Sustainable practices in the hotel industry
A systematic literature review

Alessia Acampora¹, Roberto Merli², Maria Claudia Lucchetti³

¹ Department of Business Studies, Roma Tre University, Italy, alessia.acampora@uniroma3.it
² Department of Business Studies, Roma Tre University, Italy, Roberto.merli@uniroma3.it
³ Department of Business Studies, Roma Tre University, Italy, mariaclaudia.lucchetti@uniroma3.it

Abstract

The environmental impacts generated by the tourism and hospitality sector have gained considerable attention from scholars in recent years. Green hotels and sustainable practices have been largely studied as a way to respond to the growing consumers’ environmental awareness and to improve the environmental, social and economic impact of the sector. This growing body of literature uses different points of view, methodologies and theories, also investigating different geographical areas. The aim of this review is to give a comprehensive overview of the academic studies on green hotels research, to identify research gaps and to provide potential future research directions on the topic. The paper explores the body of literature on sustainable practices in hotels, revisiting 600 articles, collected through the Scopus databases, and evaluating it using specific structural dimensions to group the selected literature into analytical categories. Several studies reviewed green and sustainability research in hospitality. With respect to past reviews produced by other scholars, this study contains various novelties that provide added value to better understand the topic under investigation. First, it explores the topic with a systematic approach to provide an exhaustive and comprehensive analysis of the phenomenon with rigorous and reproducible research criteria. Second, it includes a wide spectrum of scholars’ publications (600 papers), in comparison with other reviews previously produced and it specifically explores the research about sustainable practices in hotels. Additionally, the investigations on the topic have considerably increased during the last years, and this work provides an updated overview on this research field. Finally, the paper presents the main limitations of the study and identifies opportunities for future research.

SDG12 - Target 12.B: Develop and implement tools to monitor sustainable tourism. The current Covid-19 pandemic caused an unprecedented crisis with strong repercussions for the tourism sector. Governments and international organizations must consider the long-term implications of the crisis,
staying abreast of the digital curve, supporting the low carbon transition, and promoting the structural transformation necessary to build a stronger, more sustainable, and resilient tourism economy.

**Keywords:** Sustainable tourism; Sustainable hotels; Green hotels; Sustainable practices; systematic literature review (SLR).

1. **Introduction**

Academic research has tried to give concrete answers to hotel managers who were looking for sustainable solutions for their accommodations. However, this growing body of literature has often been considered fragmented (Kim et al., 2017), or unstructured (Aragon-Correa et al., 2015) or inconclusive and full of contradictory findings (Farrington et al., 2017). This study will try to systematically analyse the academic literature on the topic of green hotels. The aim of this review is to give a comprehensive overview of the academic studies on green hotels research, to identify research gaps and to provide potential future research directions on the topic. Several studies reviewed green and sustainability research in hospitality. Some of these are specifically focused on hotels (e.g. dos Santos, Méxas, & Meiriño, 2017; Y. H. Kim, Barber, & Kim, 2018; Nisa, Varum, & Botelho, 2017), while others analysed more than one hospitality facility (e.g. Chan & Hsu, 2016; S.-H. Kim, Lee, & Fairhurst, 2017). For example, Myung, McClaren, & Li (2012) analysed 58 environmentally related research articles, published in hospitality journals, focused on three hospitality areas: lodging, restaurant, and meeting and convention. Moreover, Chan & Hsu (2016) have investigated 149 hospitality-related studies in the research area of environmental management. Manganari & Dimara (2015), instead, reviewed 59 studies in the area of green lodging. A systematic literature review with a focus on the accommodation and lodging industry has been conducted by Hall et al. (2016). These authors studied the consumer and producer behaviours and attitudes with respect to the greening and sustainability of accommodation and lodging. Additionally, S.-H. Kim et al. (2017) reviewed 146 articles on green practices published in eight hospitality journals in order to provide a more “pragmatic” definition of green practices in the context of the hospitality industry. Other reviews have been focused on sustainable hotels research. For example, dos Santos et al. (2017) performed two bibliometric studies to analyse the Triple Bottom Line (TBL) approach of academics in the hotel industry-related research. In the hotel industry, Y.H. Kim et al. (2018) performed a comprehensive literature review on environmental sustainability of hotels. Academics also reviewed the experimental field studies carried out to promote sustainable hotel guest behaviour (Nisa et al., 2017). Finally, Tölkes (2018) conducted a SLR on sustainability communication in tourism and hospitality. With respect to past reviews produced by other scholars, this study contains various novelties that provide added value to better understand the topic under investigation. First, it explores the topic with a systematic approach providing an exhaustive and comprehensive analysis of the phenomenon with rigorous and reproducible research criteria. Second, it includes a wide spectrum of scholars’ publications (600 papers) in comparison with other reviews produced previously that
investigated roughly 150 papers (e.g. Chan & Hsu, 2016; S.-H. Kim, Lee, & Fairhurst, 2017; Y. H. Kim, Barber, & Kim, 2018). Moreover, it explores specifically the green hotels research as it has been done before by Y. H. Kim et al. (2018). However the Y. H. Kim et al. (2018) paper examines only 128 records, ranking them to select 10 to 15 articles for each year. Additionally, the investigations on the topic have increased considerably during the last years and this work provides an updated overview of this research field.

2. Methods

A systematic literature review (SLR) methodology has been chosen for its comprehensiveness when performing the search of all the publications concerning a specific theme (Petticrew and Roberts, 2008). This methodology provides a powerful tool to synthesize the literature through a series of pre-defined steps allowing to provide a transparent and reproducible process of selection, analysis and reporting of previously conducted research on a specific subject (Denyer and Tranfield, 2009).

Material collection was carried out through Scopus, which is one of the most inclusive and exhaustive scientific databases (Aghaei Chadegani et al., 2013), supporting the production process of a reliable bibliometric investigation. In order to capture green hotels studies across the scientific community, the following query has been formulated:

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TITLE-ABS-KEY ( ( hotel OR hospitality ) AND ( green* OR sustainab* OR circular OR ecolabel* OR eco-label* OR eco-friendly OR "environmental sustainab" OR "environmental pract" ) ) AND ( LIMIT-TO ( SRCTYPE , "j" ) ) AND ( LIMIT-TO ( DOCTYPE , "ar" ) OR LIMIT-TO ( DOCTYPE , "re" ) OR LIMIT-TO ( DOCTYPE , "ip" ) ) AND ( LIMIT-TO ( LANGUAGE , "English" ) )
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**Query1. Scopus Search with limitations.**

The research on Scopus returned 1396 results. Next step was to critically evaluate these results in order to select those papers focusing specifically on green practices in the hotel sector. In fact, from the analysis of query results only those specifically dealing with hotel, accommodation, lodging and that are focused on sustainability, intended in its broader definition, where further considered in the review. Starting from the 1,396 records initially extracted, we set aside 745 records that were not coherent with the scope of the research. Additionally, during the full text scan of the records further 51 records were deleted. Eventually, 600 records were employed to carry out the study.

3. Results and Discussion

The databases analysis shows that scholars’ interest in green hotels research is constantly growing over the last years. Particularly, 89.33% of the paper were published over the last ten years (2010-2018). Moreover, during 2017 and 2018, 28% of the works were issued, showing a sharp increase of publications. Figure 1 illustrates the trend of the literature, showing the increasing interest in the topic.
Figure 1. Distribution of publications per years.

Figure 2 shows the journal that published more on the topics, with these journals accounting for the 44% of the publications selected for this study. The “International Journal of Hospitality Management” is the most prolific one with the 8.7% of the publications (52 papers), followed by the “International Journal of Contemporary Hospitality Management” (43 papers) and the “Journal of Sustainable Tourism” (39 papers). The journals “Cornell Hospitality Quarterly”, “Journal of Cleaner Production”, “Sustainability (Switzerland)” and “Tourism Management” follows this triad accounting together for the 13.33% of the total publications.

Figure 2. Journals with at least 7 publications.
Considering the seven most prolific journals and the distribution of their publications per years the analysis shows that “International Journal of Hospitality Management” and the “International Journal of Contemporary Hospitality Management” and the “Journal of Sustainable Tourism” have constantly published on the topic since 1995-1996-1998 (Figure 3). The “Cornell Hospitality Quarterly” become interested in green hotels research only in the 2008 and the journal “Sustainability” in the 2015. Instead, the “Journal of Cleaner Production” intermittently published in the topic since 2005.

![Figure 3. The seven journals with the highest share of publications per years.](image)

Next, the most cited papers, according to the Scopus count, were analysed to have an overview of the most impactful researcher on the theme (Table 1). Considering the ten most cited papers in green hotels
research shows that five out of ten papers have studied consumer’s behaviour in the context of green hotels. Specifically, three of these used the “Theory of Planned Behaviour” (TPB) to understand consumers behavioural intentions formation (Chen and Tung, 2014; Han et al., 2010; Han and Kim, 2010). The most cited paper (431 citations) was written by Han et al. (2010), and studied the formation of hotel customers’ intentions to visit a green hotel under the TPB theory using the Structural Equation Modelling (SEM) methodology to analyse survey results. In another study, Han & Kim (2010) enlarged the scope of their analysis extending the TPB incorporating also the role of service quality, customer satisfaction, overall image, and frequency of past behaviour to predict customer’s intentions to visit green hotels. Additionally, also Chen & Tung (2014) works tries to develop an extended TPB model including environmental concern and perceived moral obligation to predict consumers’ intention to visit green hotels. The study of Manaktola & Jauhari (2007) analysed through a mixed-methods approach the role of consumer’s attitude and behaviour towards hotels green practices in influencing their willingness to pay for green practices. Moreover, Lee, Hsu, Han, & Kim (2010) studied how hotel green image can influence customers behavioural intentions intended as willingness to pay, intention to visit and intention to recommend. The role of hotel’s image has been studied also by Han, Hsu, & Lee (2009). They tested a model that investigated the relationships among customers attitude toward green behaviours, overall image, visit intention, word-of-mouth intention, and willingness to pay more by considering the effects of gender and age in the hotel customers' eco-friendly decision-making process. However, only two articles explored the hoteliers’ perception of hotel green practices (Bohdanowicz, 2006, 2005). In the work of Bohdanowicz (2005) the level of environmental knowledge and awareness among managers of European independent and chain-affiliated hotels were studied. Results from this work showed chain-affiliated hotels were more likely to adopt environmentally friendly solutions than were independent operators. This author also analysed the environmental awareness and initiatives in the Swedish and Polish hotel industries showing differences and similarities between these two countries (Bohdanowicz, 2006). Finally, just one paper focus the environmental aspect of green hotels performing a feasibility analysis of renewable energy supply (RES) for a stand-alone supply large-scale tourist operation in Australia (Dalton et al., 2008).

Table 1. Most cited papers.

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<tr>
<th>N.</th>
<th>Authors</th>
<th>Article title</th>
<th>Year</th>
<th>Journal</th>
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<tbody>
<tr>
<td>1</td>
<td>Han H., Hsu L.-T.(J.),</td>
<td>Application of the Theory of Planned Behavior to green hotel choice: Testing</td>
<td>2010</td>
<td>Tourism Management</td>
<td>431</td>
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<td>No.</td>
<td>Authors</td>
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<td>2</td>
<td>Manaktola K., Jauhari V.</td>
<td>Exploring consumer attitude and behaviour towards green practices in the lodging industry in India</td>
<td>2007</td>
<td>International Journal of Contemporary Hospitality Management</td>
<td>325</td>
</tr>
<tr>
<td>4</td>
<td>Bohdanowicz P.</td>
<td>European hoteliers’ environmental attitudes: Greening the business</td>
<td>2005</td>
<td>Cornell Hotel and Restaurant Administration Quarterly</td>
<td>226</td>
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<tr>
<td>5</td>
<td>Holcomb J.L., Upchurch R.S., Okumus F.</td>
<td>Corporate social responsibility: What are top hotel companies reporting?</td>
<td>2007</td>
<td>International Journal of Contemporary Hospitality Management</td>
<td>224</td>
</tr>
<tr>
<td>8</td>
<td>Bohdanowicz P.</td>
<td>Environmental awareness and initiatives in the Swedish and Polish hotel industries-survey results</td>
<td>2006</td>
<td>International Journal of Hospitality Management</td>
<td>185</td>
</tr>
<tr>
<td>9</td>
<td>Chen M.-F., Tung P.-J.</td>
<td>Developing an extended Theory of Planned Behavior model to predict consumers' intention to visit green hotels</td>
<td>2014</td>
<td>International Journal of Hospitality Management</td>
<td>182</td>
</tr>
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To further analyse the database results a graphical mapping based on bibliographic material was performed. The bibliographic network analysis has been carried out through the VOS viewer software (version 1.6.11). This free software, developed at Leiden University by Nees Jan van Eck and Ludo Waltman (van Eck and Waltman, 2010), allows to make maps to visualize bibliometric network data based on the Visualisation Of Similarities (VOS) technique (Wong, 2018). In this study, co-authorship and co-occurrence were performed to create maps showing the network of: (1) the co-authorship among researchers and countries, (2) the co-occurrence of index and authors keywords. In co-authorship networks, researchers, research institutions, or countries are linked to each other based on the number of publications they have authored jointly (van Eck and Waltman, 2017). The items or nodes represent the objects of interest (e.g., publications, researchers, keywords, authors), in this case a node depicts an author in this network. The size of the node indicates the number of authors’ co-authored publications. The distance between two nodes reflects the strength of the relation between them, i.e., shorter distance means a stronger relationship. A link between two nodes indicates a co-authorship relationship for one or more publications. Figures 4 and 5 show the co-authorship network obtained applying a threshold of a minimum of 1 article co-published per author. The analysis resulted in 33 authors selected divided into 6 clusters (Figure 4). In particular, in Figure 5 the nodes are coloured based on the average publication year of the author, using the colour scheme depicted in the legend.

**Figure 4. Co-authorship network map of authors publishing on green hotels.**
Figure 5. Co-authorship network map of authors publishing on green hotels with overlay visualization.

Figure 4 shows that in the green cluster the most prolific authors are Xu X. from the College of Business Administration in the California State University and Gursoy D. from the School of Hospitality Business Management in the Washington State University. This cluster is connected to the purple one where the author with more co-authored publications is Kasim A. from the Faculty of Tourism, Hospitality and Environmental Management at the Universiti Utara Malaysia. The light-blue cluster, instead, is dominated by Okumus F. from the Rosen College of Hospitality of the University of Central Florida. Additionally, from the analysis emerges that in two clusters the blue and the red ones the most influential authors are Wilco W. Chan and Eric S.W. Chan from the School of Hotel and Tourism Management at Hong Kong Polytechnic University (Hong Kong). The last cluster, the yellow one, is populated by different authors that published an article with Wilco W. Chan and Danny H.W. Li from the City University of Hong Kong (Chan et al., 2008).

Figure 5 shows that the most recent collaboration is between Patrizia Daniela Modica, Levent Altinay, Anna Farmaki, Mariangela Zenga and Dogan Gursoy in one paper published in 2018 in the journal “Current Issues in Tourism” (Modica et al., 2018). Instead, one of the earliest was between Wilco W. Chan and Joseph C. Lam from the Department of Building and Construction of the City University of Hong Kong. Then the Co-authorship network of countries was analysed applying a threshold of a minimum of 6 documents published per country eventually 27 countries were selected divided into 6 clusters.
In Figure 6 the countries with the largest volume of publications are in the centre of the map, represented by the bigger circles: USA (144 papers), Spain (60 papers) and UK (51 papers). Each link between two circles of different countries indicates that there is a co-authorship between the organizations based in those countries. The purple cluster is formed by USA, South Korea and India. The blue one is formed mostly by European countries as UK, Italy, Greece and Cyprus. The light blue cluster is formed by United Arab Emirates (UAE) and Switzerland. The green is composed mainly by Asian countries as China, Taiwan, Hong Kong, Thailand plus Canada and Netherlands. Instead, the red one that is dominated by Spain comprises also Australia, Malaysia and some European countries as Germany, Austria, Slovenia and Romania. Finally, the yellow cluster includes Vietnam, New Zealand, South Africa and Sweden. Figure 7 helps to visualize the temporal evolution of these collaborations between countries. The temporal network, based on the average publications per year shows that United Kingdom, Hong Kong and Australia were the pioneers of the research on green hotels. In yellow, instead, are highlighted the most recent ones: Austria, UAE, South Africa, Turkey.

Figure 6. Co-authorship: Network of collaboration among countries.
Moreover, a co-occurrence analysis of authors’ keywords has been performed. Co-occurrence analysis studies the relatedness of keywords considering the number of publications in which they occur together. Author keywords were used as unit of analysis with the full counting method. To create a clear and representative map of the network we required a minimum of five occurrences for each keyword. Eventually, 66 keywords have met the threshold.

The main keywords are presented in Figure 8. The most frequent keyword is sustainability with 94 occurrences. Seven keywords were employed more than 30 times: hotels (69), sustainable tourism (67), tourism (43), hotel industry (43), hospitality (39), sustainable development (37), and environmental management (36). Among the eight clusters identified, the strongest relationships in terms of keywords co-occurrences are among “sustainability” and “hotel industry”, “green hotel” and “corporate social responsibility”, and “sustainable tourism” and “hotel”. Authors’ keywords network analysis with overlay visualization is showed in Figure 9 shows the yellow nodes that highlight those keywords more employed in the last few years (e.g. innovation, food waste, competitive, towel reuse and attitudes). Conversely, the purple/blue nodes group highlights the keywords that were used mainly before (e.g. environmental awareness, accommodation, China, recycling and energy consumption).
Figure 8. Co-occurrence network map of authors’ keywords.

Figure 9. Co-occurrence network map of authors’ keywords with overlay visualization.
4. Conclusions

This systematic literature review has highlighted past, present and future lines of research on sustainability research in the hotel industry. The analysis has shown as green hotels have been a hot topic over the last years. Scholars have dedicated growing attention to the topic and publications have grown constantly over the years. This topic has been mostly discussed in hospitality and tourism-related journals. However, also journals dealing with sustainability and cleaner production and consumption have been interested in green hotels research such as Sustainability and Journal of Cleaner Production. This aspect is particularly relevant as it represents the interdisciplinarity of the subject and the growing interest also beside hospitality and tourism researchers. Looking at articles published in non-hospitality and tourism journals, authors’ affiliation is mainly from business studies and engineering departments all over the world. However, from the analysis emerged that most of the studies on green hotels are published by authors based in the United States, the United Kingdom, and Spain. Moreover, looking at the co-authorship network this research has shown as US scholars are in the centre of this network between Spanish and British scholars. Two other poles of collaboration are Australia and Hong Kong. Additionally, considering the co-authorship network map of authors publishing on Green hotels the main clusters are dominated by Gursoy D. from the School of Hospitality Business Management in the Washington State University, Azilah Kasim from the School of Tourism, Hospitality & Event Management (STHEM) at Universiti Utara Malaysia (Malaysia), Okumus F. from the Rosen College of Hospitality of the University of Central Florida, Wilco W. Chan and Eric S.W. Chan from the School of Hotel and Tourism Management at Hong Kong Polytechnic University (Hong Kong). Particularly, the Hong Kong Polytechnic University has the pride of place among the universities for what concern the number of published articles, almost 90 papers have been issued about sustainability in hospitality. Furthermore, the most prolific and impactful author is Heesup Han from the College of Hospitality and Tourism Management at Sejong University (Korea). He published 17 articles on the topic and 4 of his papers are among the 10 most cited documents on green hotels. Looking at the most cited documents we can have a look at the most influencing themes on green hotels research. Half of the papers on this list deal with the study of consumer’s behaviour towards green hotels. These papers analysed consumers’ attitudes, behaviour, perception, awareness and decision formation towards the green hotels. Indeed, scholars have investigated consumers’ appreciation of green practices implemented by hotels. This is partially due to the need of hoteliers to understand if their efforts towards sustainability were rewarded through a better consumers’ predisposition to pay a premium price for green hotels, a greater satisfaction, a better brand equity or a greater customer engagement.
References


