Chapter 11
Sustainable Innovation:
Challenges in the Tourism Industry

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ABSTRACT

Tourism is an industry, very focused on economic growth, with significant negative environmental and social impacts. Consequently, the tourism industry faces major challenges related to sustainability. Sustainable innovation is a tool that contributes not only to increased business competitiveness but can also play an important role in mitigating the negative impacts that such growth can generate. Recognizing the opportunity that this innovation can have in the tourism industry, this chapter analyzes the state of the art and systematizes the knowledge and evolution of the academic debate about this relationship between sustainable innovation and tourism from 1992 to 2018. This chapter indicates that sustainable tourism is focused on seven major areas of research and predominantly analyzed through quantitative methods. It is still an embryonic topic with scarce research done in several areas, such as the monitoring of its impacts, the effects felt by the communities of tourist destinations, and the impacts that sustainable innovation may have on other tourism subsectors.

INTRODUCTION

The world is rapidly changing and the growing environmental concerns are the result of careless development disregarding the environment (Hansen et al., 2000). The lack of concern for the environment has created negative outcomes, such as global warming, the deterioration of biodiversity, natural ecosystems and global warming (Schor, 2005; Tseng et al., 2013). It is important to stress that, current approaches to sustainability, such as efficiency improvements and cleaner production, on their own, do not underpin

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sustainability (Short, Bocken, Barlow, & Chertow, 2014). As such, sustainability needs to be included as a key driver for business innovation. As such, only if sustainable development goals are included in the process of innovation and are perceived as a source of competitive advantage businesses are going to actively embrace it instead of considering it as an obligation or burden (Nidumolu, Prahalad, & Rangaswami, 2009).

Innovation is considered an essential driving force for economic growth (European Commission, 1995; OECD, 2016) and is at the basis of businesses' competitive advantages (Brandão & Costa, 2013). However, in spite of its traditional economic-based perspective, focused on the acquisition and production of wealth (Smerecnik & Andersen, 2011), innovation does not automatically lead to the progress and well-being of society (Vollenbroek, 2002). Innovation needs to be targeted to a sustainable and balanced development that involves not only an economic dimension, but also the environmental and social dimension encompassing broad societal concerns without neglecting economic sustainability (Vollenbroek, 2002; Brezonec, 2013). As such, sustainable innovation can help mitigate the negative social and environmental impacts that a simplistic economic view entails (Barbieri, Vasconcelos, Andreassi, & Vasconcelos, 2010).

Tourism, one of the world's fastest growing industries (Hallenga-Brink & Brezet, 2005) has been geared essentially towards economic growth (e.g., Faché, 2000; Knowles et al., 1999). This feature has contributed to create significant negative impacts both on the environment and on the community (Chou et al., 2012; Dibra, 2015; González & León, 2001; Horng et al., 2017; OCDE, 2013). As such, sustainable innovation can be used to identify ways to ensure and maximize positive economic benefits (Bramwell & Lane, 2012; OCDE; 2013) and mitigate negative ecological and social impacts (Liburd et al., 2007).

However, the analysis of the impact that sustainable innovation has on the tourism industry has not received much attention in the academic world (Brandão & Costa, 2013; García-Pozo et al., 2016; González & León, 2001; Horng, Wang, Liu, Chou, & Tsai, 2016). Given the embryonic state of sustainable innovation studies in tourism (Chan, 2009; Hjalager, 1997; González & León, 2001; Hunter & Shaw, 2007; Lawton & Weaver, 2010), this chapter seeks to understand the state of the art of this relationship in order to contribute to a clearer and broader perception of the knowledge of this relationship. To this end, a systematic review of the literature on sustainable innovation in the field of tourism is given in order to summarize its state of the art, to identify the most relevant research flows, to understand the knowledge gaps found, as well as to discuss and debate future research perspectives.

To achieve these objectives, this chapter is based on a critical and comparative review of 42 articles selected from the *Scopus* and *Science Direct* databases.

This chapter is divided into five sections. Firstly, after this introduction, the definitions of innovative and sustainable tourism are given and analysed, as well as the relationship between these two concepts. Secondly, the methodology supporting the systematic literature review is described. The results of the analysis as well as the discussion of the findings and recommendations for future research are then summarized. Lastly, the final section sets out the conclusions of the current study.

THEORETICAL BACKGROUND

Innovation and Sustainability

There is no single consensual definition of the term innovation (Brandão & Costa, 2013; Johannesson, Olsen, & Lumpkin, 2001; Nybakk & Hansen, 2008; OSLO MANUAL); however it can be broadly defined as "*the process of using any new idea to solve problems* […], *it is the generation, acceptance and implementation of new ideas, processes, products or services*" (Hjalager 2010, p.2).

Although it is deemed as a key element for the modernization of industry and a driving force for economic growth (European Commission, 1995), innovation is very much focused on the economic benefits it provides (Barbieri, Vasconcelos, Andreassi, & Vasconcelos, 2010) without taking into account a sustainable economic growth (Peeters, Gossling, & Becken, 2006). This purely economics-based view of the innovation process, centered only on wealth creation, can exacerbate the environmental and social crisis that the world is going through (Smerecnik & Andersen, 2011).

The concept of sustainable innovation (Barbieri et al., 2010), which seeks a harmonious interdependence between the economy, human beings and the environment (Kattara & Zeid, 2002; Lawton & Weaver, 2010; Sharpley, 2000; Smerecnik & Andersen, 2011), is based on the search for a new approach to traditional economic growth, primarily aiming at the harmonization of social, environmental and economic objectives for all human beings (Asia Development Bank, 2012; International Institute for Sustainable Development, 2012; Vollenbroek, 2002). However, the concept of innovation linked to the challenge of sustainable development is difficult and complex and has been associated with various terminologies such as: eco-innovation (Brezovec 2013; García-Pozo, Sánchez-Ollero & Ons-Cappa, 2016; Martínez-Pérez, García-Villaverde & Elche, 2015; Miret-Pastor et al., 2011; OECD, 2013; Rennings, 2000), innovation driven by sustainability (Brezonec, 2013), environmental innovation (Chou, Chen, & Wang, 2012; García-Pozo et al., 2016; González & León, 2001) or green innovation (Chou et al., 2012; OECD, 2013). While eco-innovation, environmental innovation and green innovation can all be associated with an ambitious dimension, sustainability-led innovation has a more holistic view encompassing social and ethical dimensions as well.

From these definitions it can be concluded that sustainable innovation embraces the concern for the three – environmental, social, economic – dimensions of sustainability and is aimed at reducing the negative impacts of profit-driven growth and the creation of net benefits (Barbieri et al., 2010). As such, sustainable innovation emerges not only as a new key competitive business perspective (Horng, Liu, Chou, Tsai, & Chung, 2017; Smerecnik & Andersen, 2011), but also as an ideal tool for society and for sustainable development (Miret-Pastor et al., 2011; Renning, 2000).

Tourism and Sustainability

Tourism is a fast growing economic sector and one of the world's largest industries (Hallenga-Brink & Brezet, 2005). However, despite its positive impacts, it has caused harmful effects on several tourist destinations (Chou et al., 2012; Deng-Westphal, Beeton, & Anderson, 2015; Dibra, 2015; González & León, 2001; Hallenga-Brink & Brezet, 2005 ; Hjalager, 1997; Hunter & Shaw, 2007; Kasim, 2009; Kattara & Zeid, 2002; Knowles Macmillan, Palmer, Grabowski, & Hashimoto, 1999; OECD, 2013; Pace, 2016) as a result of its largely competitive market-specific features that seek to increase market shares based on consumerism and meeting consumer needs, while neglecting the reduction of environmental

impacts (Faché, 2000; Knowles et al., 1999). This focus essentially on economic growth has caused soil erosion, deforestation, (water, soil and air) pollution, loss of biodiversity, natural ecosystems' degradation and overuse of natural resources, among other impacts (González & Leon, 2001; Horng et al., 2017; Best & Tapas, 2011). To mitigate these impacts, efforts are underway to make tourism a more sustainable industry (Bramwell & Lane, 2012; Hallenga-Brink & Brezet, 2005; Scott & Cooper, 2010). As such, the concept of sustainable tourism emerged (Hallenga-Brink & Brezet, 2005), defined by the OECD (2013) as the type of tourism whose policies, practices and programs take into account not only tourists' expectations regarding responsible resource management, but also the needs of communities that support or are affected by tourism projects and the environment.

Sustainable tourism should be viewed not as a type of tourism product but as a new competitive industry paradigm and a fundamental condition for all types of tourism (Edgell, Allen, Smith, & Swanson, 2008; United Nations Environment Program, 2009) due to the "*limits imposed on the human economy by the ecological system*" (Yaw, 2005, p.119). In addition to a greater social and environmental balance, this sustainability can provide a competitive advantage for business (Dibra, 2015; Horng et al., 2017; Smerecnik & Andersen, 2011) and contribute to the survival of the tourism industry itself, which is highly dependent on the preservation of environmental attributes for their attractiveness (Best & Thapa, 2011; Deng-Westphal et al., 2015; González & León, 2001). However, this is a bilateral relationship, since, if sustainability plays a major role in attractiveness, attractiveness, as a cross-sector that interacts with many other industries and services, also plays an essential role in sustainability as it can contribute to a more pervasive sustainable economic development (OECD, 2013).

Evidently, the tourism industry faces a number of important sustainability challenges, namely (OECD, 2013): (i) energy and GHG emissions; ii) water consumption; iii) waste management; iv) loss of biological diversity; v) effective management of cultural heritage. For the tourism industry to contribute to this sustainability, sustainable innovation is a fundamental key factor for responding to this stimulus (Hjalager, 1997; Liburd, Carlsen, Edwards, & Forde, 2007; Pace, 2016) as it enables the identification of ways to ensure positive economic benefits (Bramwell & Lane, 2012) and addressing ecological, social and economic challenges (Liburd, 2007). This relationship will be further detailed below.

Relationship Between Innovation and Sustainability

Innovation in tourism is still at an embryonic stage (Hjalager, 2002; Ioannides & Petersen, 2003), very much dependent on innovations from other related industry sub-sectors (Hjalager, 1997), and ultimately seeks to generate wealth and to improve competitiveness, disregarding the mitigation of the environmental impacts it causes (Peeters et al., 2006). However, transformations in tourist behaviors, namely, those more influenced by sustainability considerations and more demanding when choosing environmentally benign products (Dibra, 2015; García-Pozo et al., 2016; Goodman, 2000; González & León, 2001; Horng et al., 2017; Martínez-Pérez et al., 2015; OECD, 2013; Smerecnik & Andersen, 2011; Yaw, 2005), on the one hand, and the serious environmental and human crisis, on the other hand, fostered that sustainable innovation can play an important and strategic role in adapting the tourism product to purchasing decisions (García-Pozo et al., 2016; González & León, 2001). Moreover, sustainable tourism innovations can lead to higher customer loyalty behaviors, better satisfaction and willingness to pay premium prices, which contributes to the generation of competitive advantage and the sustainability of tourist destinations (Xu & Gursoy, 2015). Besides being considered an essential tool for the survival of the industry (Miret-Pastor

Table 1. Types of innovation and their application to tourism

Inovation	Examples in the Context of Sustainable Innovation
Product innovation	New environmental products, regardless of their motivations (philanthropy or pragmatism) (e.g. ecotourism, volunteer tourism) or incremental changes to existing products (e.g. "green hotels", environmentally conscious airlines or tour operators).
Process innovation	Process innovations primarily aim to increase the performance of existing operations. For example, energy conservation (using environmentally friendly building materials, purchasing energy-saving equipment or green labeled items); Technological innovation (e.g. improving operational efficiency through assisting technology, creating different customer experiences through suportive technology in the service process).
Organizational change	Environmental communication (e.g. guest environmental education, community environmental support, dialogue with other industry resorts on environmental sustainability, employee environmental training, compulsory environmental statements in public messages, routine meetings to discuss environmental issues); Resource conservation (e.g. paying attention to recycling, conservation, buying reusable products, encouraging recycling among guests, buying energy-saving materials and facilities, avoiding the purchase of equipment or packaging containing hazardous substances, collecting hazardous waste by categories); Corporate social responsibility (e.g. respecting and protecting the natural environment, complying with ethical principles that take precedence over the pursuit of financial performance, long-term vision of success, being committed to promoting social welfare); Cultural management (e.g. combining local culture to enhance the value of innovation, distributing cultural and creative funds each year to promote cultural innovation, having a special department in charge of cultural and creative proposals; active involvement of the local community); Sustainability management (e.g. assessing greenhouse gas emissions and the carbon footprint, creation of a detailed program to reduce environmental impacts, written environmental policy, new environmental policies, creation of an environmental impact assessment report, supporting / training employees on sustainability-related aspects, adoption of nationally or internationally recognized sustainability certification programs – e.g. Ecolabel); Organizational environment (e.g. encouraging employees to promote innovation in sustainable services, develop indicators to monitor effectiveness in promoting sustainable innovation in services, rewarding teams for promoting innovation in sustainable services, developing annual performance indicators that measure performance).
Institutional innovation	Including better decision-making by local agencies or new global governance regimes through new forms of scientific evaluation and public participation (Renning, 2000).
Marketing innovation	Product-service (e.g. use of green consumer goods and services), price (e.g. including environmental compliance costs in the price of services provided), distribution (e.g. preference for suppliers and strategic partners who embrace environmental responsibility) and promotion (e.g. using green arguments in ads, promotional materials, and marketing campaigns).

Source: Own elaboration based on Hjalager (1997), Horng et al. (2017), Renning (2000), Salmones, Crespo and Bosque (2005) and Smerecnik and Andersen (2011)

et al., 2011; González & León, 2001), sustainable innovation presents itself as a key tool to maximize the potential environmental, social and cultural benefits of tourism (OECD, 2013).

Given the importance of considering the different types of innovation to measure sustainable innovation, these were summarized in Table 1, divided into five different types of sustainable innovation based on Martínez et al. (2015) and OECD (2009).

From Table 1, it is possible to conclude that the application of the concept of sustainable innovation to tourism activities can be widely implemented in promoting both the tourism destination and its sustainable development.

Table 2. Overview of the five-step approach to systematic literature review

1. Framing the question (question formulation)
2. Identifying relevant work (locating studies)
3. Assessing the quality of studies (selecting and evaluating studies)
4. Summarizing the evidence (analysis and synthesis)
5. Interpreting the Findings (reporting and using results)

Source: Denyer and Tranfield (2009), Khan et al. (2003)

METHODOLOGY

Systematic literature review (SLR) allows a better organization and systematization of existing knowledge, identifies existing gaps and inconsistencies in the literature and depicts future research (Borrego, Foster, & Froyd, 2014; Smith, Devane, Begley, & Clarke, 2011; Tranfield, Denyer, & Smart, 2003). Moreover, it is a replaceable, scientific and transparent process that avoids bias and overcomes the perceived weaknesses of a narrative review (Cook, Mulrow & Haynes 1997; Denyer & Tranfield, 2009; Tranfield, et al., 2003). This chapter follows the five-step approach to a SLR described by Khan, Kunz, Kleiinen, and Antes (2003) and Denyer and Tranfield (2009), as shown in Table 2.

Step 1 – Question formulation

A good SLR is based on a "*well-formulated, answerable question*" (Denyer & Tranfield, 2009, p. 681) that should be specified in the "*form of a clear, unambiguous and structured question*" (Khan et al., 2003, p. 118) before starting the revision work. Thus, three key questions for the study were delineated in order to achieve the intended objective: 1) what is the current state of the art of research?; 2) what are the limitations of the studies?; and 3) what are the paths for future research?

Step 2 and 3 – Locating, selecting and evaluating studies

Considering the purpose of this chapter, an advanced research was carried out with two keywords: "sustainable innovation" and "tourism", linked by the Boolean operator "AND" to create combined search links where both should appear somewhere in the article in the fields "*all fields*". This research was performed in the following databases: Scopus and Science Direct. Only academic articles published in top peer-reviewed scientific journals were included since they are essential communication channels and the most valid ones for the researchers (Creswell, 2009; David & Han, 2004; Podsakoff, 2005; Williams & Plouffe, 2007). Thus, books, book chapters, encyclopedias, book review**s**, editorials, errata, and other publications without arbitration were excluded.

After removing duplicates, the titles and abstracts were read. Those that were not aligned with the contribution to help answer the research questions were removed, as recommended by Sarka and Ipsen (2017).

Subsequently, through the snowballing method, relevant authors with relevant research for the subject in question were included. The full text was read, as suggested by Sarka and Ipsen (2017) and Wong, Feng,

Table 3. Overview of the five-step approach of the SLR

Total number of articles	Science direct: 69 Scopus: 10 Total: 79
Filter search - document type	Science direct: 62 Scopus: 6 Total: 68
Refined search: removed duplicated articles	Total 63 (5 of the 6 articles from Scopus were on Science Direct)
Refined search: removed based on abstract and title	Total: 36
Refined results: full text and snowballing	Final number: 42

Source: Own elaboration

Pwee, and Lim (2012). Each article was analyzed with special attention to its theoretical foundations, data collection methods, discussions of research results, their limitations and suggested future research.

Only articles after 1992 were included, which was the year the world community committed itself to the Earth Summit (Rio92) with the principles of sustainable development. It was also the year that sustainability in tourism gained prominence at the Vancouver Global Conference on Business and the Environment – Globe' 92 (Asia Development Bank, 2012; International Institute for Sustainable Development, 2012; Moniz, 2006). As a result, 42 articles were chosen and analyzed.

The results of this research conducted in February 2018 are given in Table 3.

Step 4 – Analysis and synthesis

Based on Sarka and Ipsen (2017, p.599), the summary information contained in each document "was prepared in a spreadsheet format organized into descriptive, methodological and thematic" areas and subdivided into the following categories: author, title, year, main purpose, data collection / processing method, results, limitations and suggestions for future research. A content analysis was subsequently carried out. Step 5, regarding the findings, is described in the next section.

RESULTS AND DISCUSSION

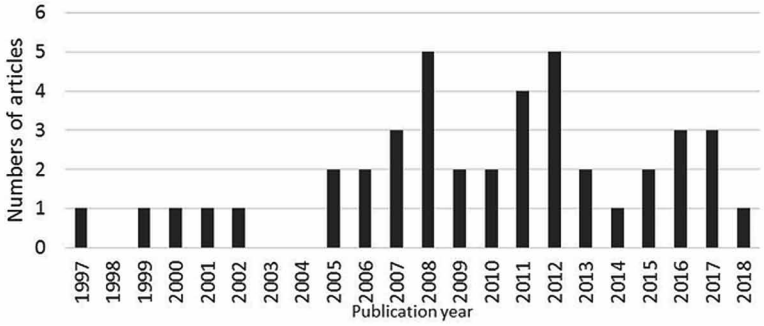
General Evolution

As shown in Figure 1, research on tourism and sustainable development only starts to be widespread after 2008. Table 4 shows that the top four journals publishing sustainable innovation research in the tourism industry account for almost 40% of published work. However, there are 22 academic journals with only one publication on this research topic.

Main Areas of Study

As a result of the content analysis, the articles analyzed cover various fields of research. Their aggregation into areas was inductively done as a result of the thematic objectives and common lines of research

Figure 1. Distribution of publication per year
Source: Own elaboration



of the different authors analyzed. They were grouped into the following thematic areas: i) impacts of sustainable innovation; ii) monitoring sustainable innovation; iii) factors that influence the integration of sustainable innovation; iv) sustainable innovation and tourist destinations; v) entrepreneurs' behavior towards sustainable innovation; vi) sustainable innovation and tourists (segmentation); and vii) broad perspective of innovation and sustainable innovation in tourism. The information on the different themes is organized in Tables 5 to 11, which summarize the authors and their main objectives and conclusions. The tables are organized by year to show if there is any trend in the type of analysis.

Impacts of Sustainable Innovation

Table 5 displays information on the impacts of sustainable innovation, their main authors and main objectives.

Table 5 reveals that the studies analyzed cover the three – environmental, economic and social – dimensions of sustainability as mentioned in the literature review, the economic dimension being the most analyzed. From the findings one can note that there is no consensus on the positive impacts of sustainable innovation at the economic level. While there are positive business impacts (García-Pozo et al., 2016; Goodman, 2000; Njite et al., 2011; Segarra-Oña et al., 2012; Yaw, 2005), they reveal that economic benefits are not perceived by all respondents (Strambach & Surmeier, 2013). Lawton and Weaver (2010) argue that there are clear positive effects of introducing sustainable innovations in cost-related aspects

Table 4. Overview of the number and percentage of articles in the main outlets

Outlet	Number of Articles	Percentage	Cumulative Percentage
International Journal of Hospitality Management	5	11,90%	11,90%
Journal of Sustainable Tourism	4	9,52%	21,43%
Journal of Cleaner Production	4	9,52%	30,95%
Tourism Management	3	7,14%	38,10%
Total	42	100%	100%

Source: Own elaboration

Table 5. Main objectives and conclusions of the articles about the impacts of sustainable innovation

Author	Main Objective	Conclusion – Main Impacts
(Goodman, 2000)	To identify the consequences of implementing sustainable innovations (environmental responsibility: employee training and environmental information systems; waste disposal practices and environmental policy; collaborating with suppliers to achieve environmental innovation) in service operations at Scandic hotels.	They contribute to improve company performance. Sustainable strategies and practices can be just as useful in service operations as they are in manufacturing operations.
(Yaw, 2005)	To study the extent to which the development and diffusion of cleaner technologies (sustainable innovations) contribute to the viability and sustainability of the Caribbean tourism industry and the reasons why businessmen adopt them.	The use of cleaner technologies in the tourism industry saves energy and material resources, which is essential for the sustainable development of tourism. However, the use of these technologies alone will not guarantee the survival of the industry. Sustainable innovation ensures greater visibility of the businesses, especially of business partners (e.g. operators) and thus the significant increase in guests and tourists.
(Krozer, Lordkipanidze, Bijma, & Akker, 2007)	To identify the impacts of sustainable innovations (sustainable mobility) in MOPARK.	Park authorities can conduct business activities to generate profit without undermining the main goals of social entrepreneurship. Sustainable activities can contribute to environmental, social and economic protection.
(Lordkipanidze, Krozer, Kadiman, Crul, & Brezet, 2008)	To analyze the impacts of sustainable innovative practices (e.g. electric boats and bikes) on the three dimensions of sustainability.	The development of sustainable innovations can reduce the negative impacts of tourism activities in National Parks by helping the rich biosphere to coexist with tourism in natural areas, which contributes to environmental protection as well as social and economic benefits.
(Tepelus, 2008)	To discuss the impact that sustainable innovation has (existing corporate social responsibility good practices such as: education of employees / tourism students, codes of conduct, marketing with social responsibility campaigns, sustainability indicators within the tourism sustainability framework) in preventing and combating trafficking in human beings.	Sustainable innovations have contributed to prevent and combat trafficking and sex tourism by creating greater awareness among all stakeholders involved (population, tourists, entrepreneurs, etc.).
(Lawton & Weaver, 2010)	To analyze the impacts that sustainable innovation (e.g. recycling and energy conservation) can have on events, particularly birdwatching events.	There are positive effects in introducing sustainable innovations both on participant cost and satisfaction. However, there are no positive effects on revenue generation.
(Njite, Hancer, & Slevitch, 2011)	To examine how companies understand corporate social responsibility and identify the motivations / limitations for practicing them.	Social corporate responsibility has positive economic results in the long term growth and less employee turnover.
Segarra-Oña et al. (2012)	To identify the impacts that environmental certificates have on hotel economic performance	Positive impacts at economic level.
Strambach & Surmeier (2013)	To identify the main economic impacts that sustainable certification programs have on tourist businesses.	The certification promotes: 1) Network relations with other certified companies, which enables mutual exchange of ideas and experiences; 2) Sharing best practices; 3) Indirect benefits perceived primarily in gaining easier access to government support and funding. Non-consensual impacts among respondents: economic impacts (recognition, credibility and positioning), attracting new business contacts and new customers.
(García-Pozo et al., 2016)	To analyze the effects of implementing sustainable innovations on labor productivity in the hotel industry and the impact of these measures on labor productivity.	Introduction of sustainable innovations has a positive influence on labor productivity, although the economic crisis has reduced the observed productivity growth for each additional eco-innovative practice implemented by hotels. However, the results show that productivity growth could have been exceeded in the years analyzed.

Source: Own elaboration

and participant satisfaction, but not in revenue generation. The introduction of sustainable innovation in tourism also generates positive social impacts (Tepelus, 2008). Lordkipanidze et al. (2008) and Krozer

Table 6. Main objectives and conclusions about monitoring

Author	Main Objective	Conclusion
(Chan, 2009)	To identify, assess and generalize the environmental measures used in sustainable innovation related to the introduction of the environmental management system in the hotel industry.	113 measures were identified. Almost half of them refer to energy conservation.
(Miret-Pastor et al., 2011)	To evaluate environmental indicators of sustainable innovation related to three environmental certificates in the field of tourism and to understand if environmental certification can be considered as an indicator of eco-innovation.	The article shows that environmental certification systems can be used as indicators of sustainable innovation in the hospitality sector.

Source: Own elaboration

et al. (2007) also conclude that sustainable innovations can reduce the negative impacts of tourism activities in National Parks and contribute to environmental, social and economic benefits. As such, one can conclude that, although the economic dimension does not yield consensual results, sustainable innovations can have a positive sustainable impact on the tourism industry.

From Table 5 it is possible to conclude that, based on the concepts laid down in Table 1, the most researched types of sustainable innovations in this area of study are: products (Krozer, et al, 2007; Lordkipanidze et al., 2008), green innovation processes (Yaw, 2005); organizational management(Garcia-Pozo et al., 2016; Tepelus, 2008); resource conservation (Garcia-Pozo et al., 2016; Goodman, 2000; Lawton & Weaver, 2010); sustainability management, namely regarding environmental certification (eg: Garcia-Pozo et al., 2016; Strambach & Surmeier, 2013; Segarra-Oña et al., 2012); and corporate social responsibility (Njite et al., 2011; Tepelus, 2008).

Monitoring Sustainable Innovation

Given the difficulty in assessing the concept of sustainability, it has been linked to the goal of maximizing positive impacts and minimizing negative impacts (Martin, 2013). As such, it is necessary to monitor sustainability to identify their effects in order to introduce preventive or corrective measures as much as possible (Bell & Morse, 2008; Choi & Sirakaya, 2006; Edgell, Allen, Smith, & Swanson, 2008; Hjalager, 1997; Moniz, 2006). However, the lack of relevant data and indicators, and their consequent monitoring, is one of the biggest challenges (Choi & Sirakaya, 2006; Miret-Pastor et al. 2011; Moscardo, 2008), and a complex issue is that it involves the same problems that make it difficult to measure innovation (Miret-Pastor et al., 2011). Therefore, research is needed to investigate the most appropriate indicators to monitor this innovation in the context of tourism.

Despite its relevance, this line of research is still under-researched as only two studies, related to the hospitality industry, have focused on this subject, as shown in Table 6.

Factors That Influence the Integration of Sustainable Innovations

There are several lines of research in this subject area, as shown in Table 7. One of them is the identification of theoretical models that explain the decision-making processes, attitudes and factors that influence entrepreneurs to adopt sustainable innovations in their tourist activities. Hallenga-Brink &

Brezet (2005) use the sustainable innovation design diamond model. Chou et al. (2012) use a model that combines Rogers' diffusion of innovation and planned behavior theories to better investigate these processes. Dibra (2015) considers Rogers' (2002) diffusion of innovation theory as the most appropriate one. Horng et al. (2017) test a new theoretical model interrelating the characteristics of innovation with sustainable innovations, environmental marketing strategy and the organizational environment as well as the mediating effect of these last two variables.

Another area of research looks at the factors and characteristics of adopters that can influence tourism businessmen to integrate sustainable innovations into their activities. This topic is extremely relevant as tourism businessmen can play a vital role in sustainable development because, if motivated, they contribute to sustainable growth and serve as a vehicle for innovation and change (Lordkipanidze et al., 2008). It is possible to conclude that managers play a key role in introducing innovation (Bergin-Seers, Breen, & Frew, 2008; Nybakk & Hansen, 2008) with a positive relationship between their environmental opinion leadership (environmental perception of managers) and sustainable innovation (Best & Tapas, 2011; González & León, 2001; Reyes-Santiago, Sánchez-Medina, & René, 2017; Smerecnik & Andersen, 2011). Similarly, businesses that are dependent on the natural environment are a key element in the adoption of environmental innovation (Best & Tapas, 2011). Recognition of opportunities, on the other hand, does not significantly influence the adoption of these innovations (Nybakk & Hansen, 2008).

Another research topic is to identify which characteristics of innovation lead to the adoption of sustainable innovations. The perceived simplicity of innovation is the most positively correlated feature with this adoption (Chou et al., 2012; Smerecnik & Andersen, 201). The ability to experiment did not correlate with the adoption of innovations for achieving sustainability (Smerecnik & Andersen, 2011). As to relative advantage, on the other hand, there is a lack of consensus among the authors: for Chou et al. (2012) and Le, Hollenhorst, Harris, McLaughlin, and Shook (2006) it is a strong predictor of the adoption of sustainable innovation, while for Smerecnik & Andersen (2011) it only entails a moderate correlation.

Another relevant topic of study is the characteristics of organization and context. The results regarding organizational characteristics are not consensual, namely in terms of company size. Some studies argue that there is a strong relationship between company size and the adoption of sustainable innovations (Best & Tapas 2011; González & León, 2001; Reyes-Santiago et al., 2017), but there are studies where this relationship is inconsistent (Le et al., 2006). In addition, there are studies that argue that larger companies have more capability to innovate (Best & Tapas, 2011; Reyes-Santiago et al., 2017) and there are studies that give greater prevalence to SMEs (Nicholls & Kang, 2006) and also argue that the more hierarchical the organization is, the lower the creativity and the experimentation in the organizations (Reyes-Santiago et al., 2017). Team participation is another favorable element in the development of sustainable innovations (Chou et al., 2018; Martínez-Pérez et al., 2015; Reyes-Santiago et al., 2017; Smerecnik & Andersen, 2011).

As to contextual characteristics, customer concerns about the environment positively influence environmental innovation (González & León, 2001), although the relationship may be very weak (Le et al., 2006) or non-statistically significant (Chou et al., 2012). Government policies do not have a consensual outcome: Bergin-Seers et al. (2008) argue that they are the most common barriers to adopting innovations, while Le et al. (2006) have not found a significant correlation between perceived changes in government policy and company decisions to adopt innovations and sustainable practices.

For Le et al. (2006) and Horng et al (2017) the characteristics of innovation are the most important factors underpinning the adoption of corporate sustainable innovation and the characteristics of the

Table 7. Main objectives and conclusions regarding the integration of sustainable innovations

Author	Main Objective	Conclusion
(González & León, 2001)	To investigate the determinants that lead to the adoption of environmental innovations in the production of hotel services.	The most frequently adopted environmental measures normally involve low investments and reduced operating costs. The environmental quality index is determined by the category of facilities, production capacity, integration into a larger management chain, environmental perception of managers and customer concern for the environment.
(Hallenga-Brink & Brezet, 2005)	To investigate the sustainable entrepreneur decision-making process based on the diamond model of sustainable innovation design.	The results indicate that this model has great potential for companies as it contributes to integrate sustainability into daily business practice.
(Le et al., 2006)	To identify the factors that influence the intentions of hotel companies to adopt environmentally sustainable innovations, namely: a) characteristics of innovation (relative advantage, compatibility, complexity, observability); b) organizational characteristics (firm size / internal resources, location, green attitude and attitude towards change (risk level); and c) perceived environmental characteristics (level of competition, customer pressure, and government / regulation).	The characteristics of innovation are the most important factors influencing the adoption of innovations of sustainable tourism practices in corporations. Relative advantages (measured in terms of savings, sales volume, and increased company reputation) also appear to be effective motivators for adopting environmental practices. As to organizational characteristics – which has the weakest correlation – the results show the level of risk is the variable that most influences the adoption of sustainable innovations. The relationship between company size and the adoption of innovation depends on the type of innovation.
(Bergin-Seers et al., 2008)	To analyze the barriers and determinants that affect the integration of innovation management in nature-based tourism in small and medium enterprises.	The most common barrier is government regulation and the main determinant that influences innovation is networks with external people, which enables the development of new products and services. Managers and a dynamic management style are key factors in making companies more innovative.
(Nybakk & Hansen, 2008)	To identify the attitudes of entrepreneurs that influence innovation in the nature-based tourism product.	The data shows that the recognition of opportunities does not significantly influence the adoption of innovations. Owners with a more entrepreneurial attitude are more likely to start new activities and adopt innovations.
(Best & Tapas, 2011)	To study what differences (in terms of characteristics, environmental attitudes / motivation, familiarity, constraints and implications) exist between adopters and non-adopters of sustainable innovations (implementation of environmental practices – energy saving lamps, energy saving devices, water saving devices, clothing and/ or towel replenishment programs, separation of solid waste for reuse or recycling, environmental policies and environmental management system).	One of the factors influencing the adoption of sustainable innovation is the environmental motivation given by the business dependence on the natural environment. As to the importance of the tourist sector's role in environmental protection, one of the factors influencing the adoption of sustainable innovations is the size of the company, given the greater ability to introduce innovations. Lastly, the results conclude that the introduction of sustainable innovation can be better if there is at least one person, a green champion within an entity that effectively drives the process, which validates other studies on the importance of this feature in adopting sustainable innovations.
(Smerecnik & Andersen, 2011)	To understand which characteristics of innovation (relative advantage, compatibility, simplicity/complexity, and testability) and the characteristics of adopters (environmental opinion leadership and innovator characteristics) that affect the voluntary adoption of sustainable innovations at ski resorts in North America.	The perceived simplicity of innovation (characteristic of innovation) and environmental opinion leadership (characteristic of adopters) are the most positively correlated characteristics with the adoption of sustainable environmental innovations. Testability did not correlate with the adoption of sustainable innovations.
(Chou et al., 2012)	Using a model that combines Rogers' theory and planned behavior theory, they investigate attitudes and behavioral decision factors in the adoption of green practices in the Taiwanese catering industry.	Attitude and perceived behavioral control have positive effects on behavioral intention, while social influence is not significant. Perceived innovation characteristics have direct positive effects on attitude and indirect positive impacts on the behavioral intention of adopting green practices. In terms of innovation characteristics (Rogers' theory), simplicity and relative advantage are correlated with greater adoption of sustainable innovation. However, contextual and organizational characteristicsplayed the most significant role.
(Nicholls & Kang, 2012)	To assess the factors and levels of adoption of various environmental innovations in the housing sector (assessed across all property characteristics, including type, property, location, and size).	Small businesses are more prone to sustainable innovations as they engage in community activities and use local and / or organic products. Nearly complete implementation of proper disposal of hazardous waste contrasts with the minimal use of key cards to control energy use.
(Dibra, 2015)	This article analyzes and compares various theoretical models to explain the factors that influence businessmen to adopt sustainable innovations in their tourism activities.	Rogers' theory was considered the most appropriate for the study of the factors that influence the adoption of sustainable innovation practices in tourism companies.
(Martínez-Pérez et al., 2015)	They analyze the mediating role played by knowledge strategy in the relationship between social capital and eco-innovation in cultural tourism clusters.	The results reveal that social capital is a key driving force that companies located in cultural tourism clusters must support to develop sustainable innovations.
(Horng et al., 2017)	They test a new theoretical model to identify the interrelationships between innovation characteristics, sustainable innovations, environmental marketing strategy and the organizational environment, as well as the mediating effect of the last two variables.	The diffusion of innovation is positively related to the environmental marketing strategy and sustainable innovations. Marketing strategy mediates the relationship between innovation diffusion and sustainable innovations. Only organizational environment plays a significant role in improving the relationship between innovation diffusion and the environmental marketing strategy. The findings reinforce the role that innovation characteristics play in selecting sustainable innovations and the role that sustainable marketing strategy plays as a mediator in strengthening the link between characteristics and the adoption of sustainable innovation.
(Reyes-Santiago et al., 2017)	To analyze the relationship between organizational culture (hierarchy, organizational culture, market and adherence) and eco-innovation.	Organizational culture and company size are the most important factors in explaining the presence of eco-innovation. This research shows that membership culture is the type of organizational culture most closely related to eco-innovation, and company size influences the adoption of sustainable innovations as small hotels have fewer financial resources.
(Chou et al., 2018)	To examine and explain the moderating role that the organizational environment (encouragement, pressure and resources) can play between sustainable services and the performance of sustainable catering companies.	There is an interaction between the organizational environment, sustainable service and company performance (overall impression for customers and increased operating profit). There is a significant perceived interaction effect between competitive pressure, employee encouragement (personal, corporate and community sustainable services' benefits) and innovative sustainable services.

Source: Own elaboration

Table 8. Main objectives and conclusions regarding sustainable innovation and tourist destinations

Author	Main Objective	Conclusion
(Moscardo, 2008)	To identify new, more sustainable tourism innovations to support the development of a destination region.	In order for sustainable innovation to contribute to a cohesive and sustainable development of a destination/ region, innovations need to integrate the socio-economic activities of the destination region, e.g. supporting the development of activities such as traditional agriculture, crafts and education.
(Scott & Cooper, 2010)	To analyze what types of sustainable innovations can be employed to make urban tourism sustainable.	A sustainable urban tourism product requires innovative measures such as: collaboration between stakeholders acting at a destination (various companies and economic activities working together in a hypercluster), creating an integrated and unique destination image of existing services and products and innovations that actively promote tourism benefits for local residents.
(Genovese et al., 2017)	To analyze the key features of agricultural organizations in the Italian alpine mountains and how they can be combined into innovative and sustainable business models.	A sustainable innovative business model must encompass the coexistence of different economic activities for better continuity and sustainability, involving not only individual organizations, but also destinations.

Source: Own elaboration

organization are the least important. However, Chou et al. (2012) argue that the contextual and organizational characteristics played the most significant role.

Sustainable Innovation and Tourist Destinations

Table 8 emphasizes that sustainable innovation applied in a territorial context should be oriented towards: 1) integrating and developing a range of other socio-economic activities beyond the tourism industry (e.g. in supporting the development of activities such as traditional agriculture, crafts, education, health) (Genovese, Culasso, Giacosa, & Battaglini, 2017; Moscardo, 2008; Scott & Cooper, 2010); 2) stimulate collaboration of a stakeholder network in the tourist destination (Genovese et al., 2017; Scott & Cooper, 2010); and 3) actively promote the benefits of tourism for local residents (Scott & Cooper, 2010).

These articles were conducted either in an urban context (Scott & Cooper, 2010) or in natural environments (Genovese et al., 2017) or in a tourist destination overview (Moscardo, 2008) and conclude that this type of innovation can contribute to a sustainable destination.

Entrepreneurs' Behaviour Towards Sustainable Innovation

Table 9 shows that there is an ambiguous behavior in the hotel sector, which may be due to studies being applied in countries with different cultures and values. While, on the one hand, there are hotel managers who lack the necessary environmental knowledge and interest (Erdogan & Barisb, 2007; Mensah, 2007), on the other hand, there is a high level of awareness and the desire to preserve the environment through the implementation of environmental practices (Kattara & Zeid, 2002; Knowles et al., 1999). There is, however, a clear gap between good "intent" and environmental action (Knowles et al., 1999) and some inactivity in the areas of sustainable innovation related to organizational management / resource conservation (Mensah, 2007) and social and environmental responsibility (Erdogan & Barisb, 2007).

Table 9. Main objectives and conclusions regarding businessmen behavior and sustainable innovations

Author	Main Objective	Conclusion
(Knowles et al., 1999)	To study the behavior of the tourism industry in England to understand if there is a gap between theory and practice regarding the application of sustainable innovation and its role in contributing to improving environmental performance.	There is a high percentage of respondents expressing concern about environmental issues in the hotel industry. However, it clearly shows a gap between good "intent" and environmental action.
(Kattara & Zeid, 2002)	To assess innovative environmental practices in Sinai and Red Sea hotels.	There is an opportunity to promote environmental practices in hotels and a high level of awareness and willingness of managers to preserve the environment and a desire to implement eco-innovations.
(Erdogan & Barisb, 2007)	To investigate the general nature of environmental protection, waste management, purchasing, energy use and conservation practices in the hotel industry in Ankara, Turkey.	Ankara hotel policies and practices often lack relevant attributes for the protection and conservation of the environment. Hotel managers generally lack the knowledge and environmental interest to achieve basic social and environmental responsibility objectives.
(Mensah, 2007)	This exploratory study analyzes sustainable innovations related to environmental organizational management (resource conservation and sustainability management) in hotels in Ghana.	Most hotel managers are inactive in the areas of recycling and solar energy use. The hotels' most popular environmental management and sustainable tourism practices were the use of energy efficient lamps and the reuse of linen and towels (it did not expand on the reasons for the hotels' activity or inactivity in environmental management).

Source: Own elaboration

Table 10. Main objectives and conclusions regarding sustainable innovation and tourists

Author	Main Objective	Conclusion
Andereck (2009)	To investigate the perceptions of tourists about environmentally innovative tourism companies' responsible practices.	Visitors with a stronger ecological orientation had more positive opinions (such innovations are important and valuable) about environmentally responsible practices by tourism companies than non-nature-oriented tourists.
Esparon, et al. (2014)	To analyze the perceived importance of various attributes of the ECO sustainable innovation certification system.	The importance of the attributes varied according to the type of products and visitor groups. In accommodations, the main attributes perceived as important were Nature (as an aesthetic experience) and Marketing. The attractions and the rides were the least important. Younger visitors give more importance to the Environment and Conservation than older visitors. Women are more sensitive to conservation than men. Visitors ranked ECO certified operators better than non-ECO certified operators in many attributes.

Source: Own elaboration

Sustainable Innovation and Tourists (Segmentation)

Although the success of eco-innovations largely depends on individual consumer adoption (Gurtner & Soyez, 2016) and the tourist as a consumer plays a leading role in the unfolding concept of sustainability in this sector (Kasim, 2004; Williams & Plouffe, 2007), little is known about the characteristics of tourists adopting green innovations. Thus, as shown in Table 10, Andereck (2009) finds a positive

Table 11. Main objectives and conclusions regarding sustainable innovation in tourism

Author	Main Objective	Conclusion
(Hjalager, 1997)	To analyze the typology of eco-innovations in sustainable tourism, specifically in natural tourism products.	Environmental issues are faced by a number of innovations in this area of sustainability. However, the tourism industry has some inertia as these are the result of innovative efforts made in other industries (e. g. suppliers).
(Peeters et al., 2006)	To analyze current innovation options that enable more sustainable tourism in three areas of the aviation sub-sector: technology, lifestyle and politics.	At a policy level, sustainable innovations can focus on financial instruments such as international travel tax or greenhouse gas emissions. However, sustainable technological innovations will not be sufficient to offset projected growth rates in aviation.
(Brezovec, 2008)	To assess the role of communication in the dissemination of sustainable innovations.	Communication needs to be treated differently from traditional communications.
(De Grosbois, 2012)	To evaluate the practice of corporate social responsibility (CSR) reporting (considered a type of sustainable innovation) among the world's largest hotel companies.	While a large number of companies report a commitment to CSR objectives, far fewer provide details of specific initiatives undertaken to contribute to those objectives and even fewer report actual performance achieved. The study identifies the following challenges: the difficulty of significantly comparing the performance of hotel groups as there are different methodologies applied; different measures used; and lack of clarity regarding the scope of the report.
(Mattera & Melgarejo, 2012)	To describe eco-innovation best practices of two leading Spanish hotel corporations: NH Hotels and Meliá Hotels International.	CSR initiatives bring financial benefits to hotel companies by identifying a relationship between CSR and financial profit. Companies incorporate important actions by focusing on reducing environmental damage (e.g. reducing energy consumption through new technologies, using recycled materials and using fair trade products).
(Horng, Wang, Liu, Chou & Tsai, 2016)	To examine the key features of sustainable innovation in hotel services.	The results show that the following characteristics are important indicators of sustainable service innovation in the field of hotel management: market position, customer satisfaction; service orientation; environmental thinking; employee involvement; incentive mechanisms; human resources development; environmental services; cultural resource management; government policy; and education.
(Pace, 2016)	To analyze how tourism companies innovate in sustainable energy consumption and explore the capabilities of adopting energy efficiency in tourist hotel establishments.	The results demonstrate different patterns of innovation adoption across companies in terms of range of energy technologies. The measures to be taken depend on a combination of companies' capabilities, particularly to solve problems regarding energy efficiency and to accumulate knowledge about energy solutions by creating spaces for the adoption of innovative ideas.

Source: Own elaboration

relationship between nature-oriented tourists and the most positive views on environmentally responsible innovation practices by tourism companies. Studying the perception and importance that sustainable (certified) innovations have for tourists, Esparon, Gyuris, and Stoeckl (2014) found that there are product characteristics (eco-housing) and demographic characteristics (gender and age) that influence the attitude towards this kind of innovative practices.

Broad Perspective of Innovation and Sustainable Innovation in Tourism

Table 11 shows the different topics of this subject area, which covers various types of research without a common thread between them.

The research topics covered are quite varied ranging from: identifying sustainable types of innovation in nature tourism – considered to be a sustainable innovative product, as shown in Table 1 – (Hjalager, 1997) and their main features in the hotel industry (Horng et al., 2016); analyzing the relationship between this type of innovation and climate change in the aviation subsector (Peeters et al., 2006); analyzing sustainable innovations related to energy efficiency (Pace, 2016); examining a type of sustainable innovation (see Table 1), namely Corporate Social Responsibility (CSR) reports (De Grosbois, 2012); and the role of communication in disseminating sustainable innovations (Brezovec, 2008).

Hjalager (1997) argues that there are several types of innovations that allow a more sustainable tourism in nature but that this industry is very dependent on other industries. Horng et al. (2016) identify several characteristics considered as relevant indicators of innovation in sustainable services in the field of hotel management, including but not limited to environmental thinking, employee involvement, environmental services and education. Of the few studies that analyze sustainable innovation in a tourism subsector other than catering/hotels, Peeters et al. (2006) conclude that sustainable technological innovations will not be sufficient to mitigate the negative impacts this subsector has on climate change. Pace (2016) concludes that different standards for adopting sustainable energy efficiency innovations depend on a combination of companies' ability to solve problems surrounding energy efficiency and accumulate knowledge about energy solutions. De Grosbois (2012) reveals that only a limited number of companies provide CSR-related sustainable innovation details, and even fewer report the actual performance achieved. Brezovec (2008) highlights the crucial role of communication in disseminating sustainable innovations by concluding that this type of communication needs to be treated differently from traditional communications.

Main Future Research

Given that sustainable innovation in tourism is still a recent and little explored topic (González & León, 2001), more research on the subject is needed. Considering this reality, there are several lines of research and gaps to explore, based on the authors of the articles analyzed. Table 12 summarizes the main lines of future research suggested by the authors under review.

Based on the articles analyzed, one can conclude that triangulation is not much explored in this subject. Given the relevance of triangulation to mitigate the limitations of each data collection method, it would be advisible to recommend its use in a more extensive way in order to make a more significant contribution to the validation and conclusion of results (which is more detailed in the previous section). Thus, the conclusions of Knowles et al. (1999), for example, who claim that there is a huge awareness of environmental issues among English hoteliers, but which is not always translated into action, could be further examined with triangulation clarifying whether this perceived awareness comes from environmental awareness or merely due to "politically correct" answers. In this line of thinking, beyond triangulation, it would be relevant to extend research methods to other data collection tools such as neuroscience tools, as attitudes and behaviors towards sustainability are often expressed using politically correct answers (Hashimoto; 2000; Lawton & Weaver; 2010), and do not represent the actual behavior. These tools could allow a better understanding of the cognitive processes that guide such behaviors and attitudes.

Table 12. Main lines of future research in sustainable innovation

Theme	Descripiton	Authors
Monitoring	Monitoring impacts of sustainable innovation (e.g. in the tourist destination)	Krozer et al. (2007)
Sustainable innovation in destination communities	To integrate the local community perspective in more detail; further analysis of the implications that sustainable innovations have for the communities involved in certified business activities.	Njite, et al (2011); Strambach and Surmeier (2013)
Sustainable innovation among employees	Employee involvement in eco-innovation tasks or how integration of these innovations is viewed from the workers' perspective	García-Pozo et al., 2016
	Analyzing the perspective of employees in the context of different types of tourism (e.g. cultural tourism).	Martínez-Pérez et al. (2015)
Sustainable innovation among businessmen	a) Factors influencing businessmen to embrace sustainable innovations, addressing, e.g., demographic or psychographic characteristics.	Bergin-Seers et al. (2008)
	b) To develop research on Rogers' (2003) theory of innovation in the context of sustainable innovation in tourism (e.g. characteristics of innovation; of the organization and of the environment) as sooner or later as it occurs.	Dibra (2015); Horng et al. (2017); Karakaya, Hidalgo, and Nuur (2014); Le et. al. (2005); Smerecnik and Andersen (2011);
	c) To explore businessmen behavioral intentions towards adopting ecological innovations and intrinsic (e.g. personality) and extrinsic (e.g. social) factors and explore other models such as the Theory of Planned Behavior.	Chou et al. (2012)
	d) Studies examining business decision-making processes in adopting sustainable innovations in hotels and tourism-related companies.	Le et al. (2006)
	e) Introducing other variables such as political ideology and level of information.	Smerecnik and Andersen (2011)
Sustainable innovation among tourists	a) Few studies have specifically considered the impact of visitors on supporting sustainable innovations in tourism businesses.	Andereck (2009)
	b) To assess visitors' perceptions of this type of innovation (e.g.: environmental certificates)	Andereck (2009); Esparon et al. (2014)
Sustainable innovation and social and ethical concerns	Sustainable innovation should not only focus on the environmental dimension but should also address social and ethical concerns.	Brezonec (2013); Tepelus (2008).
Environmental management and sustainable innovation	Studies on effective management techniques for increasing the adoption of environmental values across companies as well as finding ways to enable employees to participate in building those values.	Erdogan and Barisb (2007); Smerecnik and Andersen (2011)
Methodology	a) Studies with methodologies that allow the generalization of findings.	Genovese et al. (2017)
	b) Longitudinal studies to analyze the long-term impact that sustainable tourism innovations have on companies and the social and ecological environment.	Segarra-Oña et al. (2012)
Sustainable innovation (institutional dimension)	Studies analyzing the impact of the institutional dimension on the adoption of eco-innovation (e.g.: in different destinations; what is the government's role in encouraging the creation of sustainable innovations in tourism).	Reyes-Santiago et al. (2017)

Source: Own elaboration based on the authors mentioned above

The analysis of the articles also allows us to conclude that, in future research, it would be ideal to explore the impacts that sustainable innovation can have on various tourism subsectors, in addition to traditional, catering and hospitality, and what kind of impacts the integration of this type of innovation can have on them. Further studies, such as that of Scott and Cooper (2010), which explore the impacts that sustainable innovations have on the destination of tourism are recommended, given the importance of tourism innovations for territorial competitiveness and sustainability (Brandão & Costa, 2013).

Another perceived gap is lack of studies on Business model innovation for sustainability. If tourism destinations are to succeed based in business innovation models, they need to incorporate sustainability in their business models. As it is not a matter of the magnitude of the novelty that needs to be incorporated but how to incorporate value proposition, value creation and value capture embracing all stakeholders and having sustainability as a common ground so that sustainable strategies are widespread across all stakeholders. For that public policy needs to address not only innovation, but also sustainability among different incentives and regulations. In this way public policy needs to be concerned with a proactive behavior including all inter-organizational payers to be tuned to a shared societal added value.

Given that, in the tourism industry, the environmental problem is often related to the number of tourists and the throughput capacity of tourist destinations and locations (Hjalager, 1997), it would be relevant to research into possible sustainable innovations that could reduce this ecological problem. Lastly, it should be noted that there is still a gap in this marketing-oriented research. Considering that sustainability is often unable to be identified, studies are needed to investigate sustainable innovation information and marketing strategies as they are an essential part of this approach. Similarly, one cannot forget the importance that new technologies are having in tourism (Edgell et al., 2008; Moniz, 2006). As such, further research linking sustainable technological innovation with this sector would be an asset to the body of knowledge.

CONCLUSION

Sustainable innovation is an important tool not only for the economy but also for making sustainable development an achievable goal. This type of innovation seeks to include a concern for environmental, social and economic equity in traditional methods of innovation.

As one of the most promising growth drivers for the world economy, tourism plays an active role with its negative impacts that sustainable development seeks to mitigate. It is therefore necessary to rethink the tourism industry innovation strategies so that this industry can contribute to a greater sustainable environment. As such, analyzing sustainable innovation in the context of tourism is a necessity, although relatively unexplored academically. The objectives of this chapter emerged from this need, which led the authors to propose the identification of current knowledge and possible paths for academic research. Through systematization, the answers to the two initial questions for the study became increasingly noticeable. Regarding the first question – what is the current state of research? –, this chapter demonstrates that it is a recent research topic and that it has attracted increasing academic attention with a significant increase in publications since 2010 – 23 articles (54.76%). The data also reveals that the interest in this topic is very wide given the different fields of the academic journals that publish articles on it. Regarding the research areas, the systematization and treatment of content analysis extracted relevant information and it was possible to identify seven major areas. The two most relevant areas involve research on the factors that influence the integration of sustainable innovations (14 articles) and the impacts that sustainable

innovation has on economic, social and environmental contexts (10 articles). The quantitative methodology is used in the vast majority of studies, and survey questionnaires are the most applied instruments.

As to the second question – what are the limitations of the studies and ways for future research? –, the results show that there are still several areas to explore and discrepant research on their results. The latter case, e.g. the economic dimension, has disparate results with articles concluding that there are significant positive impacts (García-Pozo et al., 2016; Goodman, 2000; Njite et al., 2011; Segarra-Oña et al., 2012; Yaw, 2005) and other articles (Strambach & Surmeier, 2013; Lawton & Weaver 2010) where these economic benefits are not perceived as such (e.g. wealth creation). Other non-consensual results are those related to innovation characteristics, as there are distinct results in characteristics such as relative advantage. Given this discrepancy, further research on these topics would be relevant and advisible.

Another limitation found is the relationship between sustainable innovation and the social dimension, the latter being the most neglected. Indeed, the relationship between sustainability and the environment has been widely studied in multiple topics, but the sociocultural dimension has been neglected. Thus, new studies are needed to further develop the reaction / satisfaction / response / perception of tourists and other stakeholders such as industry employees and the local community regarding sustainable innovation in tourism. This analysis is relevant because the knowledge, satisfaction and involvement of the various tourism stakeholders is one of the basic principles of the concept of sustainability (Bell & Morse, 2008; United Nations Environmental Programme, 2005).

Concerning the businessmen as stakeholders, research on this important gap is in high demand, exploring the gap between good "intention" and the sustainable action that apparently exists among tourism businessmen. To this end, using neuroscience tools as research methods could underpin a better understanding of these behavioral gaps. Methodologically, it would still be relevant, given the large amount of studies with quantitative methods, to invest in research that adopts a triangulation strategy to mitigate possible drawbacks of politically correct answers.

Given the importance of climate change for the tourism industry, it would be interesting to develop studies that relate these problems to sustainable innovation (e.g. how to use it to mitigate these problems, what kind of innovations should be used, etc.). Another gap still little explored is the impact that sustainable innovation can have on the tourism sector itself, on tourist destinations and ultimately on a country. In order to reflect on these impacts, it is essential to carry out research including indicators / indexes of sustainable innovation that can assess the performance of innovations implemented / introduced in terms of sustainability. In this way, sustainable innovation can gain greater credibility and acceptance, which enables a better dissemination across the tourism industry and an increasingly relevant role for sustainable development.

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KEY TERMS AND DEFINITIONS

Green Consumer: The type of consumer that is concerned with individual environmental and social needs. It normally addresses the market in such a way that penalizes maximization of profits that disregards the maximization of the satisfaction of consumer needs, in accordance with the environment restrictions and regulations.

Sustainability: Composed of three pillars: economic, environmental, and social needs. Sustainability is concerned with the needs of the present without compromising the ability of future generations to meet their needs. It encourages businesses to be concerned with and frame their decision-making process with a long term orientation rather than short-term needs regading economic, environmental an social needs.

Sustainable Development: The organizing principle for meeting human development goals while simultaneously sustaining the ability of natural systems to provide the natural ecosystems and resources that both the economy and society depend. As such, it can be defined as the development that meets the needs of the present generations without compromising the ability of future generations to meet their own needs.

Systematic Literature Review: A specific type of literature review that uses systematic methods to collect content, secondary data and research methods that critically appraise research studies, and synthesize findings qualitatively or quantitatively. Systematic literature reviews (SLRs) are normally based as the result of research questions that seek to identify and synthesize studies that directly relate to the systematic review question. SLRs are designed to provide a complete, exhaustive summary of current evidence relevant to the research questions formulated.

Tourism: Involves the commercial provision and the demand of specific services. Tourism is a product of social arrangements involving the process of spending time away from home, normally involving recreation, pleasure, and relaxation – although in more recent times it also involves other activities as medial torism, academic tourism, industrial tourism, business tourism, pilgrimage, among others.