TripAdvisor on their official pages.

Closed the initial stage of the study, referred to the evaluation of the respective website performances of the five parks, through the provision of information to guide tourists on sustainable development. In sequence, a discussion about the Brazilian park website performance, recently established, will be held.

6. Discussion and conclusions

As viewed, parks provide new experiences (Eagles and McCool, 2002), and are the ideal places for physical and mental renovation, attracting the attention of people who want to connect with nature (Lindberg and Hawkins, 2005). Then, natural areas managers have the challenge to ensure the visitors' safety, take care of the administration and handling of the activities seeking out the destination promotion, as well as to adopt safeguard measures to keep the nature protected (Bushell and Eagles, 2007). In this circumstance, the adoption of technologies can collaborate to soften this workload and help in the propagation of values associated with the concept of sustainable development among tourists, offering meaning to their experience (Prahalad and Ramaswamy, 2004; Ali and Frew, 2014).

Indeed, the websites of the pioneers' national parks have a very high-quality content and several sections designed to disseminate sustainable development actions, from educational activities to scientific research. Also, the standards of conduct for visitors are apparent, even related to the files for download, showing the authentic contribution of the online marketing for the promotion of the notion of sustainability, evidencing that tourism and leisure are facilitators in the parks (Marion and Leung, 2001).

Regarding GT, all websites analyzed embrace these tools to display data, but in some, it is still incipient or seems not to express much concern in using them. The fact is that ICT and GT can be highlighted as support tools in the communication process between national parks and tourists, seeking information to know the area better ahead of the visit. Furthermore, in general, these technologies must be aggregated into a single online space - the national parks' websites, providing support to enhance the visitor experience.

As pointed out by Buhalis and Wagner (2013), technologies have produced significant changes in the development of tourism activities. Nonetheless, its uses are scarce in specific segments and destinations, as in the Brazilian national parks. Consequently, the website of the Itatiaia National Park has a simple layout and an easy navigability. It offers the necessary information about services, attractions, localization, and presents galleries of images and videos. However, there are no data about tourism activities around the park.

The Brazilian park counts with profiles on social media, such as Facebook and Twitter, although the interactivity is very low. Another decisive factor in marketing and commercialization is to allow reservations for accommodation, long trails, and getting in contact with tour guides, which is not accurately roofed by the Itatiaia Park's website. A problematic issue correlates to the provision of data in diverse languages since there are a couple of pages in English, as well as the absence of applications for mobile devices to offer appropriate information to visitors.

In summary, ICT, chiefly websites, and GT are vital components to launch a process of innovation in services in national parks worldwide, defining the quality of web communication and the richness of content (Tsai *et alii*, 2010; Nechita *et alii*, 2014). Similarly, the intensive use of technologies may incentive the advance of the local sustainable development (Zambrano *et alii*, 2010), combining the promotion of sustainable tourism and tactics for web design (Pan and Fesenmaier, 2006; Xiang and Fesenmaier, 2006). As it is a dynamic discussion, this paper has covered facets connected to national parks as tourism destinations. It focuses on the government roles, for instance, managing the parks, promoting online the destination as a tourism zone located in environmental preservation, where tourists must follow proper conduct rules and be aware of its significance for the next generation. In other words, it is the balanced relationship required for the management of sustainable tourism to be successful (Swarbrooke, 1998).

References

ALI, A., and FREW, A. (2014). "Technology innovation and applications in sustainable destination development". *Information Technology & Tourism*, 14 (4): 265-290. doi:10.1007/s40558-014-0015-7

ATEMBE, R., and AKBAR, B. (2014). "Tourists co-creation experiences onsite-enabled by mobile devices". *Proceedings of the ENTER Conference*, PhD Workshop, Dublin, Ireland, 21.

BAKER, T. R.; BATTERSBY, S.; BEDNARZ, S. W.; BODZIN, A. M.; KOLVOORD, B.; MOORE, S.; SINTON, D., and UTTAL, D. (2015). "A Research Agenda for geospatial technologies and learning". *Journal of Geography*, 114 (3): 118-130. doi:10.1080/00221341.2014.950684.

BOORI, M. S.; VOŽENÍLEK, V., and CHOUDHARY, K. (2015). "Land use/cover disturbance due to tourism in Jeseníky Mountain, Czech Republic: A remote sensing and GIS based approach". *The Egyptian Journal of Remote Sensing and Space Sciences*, 18: 170-26. doi:10.1016/j.ejrs.2014.12.002.

BOWEN, J. (2015). "Trends affecting social media: implications for practitioners and researchers". *Worldwide Hospitality and Tourism Themes*, 7 (3): 221-228. doi:10.1108/whatt-04-2015-0021.

BRAZIL (2000). *SNUC: National Protected Areas System*. Available at: <http://www.mma.gov.br/areas-protegidas/sistema-nacional-de-ucs-snuc>.

BUHALIS, D., and WAGNER, R. (2013). "E-destinations: Global best practice in tourism technologies and applications". *Proceedings of the ENTER Conference*, Innsbruck, Austria, 20.

BURROUGH, P. A., and MCDONNELL, R. A. (2010). *Principles of Geographical Information Systems*. Oxford: Oxford University Press.

BUSHELL, R., and EAGLES, P. F. J. (2007). *Tourism and Protected Areas: benefits beyond boundaries*. CAB International.

BUTLER, R. (1999). "Sustainable tourism: A state of the art review". *Tourism Geographies*, 1 (1): 7-25. doi:10.1080/14616689908721291.

— (1993). Tourism - an evolutionary perspective. In J.G. NELSON, R.W. BUTLER, and G. WALL (Eds.). *Tourism and Sustainable Development: Monitoring, Planning, Managing,* (pp. 27-44). Waterloo, Ontario: University of Waterloo.

CHANG, G., and CANEDAY, L. (2011). "Web-based GIS in tourism information search: Perceptions, tasks, and trip attributes". *Tourism Management*, 32: 1435-1437. doi:10.1016/j.tourman.2011.01.006.

DIBIASE, D.; DEMERS, M.; JOHNSON, A.; KEMP, K.; LUCK, A. T.; PLEWE, B., and WENTZ, E. (2006). *The Geographic Information Science and Technology Body of Knowledge. Washington*, D.C.: Association of American Geographers.

Eagles, P. F. J., and McCool, S. F. (2002). *Tourism in National Parks and Protected Areas: planning and management*. CAB International.

Eber, S. (1992). *Beyond the green horizon: principles for sustainable tourism*. Surrey, UK: World Wide Fund for Nature.

Farrell, B. H., and Twining-Ward, L. (2004). "Reconceptualizing tourism". *Annals of Tourism Research*, 31 (2): 274-295. doi:10.1016/j.annals.2003.12.002.

Favier, T. T., and Schee, J. A. (2014). "The effects of geography lessons with geospatial technologies on the development of high school students' relational thinking". *Computers & Education*, 76: 225-236. doi:10.1016/j.compedu.2014.04.004.

Fesenmaier, D.; Xiang, Z.; Pan, B., and Law, R. (2010). "An Analysis of search engine use for travel planning". *Proceedings of the ENTER 2010 Conference*, Vienna, Austria, 17.

Frost, W., and Hall, M. (2009). *Tourism and National Parks: international perspectives on development, histories and change*. USA and Canada: Routledge.

Grinberger, A. Y.; Shoval, N., and Mckercher, B. (2014). "Typologies of tourists' time–space consumption: a new approach using GPS data and GIS tools". *Tourism Geographies: An International Journal of Tourism Space, Place and Environment*, 16 (1): 105-123. doi:10.1080/14616688.2013.869249.

Hall, C. M., and Jenkins, J. (1995). *Tourism and Public Policy*. London: Routledge.

ICMBio. Chico Mendes Institute for Biodiversity Conservation: National Parks. (2015). Chico Mendes Institute for Biodiversity Conservation: National Parks. Available at: <http://www.icmbio.gov.br/>.

Lamsfus, C.; Wang, D.; Alzua-Sorzabal, A., and Xiang, Z. (2015). "Going mobile defining context for On-the-Go travelers". *Journal of Travel Research*, 54 (6): 691-701. doi:10.1177/0047287514538839.

Lindberg, K., and Hawkins, D. E. (2005). *Ecoturismo: um guia para planejamento e gestão [Ecotourism: a guide for planners and managers]*. São Paulo, SP: Editora Senac São Paulo.

Longley, P. A.; Goodchild, M.; Maguire, D. J., and Rhind, D. W. (2011). *Geographic Information Systems and Science*. 3rd ed. Wiley.

Lu, J., and Nepal, S. K. (2009). "Sustainable tourism research: an analysis of papers published in the Journal of Sustainable Tourism". *Journal of Sustainable Tourism*, 17 (1): 5-16. doi:10.1080/09669580802582480.

MARION, J., and LEUNG, Y. (2001). "Trail resource impacts and an examination of alternative assessment techniques". *Journal of Park and Recreation Administration*, 19 (3): 17-37.

MEBRATU, D. (1998). "Sustainability and sustainable development: Historical and conceptual review". *Environmental Impact Assessment Review*, 18 (6): 493-520. doi:10.1016/S0195-9255(98)00019-5.

MORRISON, A. (2013). "Destination Management and Destination Marketing: The platform for excellence in tourism destinations". *Tourism Tribune*, 28 (1): 6-9. doi:10.3969/j.issn.1002-5006.2013.01.001.

NECHITA, F.; LOZO, I., and CANDREA, A. N. (2014). "National Parks' Web-Based communication with visitors. Evidence from Piatra Craiului National Park in Romania and Paklenica National Park in Croatia". *Bulletin of the Transilvania University of Brasov*, Series VII: Social Sciences and Law, 2: 139-150.

NEUHOFER, B. (2014). "The technology enhanced tourist experience". *Proceedings of the ENTER Conference*, Dublin, Ireland, 24.

NPS. NATIONAL PARK SERVICE (2015). *Annual Recreation Visitation Report by Years: 2004 to 2014*. Available at: <https://irma.nps.gov/Stats/Reports/Park>.

NTO. THE NATIONAL TRAILS OFFICE (2012). *A Guide to Planning and Developing Recreational Trails in Ireland*. 1st ed.

PAN, B., and FESENMAIER, D. (2006). "Online information search: vacation planning process". *Annals of Tourism Research*, 33 (3): 809-832. doi:10.1016/j.annals.2006.03.006

PEARCE, D. G. (1989). *Tourist Development*. London: Longman.

PRAHALAD, C. K., and RAMASWAMY, V. (2004). "Co-creation experiences: The next practice in value creation". *Journal of Interactive Marketing*, 18 (3): 5-14. doi:10.1002/dir.20015

SANTOS, A., and HERMMAN, G. (2000). *O Parque Nacional do Itatiaia [The Itatiaia National Park]. Rio de Janeiro, RJ: Fundação Brasileira para o Desenvolvimento, FDS*, 3: 9-19.

SAYRE, R.; ROCA, E.; SEDAGHATKISH, G.; YOUNG, B.; KEEL, S.; ROCA, R., and SHEPPARD, S. (2003). *Natureza em foco: avaliação ecológica rápida [Nature in focus: rapid ecological assessment]*. Arlington, Virginia, USA: The Nature Conservancy.

SNYDER, S. A.; WHITMORE, J. H.; SCHNEIDER, I. E., and BECKER, D. R. (2008). "Ecological criteria, participant preferences and location models: A GIS approach toward ATV trail planning". *Applied Geography*, 28 (4): 248-258. doi:10.1016/j.apgeog.2008.07.001.

Supak, S.; Brothers, G.; Bohnenstiehl, D., and Devine, H. (2015). "Geospatial analytics for federally managed tourism destinations and their demand markets". *Journal of Destination Marketing & Management*, 4: 173-186. doi:10.1016/j.jdmm.2015.05.002.

Swarbrooke, J. (1998). *Sustainable Tourism Management*. CAB International.

Tsai, W.; Chou, W., and Lai, C. (2010). "An effective evaluation model and improvement analysis for national park websites: A case study of Taiwan". *Tourism Management*, 31 (6): 936-952. doi:10.1016/j.tourman.2010.01.016

Wall, G. (1996). "Is ecotourism sustainable"? *Environmental Management*, 2 (3-4): 207-16.

WCED. World Commission on Environment and Development (1987). *Our Common Future*. Oxford and New York: Oxford University Press.

Wei, W. (2011). Research on the application of geographic information system in tourism management. *International Conference on Environmental Science and Engineering (ICESE 2011)*. Procedia Environmental Sciences, 12: 1104-1109.

WTO. World Tourism Organization (1993). *Indicators for the sustainable management of tourism*. Report of the International Working Group on indicators of sustainable tourism on the environment committee. W.T.O., IISD and ISTC.

Xiang, W. N. (1996). "A GIS based method for trail alignment planning". *Landscape and Urban Planning*, 35 (1): 11-23. doi:10.1016/0169-2046(96)00303-9

Xiang, Z., and Gretzel, U. (2010). "Role of social media in online travel information search". *Tourism Management*, 31 (2): 179-188. doi:10.1016/j.tourman.2009.02.016

Xiang, Z., and Fesenmaier, D. R. (2006). "Assessing the initial step in the persuasion process: Meta tags on destination marketing websites". *Information Technology & Tourism*, 8 (2): 91-104. doi:10.1007/3-211-27283-6_20

Xiang, Z.; Wang, D.; O'leary, J. T., and Fesenmaier, D. R. (2015a). "Adapting to the internet: trends in travelers' use of the Web for trip planning". *Journal of Travel Research*, 54 (4): 511-527. doi:10.1177/0047287514522883

Xiang, Z.; Magnini, V., and Fesenmaier, D. (2015b). "Information technology and consumer behavior in travel and tourism: Insights from travel planning using the internet". *Journal of Retailing and Consumer Services*, 22 (1): 244-249. doi:10.1016/ j.jretconser.2014.08.005.

Zambrano, A. A.; Broadbent, A. N., and Durham, W. H. (2010). "Social and environmental effects of ecotourism in the Osa Peninsula of Costa Rica: The Lapa Rios case". *Journal of Ecotourism*, 9 (1): 62-83. doi:10.1080/14724040902953076.