Sustainability in the hotel sector:

An in-depth analysis of green practices implementation

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Abstract (English)

In recent years, tourism has experienced a continuous expansion and diversification to become one of the largest and fastest-growing economic sectors in the world, occupying a prominent role also in the European economy. However, its growth goes hand in hand with its increasing environmental impact. 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 thesis 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. To this purpose, the thesis also proposes a framework for the review of green and sustainable research in the hotel industry. This framework has been developed as a synthesis between the main topics emerged from the systematic literature review and a conceptual elaboration of the aspects, obtained from the literature analysis, related to the implementation of sustainable practices in the hotels. The thesis explores the body of literature on sustainable practices in hotels, revisiting 600 articles, collected through the Scopus databases, and evaluating them 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. From the literature review emerged that as a result of consumers' concern toward environmental sustainability, the hospitality industry is developing voluntary-based tools to reduce its environmental impacts and satisfy the increasing market segment of green customers. In this context, third-party certified eco-labels ensure hotel compliance with specific environmental performance criteria and offer reliable communication to their guests. Starting with the analysis of literature on eco-labelled hotels, we propose a conceptual framework to investigate whether green practices implemented by the Italian "Legambiente Turismo" certified hotels contribute significantly to the formation of guests' positive behavioural

intention toward green hotels. Firstly, a survey was conducted with guests of two Italian hotels awarded with the ecolabel and 335 questionnaires were usable and employed in the analysis, adopting Partial Least Square Structural Equation Modelling (PLS-SEM) to test the hypotheses. Results show that: Guest environmental concern influences guest perception of hotel environmental communication (H2) but does not influence directly guest perception of hotel green practices (H1) because hotel environmental communication mediates the relationship between guest environmental concern and guest perception of hotel green practices (H4). Additionally, the study demonstrates that hotel environmental communication influences guest perception of hotel green practices (H3). Then the study tests the relationship between guest perceptions of hotel green practices and their behavioural intentions. Particularly, results show that hotel environmental practices positively and directly influence guest satisfaction with the hotel (H7) but not the loyalty toward the hotel (H5) and loyalty toward green hotels (H6). In fact, guest satisfaction has been found as a significant antecedent of guest loyalty toward the hotel (H9) and toward green hotels (H10) and a mediator in the relationship between hotel environmental practices and guest loyalty toward the hotel (H11) and between hotel environmental practices and guest loyalty toward green hotels (H12). Research findings are valuable for both hotel managers and decision makers, clarifying the role of environmental communication and guest environmental concern in the guest recognition of hotels environmental efforts. The study also confirms the relationship between the implementation of green practices and the rise of market awareness and loyalty towards green hotels.

Abstract (Italian)

Negli ultimi anni, il settore turistico ha registrato una continua espansione e diversificazione fino a diventare uno dei settori economici più rilevanti e in più rapida crescita al mondo, occupando un ruolo di primo piano anche nell'economia europea. Tuttavia, la sua crescita va di pari passo con il suo crescente impatto ambientale. Gli impatti ambientali generati dal settore turistico e dell'ospitalità hanno suscitato notevole attenzione da parte degli studiosi negli ultimi anni. Gli hotel ecologici e le pratiche sostenibili sono stati ampiamente studiati come un modo per rispondere alla crescente consapevolezza ambientale dei consumatori e per migliorare l'impatto ambientale, sociale ed economico del settore. Questo corpus crescente di letteratura utilizza diversi punti di vista, metodologie e teorie, studiando anche diverse aree geografiche. Lo scopo di questa tesi è quello di fornire una panoramica completa degli studi accademici sul tema degli hotel ecologici, identificare lacune di ricerca e fornire potenziali linee di ricerca future sull'argomento. A tal fine, questa tesi propone un framework per la revisione della letteratura sugli alberghi verdi e le pratiche di sostenibilità nel settore alberghiero. Questo framework è stato sviluppato come sintesi tra i principali argomenti emersi dalla revisione sistematica della letteratura e l'elaborazione concettuale degli aspetti relativi all'implementazione di pratiche sostenibili negli hotel, ottenuti dall'analisi della letteratura. La tesi esplora il corpus della letteratura sulle pratiche sostenibili negli hotel, rivisitando 600 articoli, raccolti attraverso il database Scopus e valutandoli usando specifiche dimensioni strutturali al fine di raggruppare la letteratura selezionata in specifiche categorie analitiche. Altri studi hanno esaminato la ricerca accademica riguardante gli alberghi verdi e le pratiche di sostenibilità nel settore alberghiero. Tuttavia, rispetto alle revisioni della letteratura prodotte da altri studiosi, questa tesi contiene vari elementi di novità che forniscono un valore aggiunto per comprendere meglio l'argomento in esame. In primo luogo, la tesi esplora l'argomento con un approccio sistematico per fornire un'analisi esaustiva e completa del fenomeno con criteri di ricerca rigorosi e riproducibili. In secondo luogo, include un più ampio spettro di pubblicazioni di studiosi (600 articoli), rispetto ad altre revisioni precedentemente elaborate ed esplora in modo specifico la ricerca sulle pratiche sostenibili negli hotel. Inoltre, considerando che i contributi scientifici sull'argomento sono notevolmente aumentati negli ultimi anni, questo lavoro fornisce una panoramica aggiornata su questo campo di ricerca. Inoltre, dalla analisi sistematica della letteratura è emerso che, a seguito della crescente preoccupazione dei consumatori per la sostenibilità ambientale, l'industria dell'ospitalità sta sviluppando strumenti su base volontaria per ridurre gli impatti ambientali e soddisfare il crescente segmento di mercato dei clienti verdi. In questo contesto, i marchi di qualità ecologica certificati di terze parti garantiscono la conformità dell'hotel a specifici criteri di prestazione ambientale e offrono una comunicazione affidabile ai propri ospiti. A partire dall'analisi della letteratura sugli hotel con il marchio di qualità ecologica, questa tesi propone un quadro concettuale per indagare se le pratiche ecologiche implementate dagli hotel italiani certificati con il marchio "Legambiente Turismo" contribuiscono in modo significativo alla formazione della soddisfazione e della lealtà degli ospiti nei confronti degli hotel ecologici. A tal fine, è stato condotta un’indagine

sperimentale con gli ospiti di due hotel italiani premiati con il marchio di qualità ecologica “Legambiente Turismo” in cui sono stati raccolti 335 questionari. I risultati sono stati utilizzati per sviluppare un'analisi quantitativa che adotta il modello di analisi statistica, Partial Least Square Structural Equation Modelling (PLS-SEM), per testare le ipotesi di ricerca. I risultati emersi dall’analisi quantitativa mostrano che: la preoccupazione ambientale degli ospiti influenza la loro percezione della comunicazione ambientale dell'hotel (H2) ma non influenza in maniera diretta la percezione delle pratiche ambientali dell'hotel (H1). Quest’ultima relazione è infatti mediata dalla comunicazione ambientale dell'hotel (H4). Inoltre, lo studio dimostra che la comunicazione ambientale dell'hotel influenza la percezione degli ospiti delle pratiche ambientali dell'hotel (H3). Successivamente, lo studio testa la relazione tra le percezioni degli ospiti delle pratiche ambientali degli hotel e le loro intenzioni comportamentali. In particolare, i risultati mostrano che le pratiche ambientali degli hotel influenzano positivamente la soddisfazione degli ospiti nei confronti dell'hotel (H7) ma non la lealtà nei confronti dell'hotel (H5) e la lealtà nei confronti degli hotel ecologici (H6). In effetti, la soddisfazione degli ospiti è stata trovata come un antecedente significativo della lealtà degli ospiti verso l'hotel (H9) e verso gli hotel ecologici (H10) e un mediatore nel rapporto tra le pratiche ambientali dell'hotel e la lealtà degli ospiti nei confronti dell'hotel (H11) e tra le pratiche ambientali e la fedeltà degli ospiti nei confronti degli hotel ecologici (H12). Da i risultati di questa ricerca possono essere tratte implicazioni interessanti sia per i gestori alberghieri che per i decision-makers a livello istituzionale e territoriale, chiarendo il ruolo della comunicazione ambientale e delle preoccupazioni ambientali degli ospiti nel riconoscimento degli sforzi ambientali da parte degli alberghi ecologici. Lo studio conferma anche la relazione tra l'implementazione delle pratiche di sostenibilità e l'aumento della consapevolezza dei consumatori e della loro predisposizione a sviluppare sentimenti di lealtà nei confronti degli hotel ecologici.

Chapter 1 Introduction

1.1 Context

In the last few years, climate change and environmental sustainability have become one of the main global issues (Braun, 2010) and one of the most challenging communication issues for marketers in the commercial and public sector (Peattie, Peattie, & Ponting, 2009). In recent times, the intensification of extreme climatic phenomena, the fires in the Amazon forest, the problem of plastic, the youth movement of Greta Thunberg have raised an unprecedented media attention on the impacts of our production and consumption patterns on the environment. This has led many citizens, especially young people, to urge governments to find effective and rapid solutions to global warming. In this sense, the academic literature is struggling to keep up in photographing and analysing changes in consumer awareness and concern about environmental problems. In fact, there are still few academic studies that analyse the impact of these phenomena on the public opinion and on the predisposition of consumers to change their habits to decrease their impact on the environment. Probably the next studies that will be published will examine in depth the implications that these phenomena have had in the environmental awareness of citizens, especially as far as millennials and generation Z are concerned. All this being considered, following the current news, one cannot help but notice that citizens are clamouring for substantial changes in the way our economy produces and consume goods and services. Tourism industry is at the same time a major contributor to environmental degradation and climate change (Y.-P. P. Su, Hall, & Ozanne, 2013), but also a very vulnerable sector to a decrease in environmental quality, as the natural environment is often at the core of its activities (Kadriu, 2016). Consumers are growingly concerned and aware of the tourism industry environmental impacts and are asking for more eco-friendly choices in tourism and hospitality (Colin Michael Hall et al., 2016; Penz, Hofmann, & Hartl, 2017a; Pereira-moliner, Claver-cortés, Molina-azorín, & Tarí, 2012). To respond to these green consumers the hotel industry started to develop green solutions to reduce its environmental impacts and satisfy the market demand for green hotels (Gössling & Buckley, 2016; Leroux & Pupion, 2018). Consumers growing green consciousness has lead hoteliers to implement different environmental programs and guidelines with the aim of improve their hotels'

environmental performance (Ayuso, 2007; Gössling & Buckley, 2016). Indeed, the hotel industry has started to focus its efforts on recycling and management of wastes, energy saving and water conservation practices (Shen & Zheng, 2010). The environmental management has played an increasingly more important role in the hotel sector (Bagur-Femenias, Celma, & Patau, 2016), through the implementation of green practices, which are those aimed at minimizing the impact on the environment, reducing pollution and resource depletion (Ham & Han, 2013; N. A. Tzschentke, Kirk, & Lynch, 2008). Kim et al. (2017) define green practices as "*a value-added business strategy that benefits a hospitality operation that engages in environmental protection initiatives*". Hoteliers are committed to improve the environmental performance of hotels because they are embracing the evidence that these are commercially-driven actions that provide both financial and commercial added value while preserving the local environment (S.-H. Kim, Lee, & Fairhurst, 2017). Indeed, eco-friendly practices may ensure the reduction of operating costs, the possibility of gaining competitive advantage and an efficient way to respond to increasing institutional pressures and to the growing demand of green consumers (Erdogan & Baris, 2007; Manaktola & Jauhari, 2007). In green hotels, an important differentiation factor is the adoption of environmental certifications, such as eco-labels (Leroux & Pupion, 2018). Environmental labels are useful tools for hotel facilities, as they support the management in meeting specific environmental sustainability criteria and help increase the business success of the hotel, thanks to the positive effects they have on the green image of the facility (K. H. Lee, Lee, & Gunarathne, 2018a). Tourism eco-label has been defined by Leroux & Pupion (2018) as "*any form of certification giving assurance that the transaction or tourist activity is conducted according to a known standard that improves the environment or at least minimizes environmental impacts*". These tools stand out due to their capacity to communicate directly with customers and to the credibility ensured by external certification (Font, 2002; Penz et al., 2017a). Even though the demand for green hotels and eco-labelled hotels is still comparatively low (Levy & Park, 2011), previous studies have shown a positive relationship between green practices implementation and hotel guest behavioural intentions (Han, Lee, Trang & Kim, 2018). The more hotel guests are able to perceive and appreciate the hotel commitment toward sustainability, the higher the results in terms of satisfaction and willingness to pay, return and spread of positive word of mouth (Gao, Mattila, & Lee, 2016; S.-H. Kim et al., 2017). Therefore, study the relation between these practices and consumer attitudes and behavioural patterns changes is of a great interest for scholars, practitioners and hoteliers.

1.2 Aim of the research and research questions

The main aim of this thesis is to explore the implementation of green practices in the hotel sector. Two line of research have been developed in this thesis, following the dual goals of this work. First, I reviewed the literature inherent the theme of green practices in hotel industry and analysed the past, present and future lines of research through a Systematic Literature Review approach. The aim 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. Even if 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 explores specifically the green hotels research. Additionally, the investigations on the topic have increased considerably during the last years and this work provides an updated overview on this research field.

Therefore, the study addresses the following research question:

What is the current state of knowledge on green hotels research?

Specifically, this systematic literature review tried to answer the following more specific questions, which refer to the structural dimensions and the analytical categories subsequently chosen for the analysis:

- Who are the protagonists, both considering the source and the authors on green hotels research?
- What are the main topics under investigation?
- In which context the topic has been investigated? (e.g. in which accommodation facilities)
- Which research methods, data analysis techniques, and data collection methods have been used by researchers exploring this theme?
- What sample or unit of analysis has been chosen by researchers to answer to their research questions?
- Which dimensions of sustainability have been addressed?

- Which theories have been used?
- What concepts are associated with green hotels research?
- What is the geographical focus of their investigations?
- What are the current and future research streams?

Then, a quantitative research on two Italian hotels certified with the "Legambiente Turismo" eco-label has been conducted. The aim of this second line of research is to develop a conceptual framework to investigate whether green practices implemented by the Italian "Legambiente Turismo" certified hotels contribute significantly to the formation of guest positive behavioural intention toward green hotels. Additionally, the role of guest environmental concern in influencing the development of positive behavioural intentions for the hotel has been studied, as previous investigations have pointed out that guests more concerned of the environmental impacts of hotel operations are more likely to show positive behavioural intentions for the hotel (Verma, Chandra, & Kumar, 2019). Moreover, this thesis proposes two distinct conceptualizations of guest loyalty. The first refers to the loyalty to the hotel that guest have experienced, while the second aims to identify guest revisit intentions and word of mouth towards the general category of "green hotels". Therefore, the investigation also intends to evaluate if a positive experience in a green hotel will also contribute to generate a specific green loyalty for this peculiar hotel category (Martínez García de Leaniz, 2015; Martínez García de Leaniz, Herrero Crespo, & Gómez López, 2017; J. Wang, Wang, Xue, Wang, & Li, 2018). Furthermore, it investigates the role of guest satisfaction as a significant mediator for guest loyalty towards the hotel and towards the general category of green hotels. Then the role of hotels environmental communication in influencing guest perception of hotels green practices has been investigated. Communicating hotels commitment towards environmental sustainability is a crucial aspect for hotel managers (Gössling & Buckley, 2016; W. Wang, Krishna, & McFerran, 2017). Engaging consumers by telling a story about company sustainability commitment and explaining to them why sustainability and green practices are important for company success and a way to prevent the greenwashing suspicions.

However, there is little research that study how hotels marketing and communication strategy influences guest perceptions of green practices, guest satisfaction and guest green loyalty (Tölkes, 2018). Considering these aspects, this thesis aims to investigate these relations, analysing how environmental communication helps guests to develop a positive attitude toward green hotels and their eco-friendly practices, and thus stimulates positive behavioural

intentions toward the hotels and towards green hotels (Martínez García de Leaniz, 2015). The following research hypothesis have been tested:

- H1: Guest environmental concern influences guest perception of hotel green practices
- H2: Guest environmental concern influences guest perception of hotel environmental communication
- H3: Hotel environmental communication influences guest perception of hotel green practices
- H4: Hotel environmental communication mediates the relationship between guest environmental concern and guest perception of hotel green practices
- H5: Hotel environmental practices positively influence guest loyalty toward the hotel
- H6: Hotel environmental practices positively influence guest loyalty toward green hotel
- H7: Hotel environmental practices positively influence guest satisfaction with the hotel
- H8: Guest satisfaction is a significant antecedent of guest loyalty toward the hotel
- H9: Guest satisfaction is a significant antecedent of guest loyalty toward green hotels
- H10: Guest satisfaction mediates the relationship between hotel environmental practices and guest loyalty toward the hotel.
- H11: Guest satisfaction mediates the relationship between hotel environmental practices and guest loyalty toward green hotels.

1.3 Scope of research

Firstly, this thesis investigates the academic literature on green practices in the hotel sector, carrying out a Systematic Literature Review to revisit more than 600 articles collected through the Scopus databases. The state-of-the-art of academic research on green practices on the hotel industry has been evaluated using specific structural dimensions to group literature into analytical categories. The scope of the study was the identification of a framework to categorize the literature, through the analysis of the articles published in journals retrieved from Scopus. This framework consisted in a list of structural dimensions and analytical categories, which allowed to analyse the past and current direction of the studies on the topic.

Then, this thesis carried out a survey with guests of two Italian hotels awarded with the “Legambiente Turismo” eco-label. The Legambiente Turismo in 1997 carried out the project "Council for the commitment in defence of the environment" an agreement between tourist

accommodation facilities, institutions and local administrations, to try to reach a common goal: maintaining quality and comfort tourism services while respecting the environment. Moreover, Legambiente, through the release of an eco-label, is committed to enhancing the environmental footprint of accommodation facilities. Legambiente created a set of guidelines and check lists in which the Decalogue of actions required for the member companies of the association are listed. Legambiente Turismo eco-label aims to qualify the tourist and accommodation facilities through disciplinary measures to reduce their environmental impact, while at the same time increasing the quality of the service and the experience of the guests. Legambiente Turismo and Roma Tre University are collaborating on a research project with the main goal of understanding how green practices implemented in the tourism industry are perceived by guests and how they affect their behaviour. The survey, object of the thesis, was elaborated under this collaboration, within the Italian hotels awarded with the Legambiente Turismo eco-label and was conceived to detect the customer's perception with respect to the quality and sustainability of the service offered.

1.4 Research methods and target

Two research methods have been used to conduct this research: the systematic literature review methodology and a survey to test our research hypotheses with Partial Least Square Structural Equation Modelling (PLS-SEM) approach. Systematic literature review is a form of secondary study defined by Kitcharoen (2004) as a *"means of identifying, evaluating and interpreting all available research relevant to a particular research question, or topic area, or phenomenon of interest*". This type of analysis allows to provide a transparent and reproducible process of selection, analysis and reporting of previously conducted research on a specific subject. Methodologically, a literature review integrates qualitative and quantitative evaluation to investigate a specific topic and can be framed as a content analysis. The revisited material consists of 600 articles collected through the Scopus database, and has been evaluated using specific structural dimensions to group literature into analytical categories. Additionally, this thesis also proposes a conceptual framework for the review of green and sustainable research in the hotel industry. This framework has been developed as a synthesis between the main topics emerged from the systematic literature review and a conceptual elaboration of the aspects related to the implementation of sustainable practices in the hotels emerged from the literature analysis.

Additionally, to investigate what are the determinant of guest positive behavioural intentions toward Eco-label hotels I conducted a survey with guests of two Italian hotels awarded with the "Legambiente Turismo" eco-label. Hypothesis of this research were developed starting from the analysis of literature that studied the impact of sustainable practices implemented in the hotel industry on customer behavioural intentions. The research was carried out through a survey, by the means of a questionnaire that was built with a three-step procedure. In the first, the measurement scales were identified through a literature review. Next, the list of items obtained was skimmed with a semi-structured interview with two managers of hotels awarded with the "Legambiente Turismo" Eco-label. Then, a first version of the questionnaire was pre-tested on a sample of hotel guests to assess the suitability the measurement scales. Finally, the questionnaire was reviewed and finalized. The survey was conducted in summer 2018 in two Italian hotels awarded with the "Legambiente Turismo" Eco-label. A total of 335 questionnaires were usable and employed in the analysis. Partial Least Square Structural Equation Modelling (PLS-SEM) was chosen to build our models and test hypothesis. PLS-SEM has been chosen as its well-suits the explorative nature of this study and does not require any normality assumptions and this was our case as measures were developed with a Likert scale with a non-normal data distribution. Finally, PLS works well with interaction effects such as the mediation analysis that we performed. SmartPLS (V.3.2.6) software was employed for the analysis.

1.5 Outline of the work

The first chapter provided an overview of this thesis and presented an introduction to green practices in the hotel industry. This Chapter also stated the reasons for conducting the study on eco-labelled certified "Legambiente Turismo" hotels in Italy and provided a brief description of the study area. The aims and objectives of the research and a brief overview of the methodology used were discussed in this Chapter.

The second Chapter provided an overview of the tourism industry growth, and the economic, environmental and social impacts associated with its activities. Subsequently, in the third Chapter the environmental impacts of the accommodation sector have been explored. Next, the "green wave" in the hotel sector has been analysed, with a specific focus on green practices implementation and main drivers and barriers for their implementation by hotels managers. Furthermore, the tools available for hotels to reduce their environmental impacts and to

communicate to consumers their efforts towards sustainability have been presented. Particularly, the Chapter presents the Environmental Management Systems (EMS), the ISO 14001 and the EMAS, and the eco-labels for tourism accommodation, the EU eco-label and the Legambiente Turismo eco-label.

Chapter four presents the results of a comprehensive systematic literature review of green practices in the hotel sector. The systematic literature review gives 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. To this purpose, also a framework for the review of green and sustainable research in the hotel industry has been proposed.

The fifth Chapter, through a PLS-SEM analysis, presents the results of a survey targeted to the guests of an Italian hotel awarded “Legambiente Turismo” eco-label. The Chapter propose a conceptual framework to investigate whether green practices implemented by the Italian “Legambiente Turismo” certified hotels contribute significantly to the formation of guest positive behavioural intention toward green hotels.

Finally, the conclusion Section summarizes the key findings and draws conclusions from the research.

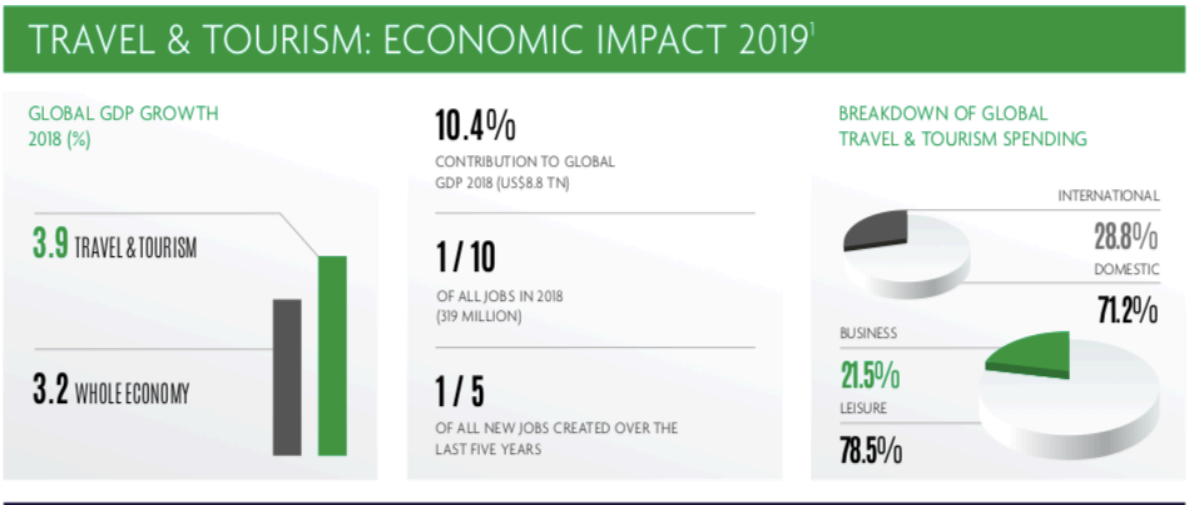
Chapter 2 Tourism sector impacts and Sustainable tourism development

2.1 Tourism sector: dynamism and growth

Tourism is a fast-growing industry, which is forecasted to grow at global level with a significant rate in the next decade. In recent years, tourism has experienced a continued expansion and diversification to become the second-fastest growing sector in the world (World Travel & Tourism Council, 2018), occupying a prominent role in the global and European economy. The travel and tourism sectors grew of 3.9% in 2018, accounting for the 10.4% of global GDP and contributing to the world economy with $8.8 trillion and 319 million jobs in 2018 (World Travel & Tourism Council, 2019) (Figure 2.1).

Europe has always been a very popular tourist destination and, according to the World Tourism Organization (WTO), five European States (France, Spain, Italy, Germany and the United Kingdom) fall into the top ten destinations preferred by travellers in the world ranking for the year 2017 (UNWTO, 2018).

Figure 2.1- Travel and tourism economic impact – 2019

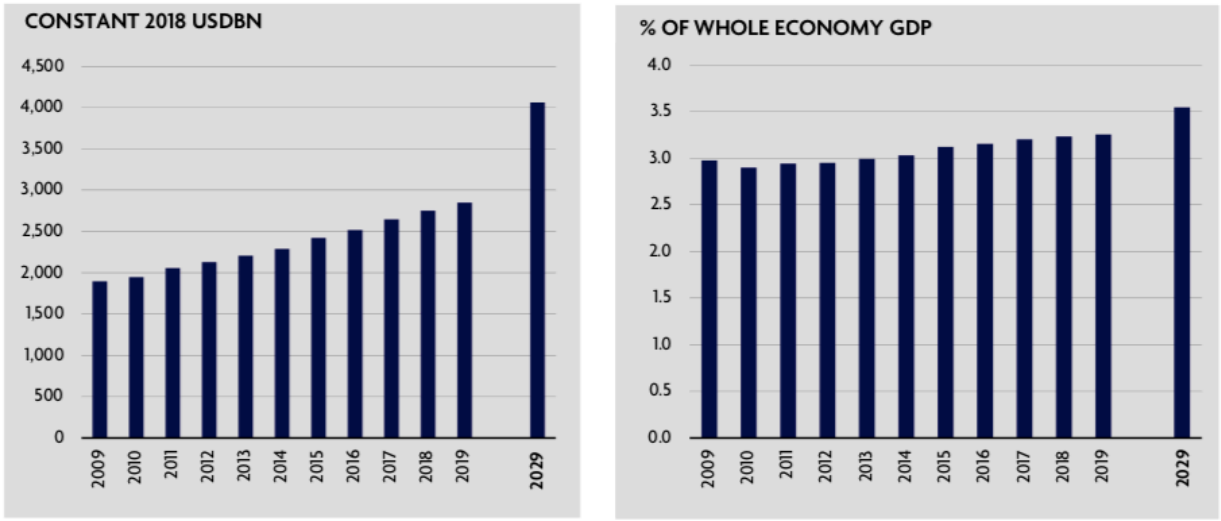


Source: World Travel & Tourism Council (2019)

According to the World Travel & Tourism Council (2019) the direct contribution of Travel & Tourism to world economy GDP in 2018 was 2,750.7bn USD, which accounts for about the 3.2%. This is forecast to rise by 3.6% to USD 2,849.2bn in 2019 and is expected to grow by

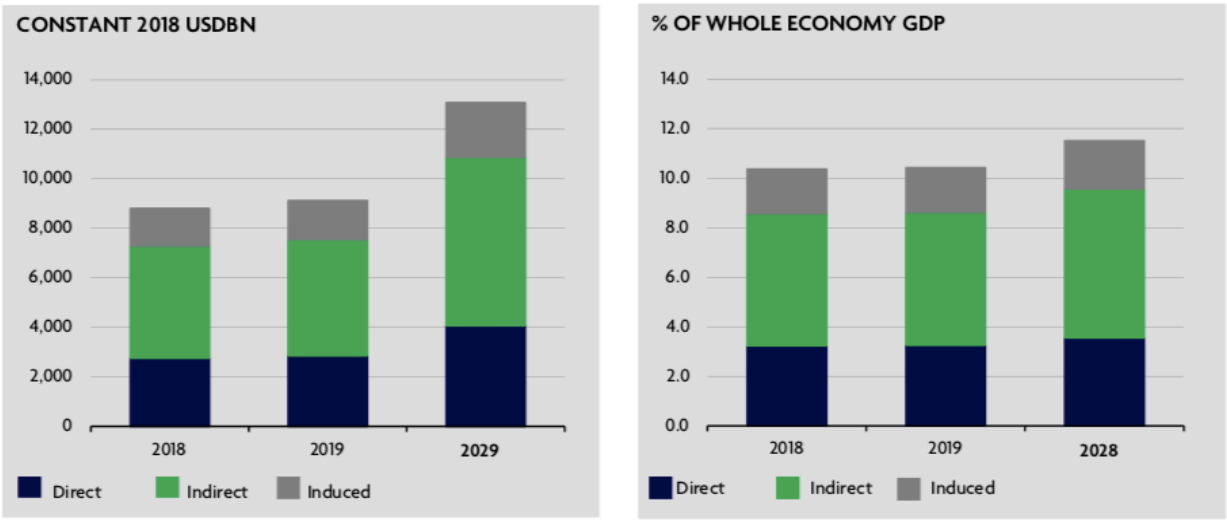
3.6% to 4,065.0bn USD (3.5% of GDP) by 2029 (Figure 2.2). However, if we consider the total contribution of Travel & Tourism to GDP this was of 8,811.0bn USD in 2018 (10.4% of GDP) and is expected to grow by 3.6% to 9,126.7bn USD (10.4% of GDP) in 2019 and it is forecast to rise by 3.7% to 13,085.7bn USD by 2029 (11.5% of GDP) (Figure 2.3).

Figure 2.2 - World direct contribution of travel & tourism to GDP



Source: World Travel & Tourism Council (2019)

Figure 2.3 - World total contribution of travel & tourism to GDP



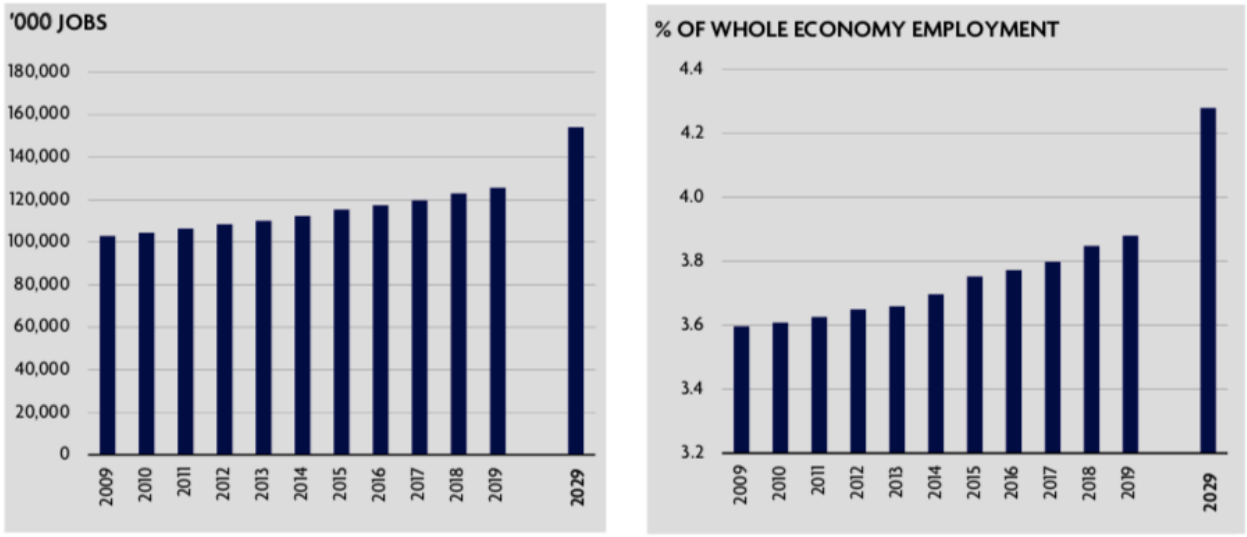
[1] All values are in constant 2018 prices & exchange rates

Source: World Travel & Tourism Council (2019)

Additionally, travel and tourism industries have generated in 2018 122,891,000 jobs directly, about 3.8% of total employment. This employment rate is estimated to grow by 2.2% in 2019. Moreover, this indicator is expected to grow of 2.1% by 2029, when the sectors will account for 154,060,000 jobs directly (Figure 2.4). If we consider also the indirect effect of travel and

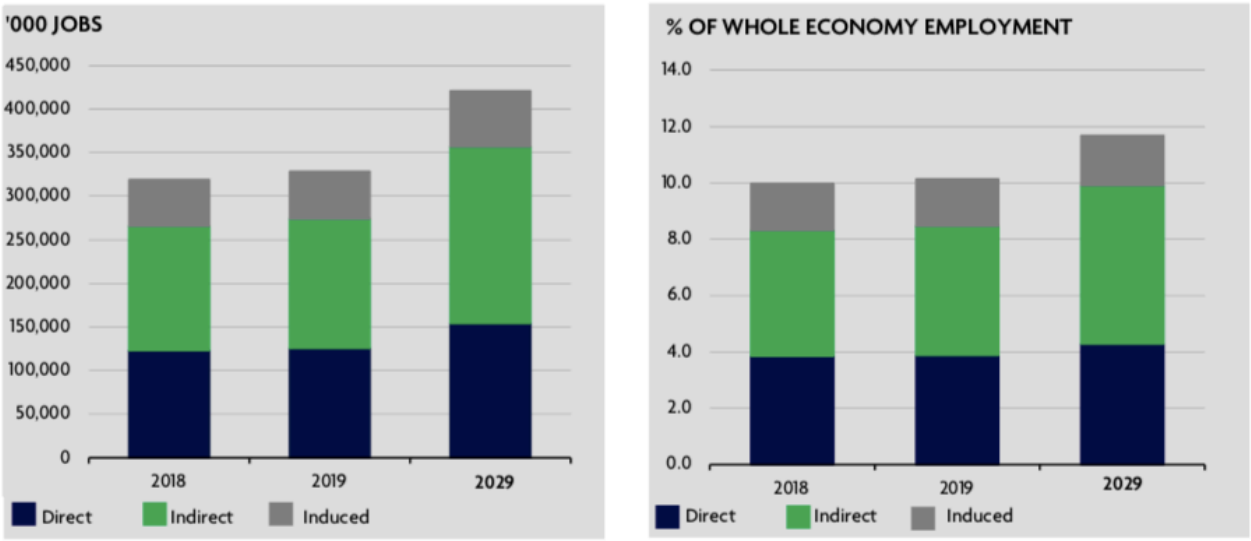
tourism on employment, we will have a contribution of 318,811,000 jobs in 2018, 328,208,000 jobs in 2019 and 420,659,000 jobs by 2029 (Figure 2.5).

Figure 2.4 - World direct contribution of travel & tourism to employment



Source: World Travel & Tourism Council (2019)

Figure 2.5 - World total contribution of travel & tourism to employment



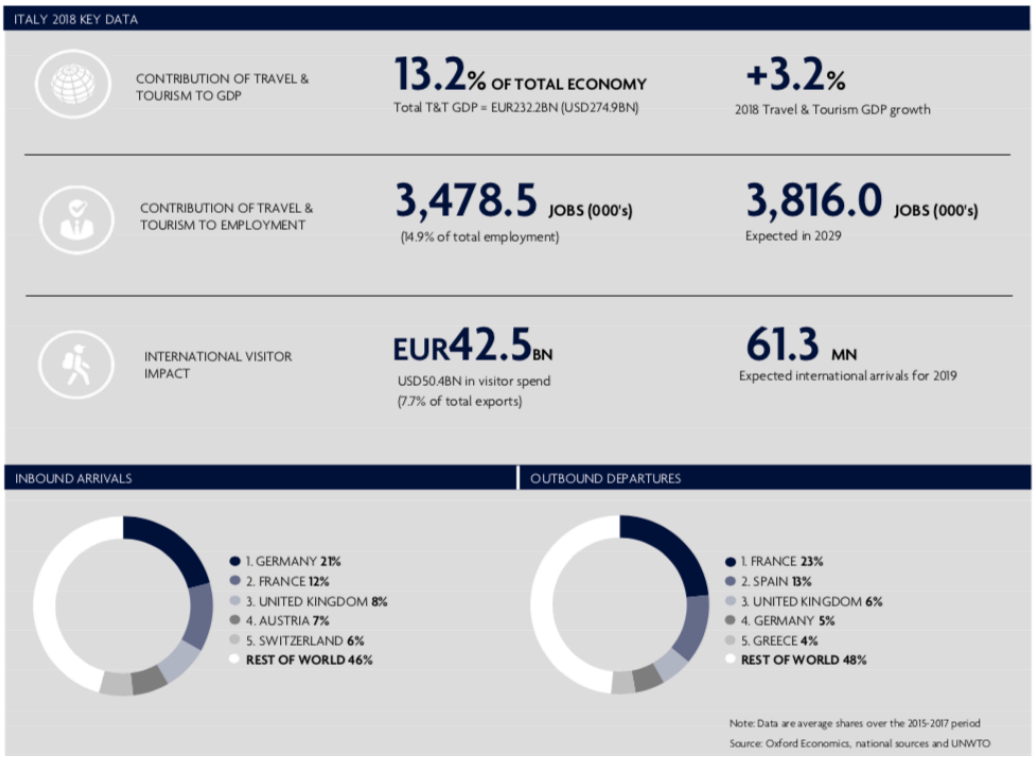
Source: World Travel & Tourism Council (2019)

2.1.1 Overview of the Italian tourism sector' economic impact

Tourism is one of the largest industries in the world and one of the economic sectors with progressive and constant growth. It is a phenomenon that has strong implications on the economic and social realities of the territories in which it develops and gives both private and public actors a tool for the design and implementation of sustainable economic development.

In this context Italy has a prominent role as is one of the countries with the oldest vocation for tourism. With its artistic and natural resource heritage as few equals in the world, Italy counts for 54 of the 1,092 UNESCO sites, becoming the number one destination for world heritage site. Reduced transport costs and the increasing income levels also in emerging economies, have boosted the tourism worldwide expansion (Banca d'Italia, 2018). New destinations have emerged, attracting a growing number of tourists. This has contracted the growth of Italian tourist destinations that, however, remains very solid. Looking at the Italian growth rate of 3.2% in 2018, this result is in line with the tourism global growth. In Italy, last year, the travel and tourism sector contributed to the national economy with 232 billion euros, thus being the second sector in terms of contribution to its GDP (13.2%), before the construction sector (11.4%) and healthcare (11.2%) and just behind retail (14.4%). The workforce employed in tourism is of 3.5 million workers, representing the 14.9% of the total Italian workforce, and is expected to grow to 3.8 m in 2029 (Figure 2.6) (World Travel & Tourism Council, 2019). In 2018, according to the ISTAT statistics, 429 millions presence have been registered in the accommodation sector, with an increase of 2% compared to 2017 (ISTAT, 2019b).

Figure 2.6 - Italian travel and tourism economic impact – 2019

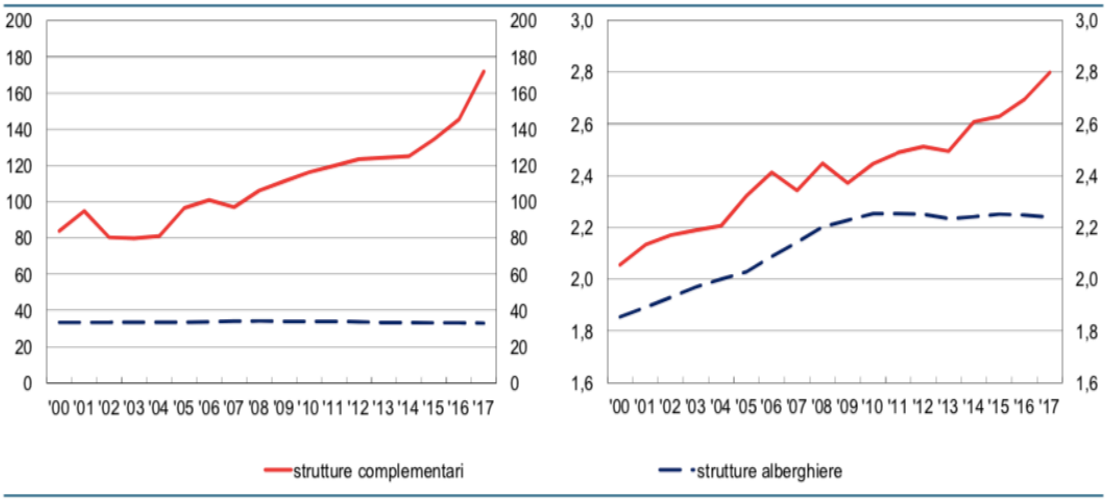


Source: World Travel & Tourism Council (2019)

The international component grows more than the Italian one (+ 2.8% compared to + 1.1%) and represents 50.5% of total presences. Italian major foreign incoming tourists are from Germany 21%, France 12% and the United Kingdom (only) 8%. In 2018 the spending of

foreign travellers in Italy increased at a sustained rate (6.5%) - reaching almost 42 billion euros, mostly driven by tourists from Europe and North America (Banca d'Italia, 2018). This number is of 42.5 billion according to the World Travel & Tourism Council (World Travel & Tourism Council, 2019). Another important fact is that 76% of Italian tourist spending is produced by the domestic market and 24% by foreign tourists. In 2017, there were almost 33,000 hotels in Italy and more than 170 thousand complementary (or extra-hotel) structures, with a total offer of around 5 million beds (Banca d'Italia, 2018). Moreover, official statistics account for more than 750,000 beds that are not regularly surveyed, as for rented accommodation, which presence in the territory is certainly greater (Banca d'Italia, 2018). Looking at the official statistics we can see as Italian accommodation capacity composition has changed over the years: decrease of the number of hotels and increase in complementary structures that have almost doubled in the last 15 years. This is due to new trends in the accommodation sector as the new paradigms of hospitality have emerged: consumer preferences changing and the affirmation of booking online platforms. Particularly, the diffusion of these platforms, which facilitated the encounter between supply and demand, had led to an increase in the development of complementary structures (Banca d'Italia, 2018).

Figure 2.7 - Italian accommodation capacity



Fonte: Eurostat.
(1) Dati in migliaia. – (2) Dati in milioni.

Source: (Banca d'Italia, 2018)

2.2 Tourism sector environmental impacts

The tourism sector is also a significant contributor to environmental degradation and climate change (Budeanu, Miller, Moscardo, & Ooi, 2016; Gossling, 2002; Kucukusta, Pang, & Chui,

2013). Estimates show that the industry is responsible for roughly 8% of global greenhouse gases (GHG) emissions (Lenzen et al., 2018). Additionally, tourism can produce negative impacts on biodiversity and cultural landscape, generating a negative effect on its ability to provide those amenities that generate its success (Gössling & Buckley, 2016; Gössling, Hall, Ekström, Engeset, & Aall, 2012). Tourism activities strongly impacts on the environment, contributing not only to environmental degradation but also to the raising of GHG emissions associated with the sector (Pang, Mckercher, & Prideaux, 2013). The study of Lenzen et al. (2018) found that, between 2009 and 2013, tourism's annual global carbon footprint increased from 3.9 to 4.5bn tons of CO_2 equivalent. Additionally, forecasts indicate that the tourism industry is becoming more energy, freshwater, land and food intense, and within 25-45 years tourism resources use will double (Gossling & Peeters, 2015). Climate change and tourism are closely interrelated. While the tourism sector massively contributes to greenhouse gases emissions, mostly related to transportation, it also faces profound impacts from global warming, being one of the most vulnerable industries to environmental degradation and climate change (Gossling & Peeters, 2015; K. Smith, 1990). Considering this aspect, the success of the tourism industry in the long-term is strictly linked to its capacity to manage environmental sustainability issues (Bramwell & Lane, 2008). Therefore, addressing sustainability has become a major concern for the industry, policy makers and consumers (M. Lee, Han, & Willson, 2011). The European Environment Agency (2014) summarised the main environmental impact of tourism (Table 2.1).

Table 2.1 - Tourism Environmental impacts

Depletion of natural resources	**Water resources:** overuses of water resources resulting in water shortages, degradation of water supplies, generation of greater volume of wastewater, over-pumping for golf courses can cause saline intrusion into groundwater.
	Local resources: increased pressure on short-supply local resources, resulting in their greater extraction and transport, the demand has usually seasonal character (such as the use of wood in alpine areas or overfishing, causing shortage for local people, in coastal areas)
	Land degradation and conversion: Increased construction of tourism and recreational facilities (use of land for accommodation, including second homes, infrastructure and use of building materials) has increased pressure on resources such as minerals, fossil fuels, fertile soil, forests, wetlands, biodiversity habitat fragmentation, and scenic landscapes.
Pollution (Air emissions, noise, solid waste and littering, release of sewage, oil and chemicals,	**Air pollution and noise:** - Air pollution is continuously increasing in response to increased transport by air, road and rail, and transport emissions and emissions from energy production and use are linked to acid rain and global warming on global level, and photochemical pollution on local level.

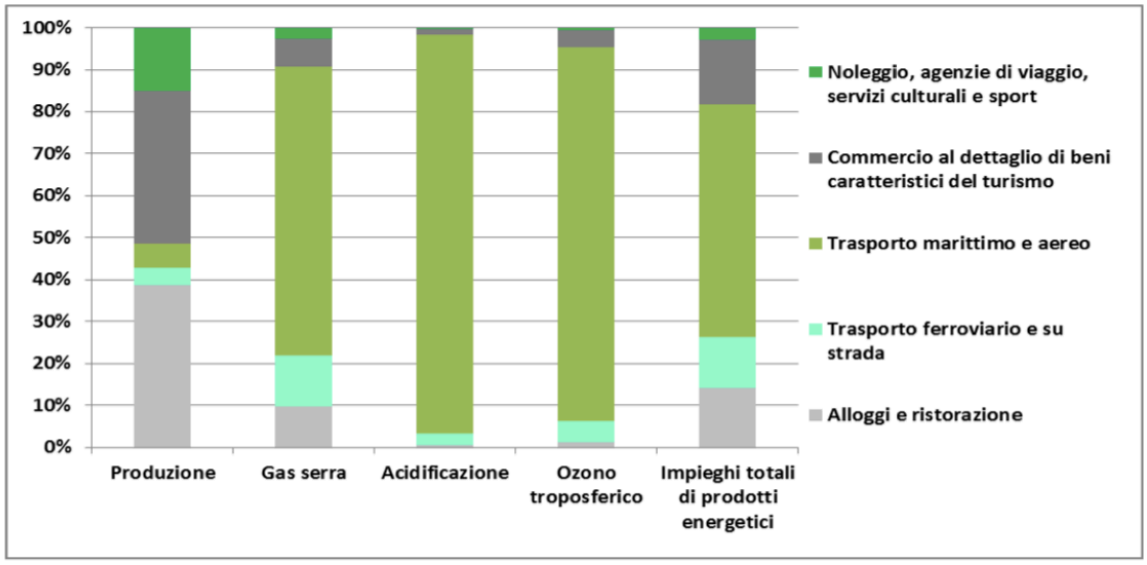
architectural/visual pollution)	- Noise pollution from airplanes, cars, buses, recreational vehicles such as snowmobiles and jet skis are causing annoyance, stress and even hear loss for humans and distress to wildlife.
	Solid waste and littering: In areas of high concentration of tourist activities and natural attractions, improper disposal can spoil natural environment, rivers, scenic views and roadsides, degrade appearance of water and shoreline and threatens marine life, also since trekking expeditions usually leave behind waste and unnecessary equipment, this practice combined with lack of collection or disposal facilities in remote areas causes degradation of mountain environment.
	Sewage: Increased number of recreational facilities often leads to increased sewage pollution of seas, lakes and rivers surrounding tourist attractions, damage of flora and fauna, damage to coral reefs by increased nutrients flow and algae growth covering coral reefs, another possible danger is change in salinity and transparency of water with impacts on coastal environments, sewage pollution can threaten health of humans and animals.
	Aesthetic pollution and cultural impacts: Tourism often fails to integrate its structures such as facilities themselves, roads, employee housing, parking, service areas and waste disposal facilities, with natural features and indigenous structures and architecture, archaeology, art and industrial heritage. It can have negative impacts on landscape, gateway communities outside protected areas and other host communities.
Physical impacts Are not caused only by tourism-related land clearing and construction, but by continuing tourist activities and long-term changes in local economies and ecologies.	**Physical impacts of Tourism Development** - Construction activities and infrastructure development (sand mining, beach and sand erosion, soil erosion, extensive paving, land degradation, loss of wildlife habitats and deterioration of scenery, habitat/ecosystem alteration and fragmentation) -Deforestation and intensified or unsustainable use of land (clearing of forested land for ski resorts, draining and filling of coastal wetlands for tourism facilities and infrastructure, causing disturbance and erosion of local ecosystems, even destruction in long term) - Marina development (changes in currents and coastlines, erosion and destruction of habitats, damage of coral reefs, disruption of land-sea connections)
	Physical impacts from Tourist activities -Trampling – impacts on vegetation: breakage and bruising of stems, reduced plant vigour, reduced regeneration, loss of ground cover, change in species composition - impacts on soil: loss of organic matter, reduction in soil macro porosity, decrease in air and water permeability, increase in run-off, accelerated erosion - Anchoring and other marine activities (tourist activities in marine areas can cause direct degradation of marine ecosystems with subsequent impacts on coastal protection and fisheries) - Wildlife disturbance effects (including synurbization, as the adaptation of animal wildlife to urban development) - Hazard introduction effects (introduction of alien species, diseases, hazards from negative behaviour)
Environmental impacts of tourism	**Loss of biological diversity:** Tourism (esp. natural tourism) is closely linked to biodiversity and attractions created by rich and varied environment. It can also cause loss of biodiversity by excessive use of land and resources and by exceeding carrying capacity of ecosystems. Loss of

	biodiversity means loss of tourism potential. Tourism can also introduce alien species causing disruption and destruction of ecosystems.
	Depletion of the ozone layer: Refrigerators and air conditioners containing ozone depleting substances (ODS) are still used in the hotel and tourism industry. Emissions from jet aircraft are also a significant source of ODS. By 2015, it is predicted that half of the annual destruction of ozone layer will be caused by air travel.
	Climate change and GHG emissions: Global tourism is closely linked to climate change and GHG emissions. Tourism accounts for about 50 % of traffic movements and through rapidly expanding air traffic is presents a significant contributor to the increasing concentrations of GHG in the atmosphere (around 5% of total emissions)

Source: (European Environment Agency, 2014)

The Italian Institute of statistic, ISTAT, has elaborated in 2015 integrated economic and environmental account for the Italian tourism sector. This pilot study was developed for the Measuring the Sustainability of Tourism (MST) project, launched since 2015 by the World Tourism Organization (United Nations World Tourism Organization, UNWTO). The ISTAT has measured the environmental pressures of tourism starting from the integration of existing accounting schemes: the "tourism satellite account" and "environmental economic account"(ISTAT, 2019a). The ISTAT study is experimental and makes it possible to measure the environmental contribution of tourism and Italian accommodation facilities in relation to their economic and production contribution. As we can see from Figure 2.8 the transport activities in terms of production account for a total of 10% of tourism activities, the same activities make up over 65% of energy use, 80% of GHG emissions and over 90% of acidification and formation of tropospheric ozone. On the other hand, accommodation and catering activities and the retail trade of tourist goods, which account for 75% of the production of tourist activities as a whole, have much lower impact on the emissions and energy use because they are characterized by low levels of energy and emission intensity (Figure 2.8).

Figure 2.8 - Production, emissions and energy use of tourism activities. Year 2015 (percentage composition)



Source: (ISTAT, 2019a)

2.3 Societal implications of tourism development

Tourist flows, if on the one hand contribute to the socio-economic growth of the local host communities, on the other hand, if not properly managed, can interfere with the preservation of the cultural identity of local populations, causing critical social issues. Local communities, in fact, often model themselves according to the preferences and expectations of tourists. This causes a change in behaviour and habits on the part of local inhabitants, often leading to a trivialization and standardization of culture. The local identities are manifold and are constantly being transformed. The places are inhabited by a heterogeneous community composed of people who react differently to the presence of tourism in their cities: for some, tourism is a great source of advantage because it brings work, territorial redevelopment, more and more efficient services; others, instead, show an open hostility towards tourists, emphasizing only the negative aspects brought by the tourist industry. Contact with 'the other', in any case, is never neutral: it affects the sociality and culture of both tourists and residents. Pizam & Milman (1984) defined social and cultural impacts of tourism as: "*the ways in which tourism is contributing to changes in value systems, individual behaviour, family relationships, collective lifestyles, moral conduct, creative e expressions, traditional ceremonies and community organization. In other words, they are the effects on the people of host communities of their direct and indirect associations with tourists*".

Starting from the work of Deery, Jago, & Fredline (2012) that reviewed scholar literature on the main sociocultural impacts of tourism, Scholtz (2014) summarised in his PhD thesis review positive and negative social impacts of tourism dividing them in tangible and intangible (Table 2.2).

Table 2.2 -Tangible and Intangible social impacts of tourism

Tangible social impacts	Intangible social impacts
Positive impacts	
• Justifies environmental protection and improvement • Provides employment for artists, musicians etc. because of visitor interest in local cultures • Provides tourists with recreational facilities which may also be used by local residents • Opportunities for local businesses • Strengthens local economy • Revenue for local Government • Funding for public services (health, education etc.) • Maintenance of public facilities • Improves public transport	• Reinforces preservation of heritage and tradition • Tourism breaks down language-, class-, racial-, political- and religious barriers • Creates a favourable worldwide image for a destination • Promotes a global community • Promotes international understanding and peace • Community pride • Intercultural interactions (learning etc.) • Greater community organisation (people learn to work together) • Social inclusion • Urban regeneration • Improved local environment • Improved livelihood security • Empowerment • Development of new skills
Negative impacts	
• Develops excess demand for resources • Spread of disease • Transportation problems • Economic fluctuation • Increase in crime • Increase in prostitution • Degrades natural environment (pollution etc.) • Inflation • Unbalanced economic developments • Excess demand for resources • Cheap labour from external sources • Noise levels • Alcohol related behavioural problems • Illegal drug use • Exclusion of locals from natural resources • Gambling • Property values	• Seasonality (only sometimes have customers) • Degrades the cultural environment • Threatens family structure • Commercialises culture, religion and art • Creates misunderstandings • Conflicts in the host society • Social dualism (adoption of another culture) • Demonstration effect (younger generation adopts behaviour and attitudes of tourists) • Stereotyping • Xenophobia • Language degradation (slang) • Increased cost of living

Source: Scholtz (2014) and Deery, Jago, & Fredline (2012)

2.4 Sustainable tourism

Therefore, it arises the need to implement efficient policies and practices that may meet the twofold goals of reducing its negative impact on the environment while generating a positive impact on the society and the economy (Fusco Girard & Nocca, 2017).

Figure 2.9 - Tourism contributions to world economy

Source: (World Tourism Organization (UNWTO), 2018)

The international community has widely recognized the importance to develop sustainable tourism and has defined this concept as follow: "*tourism that takes full account of its current and future economic, social and environmental impacts, addressing the needs of visitors, the industry, the environment and host communities*" (United Nations World Tourism Organization and United Nations Environment programme, 2005 p.11-12). However, different definitions of sustainable tourism have been formulated over the years. The UNWTO has defined sustainable tourism as: "*Sustainable tourism development meets the needs of present tourists and host regions while protecting and enhancing opportunity for the future. It is envisaged as leading to management of all resources in such a way that economic, social, and aesthetic needs can be fulfilled while maintaining cultural integrity, essential ecological processes, biological diversity, and life support systems*"(World Tourism Organization (WTO), 1998).

According to the UNWTO sustainable tourism should:

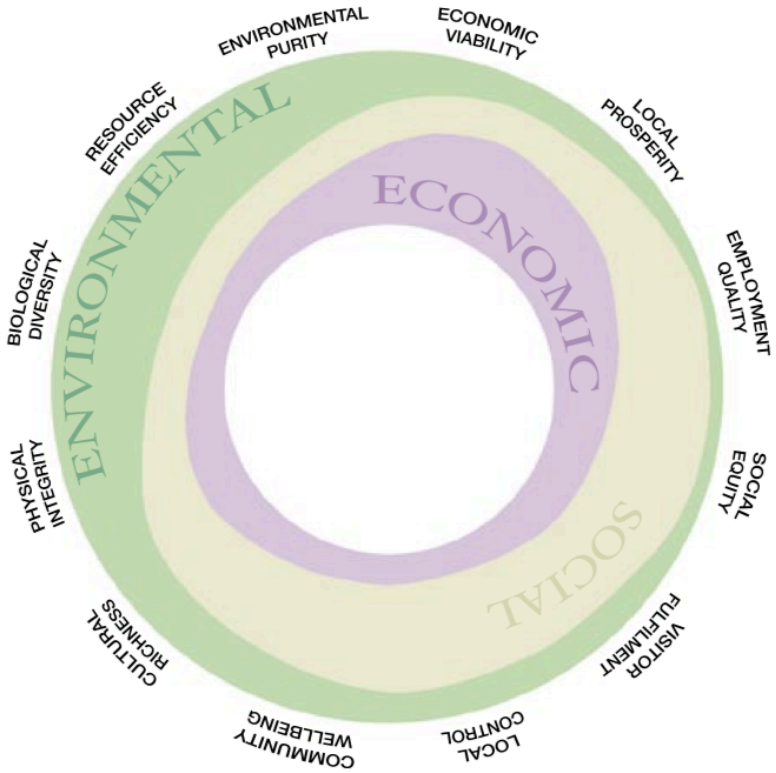
- Make optimal use of environmental resources that constitute a key element in tourism development, maintaining essential ecological processes and helping to conserve natural heritage and biodiversity.
- Respect the socio-cultural authenticity of host communities, conserve their built and living cultural heritage and traditional values, and contribute to inter-cultural understanding and tolerance.
- Ensure viable, long-term economic operations, providing socio-economic benefits to all stakeholders that are fairly distributed, including stable employment and income-earning opportunities and social services to host communities, and contributing to poverty alleviation.

In the report "Making Tourism More Sustainable" published by UNEP and UNWTO twelve pillars, emphasizing economic, social and environmental aspects, have been selected as guiding principles for sustainable tourism (United Nations World Tourism Organization and United Nations Environment programme, 2005) (Figure 2.7). These pillars are strictly interconnected with each other and linked in relation of economic, environmental and social considerations.

Especially, there are two basic directions playing a very important role in the set of twelve pillars (United Nations World Tourism Organization and United Nations Environment programme, 2005).

- Minimize the negative impacts of tourist industry in terms of environment, social-cultural and economic aspects;
- Maximize the positive contribution from tourist industry, and enlarging the benefits for local residents and visitors, protecting natural resources and cultural heritages.

Figure 2.10 - Twelve pillars for Sustainable Tourism



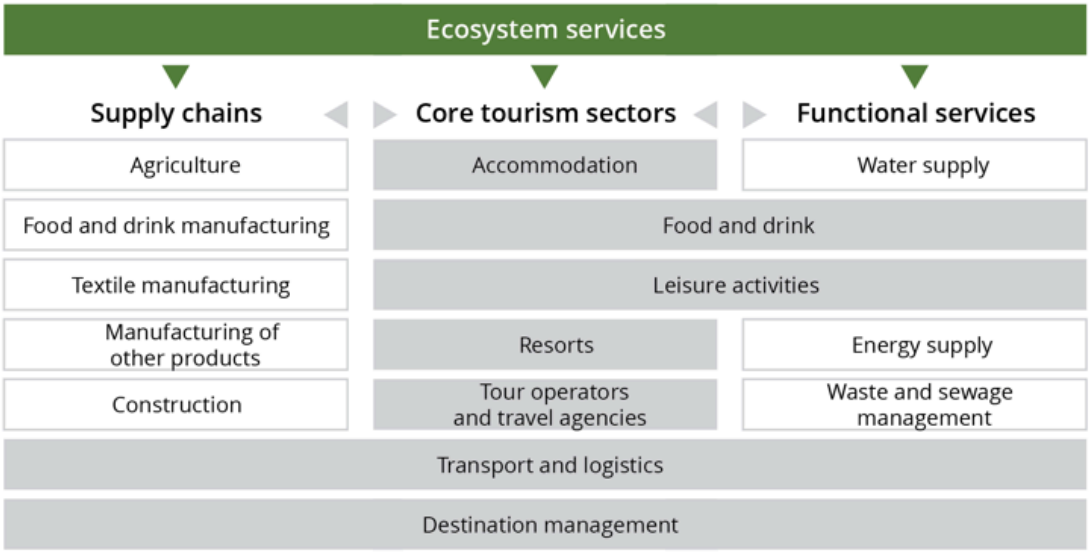
(United Nations World Tourism Organization and United Nations Environment programme, 2005)

Chapter 3 “Going green” in the hotel industry

3.1 The accommodation sector environmental impacts

Considering the boundaries of the tourist system supply chain, summarized in Figure 3.1 (European Environment Agency, 2014), this thesis particularly focuses on the accommodation sub-sector of this system.

Figure 3.1 - Components of the tourism system



Source: (European Environment Agency, 2014)

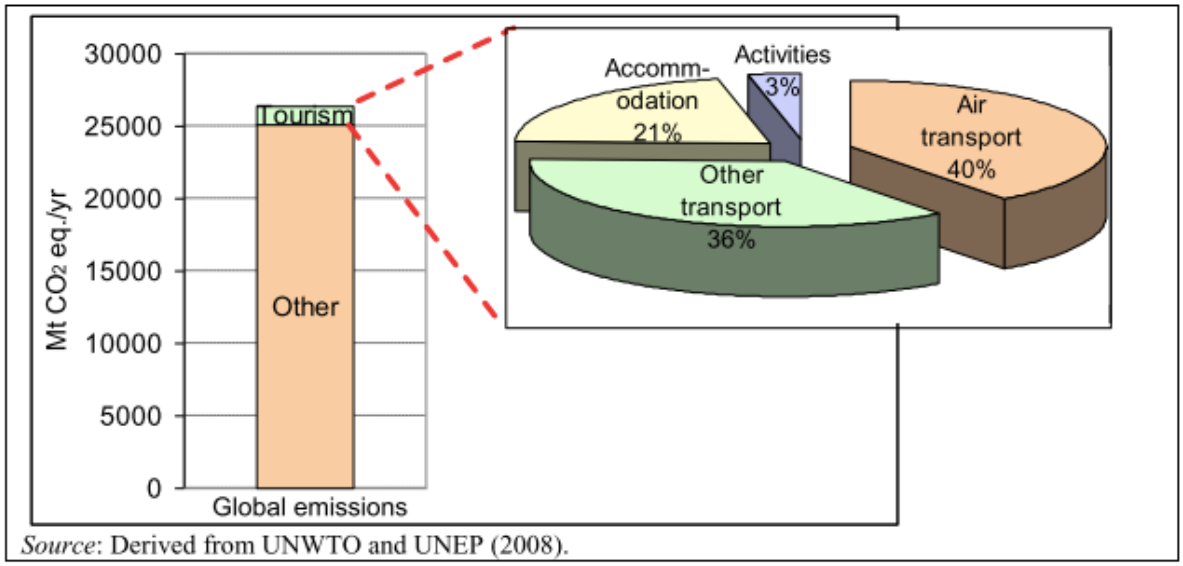
The tourist accommodation service has been defined by the European Commission (2017) as: “*the provision, for a fee, of sheltered overnight accommodation in appropriately equipped rooms, including at least a bed, offered as a main service to tourists, travellers and lodgers. The provision of overnight sheltered accommodation may include the provision of food services, fitness activities and/or green areas*”. Accommodation is a fundamental element of the tourism product (Sharpley, 2000). In fact, accomodation is one of the largest and most ubiquitous subsector within the tourism economy (Cooper, Fletcher, Fyall, Gilbert, & Wanhill, 2008). Moreover, according to the NACE classification, the tourist accommodation facilities can be divided in:

- **Hotels and similar accommodation** (NACE 55.10): This class includes accommodation provided by hotels; resort hotels; suite/apartment hotels and motels.

- **Holiday and other short-stay accommodation** (NACE 55.20): This class includes accommodation provided by children and other holiday homes; visitor flats and bungalows; cottages and cabins without housekeeping services and youth hostels and mountain refuges.
- **Camping grounds, recreational vehicle parks and trailer parks** (NACE 55.30): This class includes: provision of accommodation in campgrounds, trailer parks, recreational camps and fishing and hunting camps for short stay visitors; provision of space and facilities for recreational vehicles; accommodation provided by protective shelters or plain bivouac facilities for placing tents and/or sleeping bags.

The accomodation sector is one of the most harmful hospitality sector in terms of environmental impacts (Rahman, Reynolds, & Svaren, 2012). This sector is responsible for roughly 20% of the tourism emissions (European Commission - Joint Research Centre - Institute for Environment and Sustainability, 2012) (Figure 3.2). However, beside GHG emissions the accommodation sector is responsible for a variety of environmental impacts. According to Bohdanowicz (2006b) the 75% of accomodation environmental impact is due to resources consumption followed by emissions released to air, water, and soil. These aspects are posing serious environmental and reputational problems to accommodation managers.

Figure 3.2 - GHG emissions associated with the accommodation sector

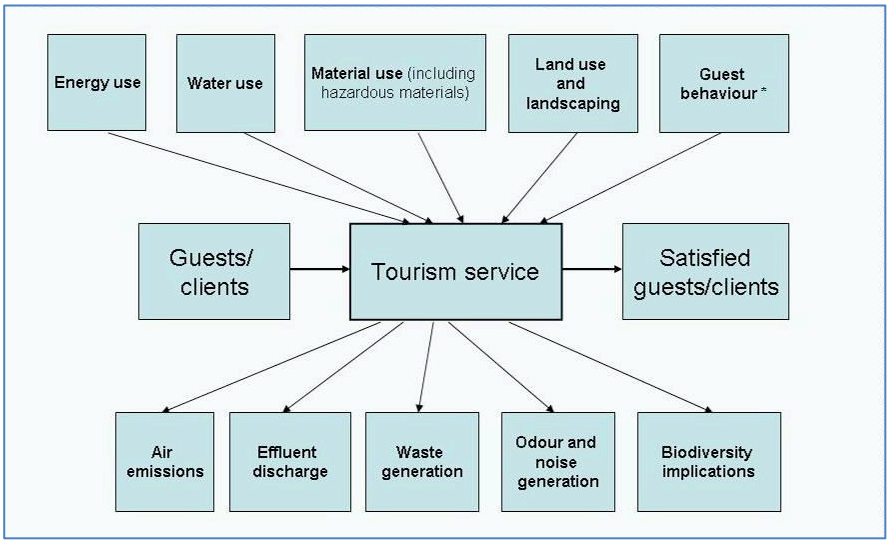


Source: (European Commission - Joint Research Centre - Institute for Environment and Sustainability, 2012)

The accommodation sector is one of the most important sectors of the travel and tourism industry, but is also a major energy and water-intensive sector in its day to day operations (Han et al., 2018; Verma & Chandra, 2016). The Sectoral Reference Document (SRD) in the tourism

sector elaborated by the European Commission, the Joint Research Centre, and the Institute for Environment and Sustainability (2012) summarised the main environmental impacts from tourism activities (Figure 3.3).

Figure 3.3 - Tourism Activities Environmental Impacts



Source: (European Commission - Joint Research Centre - Institute for Environment and Sustainability, 2012)

In this document the Best Environmental Management Practice (BEMP) in the tourism sector have been elaborated to provide sector-specific guidance and to set the benchmark of excellence and environmental performance indicators for tourism activities. Increased pressure on the environment comes from different activities of the accommodation sector, and in the Sectoral Reference Document (SRD) the main environmental impacts and pressures associated with tourism accommodation services for these activities have been reported (Table 3.1).

Table 3.1 - Activities in tourism organisations (hotels, campsites, restaurants and tour operators) and associated environmental aspects and pressures

Service/Activity	Main environmental aspects	Main environmental pressures
Administration	– Office management – Reception of clients	– Energy, water and material (mainly paper) consumption – Generation of municipal waste (large amounts of paper) and hazardous waste (e.g. toner cartridges)
Technical services	– Production of hot water and space heating/cooling – Lighting – Elevators – Swimming pools	– Energy and water consumption – Consumption of a range of hazardous products – In some cases, use of CFC and HCFC refrigerants [1].

[1] CFC and HCFC stand for chlorofluorocarbon and hydro chlorofluorocarbon

	– Green areas – Pest and rodent control – Repair and maintenance	– Emissions to air (air pollutants, greenhouse gases) – Generation of a wide range of potentially hazardous waste types such as empty chemical containers – Generation of wastewater
Restaurant/bar	– Breakfast, dinner, lunch – Beverages and snacks	– Supply chain pressures (see 'Purchasing') – Energy, water and raw material consumption – Generation of municipal waste (especially food waste and packaging waste)
Kitchen	– Food conservation – Food preparation – Dish washing	– Supply chain pressures (see 'Purchasing') – Significant consumption of energy and water – Generation of municipal waste (especially food waste and packaging waste) – Generation of vegetable oil waste – Generation of odours
Room use	– Use by guests – Products for guests' use – Housekeeping	– Energy, water and raw materials consumption – Use of a wide range of hazardous products – Generation of waste packaging and small amounts of municipal waste – Generation of wastewater
Laundry	– Washing and ironing of guests' clothes – Washing and ironing of towel, bedclothes, etc.	– Significant consumption of energy and water – Use of hazardous products – Generation of wastewater
Purchasing	– Selection of products and suppliers – Storage of products	– Supply chain pressures (land occupation, degradation or destruction of ecosystems, disturbance of wildlife, energy and water consumption, emissions to air of pollutants and greenhouse gases, emissions to water, waste generation) – Generation of packaging waste – Hazardous substance leakages
Activities	– Indoor activities – Outdoor activities	– Energy, water and raw materials consumption – Local impacts on ecosystems – Noise – Generation of municipal waste – Infrastructure pressures (see 'Building and construction')
Transport	– Transport of guests – Transport of employees – Transport by suppliers	– Energy (fuel) consumption – Emissions to air – Infrastructure pressures (see 'Building and construction')
Additional services	– Medical services, supermarkets, souvenir shops, spa and wellness, hairdresser, etc.	– Energy, water and raw materials consumption – Generation of municipal waste, and some specific hazardous waste types (e.g. sanitary waste)
Building and construction	– Construction of new areas or services – Repair of existing areas or services	– Land occupation – Degradation or destruction of ecosystems – Disturbance of wildlife – Energy and water consumption – Significant consumption of raw materials and hazardous products – Significant generation of construction waste

		– Generation of hazardous waste

Source: (European Commission - Joint Research Centre - Institute for Environment and Sustainability, 2012)

3.2 Green hotels and green practices in the hotel industry

Considering the environmental impacts of the accommodation sector analysed in the previous sections, I decided to focus this analysis on the hotel response to this sustainability issues. Indeed, hotels are the primary form of accommodation and one of the most important subsectors of the travel and tourism industry. However, their activity is associated with a great environmental impact. Hotels are a major energy and water-intensive sector in their day to day operations (Han et al., 2018; Verma & Chandra, 2016). To overcome these issues hoteliers are increasingly introducing hotel eco-friendly practices in the management of their operations, not only to develop a more eco-friendly business environment but also to reduce their operating costs (Yi, Li, & Jai, 2018). Indeed, the hotel sector has been a pioneer of corporate social responsibility (CSR) practices in the tourism sector. Since decades, has been applying green practices, starting to consider environmental related aspects of the service as a pillar in its operations (Han et al., 2018; J. Park & Kim, 2014; J. Wang, Wang, Xue, et al., 2018). The implementation of green practices in the hotel industry is becoming in the last years a pivotal aspect of hotel management strategy (S. H. Kim & Choi, 2013a). This is due not only to managers awareness of this impact, but also to the fact that consumers are becoming increasingly aware of hotels environmental impact and seems to appreciate hotels' efforts to reduce their environmental footprint (Yi et al., 2018). The efforts of hotels towards more sustainable activities are positively judged by consumers (Oroian, Rațiu, & Gheres, 2014), enhancing customer satisfaction (Han & Kim, 2010) and loyalty (Han et al., 2018) and indirectly increasing firms' competitiveness (Bagur-Femenias et al., 2016). Considering these phenomena, many hotels have been proactive in adopting green practices and becoming greener, to attract eco-consciousness consumers that are demanding "green consciousness" in hotels operation management (J. Wang, Wang, Xue, et al., 2018; Yi et al., 2018). Therefore, addressing sustainability has become a major concern for the industry, policy makers and consumers (M. Lee et al., 2011). Hoteliers are adapting to these "green wave" providing ecofriendly attributes to their services and transforming their business in "green hotels" or "environmentally friendly hotels"(Verma & Chandra, 2016). Green hotels can be defined as: "*pro-environmental lodging properties which implement different green practices such as saving water and energy, reducing the solid waste, and recycling and reusing the durable*

service items (e.g., bins, towels, etc.) to protect the earth we live in" (Green Hotel Association, 2012; Han, Hsu, & Lee, 2009; Y. Kim & Han, 2010). Similarly, Bohdanowicz, (2005) has defined green hotels as those that: "*practice certain functional or operational tasks in the areas of energy efficiency, water conservation, waste reduction, and clean air*". Green hotels are transforming the way in which hospitality managers are doing business. Nowadays, green hotels are implementing a wide spectrum of green practices, such as waste recycling, energy and water savings, and certification standards (Berezan, Raab, & Love, 2013; T. Hsiao, Chuang, Kuo, & Yu, 2014; X. Xu & Gursoy, 2015). As a consequence, several definitions of green practices in the hospitality context have been proposed. Kim et al. (2017) define them as "*a value-added business strategy that benefits a hospitality operation that engages in environmental protection initiatives*"(p.236), embracing the evidence that are commercially-driven actions that provide both financial and commercial added value while reducing the environmental impact (S.-H. Kim et al., 2017). Water conservation, towel and linen reuse programmes, the use of energy-efficient light bulbs and wastewater treatments are among the most popular green practices adopted in the hotel industry (Bohdanowicz, 2006a; R. Y. K. Chan, Leung, & Wong, 2006; Manganari & Dimara, 2015).

3.3 Drivers and barriers of green practices implementation

Considering the developments in the hospitality industry, going green is becoming an effective strategy to boost hotels competitiveness and gaining market share, acquiring sustainability-sensitive guest segments (Merli, Preziosi, Acampora, Lucchetti, & Ali, 2019; Verma & Chandra, 2018; Yi et al., 2018). Green hotels are recognized as a great opportunity to exploit this differentiation factor in the market (Cronin, Smith, Gleim, Ramirez, & Martinez, 2011; Dodds & Holmes, 2016) and to succeed in the marketplace (X. Luo & Bhattacharya, 2006). Hotels benefit from green practices implementation mainly from two sources. First, the potential gains of resource efficiency and the related savings in consumption and prevention of fines, and legislation-driven interventions (e.g. water and energy consumption) (Bonilla Priego, Najera, & Font, 2011). Second, a legitimization among stakeholder and the creation of new market opportunities deriving from the growing attention of consumers toward sustainability (S. Chen, Chen, Zhang, & Xu, 2018). However, hotels are also face several barriers in adopting green practices. Alonso-Almeida et al. (2017) identified internal (financial barriers, operational barriers and internal forces) and external (consumer attitude and legislation) barriers to the

implementation of hotels' green practices (Alonso-Almeida et al., 2017). Tarí, Claver-Cortés, Pereira-Moliner, & Molina-Azorín (2010) pointed out that lack of information and funding and limited skills are the most frequently reported barriers for the adoption of green practices. Moreover, Tzschentke, Kirk, & Lynch (2008) found that potential negative effect on quality standards, the lack of adequate infrastructure and the lack of governmental support are key barriers for green integration for small environmentally accredited businesses. Ayuso (2007), summarized the main incentives and barriers for green practices implementation in hotels as shows in Figure 3.4.

Figure 3.4 - Drivers and Barriers for Green practices implementation

Incentives • Financial gain (reducing costs or increasing efficiency) • Ethical stance (altruistic or personal concern for the environment) • Response to customer demand • Improved hotel image ('green image') • Marketing advantage	Bohdanowicz (2005), Bramwell & Alletorp (2001), Cheyne & Barnett (2001), Kirk (1998), Tzschentke *et al.* (2004), Vernon *et al.* (2003)
Obstacles • Costs too high (investment and running costs) • Lack of time and knowledge • Jeopardise customers satisfaction • Difficult to involve staff • Belief that hotels are not responsible for environmental impact	Bohdanowicz (2005), Bramwell & Alletorp (2001), Forsyth (1995), Stabler & Goodall (1997), Vernon *et al.* (2003)

Source: (Ayuso, 2007)

However, business take action for different reasons, but they need to be certain that implementing green practices in their hotels makes good business sense (Graci & Dodds, 2008). From a company perspective to understand if hotel' green commitment lead to a better financial performance it's a matter of interest for both scholars and managers. Even if a great amount of papers has dealt with this research question, a univocal response still does not exist. Generally, the implementation of environmental management strategies in hotels has been found by scholars positive correlated with better company environmental performance (Mei-fang Fang Chen & Tung, 2014; H. M. Choi, Kim, Kim, & Agmapisarn, 2018), better financial performance (Aragon-Correa, Martin-Tapia, & de la Torre-Ruiz, 2015; Inoue & Lee, 2011), increase competitive advantage (Gürlek & Tuna, 2018; Iraldo, Testa, Lanzini, & Battaglia, 2017), better green image (R. J. C. Chen, 2015), reduced costs (Butler, 2008; T. Y. Hsiao, Chuang, & Huang, 2018) and greater stakeholders satisfaction (Molina-Azorín, Claver-Cortés, Pereira-Moliner, & Tarí, 2009; Tarí et al., 2010).

Particularly, Molina-Azorín et al. (2009) found that environmental management exerts a significant influence on hotel performance conceptualized as occupancy rate per room, gross operative profit, and gross operative profit per available room per day, stakeholder satisfaction and competitive performance. Bagur-Femenías, Martí, & Rocafort (2015) in their study stated that environmental practices implementation boost company's competitiveness and indirectly their financial performance, through a better company image, customer and employee satisfaction and company differentiation strategy. In C.-J. Wang (2014) study, ethical and sustainable practices have been found affective organizational commitment, innovation and customer loyalty and that all have positive effects on business performance.

Moreover, Tarí et al. (2010) demonstrated that the joint implementation of Quality and Environmental management has a positive effect on hotel competitive performance (Room occupancy rate, Market share gain, Average sales growth in the last five years, Income per room, Total gross profit, Gross profit per room, Wealth creation (Accounting value of the firm with respect to its market value), Capacity to generate profit in times of crisis) and stakeholder satisfaction (Customer satisfaction level and Employee satisfaction level).

Singal (2014) found that investment in the hotel' environmental strategy in one period had a positive impact on the next period's credit rating. Moreover, Leonidou, Leonidou, Fotiadis, & Zeriti (2013a) stated that an environmental marketing strategy can lead hotels to acquire a unique competitive advantage enabling hotels to achieve superior market and financial performance, and market performance is expected to affect financial performance favourably. Contrarily, Aznar, Sayeras, Galiana, & Rocafort (2016) found no positive relationship between financial performance and commitment to sustainability. Furthermore, Jackson, Singh, & Parsa (2015) study shows as this relationship is dual; in fact, they stated that firms' financial performance influence the adoption of environmental initiatives as they have more resources to be allocated on firm' environmental strategy.

For what concern the reduction of the cost associated with eco-friendly practices implementation in hotels María D. López-Gamero, Pertusa-Ortega, Molina-Azorín, Tarí-Guilló, & Pereira-Moliner (2016) findings show that hotel adoption of environmental practices contributes to increasing competitive advantage and cost competitive advantage. Also, Leonidou et al. (2013), founded in their study that environmental proactivity contributes to decreasing cost and differentiation competitive advantage in the hotel industry. However, (Shieh, 2012) study' results showed as green practices are insignificantly associated with the cost efficiency of a hotel. Nevertheless, also (Bagur-Femenias et al., 2016) findings seems to

contradict these results as even in small hotels, green practices seems to enhance efficiency leading to better use of resources and then cost savings.

Additionally, green practices implementation in hotels seems to affect employee loyalty (Han & Hyun, 2019) employee pro-environmental behaviour (Islam, Ali, & Asad, 2018; Tian & Robertson, 2017), employee job satisfaction and employee organizational commitment (Yen, Chen, & Teng, 2013).

Several scholars studied the correlation between hotel size and environmental management implementation. The majority of this studies supports the hypothesis that larger hotels are more likely to develop a comprehensive green strategy for improve hotel sustainability (Álvarez Gil, Burgos Jiménez, & Céspedes Lorente, 2001; Rahman et al., 2012; Smerecnik & Andersen, 2011). Moreover, Hsieh (2012) stated that large hotels are more likely to communicate their commitment towards the environmental sustainability in their website and information material. According to Ouyang, Wei, & Chi (2019) large hotels and luxury hotels are more likely to adopt green practices as they are subject to greater social attention about their impact on the environment. Instead, for Álvarez Gil et al. (2001) this is due to the concomitant effect of economies of scale and the existence of slack resources. Additionally, N. A. Tzschentke et al. (2008) suggest that in small hotels the decision to implement green practices is more likely to be influenced by owner or managers personal values and environmental beliefs than in larger hotels.

Furthermore, scholars investigate the relation between green management implementation and chain-affiliated and independent hotels. Rahman et al. (2012) found that chain-affiliated hotels are stronger adopters of green practices than are independent hotels. According to Smerecnik & Andersen (2011) this difference is due to the fact that independent hotel environmental commitment relies more on managers interest in sustainability, while chain hotels have more strategic environmental policies and values. This is supported also by Bohdanowicz (2005) that found independent hotels green strategy more dependent on manager's attitude and knowledge in contrast with chain-affiliated hotels that incorporate this strategy in their company policies with a top-down approach, imposed on individual establishments. Álvarez Gil et al. (2001) found a series of advantages for chains hotel in the implementation of their environmental management:

- chains have more access to environmental information

- chains may take advantage of the successful practices of individual units and distribute it among members of the chain
- hotel chains may support individual units by providing them with training on environmental protection techniques, methods and/or activities; facilitating their inclusion in programs or activities already functioning or that are known to be useful; providing technical advice to hotels that start up such activities; easing their access to more ecological markets.

Moreover, Ingram & Baum (1997) affirmed that affiliation with a chain can also set a minimum level for environmental responsibility that may foster the implementation of green practices for associated hotels.

3.4 Certify hotel' environmental commitment: environmental certifications, EMS and Eco-labels

One way for the hotels to demonstrate to guests their commitment to go green and at the same time manage their environmental impacts is adopting voluntary environmental instruments (Ayuso, 2007). Indeed, more and more hotels are implementing environmental certification programs to reduce their environmental impacts and earn recognition from customers (T. Y. Hsiao et al., 2018; Martínez García de Leaniz, Herrero Crespo, & Gómez López, 2018). Environmental certifications help hotels to assure customers about their genuine interest in environmental issues and their commitment to the sustainable management of hotel activities (Martínez García de Leaniz et al., 2018). Geerts (2014) pointed out the main reasons for implementing an environmental certification schemes. According to this author hotel managers decide to certify their green commitment mainly to access to the expertise of the certification body, reduce the risk of being seen as 'greenwashed' hotel, to gain credibility, to provide potential guests with more accurate information about hotels environmental performance, to gain profitability (Geerts, 2014). According to Ayuso, (2006) the most applied self-regulation instruments in the hotel industry are codes of conduct, best environmental practices, eco-labels, environmental management systems (EMSs) and environmental performance indicators (World Travel and Tourism Council (WTTC), International Hotel and Restaurant Association (IH&RA), International Federation of Tour Operators (IFTO), United Nations Environment Programme (UNEP), International Council of Cruise Lines (ICCL), 2002). In her study on Spanish hotels implementation of voluntary policy instruments for sustainable tourism, Ayuso

(2007), categorized them according to their scope and their main drivers and barriers (Figure 3.5).

Figure 3.5 - Comparison of voluntary policy instruments for sustainable tourism

Policy tool	*Scope*	*Incentives*	*Obstacles*
Codes of conduct	To show commitment of improving environmental performance of the company	• Low effort and costs • Possible delivery of specific services	• Lack of knowledge of existing codes
Best environmental practices	To take action to improve the environmental performance of the company	• Cost savings in the medium/long term • Response to demands of customers and tour operators • Personal awareness of hotel manager • Improvement of company image	• Difficulties in involving hotel staff • Lack of collaboration of customers
Ecolabels and awards	To ensure the environmental performance of the company with regard to certain aspects, and offer the corresponding information to the consumer	• Cost savings in the medium/long term • Response to demands of customers and tour operators • Personal awareness of hotel manager • Official recognition of environmental commitment • Improvement of company image	• High costs for applying and maintaining the ecolabel • Confusion due to existence of different ecolabel schemes • Lack of knowledge and interest of customers and tour operators
Environmental management systems (EMSs)	To manage the environmental performance of the company and improve it continuously according to a planned strategy	• Cost savings in the medium/long term • Response to demands of customers and tour operators • Personal awareness of hotel manager • Official recognition of environmental commitment • Improvement of internal management system • Improvement of company image • Compliance with legal requirements	• High cost for certification audits • Difficulties in involving hotel management and staff • Important change of routines and management style • Lack of support from public authorities, suppliers and subcontractors
Environmental performance indicators	To assess and communicate the environmental performance of the company	• Cost savings in the medium/long term • Response to demands of tour operators • Improvement of internal management system	• Difficulty collecting the necessary data

Source: (Ayuso, 2007)

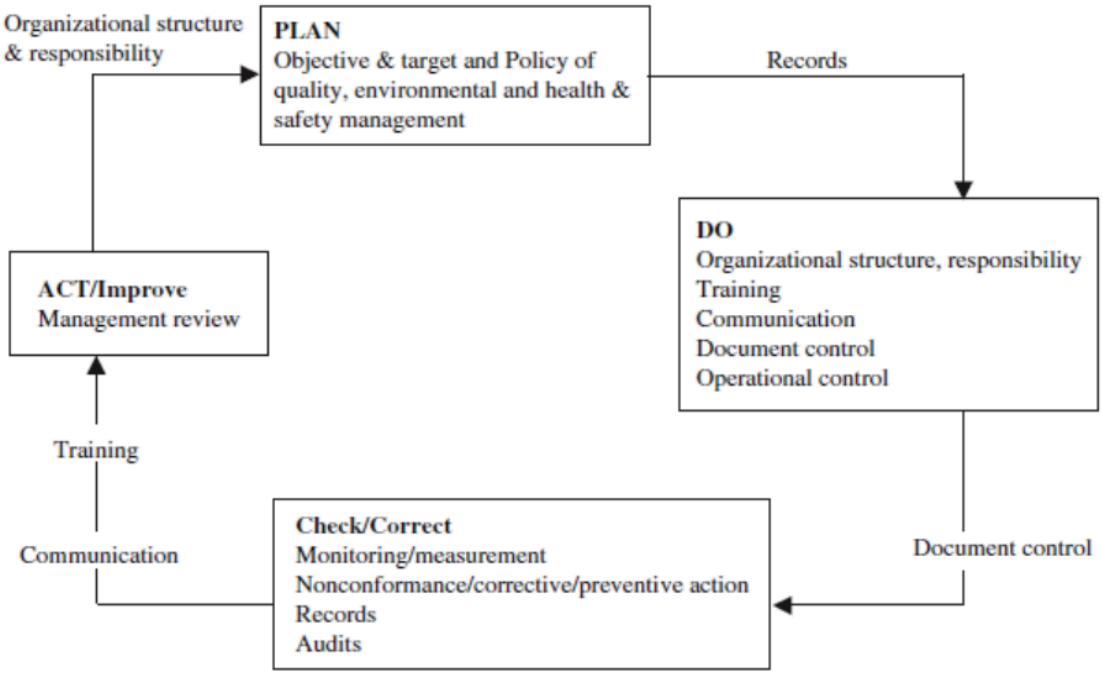
These voluntary initiatives can be categorized in two different types: product-oriented and process-oriented. The product-oriented ones refer to eco-labels, which aim to promote products less harmful for the environment and to Environmental product life cycle assessment. Process-oriented instruments, instead, guide firms in internalizing and orientating their processes toward a reduced environmental impact (Merli, Lucchetti, Preziosi, & Arcese, 2018). Eco-labels, together with Environmental Management Systems (EMS), have been proven to be the most effective in reducing companies' negative impact on the environment and to communicate hotel's efforts toward sustainability (Ayuso, 2007; Tepelus & Córdoba, 2005). Those certifications, released by an independent third party, support hoteliers in proposing the voluntary implementation of green practices and in differentiating on the market, avoiding green-washing operations (H. Chen, Bernard, & Rahman, 2019; Martínez García de Leaniz et al., 2017). Moreover, eco-labels and certification can be useful tools in transmitting information to consumers and can help companies to market and communicate their eco-friendly efforts (Gössling & Buckley, 2016; Martínez García de Leaniz et al., 2017). In the next Sections I will examine in depth their main characteristics and their application in the hotel industry.

3.4.1 Environmental Management Systems (EMS)

In this context, sustainability is a strategic choice for companies. This choice is influenced by both internal and external drivers. The internal ones are the ethical motivations that inspire the top management and the perception of being able to obtain from sustainability strategies a competitive advantage. The external drivers, however, concerns the pressures exerted towards the company by customers, environmentalists, institutions, community and more generally by all those actors that can be considered, in one way or another, company's stakeholders (Leonidou, Leonidou, Fotiadis, & Zeriti, 2013b). The problem of sustainability in the hotel industry has led in the recent years to a proliferation of projects, protocols and tools to develop sensitivity, for both enterprises and consumers (Buffa, Franch, Martini, & Tamanini, 2018; Ouyang et al., 2019; H. C. Wu & Cheng, 2019). A systematic way through which companies can manage their environmental pressure and embrace a voluntary path for sustainability are the Environmental Management Systems (EMSs) (Steurer, Langer, Konrad, & Martinuzzi, 2005). The Environmental Management system is: "*a part of the overall management system of an organization, which consists of organizational structure, planning, activities, responsibilities, practices, procedures, processes, and resources for developing, implementing, achieving, reviewing, and maintaining the environmental policy*" (El Haggar, 2005). Together with the ISO 14001:2015 standard, the Eco-Management and Audit Scheme (EMAS) is the most widely known third-party certified EMS. The EMAS has more stringent requirement respect to the ISO 14001, especially considering external communication, as registered organizations have to produce a public document (Environmental Statement) that includes specific environmental indicators (Francesco Testa et al., 2014). Both the EMAS regulation and the ISO 14001 standard identify the fundamental phases for the implementation of an environmental management system that aims to continuously improve the environmental performance of the company, which coincide with the Deming cycle (Figure 3.6):

- initial environmental examination, in order to quantify and analyse the environmental aspects and impact of the company on the environment;
- a planning phase of the improvements to be pursued (Plan); a phase of implementation and operation of the environmental management system (Do);
- a monitoring and control phase aimed at identifying the necessary corrective actions (Check);
- a system review and management review phase (Review)

Figure 3.6 - Deming Cycle



Source: (Muzaimi, Chew, & Hamid, 2017)

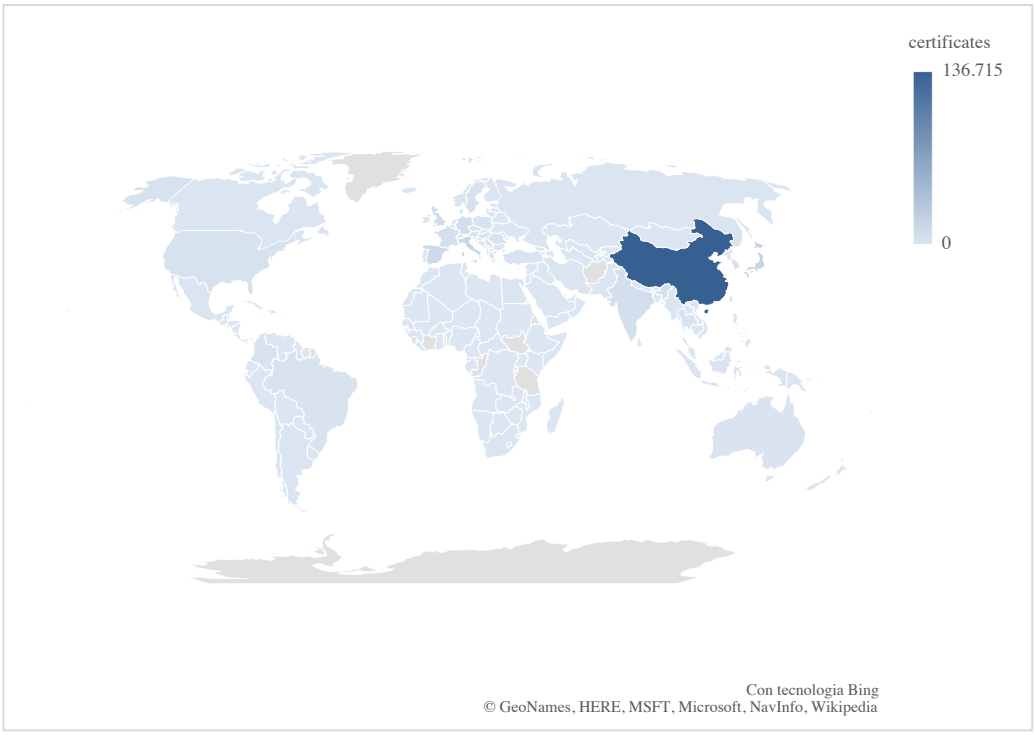
Both the EMAS and the ISO14001 have been employed also by hotels managers as an effective way to analyse and improve hotel environmental performance, and with the use of specific indicators to monitor the progressive reduction of their environmental impact (T. Y. Hsiao, Chuang, Kuo, & Yu, 2014).

3.4.1.1 ISO 14001 in Hotels

Parallel to the European diffusion of EMAS, starting from 1995, the date of publication by the ISO (International Standardization Organization) of the first version of the ISO standard concerning environmental management systems, the adoption by the companies of another type of voluntary environmental certification: the one obtained according to the standards of the ISO 14000 series. The UNI EN ISO 14001:2015 standard "Environmental management systems - Requirements with guidance for use" is a standard, known and recognized internationally that identifies the main characteristics of a "management system" aimed at safeguarding and protecting the environment (ISO (the International Organization for Standardization), 2015). The development of the environmental management system is aimed, as for the EMAS regulation, at the continuous improvement of the management of environmental problems attributable to the organization. In particular, the standard requires that activities, aimed at continuous improvement of the environmental aspect of firm activities.

According to “ISO14001 2018 Survey” results, at the 31 December 2018 307,.059 certificate were issued and 447.547 site were certified (ISO (the International Organization for Standardization), 2019). Figure 3.7 shows the geographical distribution of the ISO 14001 certificates. The country where the ISO14001 is most diffuse among firms is China with 136.715 certificates issued, followed by Japan (19.131 certificates), Italy (15.118 certificates) and Spain (12.198 certificates) (Figure 3.7).

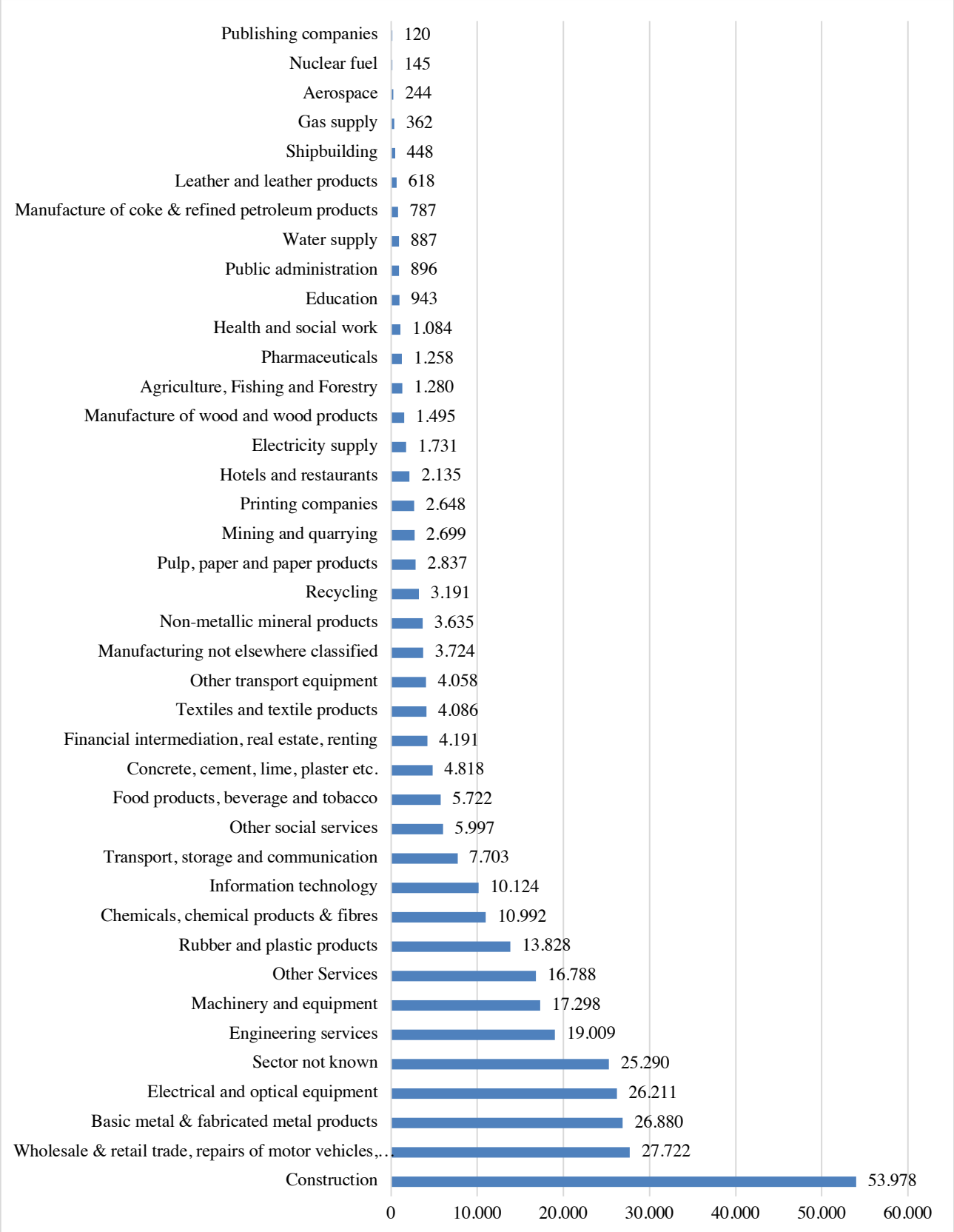
Figure 3.7 - Number of ISO 14001 certificates worldwide



Source: Author own elaboration on ISO14001 2018 Survey data (ISO (the International Organization for Standardization), 2019)

Going then to analyse the division of certifications by sector, we can see how the construction sector is the most active in the implementation of the standard with 53.978 certificates followed by the “wholesale & retail trade, repairs of motor vehicles, motorcycles & personal & household goods” sector with 27.722 certificates and by the “basic metal & fabricated metal products” sector with 26.880 certificates. The sector of hotels and restaurants instead counts 2135 certifications and it ranks only 25th among the sectors with the most certifications.

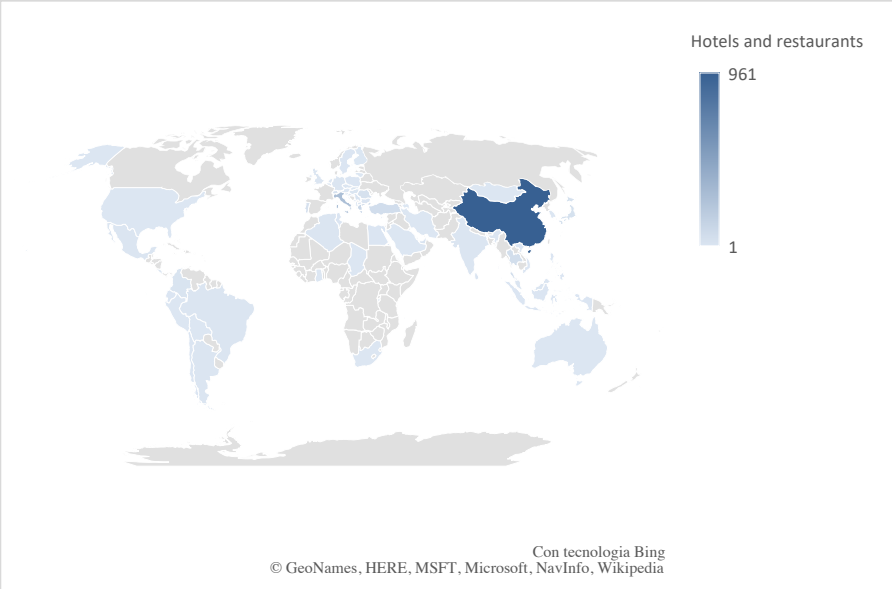
Figure 3.8 - ISO 14001 certificates for sector



Source: Author own elaboration on ISO 14001 2018 Survey data (ISO (the International Organization for Standardization), 2019)

According to the geographical distribution of hotels and restaurants ISO 14001 certifications, China is the most certified country with 961 certifications, followed by Italy with 282 certifications, Spain (159), Greece (115) and Turkey (66) (Figure 3.9).

Figure 3.9 - Hotel and restaurant sectors ISO 14001 certificates countries distribution



Source: Author own elaboration on ISO 14001 2018 Survey data (ISO (the International Organization for Standardization), 2019)

Several scholars studied the implementation of ISO 14001 in hotels. For instance, W. W. Chan & Ho (2006) explored the application of ISO 14001 EMS through three case study on Hong Kong hotels. They found that collaboration with green body, trade associations and university departments can guide hotels in the implementation of the EMS and in better allocate monetary investments (W. W. Chan & Ho, 2006).

The main motivations for ISO 14001 implementation in the hotel industry have been pointed out by E. S. W. Chan & Wong (2006). These authors find that internal forces (corporate governance and legislation) influence certification adoption, more that the external forces.

E. S. W. Chan (2008) also identified the main barriers to ISO 14001 EMS diffusion in the hotel sector. He found that the main barriers to EMS adoption are implementation and maintenance costs, lack of professional advice, lack of knowledge and skills, lack of resources, certifiers/verifiers and uncertainty of outcome, with the internal barriers (knowledge, skills, resources, and maintenance cost, etc.) having a greater role in hindering EMS. Moreover, Segarra-Oña, Peiró-Signes, Verma, & Miret-Pastor (2012) study shows that ISO-certified hotels have better economic performance and that larger hotels and hotels in natural

surroundings are more likely to implement ISO 14001. Additionally, Kasim (2015) demonstrated that EMS development in hotels can facilitates organizational learning, leading to enhanced organizational performance and business success. This result is supported also by Iraldo et al. (2017) that found ISO 14001 certification having a positive effect on company competitiveness and enhancing employee participation and commitment. Finally, M.-V. Segarra-Oña, Peiro-Signes, Verma, Mondejar-jimenez, & Vargas-vargas (2014) found that ISO 14001 certification has a positive effect on guests' hotel review.

3.4.1.2 EMAS and Best Environmental management practices (BEMPs) for the accommodation sector

The Eco-Management and Audit System (EMAS) is a management tool developed by the European Commission in 1993 to allow organizations to evaluate, communicate and improve their environmental performance. This type of system is open to any type of organization wishing to improve its environmental performance and applicable to all sectors. The EMAS, likewise the ISO 14001, for the implementation of the EMS follows the 4 phases of the Deming cycle: Plan, Do, Check, Act.

However, before starting the planning phase (plan), there are two steps that the organization that are implementing EMAS must perform: the first concerns the collection of information useful for implementing EMAS by contacting the local competent body; the second involves an initial environmental analysis of their organization.

Additionally, after the 4 phases of the Deming cycle, in order to obtain the environmental certification, companies must draw up an environmental statement, which represents a communication and information tool concerning company's environmental performance, aimed at the public, and at the institutional and territorial stakeholders outside the company. Once the environmental statement has been processed, through the phases shown in figure 3.10, it must then be validated by an independent environmental verifier, accredited for this purpose. The verification concerns both the completeness and the truthfulness of the declaration and the respect of all the EMAS requirements in the implementation of the EMS. Subsequently the validated environmental declaration is sent to the competent body of the Member State where the site is located, making it then available for the public after obtaining registration in the list of registered sites. Once the relative registration and publication in the European Union Registry has been obtained, the company may use the EMAS logo, in accordance with the

procedures set forth in art. 10. The environmental declaration must be re-published every three years, when the registration is renewed.

Figure 3.10 - EMAS registration phases

Source: (European Commission, 2019a)

Introduced by the European Commission with Regulation 1836/93 "On the voluntary adherence of companies in the industrial sector to a community eco-management and audit system", EMAS I aimed to continuously improve environmental performance and inform the public about environmental efficiency. However, the first EMAS regulation turned out to be an effective tool with respect to the internal problems of companies: compliance with environmental legislation, saving of environmental and financial resources, management efficiency, involvement of employees in environmental management. On the other side, it was mostly inadequate to improve the "external" results related to the improvement of the corporate image, relations with stakeholders outside the company, and administrative simplifications. These reasons were the basis of the process of revision and modification of EMAS I which resulted in the issuance by the European Parliament and Council of Regulation (EC) No. 761/2001 of March 19, 2000. This decision was published in the Official Journal L 114 (page 1) of 24 April 2001, then amended by Regulation 196/2006 to realign the requirements of the EMS with the provisions of the new ISO 14001:2004. The latest version of the EMAS III regulation dates back to 2009: Regulation (EC) No. 1221/2009 of 25 November 2009 on voluntary participation by organizations in a Community eco-management and audit scheme

(EMAS) that repeals the regulation (EC) No. 761/2001 and Commission Decisions 2001/681/EC and 2006/193/EC. This regulation was also enforceable from 11 January 2010.

The regulation introduces several new features:

- lightening of the registration procedure;
- Bureaucratic simplification aimed at facilitating the accession of companies, especially SMEs;
- Greater emphasis on precise environmental performance indicators, concerning energy efficiency, material efficiency, water use, waste, emissions and biodiversity to be included in the environmental declaration;
- A concrete simplification is implemented in the legal controls for the registered companies;
- the registration can be achieved and recognized even to organizations operating outside the EU.

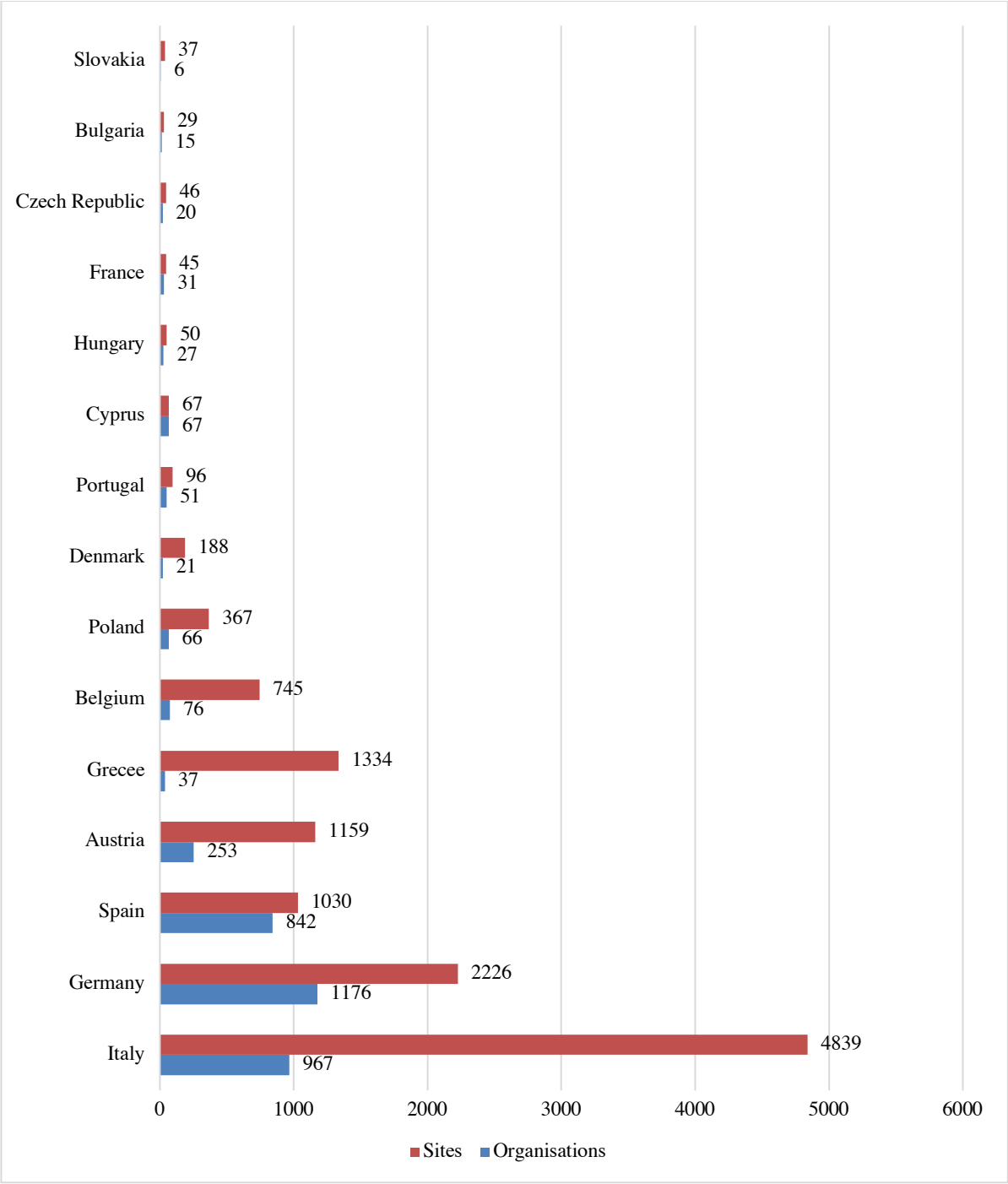
EMAS III included two new registration methods for organizations with non-European sites:

- corporate EMAS: allows multinationals with both EU and non-EU sites to request a single cumulative registration;
- global EMAS: allows non-EU organizations to join EMAS.

In 2017 Annexes I, II and III of the EMAS Regulation were amended to include the changes associated with the revision of the ISO 14001:2015 standard. The Commission Regulation (EU) 2017/1505 amending these annexes entered into force on 18/09/2017.

The last statistics of EMAS certified companies date back to April 2019 and are available on the dedicated European Commission webpage (European Commission, 2019b). Currently, 3,728 organisation and 12,.409 sites are registered EMAS. Figure 3.11 shows the fifteen countries with more sites and organisations awarded with EMAS certification. The countries with more certification are Italy with 967 certified organisations and 4839 sites, Germany with 1176 organisations and 2226 sites, Spain with 842 organisations and 1030 sites, followed by Austria (253 organisations and 1159 sites) and Greece (37 organisations and 1334 sites) (Figure 3.11) (European Commission, 2019b).

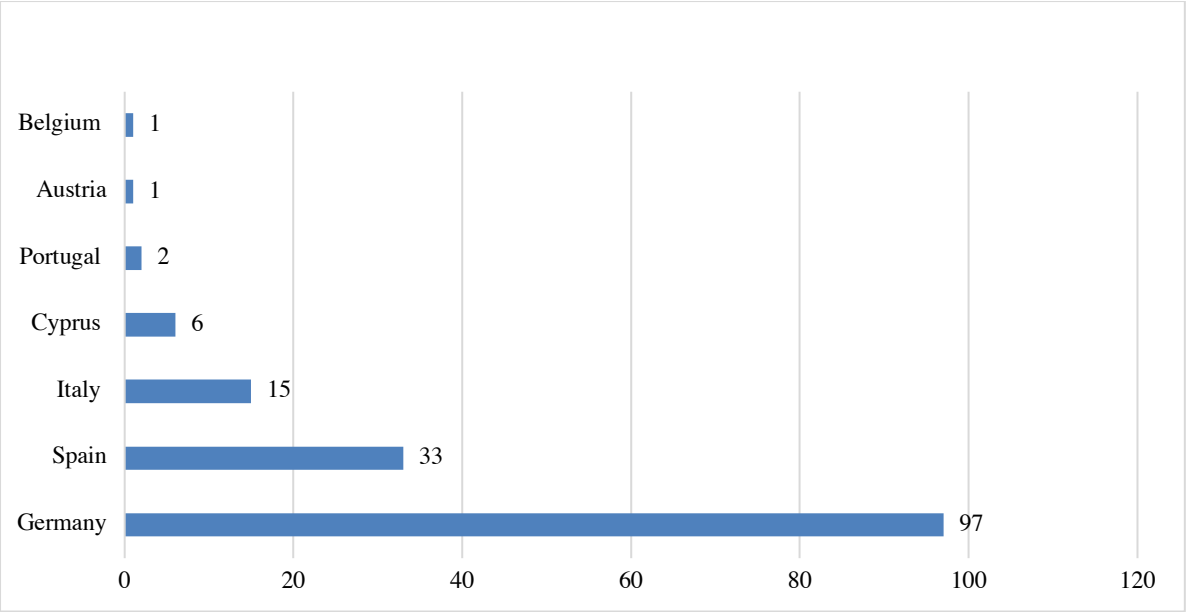
Figure 3.11 - EMAS register organisation and sites



Source: Author own elaboration on European Commission (2019) data

Then I used the European Commission (2019) database to extract specific data on the diffusion of EMAS certification on the accommodation sector. Currently, there are 155 organisations registered with the EMAS scheme of which 97 are in Germany, 33 in Spain, 15 in Italy, 6 in Cyprus, 2 in Portugal, 1 in Austria and 1 in Belgium (Figure 3.12).

Figure 3.12 - EMAS certified organisations in the accommodation sector for country



Source: Author own elaboration on European Commission (2019) data

The EMAS regulation, due to its lower diffusion, has been less studied in literature than the ISO 14001. However, some studies on the implementation of EMAS in the hotel sector have been developed in scientific literature (Kasim, 2015; S.-H. Kim et al., 2017).

Particularly, Maria Jesús Bonilla-Priego & Avilés Palacios (2008) explored EMAS implementation in Spanish hotels. These authors analysed the environmental reports of EMAS registered companies to explore the environmental indicators used in these reports. They found that Organizational performance indicators (OPIs) are more often disclosed by hotels than Management performance indicators (MPIs). In the OPIs category the most frequently disclosed indicators were energy consumption, water use, and generated waste. Results of this study also fail to confirm their initially hypotheses that the level of environmental disclosure was influenced by hotels characteristics as size, type of tourism (rural or coastal vs urban), ownership, and years having environmental certifications. In another study, Maria Jeśus Bonilla-Priego, Najera, & Font (2011) explored hotels managers' perceptions of EMAS and the main reasons behind certification in Spanish hotels. They found that environmental legal compliance is jointly the main motivation and the main benefit for EMAS. Additionally, results from their study suggest that hotel managers struggle to recognized EMAS as a source of competitive advantage. According to these authors this is also linked to the fact that environmental management is not strategically internalised by EMAS registered companies and to the difficulties companies are facing in exploit the demand-led change related to EMAS

implementation and in adopting a successful green marketing strategy based on the EMS. Pröbst & Müller (2012) examined the integration of EMAS regulation and ISO standards for eco-label compliance. They stated that the integration between the two may raise the quality of the label, ensuring external evaluation and enhancing their comparability for owners as well as clients. Moreover, Rodríguez-Antón, Del Mar Alonso-Almeida, Celemín, & Rubio (2012) studied the use of different sustainability management systems in the Spanish hotel sector. They found that the most commonly adopted certified EMSs are Sector Specific, ISO 9001, ISO 14001 and OHSAS 18001 and EMAS. However, they found that analysing the sequence that follows the implementation of standards in the hotel industry, companies firstly implemented ISO 9001, secondly sector specific quality management systems, followed by ISO 14001 and EMAS, and finally, OHSAS 18001.

The EMAS Regulation (Article 46) also encourages the development of specific Sector Reference Documents (SRD) to assist registered organizations. These documents are aimed to the identification of the best environmental management practices and environmental performance indicators for each specific sector, in order to define a comparison between organizations according to their environmental performance levels (JRC, 2015). The aim of SRD is to provide to all organizations an overall picture of the best management practices in their own environmental field. The SRD also want to serve as a guide not only for organizations already registered under EMAS, but also for those seeking to achieve the registration in the future, those who already have an EMS or those who are simply interested in improving their environmental performance. The Sectoral Reference Document (SRD) in the tourism sector has been elaborated by the European Commission, the Joint Research Centre, and the Institute for Environment and Sustainability (2012). In this document the Best Environmental Management Practice (BEMP) in the tourism sector have been described to provide sector-specific guidance and to set the benchmark of excellence and environmental performance indicators for tourism activities. Table 3.2 summarizes the BEMPs, the environmental performance indicators and the benchmarks of excellence for the accommodation sector.

Table 3.2 - EMAS' BEMPs for the accomodation sector

Scope	BEMP	BEMP Description	Environmental performance indicator	Benchmarks of excellence
Cross-cutting issues	Environmental management system implementation	BEMP is to undertake an assessment of the most important direct and indirect environmental aspects associated with the organisation, and to apply relevant performance indicators and compare with relevant benchmarks of excellence.	Implementation of an environmental management system (y/n)	- Appropriate indicators are used to continuously monitor all relevant aspects of environmental performance, including less easily measurable and indirect aspects such as biodiversity impacts. - All staff are provided with information on environmental objectives and training on relevant environmental management actions. - Best environmental management practices are implemented where
	Supply chain management	BEMP is to screen supply chains for products and services used by the organisation in order to identify supply chain environmental hotspots, considering the entire value chain, and to identify relevant control points (e.g. product selection, avoidance, green procurement, supplier criteria) that can be used to minimise the environmental impact over the whole value chain.	Percentage of products and services complying with specific environmental criteria (%)	- The organisation has applied life cycle thinking to identify improvement options for all major supply chains that address environmental hotspots. - ≥ 97 % of chemicals (by active ingredient weight or purchased volume) used in accommodation and restaurant premises are certified according to an ISO Type I ecolabel (1) (or can be demonstrated to be the most environmentally friendly available option). - ≥ 97 % of all wood, paper and cardboard purchased by accommodations and restaurants are recycled or environmentally certified (eco-labelled, FSC, PEFC).
Minimising water consumption in accommodation facilities	Water system monitoring, maintenance and optimisation	BEMP is to undertake a water consumption audit and monitor water consumption across key water- consuming processes and areas (i.e. sub-metering) in order to identify efficiency improvement options, and to ensure that all equipment is maintained through appropriate periodic inspection, including during housekeeping.	Water consumption per guest-night (l/ guest-night)	- Implementation of a site-specific water management plan that includes: (i) sub-metering and benchmarking all major water- consuming processes and areas; (ii) regular inspection and maintenance of water system 'leak points' and appliances. - Total water consumption ≤ 140 L per guest-night in fully serviced hotels, and ≤ 100 L per guest-night in accommodation where the majority of the bathrooms are shared (e.g. hostels).
	Efficient water fittings in guest areas	BEMP is to install efficient water fittings, including low-flow spray taps and low-flow thermostatic showers, low- and dual-flush WCs, and waterless urinals. In the interim, aerators may be retrofitted to existing fittings.	- Water consumption per guest-night (l/ guest-night) - Energy consumption for water heating (kWh/guest-night)	- Water consumption, and associated energy consumption for water heating, of ≤ 100 L and 3,0 kWh per guest-night, respectively, for en suite guest bathrooms.

			- Flow rates of showers, bathroom taps, urinals and toilet flushes (l/ min or l/flush)	- Shower flow rate ≤ 7 L/min, bathroom tap flow rate ≤ 6 L/ min (≤ 4 L/min new taps), average effective toilet flush ≤ 4,5 L, installation of waterless urinals
	Efficient housekeeping	BEMP is to minimise laundry requirements through green procurement of bedclothes and towels (in terms of size, density, colour, material), and by requesting or encouraging guests to reuse bedclothes and towels. Best practice is also to train staff on the implementation of water- and chemical-efficient cleaning methods, and to procure environmentally certified consumables for bedrooms and bathrooms.	-Laundry mass generated per guest- night (kg/guest-night) - Percentage of reused towels and bedclothes (%) - Consumption of chemical products for cleaning and dishwashing in terms of active chemical ingredients per guest- night (g/guest-night) - Percentage of ISO Type I eco-labelled chemicals and textiles (%)	- At least 80 % of bedclothes are cotton-polyester mix or linen. - At least 80 % of bedroom textiles have been awarded an ISO Type I ecolabel (e.g. EU Ecolabel) or are organic. - Consumption of chemical products for cleaning and dishwashing (excluding laundry detergents, special cleaners and pool chemicals) ≤10 grams of active chemical ingredients per guest- night. - Reduction in laundry achieved through reuse of towels and bedclothes of at least 30 %. - At least 80 % (by active ingredient weight or purchased volume) of the all-purpose cleaners, sanitary detergents, soaps and shampoos used by the tourist accommodation have been awarded an ISO Type I ecolabel (e.g. EU Ecolabel).
	Optimised small-scale laundry operations	BEMP is to procure the most water- (and thus energy-) efficient washing extractors and the most energy-efficient driers (e.g. heat-pump driers) and ironers, to reuse rinse water and, in high-water- stress areas, the main wash water following micro-filtration. Best practice is also to recover heat from wastewater and exhaust ventilation air.	Water consumption per kg of laundry (l/kg) (i31) Energy consumption per kg of laundry (kWh/kg) (i32) Percentage of eco-labelled laundry detergents (%)	-For small scale laundry operations, all new domestic washing machines have an EU energy label rating of A+++, and commercial washing machines have an average laundry water consumption ≤ 7 L per kg of laundry washed. - Total on-site small-scale laundry process energy consumption ≤ 2,0 kWh per kg of textiles, for dried and finished laundry products. - At least 80 % of the small-scale laundry detergents used (by active ingredient weight or purchased volume) have been awarded an ISO Type I ecolabel (e.g. EU Ecolabel, Nordic Swan, Blaue Engel).
	Optimised large-scale or outsourced laundry operations	BEMP is to select an efficient laundry service provider that is certified by an ISO Type I ecolabel or that complies with criteria in such labels, or to ensure that on-site large-scale laundry operations comply with such criteria.	-Eco-labelled laundry service (y/n) - Water consumption per kg of laundry (l/kg) -Energy consumption per kg of laundry (kWh/kg) - Percentage of eco-labelled laundry detergents (%)	- All outsourced laundry is carried out by a provider who has been awarded an ISO Type I ecolabel (e.g. Nordic Swan), and all in-house large-scale laundry operations, or laundry operations outsourced to non-certified service providers, comply with the relevant benchmarks. -Total water consumption over the complete wash cycle of large-scale laundry operations of ≤ 5 L per kg textile for accommodation laundry and ≤ 9 L per kg textile for restaurant laundry.

				- Total process energy consumption for dried and finished large- scale laundry products of ≤ 0,90 kWh per kg of textiles for accommodation laundry and ≤ 1,45 kWh per kg of textiles for restaurant laundry. - For large-scale laundry operations, exclusive use of laundry detergents for professional use compliant with an ISO Type I ecolabel (e.g. EU Ecolabel, Nordic Swan), applied in appropriate doses.
	Optimised pool management	BEMP is to optimise the frequency and timing of backwashing based on the pressure drop rather than fixed schedules, to use ozonation or UV treatment and careful dosing control to minimise chlorination, and to recover heat from exhaust ventilation air.	-Implementation of a pool environmental management plan (y/n) -Application of ozonation or UV treatment (y/n)	Implementation of an efficiency plan for swimming pool and spa areas that includes: (i) benchmarking specific water, energy and chemical consumption in swimming pool and spa areas, expressed per m2 of pool surface area and per guest-night; (ii) minimisation of chlorine consumption through optimised dosing and use of supplementary disinfection methods such as ozonation and UV treatment
	Rainwater and grey water recycling	BEMP is to install a grey water recovery system that recovers grey water for use in indoor processes (e.g. toilet flushing) following treatment, or for exterior processes (e.g. irrigation), or a rainwater collection system that uses rainwater for indoor purposes.	Implementation of grey water or rainwater recycling (y/n)	Installation of a rainwater recycling system that supplies internal water demand, and/or a grey water recycling system that supplies internal or external water demand.
Waste and wastewater management in accommodation facilities	Waste prevention	BEMP is to prevent waste generation through green procurement of products, considering product life cycle impacts — for example by avoiding single-use items (food, soaps, shampoos) and by buying cleaning agents in concentrated and bulk form — and by careful management of procurement volumes.	Waste generation per guest-night (kg/ guest- night)	Total waste generation (sorted plus unsorted) ≤ 0,6 kg per guest-night.
	Waste sorting and sending for recycling	BEMP is to provide separated waste collection facilities throughout the establishment, to ensure that there is a clear procedure for waste separation, and to contract relevant recycling services at least for glass, paper and cardboard, plastics, metals and organic waste.	- Percentage of waste sent for re-use or recycling (%) - Unsorted waste generated per guest- night (kg/guest-night) Benchmarks	- At least 84 % of waste, expressed on a weight basis, is sent for recycling. - Unsorted waste sent for disposal is ≤ 0,16 kg per guest-night.

	Wastewater treatment BEMP	BEMP is to install an on-site waste water treatment system that treats waste water at least to secondary, and preferably to tertiary, level, and includes at least pre-treatment to screen solids and settle particulate matter followed by efficient biological treatment (e.g. in a sequencing batch reactor) to remove a high proportion of COD, BOD, nitrogen and phosphorus from the final effluent. Sludge is treated and disposed of in an environmentally acceptable manner.	- Removal efficiency of on-site wastewater treatment (e.g. % of BOD, COD) - Concentration in final effluent (mg/l) (e.g. BOD, COD, total nitrogen, phosphorous) Benchmarks	Where it is not possible to send wastewater for centralised treatment, on-site wastewater treatment includes pre-treatment (sieve/bar-rack, equalisation and sedimentation) followed by biological treatment with > 95 % BOD5 removal, > 90 % nitrification, and (off-site) anaerobic digestion of excess sludge.
Minimising energy consumption in accommodation facilities	Energy monitoring and management systems	BEMP is to undertake an energy audit and monitor energy consumption across key energy-consuming processes and areas (i.e. sub-metering) in order to identify efficiency improvement options, and to ensure that all equipment is maintained through appropriate periodic inspection (also according to ISO 50001)	- Implementation of a site-specific energy management plan (y/n) - Specific energy use (kWh/m2yr)	- Implementation of a site-specific energy management plan that includes: (i) sub-metering and benchmarking all major energy-consuming processes; (ii) calculation and reporting of primary energy consumption and energy-related CO2 emissions. - For existing buildings, final energy use for HVAC (heating, ventilation and air conditioning) and water heating ≤ 75 kWh, or total final energy use ≤ 180 kWh, per m2 heated and cooled area per year
	Improved building envelope	For new buildings, BEMP is to ensure that these are compliant with the highest achievable energy ratings, such as the PassiveHouse and Minergie P standards. For existing buildings, BEMP is retrofitting to minimise heating and cooling energy requirements	Specific energy use (kWh/m2yr)	- For existing buildings, final energy use for HVAC (heating, ventilation and air conditioning) and water heating ≤ 75 kWh, or total final energy use ≤ 180 kWh, per m2 heated and cooled area per year. - For new buildings, the rated energy performance conforms with Minergie P or PassiveHouse standards or equivalent.
	Optimised HVAC systems	BEMP is to minimise energy consumption from HVAC (heating, ventilating, and air conditioning) systems by installing products with the top energy label classes (when applicable), zoned temperature control and controlled ventilation with heat recovery (ideally controlled by CO2 sensors) and energy- efficient components (e.g. variable-speed fans), and to optimise HVAC in relation to	Specific energy use (kWh/m2yr)	- For existing buildings, final energy use for HVAC (heating, ventilation and air conditioning) and water heating ≤ 75 kWh, or total final energy use ≤ 180 kWh, per m2 heated and cooled area per year. - For new buildings, the rated energy performance conforms with Minergie P or PassiveHouse standards or equivalent

		building-envelope and energy source characteristics.		
	Efficient applications of heat pumps and geothermal heating/cooling	BEMP is to install efficient (e.g. eco-labelled, products with the top energy label classes) heat pumps for heating and cooling, or, where possible, groundwater cooling.	Specific energy use (kWh/m2yr)	Water-source heat pumps and/or geothermal heating/cooling are used in preference to conventional heating and cooling systems wherever feasible, and heat pumps comply with EU Ecolabel criteria and with the top energy label classes. 3 41
	Efficient lighting and electrical equipment	BEMP is to install zoned and appropriately sized compact fluorescent and LED lighting with intelligent control based on motion, natural light and time. BEMP is also to optimise building design and interior layout with respect to the use of natural light, considering the energy impact of large glazed areas for heating and cooling. As regards electrical equipment (white goods and consumer electronics), products with EU Ecolabel or the top energy label classes should be chosen whenever possible.	- Installed lighting capacity (W/m2) - Lighting-specific energy use (kWh/m2yr) - Total electricity use (kWh/m2yr)	- Installed lighting capacity ≤ 10 W per m2 - Lighting electricity use ≤ 25 kWh per m2 heated and cooled floor area per year. - Total electricity use ≤ 80 kWh per m2 heated and cooled floor area per year
	Renewable energy sources	BEMP is to install on-site geothermal, solar or wind energy generation equipment where appropriate, and to procure electricity from a genuine (i.e. verifiably additional) renewable electricity supplier.	- Percentage of final energy use met by renewable energy generated on site (%) - Use of certified renewable energy credits (y/n)	- The equivalent of 50 % of the accommodation's annual energy use is generated by on-site renewable sources, or by verifiably additional off-site renewable energy sources. - 100 % of electricity is from traceable renewable electricity sources not already accounted for by another organisation or in the national electricity average generating mix, or that are less than two years old.
Restaurants and hotel kitchens	Green sourcing of food and drink products BEMP	BEMP is to assess food and drink supply chains to identify environmental hotspots and key control points, including selection of environmentally certified products and editing of menus to avoid particularly damaging ingredients (e.g. endangered fish species and some out-of-season fruit) and ensure judicious portioning of meat and dairy products and availability of vegetarian options.	Percentage of environmentally certified ingredients (by value) (%)	-The organisation is able to provide documented information, at least including country of origin, for all main ingredients. - At least 60 % of food and drink products, by procurement value, are environmentally certified (e.g. organic)

	Organic waste management	BEMP is to minimise avoidable food waste by careful menu development and portion sizing, and to ensure that all organic waste is separated and sent for anaerobic digestion where available, or alternatively incineration with energy recovery or local/on-site composting.	- Organic waste generation (kg per dining guest) - Percentages of organic waste sent for anaerobic digestion, alternative energy recovery, composted on-site or sent for composting (%)	- ≥ 95 % of organic waste is separated and diverted from landfill, and, where possible, sent for anaerobic digestion. - Total organic waste generation ≤ 0,25 kg per dining guest, and avoidable waste generation ≤ 0,18 kg per dining guest.
	Optimised dishwashing, cleaning and food preparation	BEMP is to select efficient washing equipment, including trigger-operated low-flow pre-rinse spray valves, efficient dishwashers and connectionless steamers, and to monitor and benchmark water consumption in kitchen/restaurant areas	- Kitchen water consumption per dining guest (l/dining guest) - Percentage of eco-labelled dishwashing and kitchen cleaning chemicals (%) - Green procurement of efficient kitchen equipment (y/n)	- Implementation of a kitchen water management plan that includes monitoring and reporting of total kitchen water consumption normalised per dining guest, and the identification of priority measures to reduce water consumption. - At least 70 % of the purchase volume of chemical cleaning products (excluding oven cleaners) for dishwashing and cleaning are eco-labelled (e.g. EU Ecolabel)
	Optimised cooking, ventilation and refrigeration	BEMP is to select efficient cooking equipment, including induction-hob or pot-sensor-controlled gas hobs, efficient refrigeration equipment that uses natural refrigerants such as ammonia or carbon dioxide, and to control ventilation according to demand	Specific energy use per dining guest (kWh/ dining guest)	Implementation of a kitchen energy management plan that includes monitoring and reporting of total kitchen energy use normalised per dining guest, and the identification of priority measures to reduce energy consumption.

Source: (Styles, Schönberger, & Martos, 2013)

3.4.2 Eco-labels

Among a large spectrum of voluntary environmental management tools, third party certified eco-labels stand out due to their capacity to inform guest and to the trustworthiness ensured by third-party certification process (Geerts, 2014).

Many researchers define a tourism eco-label as “any form of certification giving assurance that the transaction or tourist activity is conducted according to a known standard that improves the environment or at least minimizes environmental impacts”. Font (2005) defines eco-labels as “methods to standardize the promotion of environmental claims by following compliance to set criteria generally based on third party, impartial verification usually by gov
ernments or non-profit organizations”.

Nevertheless, the success of eco-labels depends on guest perception and behaviour intention, and on the willingness to collaborate with the hotel in the improvement of environmental performance (Ayuso, 2007; Penz et al., 2017). Additionally, eco-label can contrast the “distortive effect” caused by greenwashing and the consequent mistrust of consumers as they provide accepted and recognized certification schemes that can assure to consumers credible and clear information (F. Testa, Iraldo, Vaccari, & Ferrari, 2015). In this sense, the ISO 14020 series standards, helps companies to accurately communicate environmental information to consumers without being inaccurate and avoiding consumer confusion or the risk of greenwashing practices. In fact, these standards “*provides businesses with a globally recognized and credible set of international benchmarks against which they can prepare their environmental labelling*” (ISO Central Secretariat, 2012). In the ISO 14020 series we can distinguish three types of labelling / ecological declarations:

- 1st type (ISO 14024) (ISO, 2018): is a voluntary "third party" eco-label, for which there is a need for verification by an independent organization, defined as the "competent body for the environmental labelling", which certifies the compliance with specific predefined requirements. The predefined requirements to be met for obtaining the label are the "product environmental criteria", relating to an entire category of products, which must be based on appropriate indicators deriving from the life cycle analysis for that specific category. The most authoritative example of labelling of the first type is the European Ecolabel regulation, an ecological quality mark created in 1992 with the adoption of the European Regulation n. 880/92 and updated with the new Regulation n. 66/2010.

- 2nd type (ISO 14021:2016) (ISO, 2016): labels and ecological declarations that contain environmental information or "self-declared environmental claims" (i.e. declarations, labels, environmental symbols on product packaging or advertising) declared by producers, importers or products distributors, without the intervention of an independent certification body (among which: "Recyclable", "Compostable", etc.). The standard provides however a series of constraints to be respected in terms of dissemination and information requirements.
- 3rd type (ISO 14025:2010) (ISO, 2010): ecological declarations containing information based on established parameters that contain a quantification of the environmental impacts associated with the life cycle of the product calculated through an LCA system. They are subject to an independent control and presented in a clear and comparable form. These include, for example, the "Environmental Product Declarations" or Environmental Product Declaration (EPD). This tool represents a communication method that guarantees objective, comparable and credible information relating to the environmental performance of products and services and aims to respond to the need to make the comparison between products of the same class easier.

When contextualizing green practices implemented by tourism facilities the adoption of environmental certifications, such as ecolabels is an important differentiator factor (Esparon, Gyuris, & Stoeckl, 2014). The third-party certified ecolabels support the voluntary implementation of green practices, avoiding green-washing (Karlsson & Dolnicar, 2015; Martínez García de Leaniz et al., 2017). Ecolabels stand out for their capacity to communicate directly with costumers influencing their choices, and for the credibility ensured by external certification (Geerts, 2014; Penz et al., 2017a). Moreover, by applying for eco-labels hoteliers can further facilitate the customer decision-making process (Bohdanowicz, 2006c). Indeed, green practices have a significant influence on guest satisfaction (Berezan, Raab, & Love, 2013; Bruns-smith, Choy, Chong, & Verma, 2015; Gao & Mattila, 2014; G I Kassinis & Soteriou, 2003; George I. Kassinis & Soteriou, 2015; Oroian et al., 2014; Verma & Chandra, 2017) and are considered as part of service quality attributes in eco-labelled certified facilities (Han & Kim, 2010). According to other studies investigating guest perceptions of green practices in tourism hospitality, consumers demand no longer basic eco-friendly practices but expected more from ecolabel tourism facilities and required their practices to be even more socio-environmentally responsible (Ogbeide, 2012). As Robinot & Giannelloni (2010) pointed

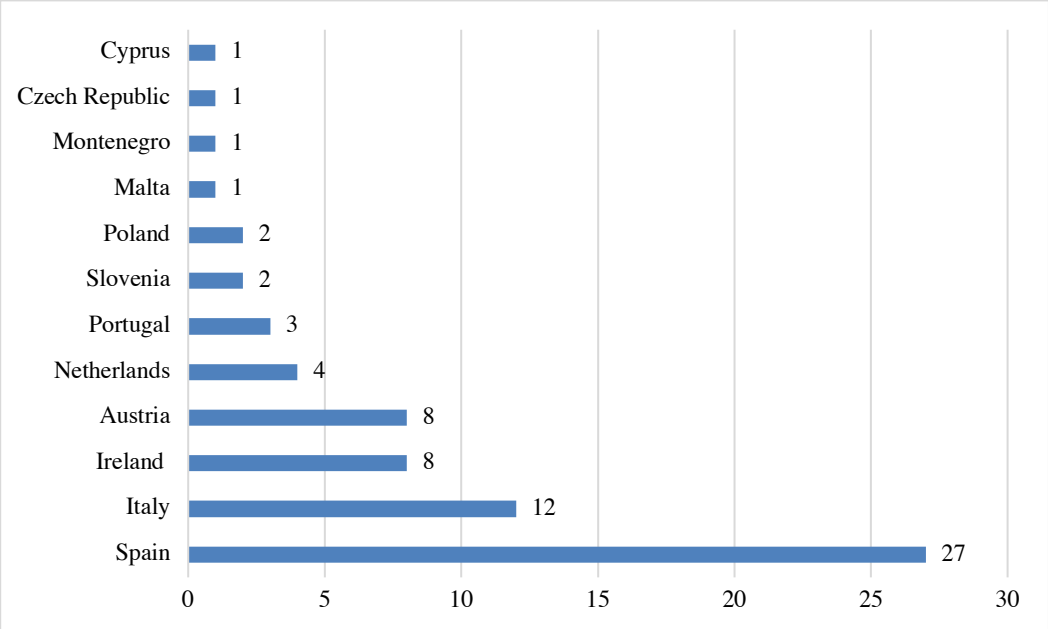
out, some environmental attributes are evaluated as “basic” and are seen as an integral part of the service offer, rather than as differentiating criteria. So practitioners have to look forward to innovative green practices as most of these practices are increasingly becoming commonplace (Rahman & Reynolds, 2016). This is notable for tourism facilities, which are more sensitive to environmental issues and are thus innovative adopters of sustainable practices (Reid, Johnston, & Patiar, 2017). Consumers with a high level of environmental concern will be more likely to have a positive attitude towards green practices that can facilitate the choice of ecolabel facilities as opposed to regular one (Han et al., 2009; Manaktola & Jauhari, 2007) and the development of positive behavioural intentions (M. Lee et al., 2011). Eco-labels, together with Environmental Management Systems (EMS), have been proven to be the most effective in reducing companies’ negative impact on the environment and to communicate hotel’s efforts toward sustainability (Ayuso, 2007; Tepelus & Córdoba, 2005). Plenty environmental and sustainability certifications are available to hotels aiming to guarantee their sustainability performance; however, not all are recognized by their credibility (Núñez et al., 2014). Nowadays, there are more 140 quality labels worldwide for the tourism and hospitality sectors (Núñez et al., 2014). If, on one hand, the growth of tourism eco-labels has the positive effect to increase the sector’s sustainability, on the other one it leads to market confusion, in which consumers have difficulties in distinguish credible labels and certifications (Font, 2002).

3.4.2.1 EU Eco-label

Among these, EU-Ecolabel is a recognized certification, focused on the environmental dimension of sustainability, applied in the European Union. The EU Ecolabel is the European ecological quality label established with the EEC Regulation No. 880/92 and subsequently modified with the EC Regulation n. 66/2010 and recently updated by the Commission Decision (EU) 2017/175 of 25 January 2017 on establishing EU Ecolabel criteria for tourist accommodation (notified under document C (2017) 299). It is a tool of voluntary adhesion (it is granted to those products and services that have a reduced environmental impact and that respect ecological and performance criteria established at a European level) and selective (in that the ecological and performance criteria are developed in such a way to allow the obtaining of the mark only by those products that are able to comply with the criteria established for its granting). This ecolabel is one of the least explored in tourism and hospitality academic literature. Nevertheless, some studies have been carried out on the implementation of EU-ecolabel in accommodation facilities. Dziuba (2016), through an econometric model,

demonstrated that compliance with EU ecolabel standards involves benefits resulting not only from a marketing and competitive side, but also reducing the operating costs of the facility. The analysis showed that benefits from the EU eco-label include reduction of water and energy consumption costs by about 20% and waste disposal costs by 80%, and a significant reduction of the general operating costs of a hotel compared to other facilities. Preziosi, Tourais, Acampora, Videira, & Merli (2019) explored green practices implemented by Portuguese EU-Ecolabel certified hotels and their influence on the formation of guest positive behavioural intention toward green hotels. Results from this study suggest that the EU-Ecolabel provides a framework and a base to guide hotel managers to the implementation of green practices and to an effective communication. Moreover, Preziosi, Balata, Merli, & Tola (2018) performed an Importance- Performance Analysis (IPA) on guests staying in an Italian EU-eco-labelled hotel finding that while eco-label related attributes are not recognized as particularly important, some specific practices may play a role in enhancing satisfaction and delighting guests, contributing to increase the hotel competitiveness and attractiveness. Furthermore, Duglio, Ivanov, Magliano, & Ivanova (2017) analysed Italian EU eco-labelled hotels' motivations, difficulties, costs and benefits deriving from the certification. Findings from this study revealed that the main motivation for certification were related to the hotel manager' personal awareness of the sustainability issue and to the improvement of the corporate image. Perceived benefits of the ecolabel mostly relate to energy efficiency and water saving improvements. Looking at the diffusion of EU eco-label in 2019, considering all products and services certifiable with this ecolabel, its adoption rate has increased by 88% since 2016 (European Union, 2019). However, for what concern tourism accommodation its diffusion is limited, only 90 hotels and 6 campsites are currently registered in Europe (European Commission, 2019c). Figure 3.13 shows the geographical distribution of EU eco-labelled hotels in Europe. Spain and Italy are the countries with the highest number of certified hotels respectively 27 and 12 hotels.

Figure 3.13 - EU eco-labelled Hotels



Source: (European Commission, 2019c)

The regular update of its criteria and the acceptance and recognition of the label among the EU consumers and accommodation sector were the main reasons to select this ecolabel. The high credibility of the label it is guaranteed by the public third party that preforms the in-hotel certification audit and released the certification. Additionally, the EU-Ecolabel allows the comparison of the results provided by this study with previous or future studies developed in Europe and using the same certification. As far as the tourist accommodation is concerned, the current set of criteria is divided into two main categories: mandatory (22 criteria) and optional (45 criteria) (Garrido et al., 2016) (Table 3.3). An accommodation establishment has to comply with all the mandatory criteria, whereas it has to follow a sufficient number of optional criteria in order to acquire a fixed number of points, indicated by the Regulation: a minimum of 20 points and 3 more points based on the presence of some additional services. Table 3.3 and Table 3.4 contain the macro areas in which the mandatory and the optional criteria have been defined (Duglio et al., 2017).

Table 3.3 -. List of EU Eco-label mandatory criteria for Tourist Accommodation

General management criteria	
1	Basis of an Environmental Management System
2	Staff training
3	Information to guests
4	General maintenance
5	Consumption monitoring
Energy criteria	
6	Energy efficient space heating and water heating appliances
7	Energy efficient air conditioning and air-based heat pumps appliances

8	Energy efficient lighting
9	Thermoregulation
10	Automatic switching off of HVAC and lighting
11	Outside heating and air conditioning appliances
12	Procurement of electricity from a renewable electricity supplier
13	Coal and heating oils
Water criteria	
14	Efficient water fittings: Bathroom taps and showers
15	Efficient water fittings: Toilets and urinals
16	Reduction in laundry achieved through reuse of towels and bedclothes
	Waste and wastewater criteria
17	Waste prevention: Food service waste reduction plan
18	Waste prevention: Disposable items
19	Waste sorting and sending for recycling
Other criteria	
20	No smoking in common areas
21	Promotion of environmentally preferable means of transport
22	Information appearing on the EU Ecolabel

Source: (Garrido et al., 2016)

Table 3.4 - List of EU Eco-label optional criteria for Tourist Accommodation

General management criteria	
23	EMAS registration, ISO certification of the tourist accommodation (up to 5 points)
24	EMAS registration or ISO certification of suppliers (up to 5 points)
25	Eco-labelled services (up to 4 points)
26	Environmental and social communication and education (up to 2 points)
27	Consumption monitoring: Energy and water sub-metering (up to 2 points)
Energy criteria	
28	Energy efficient space heating and water heating appliances (up to 3 points)
29	Energy efficient air conditioning and air-based heat pumps appliances (up to 3,5 points)
30	Air-based heat pumps up to 100 kW heat output (3 points)
31	Energy efficient household appliances and lighting (up to 4 points)
32	Heat recovery (up to 3 points)
33	Thermoregulation and window insulation (up to 4 points)
34	Automatic switch off appliances/devices (up to 4,5 points)
35	District heating/cooling and cooling from cogeneration (up to 4 points)
36	Electric hand driers with proximity sensor (1 point)
37	Space Heater emissions (1,5 points)
38	Procurement of electricity from a renewable electricity supplier (up to 4 points)
39	On site self-generation of electricity through renewable energy sources (up to 5 points)
40	Heating energy from renewable energy sources (up to 3,5 points)
41	Swimming pool heating (up to 1,5 points)
Water criteria	
42	Efficient water fittings: Bathroom taps and showers (up to 4 points)
43	Efficient water fittings: Toilets and urinals (up to 4,5 points)
44	Dishwasher water consumption (2,5 points)
45	Washing machine water consumption (3 points)
46	Indications on water hardness (up to 1,5 points)
47	Optimised pool management (up to 2,5 points)
48	Rainwater and grey water recycling (up to 3 points)
49	Efficient irrigation (1,5 points)
50	Native or non-invasive alien species used in outdoor planting (up to 2 points)
Waste and wastewater criteria	
51	Paper Products (up to 2 points)
52	Durable goods (up to 4 points)
53	Beverages provision (2 points)

54	Detergents and toiletries procurement (up to 2 points)
55	Minimisation of the use of cleaning products (1,5 point)
56	De-icing (1 point)
57	Used textiles and furniture (up to 2 points)
58	Composting (up to 2 points)
59	Wastewater treatment (up to 3 points)
Other criteria	
60	No smoking in rooms (1 point)
61	Social policy (up to 2 points)
62	Maintenance vehicles (1 point)
63	Environmentally preferable means of transport offer (up to 2,5 points)
64	Unsealed surfaces (1 point)
65	Local and organic products (up to 4 points)
66	Pesticide avoidance (2 points)
67	Additional environmental and social actions (up to 3 points)

Source: (Garrido et al., 2016)

3.4.2.2 The Legambiente turismo eco-label

The Legambiente association was founded in 1980 with the aim of putting in place policies aimed at using scientific data to protect the environment. Legambiente performs field operations to inform, raise awareness and involve citizens on the Italian territory. Legambiente Turismo is a department of Legambiente, an Italian environmental NGO running the label of the same name. The Legambiente Turismo eco-label is an Italian certification standard awarded to tourism organisations in compliance with good management practices described in relation to ten social and environmental themes including waste, water, energy and transport (Styles et al., 2013) (Figure 3.14).

Figure 3.14 - Legambiente Turismo Logo

Source: (Legambiente, 2019)

At the national level Legambiente Turismo is the most widespread environmental brand (Legambiente, 2017), that currently count 95 hotels awarded with the eco-label (Legambiente, 2019). This brand also participates in the VISIT network[2] of European eco-friendly brands for eco-sustainable tourism, which aims to harmonize and standardize the regulatory principles of

[2] http://www.visit21.net/VISIT_Ecolabels_Ecolabels.html

the various brands environmental adherents, in order to guarantee a high level of environmental quality of the participating accommodation facilities (Associazioni Italiane Alberghi, 2010).

With the ecological label "Recommended for the commitment in defence of the environment", born in 1997, Legambiente Turismo distinguishes and enhances the accommodation facilities (hotels, campsites, holiday farms, hostels, residences and B&Bs) present in the coastal areas, in the hinterland, in the art cities and in natural parks that take measures, in carrying out their activities, to protect the environment.

The guiding principles behind this association are:

• Enhance the quality of even the smallest structures, which despite their size, are increasingly appreciated by tourists;

• Extend the rational use of natural resources, support collective mobility and food safety by also focusing on local products and enhancing Italian artistic, cultural and environmental assets;

• To actively involve the participants in defining innovative methods, procedures, criteria and measures. The eco-labelling criteria come from the Decalogue of Legambiente Turismo. In this Decalogue the main areas of intervention are (Legambiente, 2017):

1. waste reduction with more targeted purchases;
2. separate collection for recycling;
3. water and energy savings with a more rational use of natural resources;
4. food safety;
5. the promotion of local cuisine and local products;
6. the promotion of collective transport and light mobility;
7. the reduction of noise pollution within the premises and participation in similar initiatives in nearby areas;
8. the promotion of natural and cultural assets,
9. the involvement of guests in the implementation of eco-sustainable behaviour
10. the distribution of materials that help information and control on the agreed measures and the participation of tourists in the monitoring and control of the effective realization of the environmental management objectives assumed by the exercise and by the host tourist location.

The Decalogue lied down a number of criteria and forms integral part of the protocol agreement that are signed with communities and business groups when establishing a local Legambiente Turismo project for tourist services. Each section is developed into several criteria and specific practical measures. Particularly, for hotels certification Legambiente Turismo provides the mandatory compliance of 26 criteria (Table 3.5) plus additional scores deriving from the optional sustainability practices (Table 3.6). However, only those elements which are applicable to the nature of the different businesses are adopted during the evaluation process. Legambiente Turismo supports the accommodation facilities in the path of sustainability, through operators' training activities and by carrying out annual periodic verification foreseen by the association on the application of the specifications that determine the release of the label, representing an excellence in the national context of environmentally friendly tourism. To joining the scheme, companies have to address all the sections included in the Decalogue and relevant criteria and measures (Sofia, 2010). Prices for joining the scheme range between 100 € and 300 €, depending on the size and type of establishment. (Sofia, 2010).

Table 3.5 - List of Legambiente Turismo mandatory criteria for Hotels

1-WASTE	
1	Separate the waste according to the fractions (wet, plastic glass, cans, metal, paperboard) supported by the service company or go to the ecological islands and deliver the waste that is not collected by the competent company
2	Place containers for separate collection in a visible and usable point for customers.
3	Gradually remove the courtesy kit and replace it with a dispenser
4	In the breakfast service, integrate at least three loose products in the food sector with the single-dose product
5	Use only ecological office paper (hemp paper, alga paper, recycled paper or paper with FSC or PEFC certification, Ecolabel, TUV)
6	Use at least two references of concentrated detergents for the cleaning of the rooms and possibly of the linen
2-WATER	
7	Install water-saving technologies in 80% of the shower points and sinks.
8	To add to the traditional cleaning products at least two references of ecological products and/or two references of mechanical cleaning systems (microfiber, steam, products with ecological certification)
3-ENERGY	
9	Making the communication visible in the rooms inviting the customer to request a change of linen only when necessary.
10	Install at least two class A or higher lamps in each room.
11	Install energy-saving lighting technologies in 80% of the common areas (class A lamps, LED lamps, photocells, twilight, photovoltaic lamps)
4- FOODS	
12	Enter at least four organic and / or typical products during breakfast signalling them with a specific communication
13	Provide written information about companies selling organic products (cellars, farms with direct sales, farmer market)
5-GASTRONOMY	
14	Daily offer biscuits or cakes of own production and / or artisan in the breakfast buffet

15	Enhancing the gastronomic specificities of the area by offering dishes made with typical local products at least 2 times a week, communicating it on the menu.
6-TRANSPORTS	
16	Promote the forms of public and / or collective transport available with information to customers on services and timetables.
17	Insert in the website of the structure, the necessary information to favour the choice of alternative means to the car to reach the locality (trains, bus lines, airplanes, shuttle services etc.)
7-MOVEMENTS	
18	Provide bicycles free of charge / payment of at least one every 5 rooms and / or provide other collective transport services with low environmental impact
19	Make written information available on tracks, cycle paths and nature trails in the area
8-NOISE	
20	Respect the hours of silence dictated by national and municipal regulations
21	If you use music for common areas, keep a soft background.
9-CULTURAL AND ENVIRONMENTAL HERITAGE	
22	Promote the cultural and / or environmental assets and events of the territory with the exposure of the reference material
23	Organize or promote guided tours to get to know the area
10-GUESTS AND COMMUNICATION	
24	Exhibiting and distributing information material to customers, contained in the adhesion package sent by Legambiente Turismo
25	10.03 Inform collaborators, through a written document, of the company's environmental commitments, to encourage the formation of conscious attitudes.
26	Insert the Legambiente Turismo logo on the website and / or in your promotional publications.

Source: (Legambiente, 2016)

Table 3.6 - List of Legambiente Turismo optional criteria for Hotels

1 - WASTE	
27	Use only cotton or reusable table linens or certified ecological paper (3 points)
28	Place the container for exhausted batteries in a visible point by the customers (0,5 points)
29	Also use ecological toilet paper (PFC, FSC, Ecolabel) (3 points)
30	Also use remanufactured cartridges and toner (2 points)
31	Offer water to tables only in returnable glass bottles and / or install water dispensers (4 points)
32	Also use wine and other beverages on tap (3 points)
2- WATER	
33	Install double flush toilet cisterns in at least 50% of bathrooms (3 points)
34	Watering vegetable gardens and gardens in the evening-night period (0,5 points)
35	Use alternative chlorine systems and / or products for disinfecting the swimming pool (s) (3 points)
36	Perform the recovery of rainwater for non-domestic purposes (irrigation, vehicle washing) (2 points)
37	Perform the recovery of rainwater for domestic use (wc, laundry) (4 points)
3-ENERGY	
38	Invite customers, by written communication, to turn off the air conditioning if the windows are opened or if you leave the room. (1 point)
39	Recycle paper already used for internal notes and photocopies (0,5 points)
40	Install one or more power plants with renewable sources (solar thermal, geothermal, biomass, heat pumps, etc.) that produce hot water for sanitary use in a significant percentage compared to its annual needs (5 points)
41	Install one or more plants powered by renewable sources (photovoltaic solar, mini wind, biomass cogeneration, etc.) for the production of electricity in a significant percentage compared to the annual requirement. (5 points)
42	Signing contracts for the supply of energy from renewable sources (3 points)
43	Install one or more systems for summer air conditioning that use saving technologies (for example high efficiency heat pumps) or systems powered by renewable sources (for example solar cooling). (5 points)
44	Realization of energy efficiency interventions on the building (insulation of the walls, replacement of the existing windows with high efficiency fixtures, etc.) (5 points)
45	Replacing traditional boilers with condensing boilers (3 points)
4- FOODS	

46	Make available at least a reference to wine from organic farming (2 points)
47	Make available at least one reference of oil from organic farming (2 points)
48	Offer only seasonal fruits and vegetables (0,5 points)
49	Do not use products containing GMOs declared on the label (0,5 points)
50	Creating menus for balanced and possibly organic children (2 points)
51	Offer vegetarian / vegan dishes on the restaurant menu (2 points)
52	Offer gluten-free dishes on the restaurant menu (2 points)
5-GASTRONOMY	
53	Offer a Km0 dish at least once a week communicating it on the menu. (3 points)
54	Make available also typical local wine (1 point)
55	Make local oil available also (2 points)
56	Provide written information on food and wine festivals and events in the area (2 points)
57	Provide written information on food and wine itineraries in the area (2 points)
6-TRANSPORTS	
58	Provide written information to the customer on the availability of public transport tickets (2 points)
59	Promote in writing the car-sharing initiatives present in zone (0,5 points)
60	Promote the bike-sharing initiatives in the area in written form (0,5 points)
61	Enter a shuttle service for guests. (3 points)
7-MOVEMENTS	
62	Have an area equipped for shelter and maintenance of bicycles (2 points)
63	Making seats available for transporting children on bicycles (1 point)
8-NOISE	
64	Pre-set, where possible, the volume of televisions in rooms (1 point)
65	Report in writing to the guests any silence times foreseen in the structure (1 point)
9-CULTURAL AND ENVIRONMENTAL HERITAGE	
66	Participate in the enhancement of alternative tourism proposals and in the promotion of local assets. (2 points)
67	Ensure the availability of publications (books or magazines) of an environmental or scientific / popular nature with the creation of a reading corner (1 point)
68	Guarantee the availability of publications (books or magazines) relating to the natural and cultural heritage of the territory (1 point)
69	Promote the development of an environmental conscience aimed particularly at children, with dedicated activities. (2 points)
70	Participate in training courses on tourist proposals organized by local authorities (itineraries, guided tours, excursions and local productions) (0,5 points)
10-GUESTS AND COMMUNICATION	
71	Inform tourists, through a written document, of the company's environmental commitments, to encourage the formation of conscious attitudes. (3 points)
72	Provide clear and reliable written information on the services offered for different types of disabilities (food allergies and intolerances, physical disabilities, mental disabilities) (3 points)

Source: (Legambiente, 2016)

Scholar literature on the effectiveness of the Legambiente Turismo eco-labels is very poor. However, Merli, Preziosi, Acampora, & Ali (2019) explored guest perception of green practices implemented in an Italian Legambiente Turismo awarded hotel. They demonstrated that consumers positively recognize the environmental practices implemented by the hotel, but in most cases, they are not aware of the eco-label program. This highlights a failure in communicating the eco-label certification. In this context, Legambiente should further encourage companies to communicate their environmental commitment. Hotels should inform guests that the eco-label is certified by an independent third party that perform credible audits (Gössling and Buckley, 2016), and this would lead to enhance the credibility of the hotel

sustainability actions, also increasing brand recognition and awareness from the public (Berezan et al., 2013a; Han et al., 2011). Furthermore, Merli et al. (2019) explored the impact of green initiatives in a beach club awarded with a third party certified Legambiente Turismo eco-label. Indeed, Legambiente has issued a disciplinary specifically dedicated to beach clubs (Legambiente, 2017). According to it, beach clubs that implement a list of specific green practices can be awarded with the Legambiente Turismo Ecolabel. At the moment, nearly 20 beach clubs are awarded with this Ecolabel, (Cesab - Centro Ricerche in Scienze Ambientali e Biotecnologie & Cesab - Center for Research in Environmental and Biotechnology, 2017; Legambiente, 2017). The authors found a positive relation between green practices performance evaluation, guest satisfaction and loyalty. Additionally, the study suggests to the organizations involved in the diffusion of Ecolabels that this tool is valuable in supporting a more sustainable coastal management.

Chapter 4 Green practices in the hotel industry: A systematic literature review

4.1 Introduction

In recent years, tourism and hospitality sector environmental impacts have gained considerable attention from governments, industry practitioners and scholars. As a result of this growing attention to environmental, social and economic issues, academic literature on green hotels has developed considerably. 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, different methodologies, different theories and investigates different geographical areas. 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 (S.-H. 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. In particular, this work will try to organize the various sub-areas of academic research with the aim of exploring the theories, themes and methodologies applied by scholars. 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. To this purpose, the paper also proposes a framework for the review of green and sustainable research in the hotel industry. This framework has been developed as a synthesis between the main topics emerged from the systematic literature review and a conceptual elaboration of the aspects related to the implementation of sustainable practices in the hotels emerged from the literature analysis.

This study presents the results of a systematic literature review exploring the state-of-the-art of academic research on sustainable practices in the hotel industry. The paper explores the body of literature with a systematic approach to provide an exhaustive analysis of the phenomenon with rigorous and reproducible research criteria. The revisited material consists of 600 articles

collected through the Scopus databases, and has been evaluated using specific structural dimensions to group 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 explores specifically the green hotels research. Additionally, the investigations on the topic have increased considerably during the last years and this work provides an updated overview on this research field.

4.2 Research Methodology and Systematic Review Process

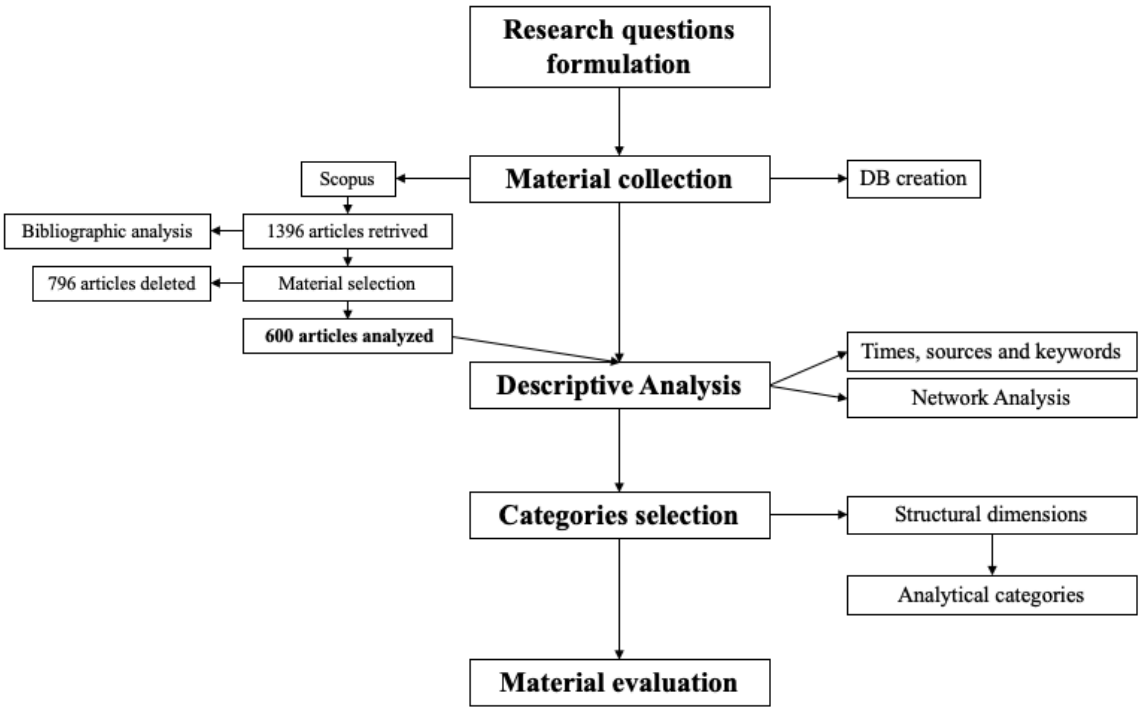
A systematic literature review (SLR) methodology has been chosen for its comprehensiveness when performing the search of all the publications concerning a specific theme (Petticrew & Roberts, 2008). SLR has been defined by Kitcharoen (2004) as a: "*means of identifying, evaluating and interpreting all available research relevant to a particular research question, or topic area, or phenomenon of interest".* 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 & Tranfield, 2009). The notion of SLR, that was originally developed in the healthcare domain (Mulrow, 1994), has recently gained a research momentum in business studies and hospitality research (Merli, Preziosi, & Acampora, 2018; Tölkes, 2018). This type of analysis integrates qualitative and quantitative evaluation being framed as content analysis (Brewerton & Millward, 2001).

Following the guidelines of Denyer and Tranfield (2009) and Mayring (2003), the review process has been structured in five main five stages, which are explained in Figure 4.1 and listed below:

- Research questions formulation;
- Material Collection: definition and delimitation of materials and unit of analysis;
- Descriptive Analysis: formal aspects of collected material are assessed and analysed using quantitative methods;

- Category Selection: in order to organize the collected material, structural dimensions and related analytic categories are identified;
- Material Evaluation: the material is evaluated according to dimensions and categories previously established. Results are interpreted to define relevant issues.

Figure 4.1 - Summary of the Systematic review process



4.3 Aim of the review and research questions formulation

There are different reasons to conduct a SLR; they mainly concern the fact that this methodology allows to:

- summarize the existing evidence concerning a specific topic;
- identify the most important authors and journals
- identify any gaps in current research in order to suggest areas for further investigations;
- to provide a framework/background in order to appropriately position new research activities (Okoli, 2015).

Therefore, the study addresses the following research question:

What is the current state of knowledge on green hotels research?

Specifically, this systematic literature review tried to answer the following more specific questions, which refer to the structural dimensions and the analytical categories subsequently chosen for the analysis:

- Who are the protagonists, both considering the source and the authors on green hotels research?
- What are the main topics under investigation?
- In which context the topic has been investigated? (e.g. in which accommodation facilities)
- Which research methods, data analysis techniques, and data collection methods have been used by researcher exploring this theme?
- What sample or unit of analysis has been chosen by researcher to answer to their research questions?
- Which dimensions of sustainability have been addressed?
- Which theories have been used?
- What concepts are associated with green hotels research?
- What is the geographical focus of their investigations?
- What are the current and future research streams?

The review presented in the next sections of this work aims at answering these questions by analysing a significant portion of academic works dealing with green hotels research.

4.4 Previous SLR on Green research in the hospitality sector

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.

Table 4.1 provides the main characteristics of literature reviews on these topics published over the last years that employed a systematic approach to the analysis.

Table 4.1 - Literature reviews on Green hotels research with a systematic approach.

Focus	Hospitality subsectors	Authors	Databases	Years	Keywords	Number of revisited papers	Source
Environmentally related research	Lodging, restaurant, meeting and convention	(Myung et al., 2012)	Emerald; Academic Search Premier; Business Source Complete; Google Scholar	2000-2010	environmental or green AND hospitality, hotel, restaurant, meetings or conventions	58	International Journal of Hospitality Management
Environmental management	Hospitality in general	(E. S. W. Chan & Hsu, 2016)	Google scholar with Journals restriction: International Journal of Hospitality Management, Cornell Hospitality Quarterly, International Journal of Contemporary Hospitality Management and Journal of Hospitality and Tourism Research	1993-2014	EM, environmental responsibility, environmental performance, sustainability, green, conservation, pollution and nature/natural, energy and water saving, waste management and carbon footprint	149	International Journal of Contemporary Hospitality Management
Green lodging	Lodging	(Manganari & Dimara, 2015)	ABI Inform; Business Source Complete; Emerald; JSTOR; EBSCOhost and Science Direct	2003-2014	green lodging, green hotel, environmentally friendly hotel, towel reuse practices, green hotel measures, green initiatives, environmental schemas, water conservation, etc.	59	Current Issues in Tourism
Consumers and Providers' Attitudes, Behaviours and Practices for Sustainability	Accommodation and lodging	(Colin Michael Hall et al., 2016)	Scopus	1992-2015	Various keywords[3]	93	Sustainability (Switzerland)

[3] Query definition: TITLE-ABS-KEY ("consumer" OR "target audience" OR "tourism" OR "tourist" OR "travel*" OR "holiday*" OR "VFR" OR "vacation*") AND TITLE-ABS-KEY ("response" OR "perception" OR "attitude" OR "behaviour" OR "motivation*") AND TITLE-ABS-KEY ("sustain*" OR "green*" OR "environment*" OR "ecolog*" OR "CSR" OR "carbon" OR "emission*" OR "energy" OR "waste") AND TITLE-ABS-KEY ("accommodation" OR "backpacker*" OR "hostel*" OR "motel*" OR "hotel*" OR "lodging" OR "caravan park*" OR "holiday park*" OR "cabin*" OR "campground*" OR "resort*") AND DOCTYPE (ar OR re) AND PUBYEAR < 2015.

Green research	Hospitality in general	(S.-H. Kim et al., 2017)	Journal databases: Journal of Hospitality & Tourism Research; Annals of Tourism Research; Cornell Hospitality Quarterly; International Journal of Hospitality Management; Journal of Travel Research; Tourism Management; International Journal of Contemporary Hospitality Management; and Journal of Sustainable Tourism.	2000-2014	sustainability, eco/-friendly, green, environment/-al and CSR/corporate social responsibility	146	International Journal of Contemporary Hospitality Management
TBL approach	Hotels	(dos Santos et al., 2017)	Scopus	1)no restrictions 2) 2011-2015	1-Hotel AND Planning AND Sustainability. 2-"Hotel Management" AND "Sustainable Tourism" AND "Certification"	1- 14 2- 239	Journal of Cleaner Production
Guest behaviour	Hotels	(Nisa et al., 2017)	EBSCO Business Source Complete, EconLit, PsycArticles, JSTOR, and Google Scholar	No restrictions	Various Keywords[4]	9	Cornell Hospitality Quarterly
Environmental sustainability of hotels	Hotels	(Y. H. Kim et al., 2018)	EBSCO and Google Scholar Index	No restrictions (articles were ranked to select 10 to 15 articles for each year)	sustainability, hotel, and management.	128	Journal of Hospitality Marketing & Management
Sustainability Communication	Tourism	(Tölkes, 2018)	Ebsco Host (Hospitality and Tourism Complete), Science Direct (Elsevier), Emerald, Scopus, Sage, Web of Science, and Proquest	No restriction (until 2017)	"sustainability communication", "sustainability" and "communication", and "tourism".	94	Tourism Management Perspectives

[4] Query definition: [(tourism OR hotel OR camping OR restaurant OR hospitality) AND (energy OR water OR towel OR linen OR waste OR recycl*) AND (experiment OR intervention OR (field study)].

4.5 Material Collection

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:

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 PRACTIC*"))

Query 1- First Scopus search

In the Scopus search, the research criteria were "Title, Author Keywords, Abstract". The research was performed on April 1, 2019. The research on Scopus returned 2,251 results.

The foundation of a review process is the delimitation of the unit of analysis. In this study, the single research or review article composes the unit. Thus, on database the results were limited to "Journal", "Article", "Article in press" and "Review". Lastly, exclusively articles in English were chosen, as in the database English represents the most used language and it is also widely recognized as the international academic language.

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 PRACTIC*")) 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"))

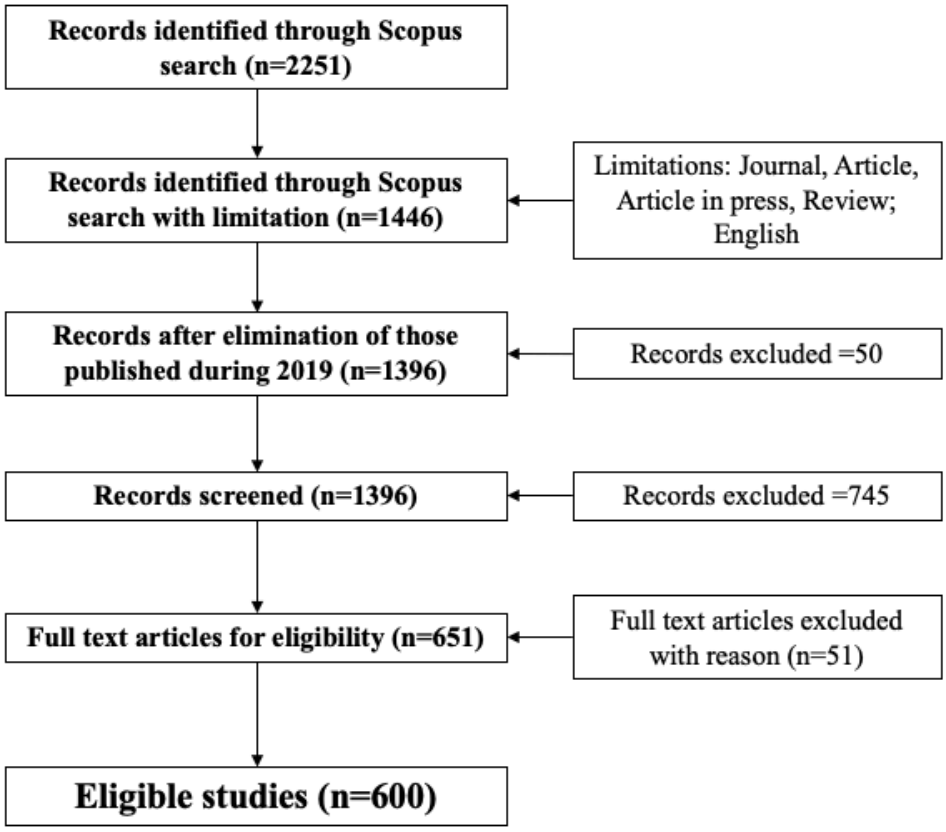
Query 2 – Scopus Search with limitations

The research on Scopus returned 1,446 results. Consequently, we decided to limit the analysis to the paper published until 2018, so 50 paper published on 2019 were eliminated. The final number of selected papers was 1396.

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 (Figure 4.2).

Figure 4.2 - Overview of systematic research process



4.6 Results from the Descriptive analysis on the first selection of 1396 paper

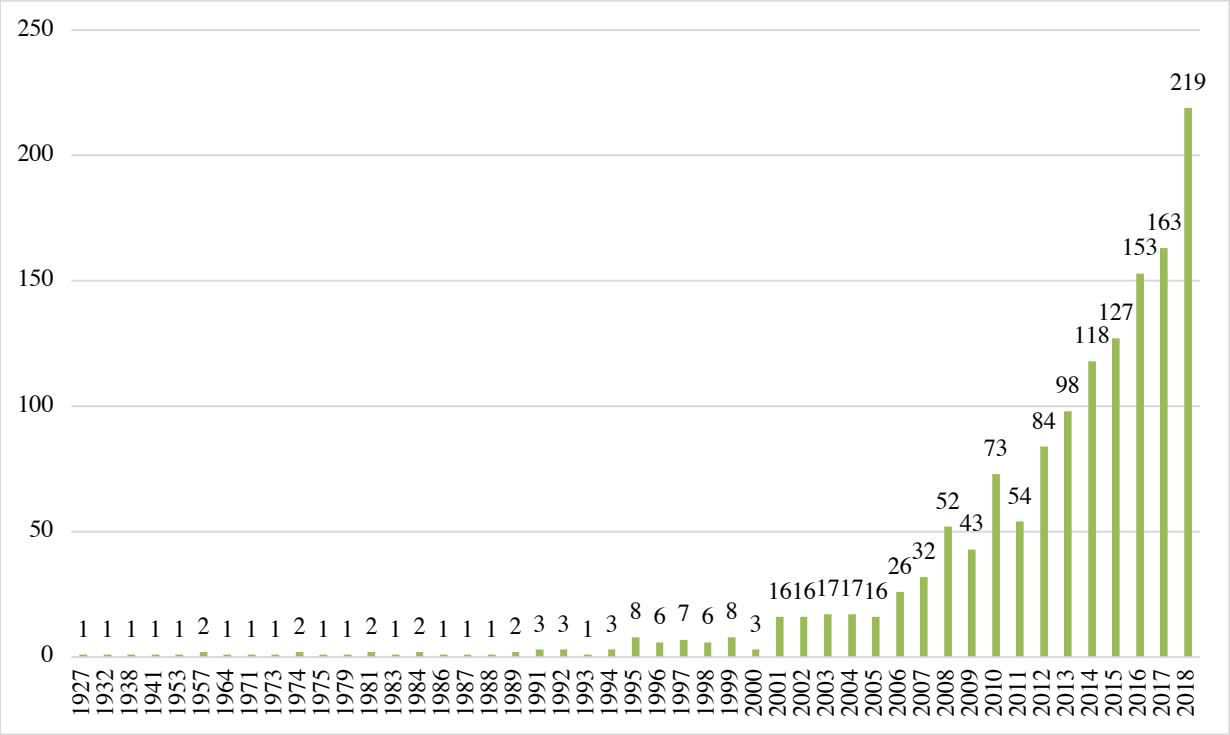
The first step of the analysis was a preliminary scan of collected material obtained through the Scopus query. The 1396 records were firstly analysed with a bibliographic approach and then selected through a full text screening to eliminate all the papers that are not specifically focused on hotels or sustainability. The next section (2.6.1) reports the results of bibliographic analysis on the first selection of 1396 papers.

4.6.1 Bibliographic analysis

The database analysis shows that green hospitality research is a rapidly growing research topic. Over three-quarters (84.81%) of the records were published in the last 10 considered years

(2008-2018). Moreover, during 2016-2018, 38.32% of the works were issued, showing a sharp increase of publications. Figure 4.3 illustrates the trend of literature, underlining the increasing interest for the topic.

Figure 4.3 - Distribution of publications per years



Most of the journals were the articles have been published have tourism and hospitality as their main topic. The “International Journal of Contemporary Hospitality Management” has pride of place, with 4.80% of published articles. It is followed by the “International Journal of Hospitality Management” (62 articles) and the “Journal of Sustainable Tourism” (48 articles). The 10 most prolific journals account for 27.51% of the records (Figure 4.4).

Figure 4.4 - Distribution of publications per journals

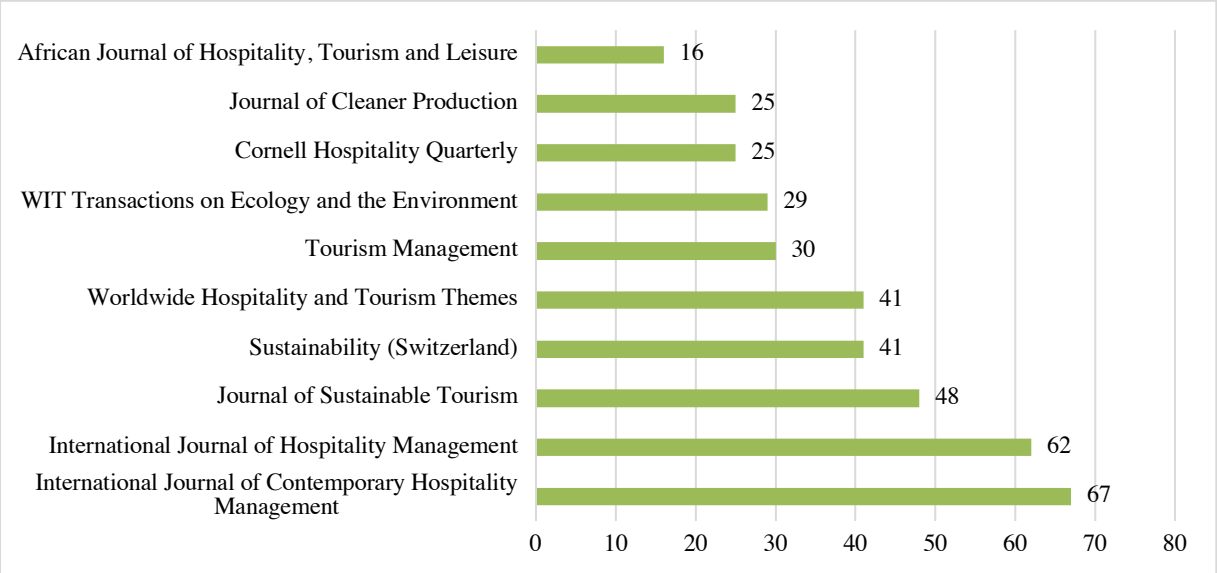
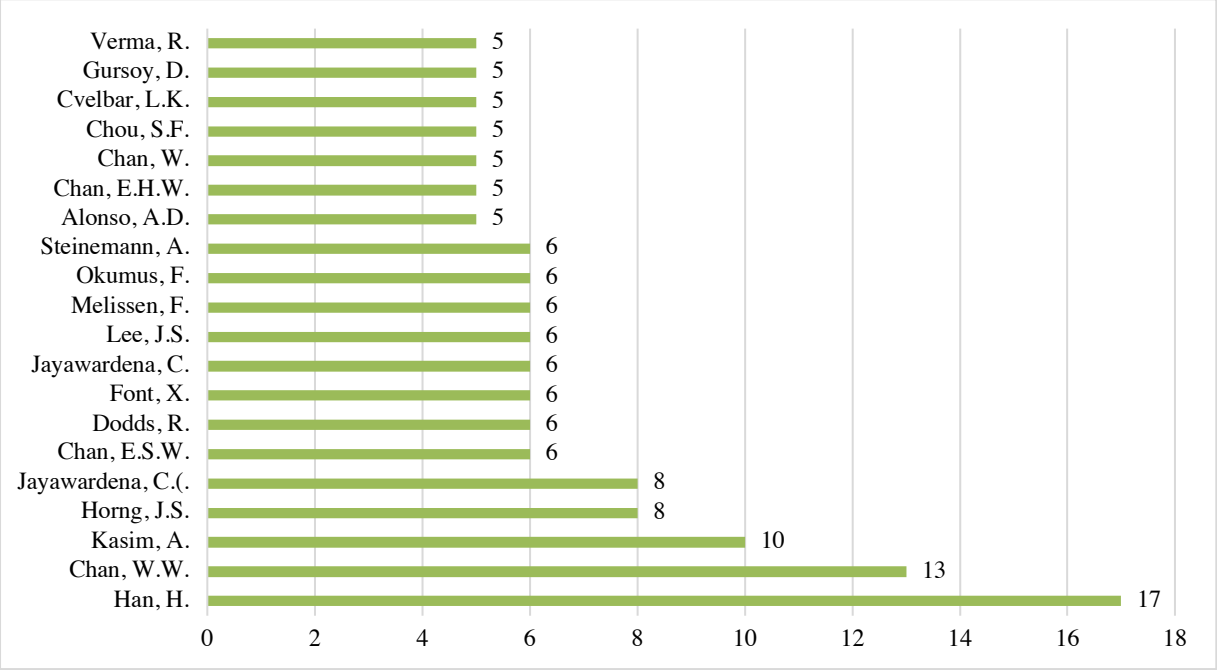


Figure 4.5 shows the most prolific authors on the subject. The most representative author is Heesup Han from the College of Hospitality and Tourism Management at Sejong University (Korea), followed by Wilco W. Chan from the School of Hotel and Tourism Management at Hong Kong Polytechnic University (Hong Kong) with 13 papers and Azilah Kasim from the School of Tourism, Hospitality & Event Management (STHEM) at Universiti Utara Malaysia (Malaysia)(10 papers).

Figure 4.5 - Authors with at least 5 publications



The most prolific institutions are based in the United States with 21.99% of publications (307 papers), followed by the United Kingdom (104 papers), Spain (101 papers) and Australia (99 papers) (Figure 4.6).

Figure 4.6 - Most significant countries of Authors' affiliation.

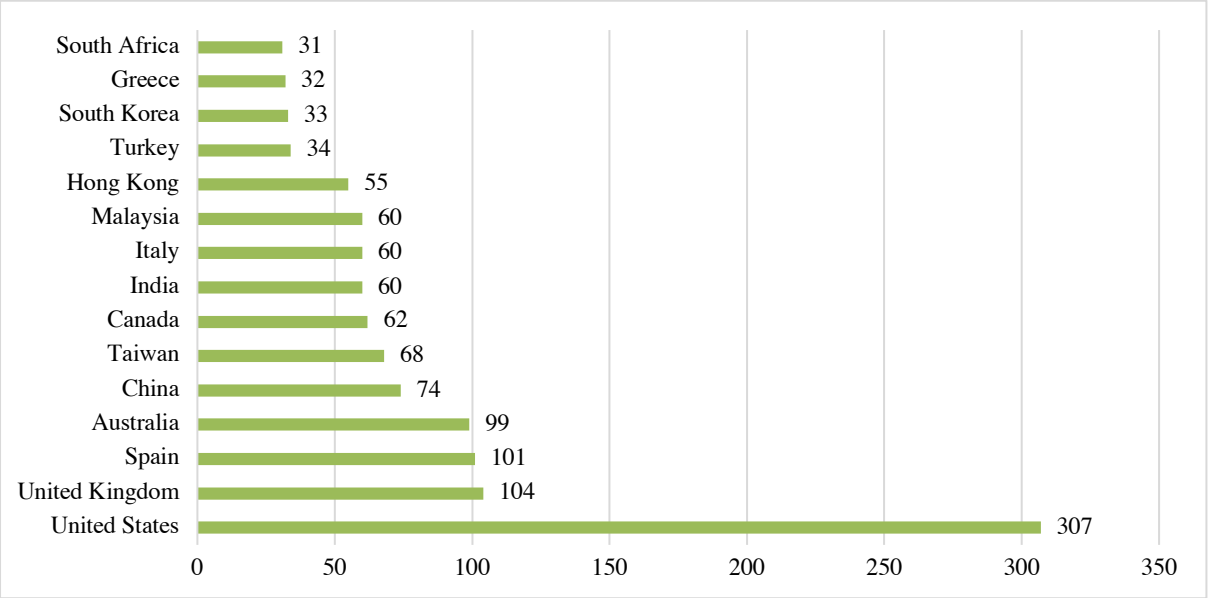


Table 4.2 shows the university affiliation (and university country) of the authors that have published the most on the topic. The most prolific universities in relation to green hospitality research are the Hong Kong Polytechnic University with 89 papers, the Griffith University with 21 papers and the University of Central Florida (20 papers).

Table 4.2 - Affiliation university with at least 9 publications

Affiliation	**Country**	**n.**
Hong Kong Polytechnic University	Honk Kong	89
Griffith University	Australia	21
University of Central Florida	USA	20
Universiti Utara Malaysia	Malaysia	17
University of Queensland	Australia	16
University of Nevada, Las Vegas	USA	15
University of Johannesburg	South Africa	13
Pennsylvania State University	USA	12
Dong-A University	South Korea	12
Ming Chuan University	Taiwan	12
Rosen College of Hospitality Management	USA	12
Cornell University	USA	11
Universitat de les Illes Balears	Spain	11
City University of Hong Kong	Honk Kong	10
Sejong University	South Korea	10

Ryerson University	Canada	10
Universidad de Cantabria	Spain	9
University of South Carolina	USA	9
Washington State University Pullman	USA	9
James Cook University	Australia	9
Edith Cowan University, Joondalup	Australia	9

4.7 Descriptive analysis of eligible studies

After the full text scanning, starting from the 1,396 records initially extracted with the original query, I set aside 796 records that were not coherent with the scope of the research. From the original records, I selected for further analysis only those investigating specifically hotel sector and its sustainability aspects. Finally, I consider eligible 600 papers that are analysed in the following sections.

4.7.1 Distribution and evolution of papers across years and journals

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 4.7 illustrates the trend of the literature, showing the increasing interest in the topic.

Figure 4.7 - Distribution of publications per years

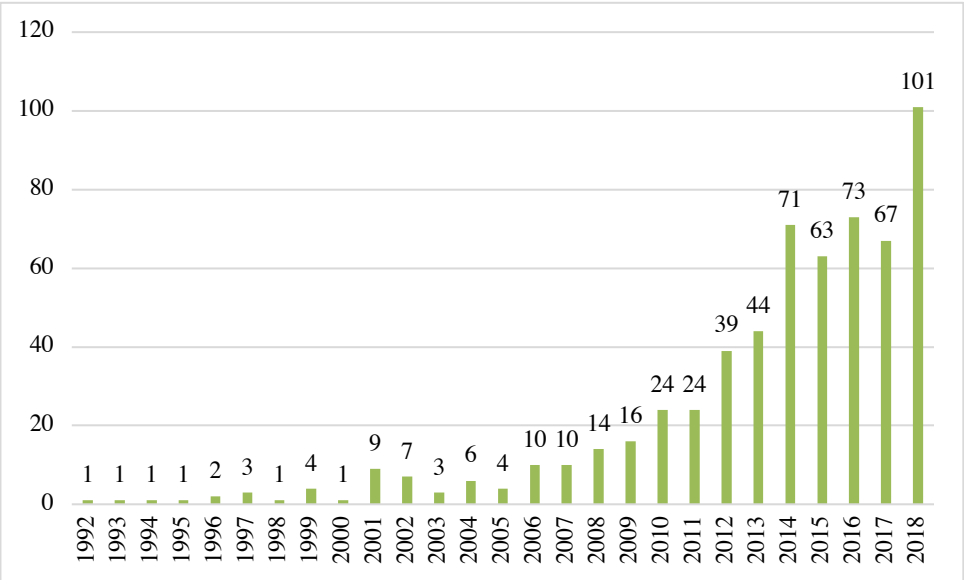
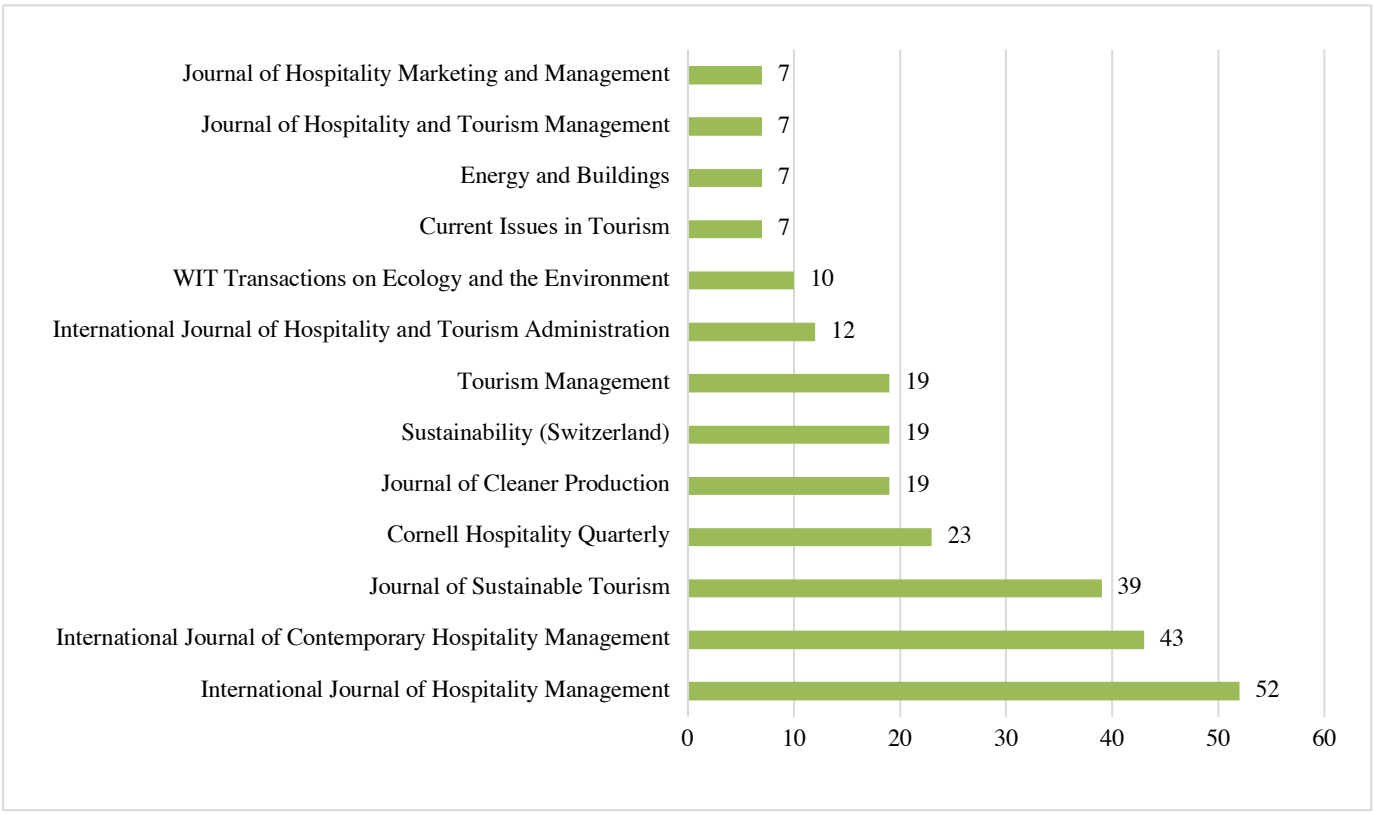


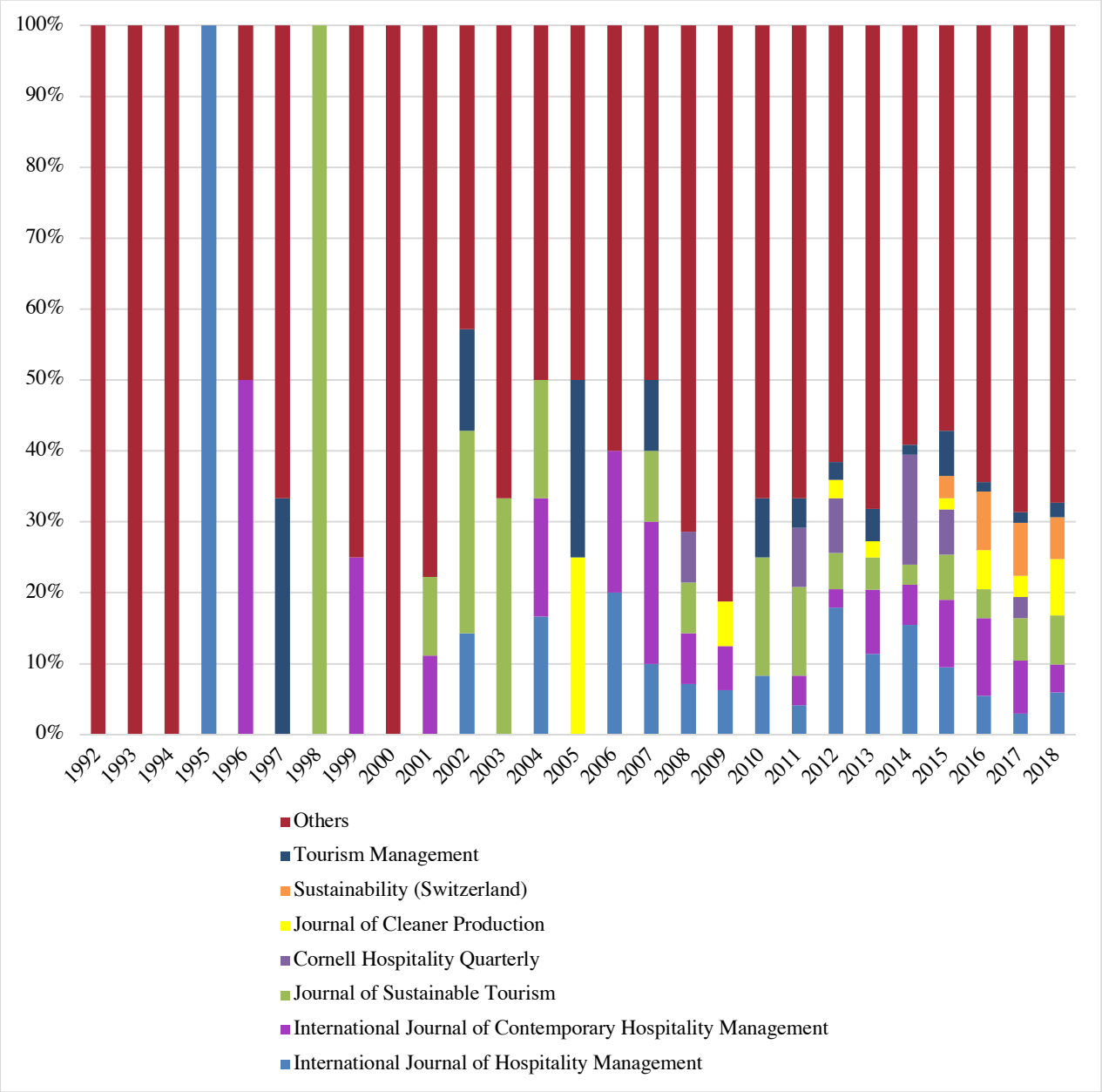
Figure 4.8 shows the journal that published more on the topics, with these journals accounting for the 44% of the publications selected for this study. The "International Journal of Hospitality Management" is the most prolific one with the 8.7% of the publications (52 papers), followed by the "International 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 4.8 - 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 4.9). 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 4.9 - The seven journals with the highest share of publications per years



4.7.2 The ten most cited papers in green hotels research

Next, the most cited papers, according to the Scopus count, were analysed to have an overview of the most impactful researches on the theme (Table 4.3). Considering the ten most cited papers in green hotels research the analysis 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 (Mei-fang Fang Chen & Tung, 2014; Han, Hsu, & Sheu, 2010; Han & 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, 2005, 2006b). 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, 2006b).

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, Lockington, & Baldock, 2008).

Table 4.3 - Most cited papers

N.	Authors	Article title	Year	Journal	Cited by
1	Han H., Hsu L.-T.(J.), Sheu C.	Application of the Theory of Planned Behavior to green hotel choice: Testing the effect of environmentally friendly activities	2010	Tourism Management	431
2	Manaktola K., Jauhari V.	Exploring consumer attitude and behaviour towards green practices in the lodging industry in India	2007	International Journal of Contemporary Hospitality Management	325
3	Lee J.-S., Hsu L.-T., Han H., Kim Y.	Understanding how consumers view green hotels: How a hotel's green image can influence behavioural intentions	2010	Journal of Sustainable Tourism	276
4	Bohdanowicz P.	European hoteliers' environmental attitudes: Greening the business	2005	Cornell Hotel and Restaurant Administration Quarterly	226
5	Holcomb J.L., Upchurch R.S., Okumus F.	Corporate social responsibility: What are top hotel companies reporting?	2007	International Journal of Contemporary Hospitality Management	224
6	Han H., Kim Y.	An investigation of green hotel customers' decision formation: Developing an extended model of the theory of planned behavior	2010	International Journal of Hospitality Management	207
7	Han H., Hsu L.-T.(J.), Lee J.-S.	Empirical investigation of the roles of attitudes toward green behaviors, overall image, gender, and age in hotel customers' eco-friendly decision-making process	2009	International Journal of Hospitality Management	207
8	Bohdanowicz P.	Environmental awareness and initiatives in the Swedish and Polish hotel industries-survey results	2006	International Journal of Hospitality Management	185
9	Chen M.-F., Tung P.-J.	Developing an extended Theory of Planned Behavior model to predict consumers' intention to visit green hotels	2014	International Journal of Hospitality Management	182

10	Dalton G.J., Lockington D.A., Baldock T.E.	Feasibility analysis of stand-alone renewable energy supply options for a large hotel	2008	Renewable Energy	172

4.7.3 Network analysis

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 & Waltman, 2010), allows to make maps to visualize bibliometric network data based on the Visualisation Of Similarities (VOS) technique (D. 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 & 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 4.10 and 4.11 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 4.10). In particular, in Figure 4.11 the nodes are coloured based on the average publication year of the author, using the colour scheme depicted in the legend.

Figure 4.10 - Co-authorship network map of authors publishing on green hotels

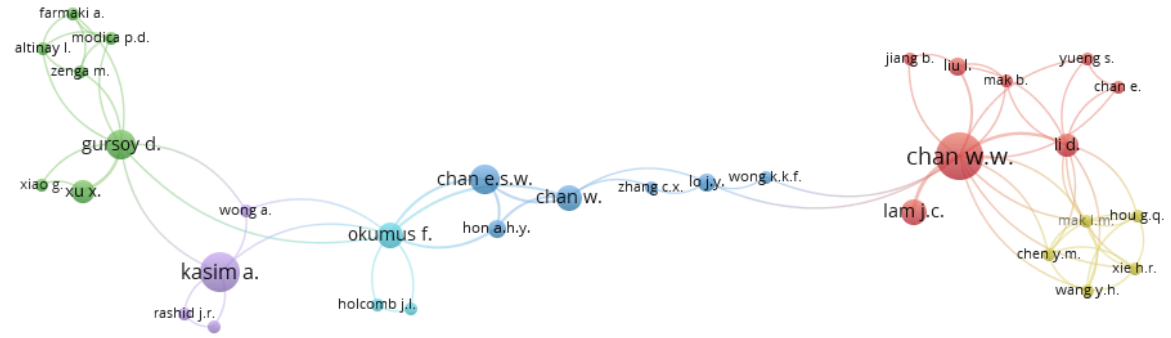


Figure 4.11 - Co-authorship network map of authors publishing on green hotels with overlay visualization

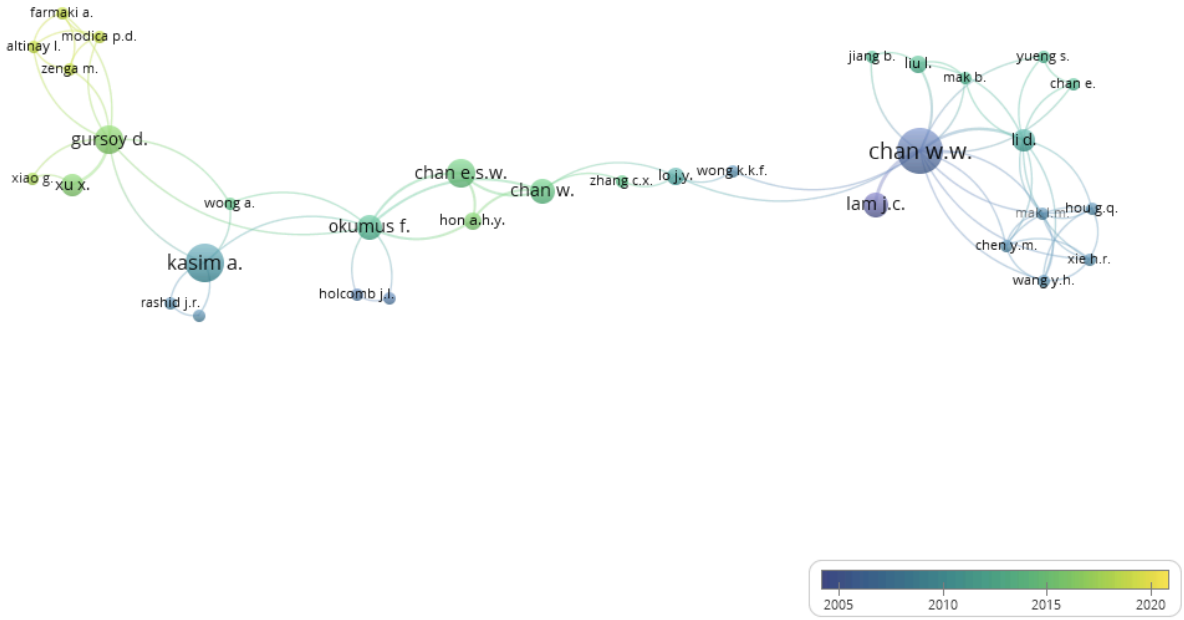


Figure 4.10 shows that in the green cluster the most prolific authors are Xu X. from the College of Business Administration in the California State University and Gursoy D. from the School of Hospitality Business Management in the Washington State University. This cluster is connected to the purple one 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 (W. W. Chan et al., 2008).

Figure 4.11 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, Altinay, Farmaki, Gursoy, & Zenga, 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 4.12 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 4.13 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 4.12 - Co-authorship: Network of collaboration among countries

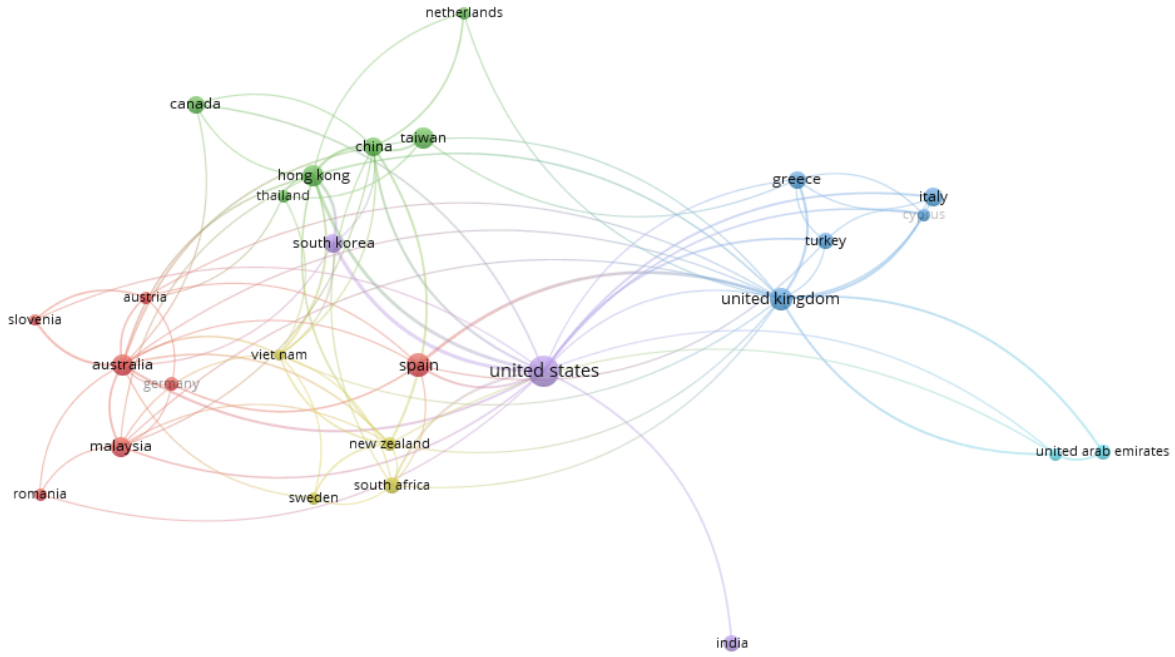
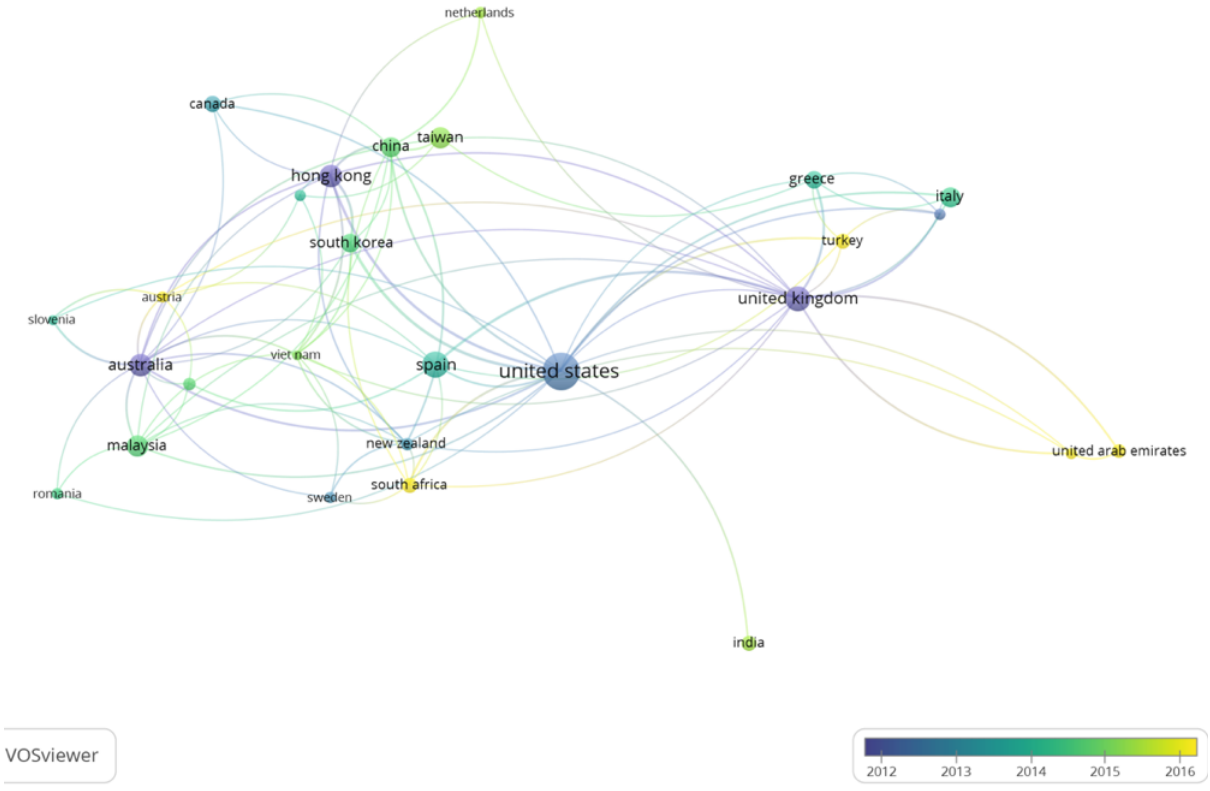


Figure 4.13 - Co-authorship: Network of collaboration among countries with overlay visualisation



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 4.14. 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 4.15 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 4.14 - Co-occurrence network map of authors' keywords

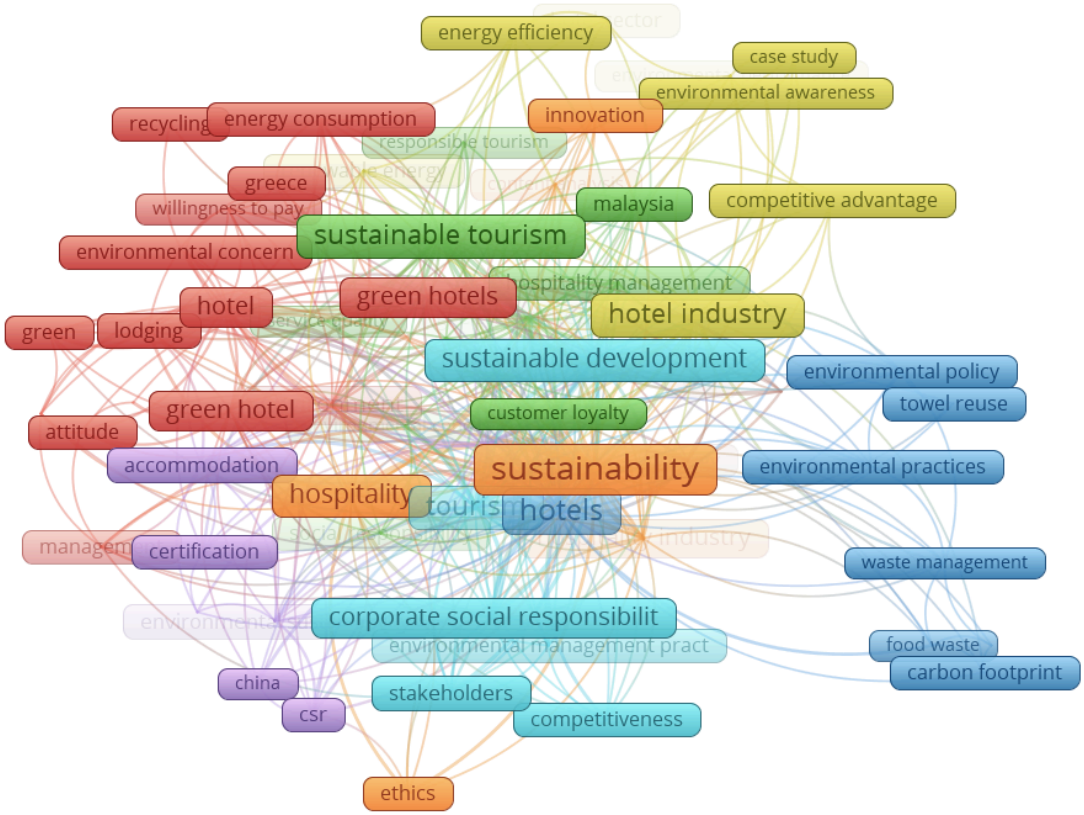
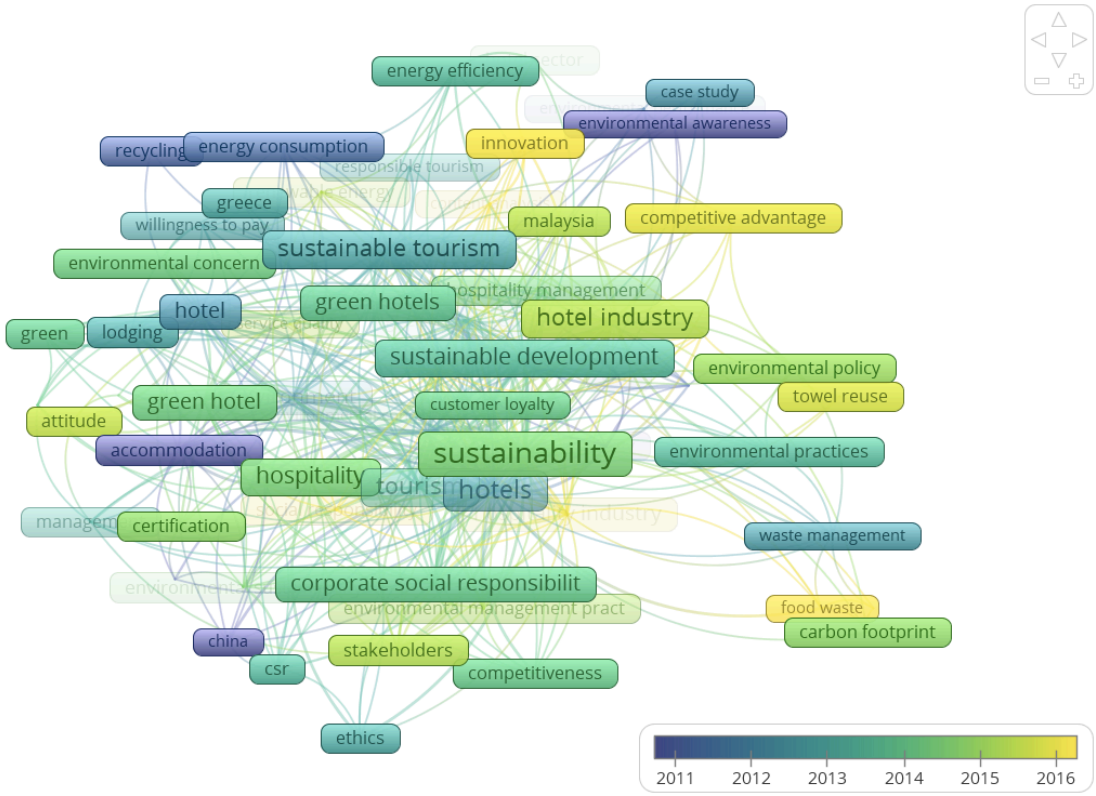


Figure 4.15 - Co-occurrence network map of authors' keywords with overlay visualization



4.8 Category selection

A concept-centric approach has been employed to structure the next part of this review (Webster & Watson, 2002). The structural dimensions and the analytical categories have been chosen considering the research questions proposed (Mayring, 2003; Shukla & Jharkharia, 2013). Different structural dimensions were applied to analyse the topic. Next, for each of them, analytical categories were employed to evaluate the material. As a consequence, each unit of analysis may be part of different categories simultaneously. Therefore, the total count of articles may differ when considering the structural dimensions. Beginning with a deductive approach, categories have been retrieved from studies specifically investigating green practices in the hotel industry, employing an iterative process. Finally, using an inductive process, those analytical categories that were not coherent with our analysis have been discarded and new ones identified (Mayring, 2003; Shukla & Jharkharia, 2013)(Figure 4.16).

Figure 4.16 - Research process of a structured review analysis (Mayring, 2003; Seuring & Müller, 2008).

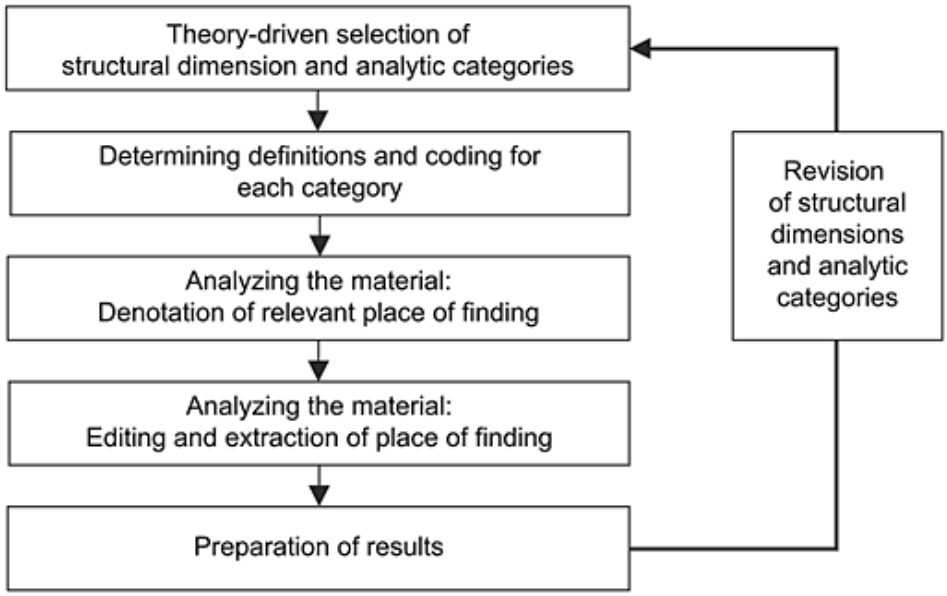


Table 4.4 summarizes the structural dimensions and associated analytical categories employed for material evaluation.

Table 4.4 - Structural dimensions and analytical categories

Structural dimensions	**Analytical categories**
Type of accommodation	• Type of accommodation analysed in the study
Research Topic (Y. H. Kim et al., 2018)	• Hotel industry relation with other sectors→ Hotel industry inter-sectoral linkages • Sustainable operations management (waste, water, CO_2, etc.) • Green Practices • Environmental impact assessment (LCA, CFP, etc.) • Eco-label/environmental management system • Firm Perspective • Innovation in hospitality • Consumer's Behaviour • Employee's Behaviour • Manager's Behaviour • Sustainable Architecture • Social inclusion • Social aspect • Economic sustainability • Indicators/Sustainability Reporting • Energy Conservation/Efficiency • Sustainability Education • Relations with Stakeholders • Policy Implementation • Marketing/Communication Strategy

Research Methods	• Quantitative • Qualitative • Mixed • Conceptual (S.-H. Kim et al., 2017)
Data analysis techniques	- Quantitative, type of statistical analysis as for example: • IPA • PLS • ANOVA • Factor Analysis • Etc. - Qualitative: • Data Display/Description and Analysis • Content Analysis • Framework Analysis • Analytic Induction • Grounded Theory • Abductive Reasoning • Phenomenon Observation • Ethnographic Approach • Thematic Data Analysis • Discourse Analysis • Narrative Analysis
Keywords	• Keywords families
Sustainability approach	• Economic • Environmental • Social • TBL approach • CSR approach • Quality • Circular Economy (CE)
Data collection methods (Yoo, Lee, & Bai, 2011)	• Survey • Questionnaire • Interview • Case Study • Experiment • In situ visit • Focus Group • Literature Review • Secondary data: Company reports, Panel Data Set; government data etc. • Eye-tracking technique • Field data • Website search
Sample/Unit of analysis	• Manager • Hotels • Customers • Consumers • Employee • Tourist • Experts • Literature/Papers • Students • Websites

	• Stakeholders • Company reports • Reviews obtained on TripAdvisor • Engineers • Sustainability reports • Award submissions • Hospitality facilities • Resorts • TripAdvisor database • Auditors • Board member • Certifications schemes • Course leaders • Educators • Farmers • Food suppliers • Hosts • Hotel chain • Owners • Platform operators • Salespeople • Scholars • Travel agencies
Geographical focus	• Specific geographical areas object of the studies
Theory	• Specific theory applied in the study

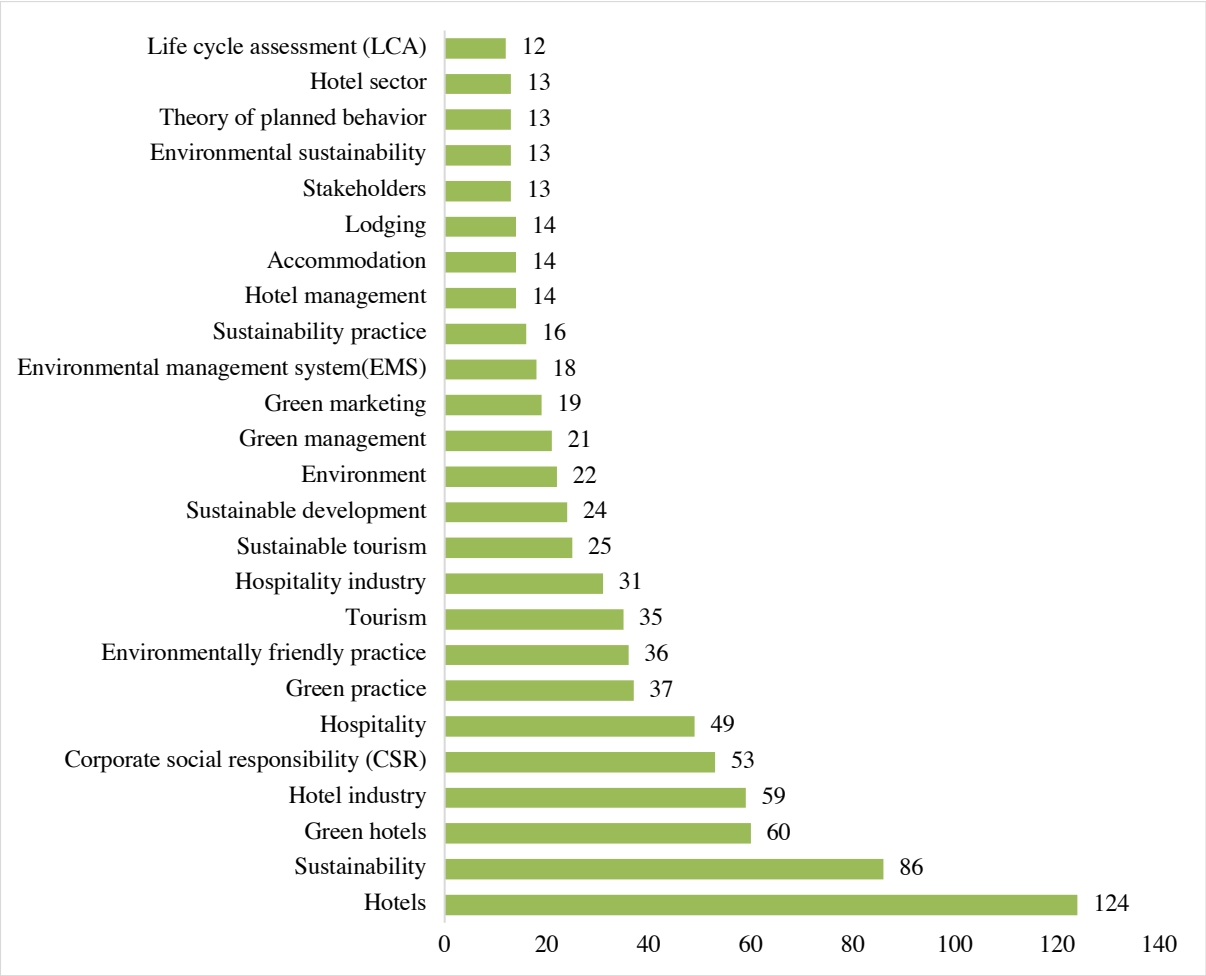
4.9 Material evaluation: Analytical categories and structural dimensions analysis

4.9.1 Keywords analysis

Keywords analysis was conducted to analyse the area of research associated with green hotels investigations. This type of analysis can help understand how scholars approached the topic and highlight the mainstream concepts. From the articles' database, all authors' keywords were manually extracted to perform the analysis. First, the most used keywords by authors were analysed. Figure 4.17 shows the 25 most popular keywords, which represent the 27.07% of all the 3,033 keywords extracted. The most used keywords are Hotels (4.09%), Sustainability (2.84%) and Green hotels (1.98%). Corporate Social Responsibility, that is one of the five top keywords, has been utilized 53 times. In this selection, two keywords are strictly related to each other Environmentally friendly practice (36) and Green practice (37) that are accountably together for the 2.4% of the keywords. Instead sustainability practice has been used just 16

times. From the analysis also emerges that Green management (21 occurrences), Green marketing (19), and Environmental Management System (EMS) (18) are quite popular keywords. Additionally, only one theory, the Theory of Planned Behaviour (TPB) (13 occurrences), and one methodological tool, the Life Cycle Assessment (LCA) (12 occurrences), have been used often as keywords.

Figure 4.17 – The 25 most used keywords



Given that many keywords differ only in formal aspects (as in the use of a line or acronyms) while others have strong conceptual similarities, to summarize and clarify the analysis, keyword clusters were created (Figure 4.18). However, for the 12.36 % of the keywords was not possible to classify them in one specific cluster.

The main cluster is the one that includes all the different type of hospitality facilities analysed by the authors “Type of hospitality facilities” that represents the 15.83 % of the sample, followed by the “Sustainability/CSR/Environmentally friendly” cluster with 10.12 % (this cluster includes all the keywords that are related in general to sustainability but also to green strategy, environmental protection, ecology etc.). The third most populated cluster is the

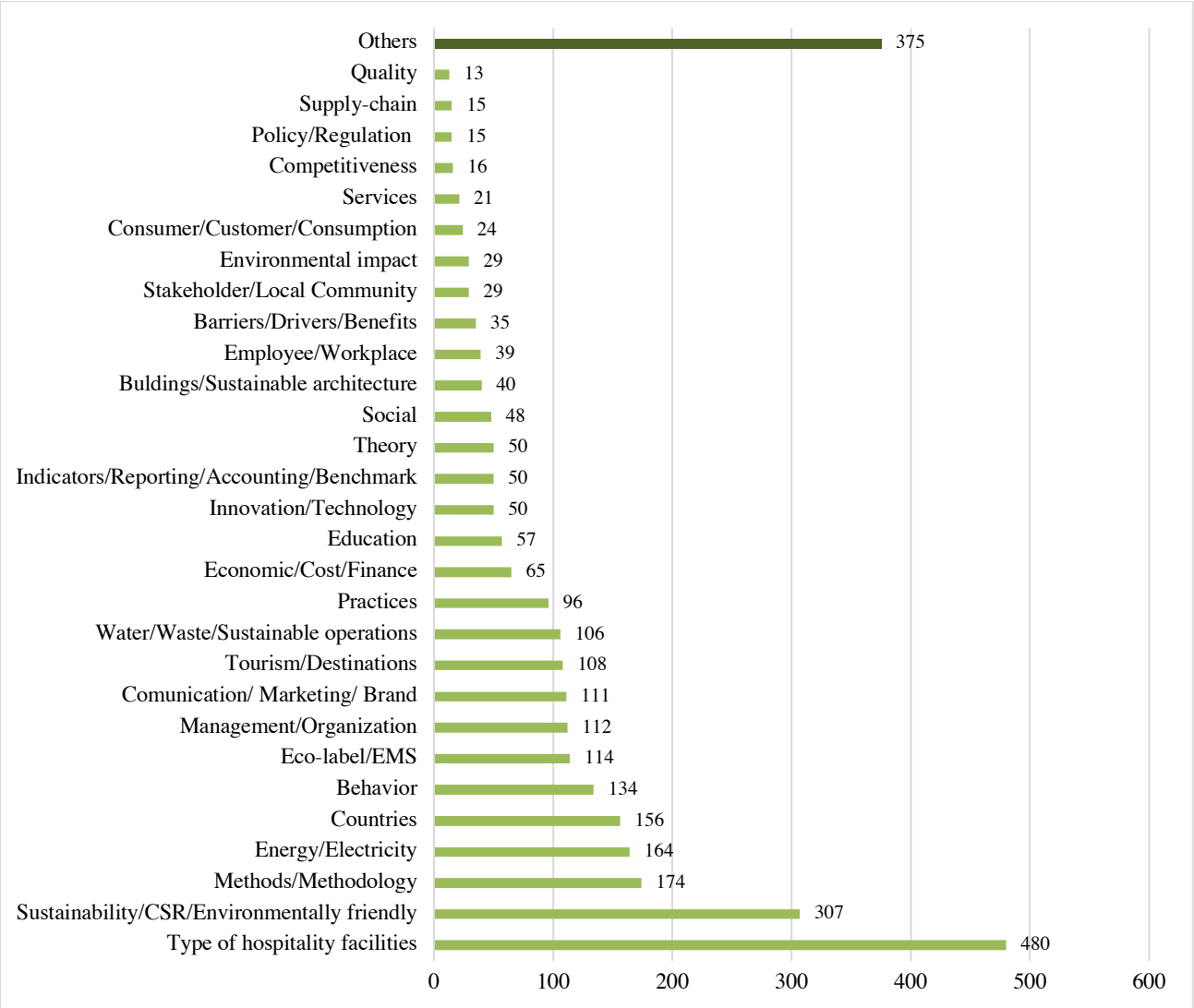
“Methods/Methodology” with 174 occurrences this cluster represents the 5.74 % of the keywords. In this cluster the most frequent keyword related to the methodology is the LCA (12 occurrences) followed by case study (6 occurrences), content analysis (5) and Delphi method (5). In the Energy/Electricity cluster (164 occurrences), Renewable energy (11), Greenhouse gas (GHG) emission (8), Carbon footprint (8) and Energy efficiency (8) are the keywords that are used by authors more often. Then we have the Countries cluster (156) in which the most popular keywords are Malaysia (9), Greece (8) and India (7).

Additionally, a Behaviour cluster (134 occurrences) was created. In this cluster all the keywords related to behavioural, attitudinal, and satisfaction-related variables have been collected. The most used were Attitudes (11), Environmental concern (11), Consumer satisfaction (9) Consumer behaviour (8) and perceived value (8).

Another interesting cluster is the “Water/Waste/sustainable operations” one (106 occurrences); the main keywords that composes this cluster are Food waste (5), Waste management (5) and Water conservation (5). The “Theory” cluster groups together all the keywords that represents theories or frameworks applied or analysed in the studies. This is mainly characterized by the keywords “Theory of planned behaviour” (13), Triple bottom line (TBL) (4), New Ecological Paradigm Scale (3), Persuasion knowledge model (3) and the Value-belief-norm theory (3). Moreover, it is interesting highlight some clusters that emerge from the analysis, the social cluster (48) mainly characterized by Social responsibility (6), Social innovation (3), Social entrepreneurship (3), Human rights (3) and Ethics (3) keywords, and the “Barriers/Drivers/Benefits” cluster (35) in which the most used keywords are Incentive (5), Facilitators (3), Motivation crowding effect (3), Motivational factors (3), Barriers (2) and Benefit (2) .

Finally, from the study also emerged the supply chain cluster (15) and the “quality” one (13) (Figure 4.18).

Figure 4.18 - Keywords Cluster Analysis



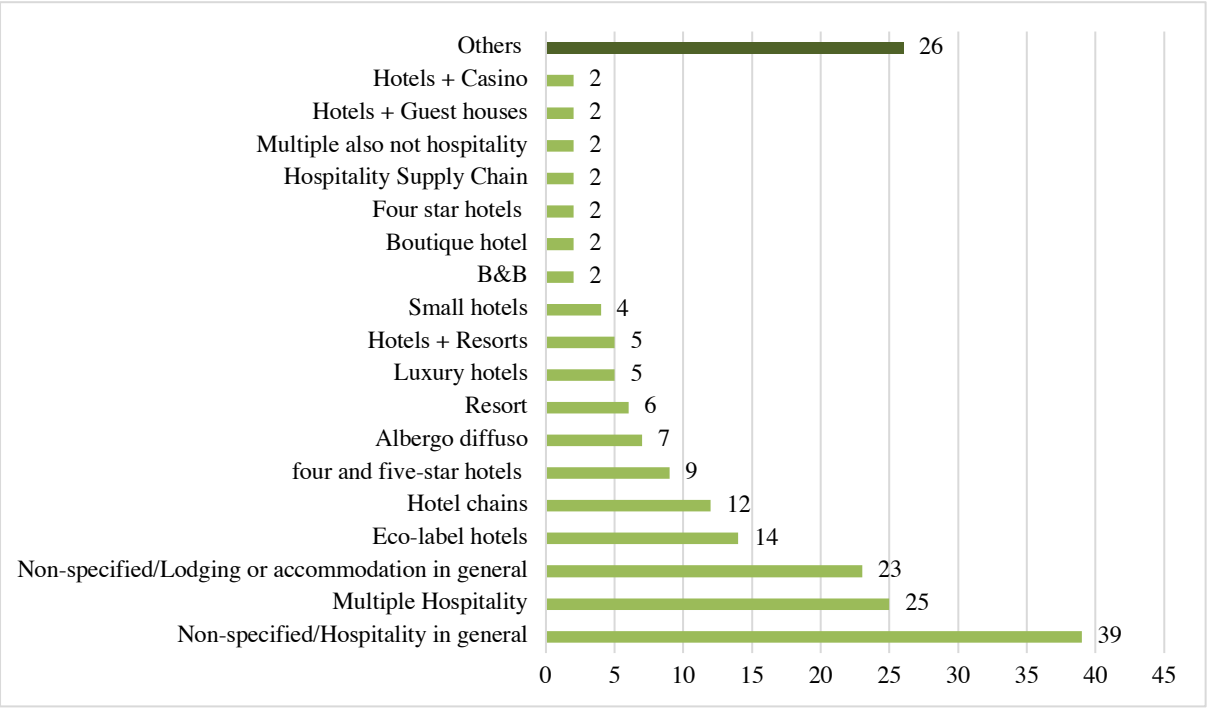
4.9.2 Type of accommodation

The next step of the analysis consisted of categorizing papers in relation to the type of accommodation investigated (Figure 4.19). The 68.5% (411 papers) of the papers deal specifically with the implementation of sustainable solutions in the hotel industry. Additionally, hotels have been studied also jointly with casino (2 papers) (e.g. Tian & Robertson, 2017) and guest house (2 papers) (e.g. Azarmi, Oladipo, Vaziri, & Alipour, 2018). However, 62 papers, the 10.33% of the sample, do not specify the type of facilities investigated in the study. Particularly, of these 39 papers fall in the category "Non-specified/Hospitality in general" and 23 papers belong to the "Non-specified/Lodging or accommodation in general" category. Additionally, 27 papers investigate more than one type of hospitality facility (e.g. Gössling, 2018; Jarvis, Weeden, & Simcock, 2010) or investigate a hospitality activity jointly

with another industry (e.g. Rahman, 2018; Rao, Singh, La O'Castillo, Intal, & Sajid, 2009). Of these, 25 papers fall in the "Multiple Hospitality" category and 2 in "Multiple also not hospitality". Eco-labelled hotels have been studied in 14 articles (e.g. Nižić & Matoš, 2018; Priego, Najera, & Font, 2011) and hotel chains in 12 (e.g. Confalonieri, 2014; Jones, Hillier, & Comfort, 2014). Furthermore, scholars have dedicated special attention to study sustainability in relation to four stars hotels (2 papers) four and five stars hotels (9) (e.g. Aripin, Amran, Saad, & Awaluddin, 2018; Davidson & Wang, 2011) and luxury hotels (5) (e.g. Cherapanukorn & Focken, 2014; Rishi, Jauhari, & Joshi, 2015). Particular is the case of the "Albergo diffuso" (7 papers) defined by Paniccia & Leoni (2019) as a: "*sustainable and innovative form of hotel that originates in enhancing historical and cultural real estate heritage, characterized by original structures, places (rural areas or small urban centres) and persons involved (both residents and tourists) in the production-distribution process and with experiential authenticity*". This type of accommodation originates in Italy and it is mainly studied by Italian scholars (e.g. Confalonieri, 2011; Romolini, Fissi, & Gori, 2017). From the analysis also emerges the academic attention to the sustainability research in resort (6 papers) (e.g. De Oliveira Menezes & Schoab, 2018; Doganer, 2014) and hotels and resort (5 papers) (e.g. Dhanda, 2014; Meade & Pringle, 2003).

However, also smaller accommodations have been studied in literature as for example small hotels (4 papers) (e.g. Bagur-Femenias, Celma, & Patau, 2016), B&B (2 papers) (e.g. van Haastert & de Grosbois, 2010) and boutique hotels (2 papers) (e.g. Kleinrichert, Ergul, Johnson, & Uydaci, 2012). Finally, in 2 papers the entire hospitality supply chain was the subject of scholar's investigations (e.g. Al-Aomar & Hussain, 2018; Xu & Gursoy, 2014).

Figure 4.19 - Type of accommodation.



4.9.3 Research Methods

Analysing the research methods structural dimension emerged the predominance of the quantitative research (377 papers) representing the 62.83 % of the sample (Figure 4.20). However, also qualitative research has been frequently used to study sustainability in the hotel sector in 139 studies (23.17 %).

In the mixed-methods research category have been categorized all the papers that use both quantitative and qualitative instruments following the definition provided by Johnson & Onwuegbuzie (2007) in which this type of research design has been conceptualized as: "*type of research in which a researcher or team of researchers combines elements of qualitative and quantitative research approaches (e. g., use of qualitative and quantitative viewpoints, data collection, analysis, inference techniques) for the broad purposes of breadth and depth of understanding and corroboration".*

This type of research method allows researchers to reach a greater robustness of data through stakeholder triangulation as well as a greater understanding of the stakeholder's feedback (Molina-Azorín & Font, 2016).

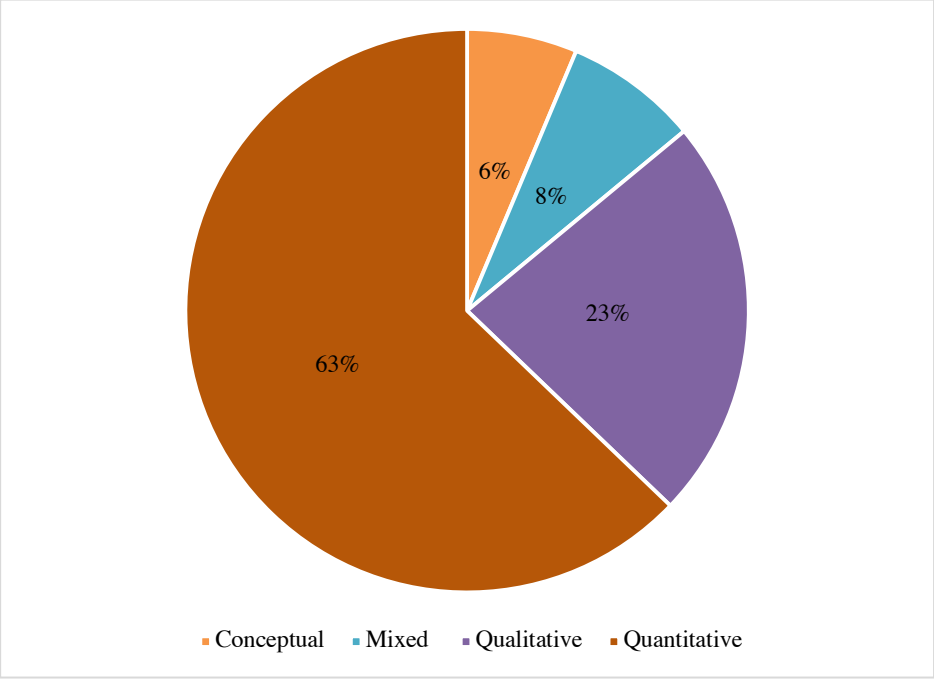
This category is less popular among scholars representing only the 7.67 % (46 papers) of the works conducted on this topic. A good example of this is the paper of Pérez-Pineda, Alcaraz,

& Colón (2017), that used the mixed-methods approach in their study on sustainable practices adoption in the Dominican Republic hospitality industry from a multi-stakeholder perspective, conducting interviews with hotels managers and different stakeholders. These interviews were firstly analysed through the qualitative thematic and content analysis, then interview findings were turned into a numerical array and analysed through a quantitative k-means cluster analysis.

Finally, conceptual research studies represent the 6.33 % (38 papers) of the sample (e.g. Jones, Hillier, & Comfort, 2016; Rezapouraghdam, Alipour, & Arasli, 2018).

This type of research design in tourism studies has been defined by Xin, Tribe, & Chambers (2013) as: "*a set of activities that focus on the systematic analysis and profound understanding of tourism concepts. Research can cover the antecedents, origin, history and development of the concept as well as its cur- rent use, facets, controversies, applications, characteristics and idiosyncrasies, points of differentiation, discourse and ideological analysis and deconstruction. Its major outcomes include the clarification of a concept, the proposing of a new concept, the modification of an existing one (reconceptualization) or ideological or other critique*".

Figure 4.20 - Research methods



4.9.4 Data Collection Methods and Sample/Unit of the analysis

For the data collection methods category, the analysis has been divided in two parts. First, the total number of occurrences of one specific data collection method has been counted (Figure 4.21) and then the most popular combinations of data collection methods have been reported (Figure 4.22). The most widespread data collection methods are surveys/questionnaires (331 occurrences) and interviews (112 occurrences) (Figure 4.21). The next most data collection method is case study (108 occurrences), followed by secondary data (100) and field data (52). Some studies also used experiments (31) (e.g. Susskind, 2014; Theotokis & Manganari, 2015) and focus groups (8 occurrences) (e.g. Nimri, Patiar, & Kensbock, 2017; Njite & Schaffer, 2017). Finally, Penz, Hofmann, & Hartl (2017) used eye-tracking technique to verify consumers awareness of eco-labels when they look at hotel website, and if this awareness is related to the perception of the website.

Figure 4.21 - Data collection methods[5]

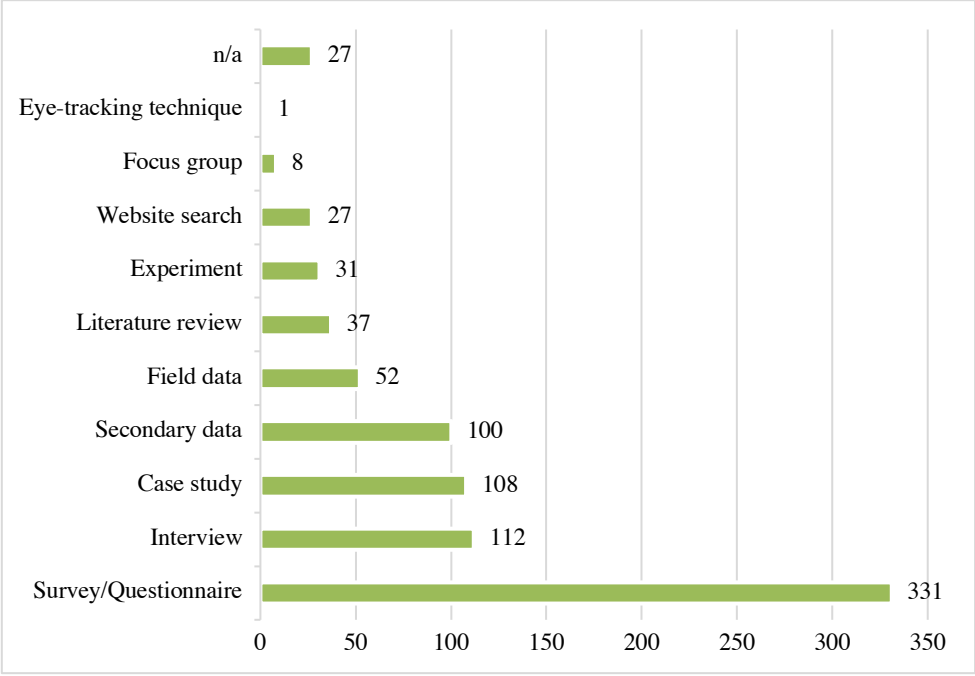
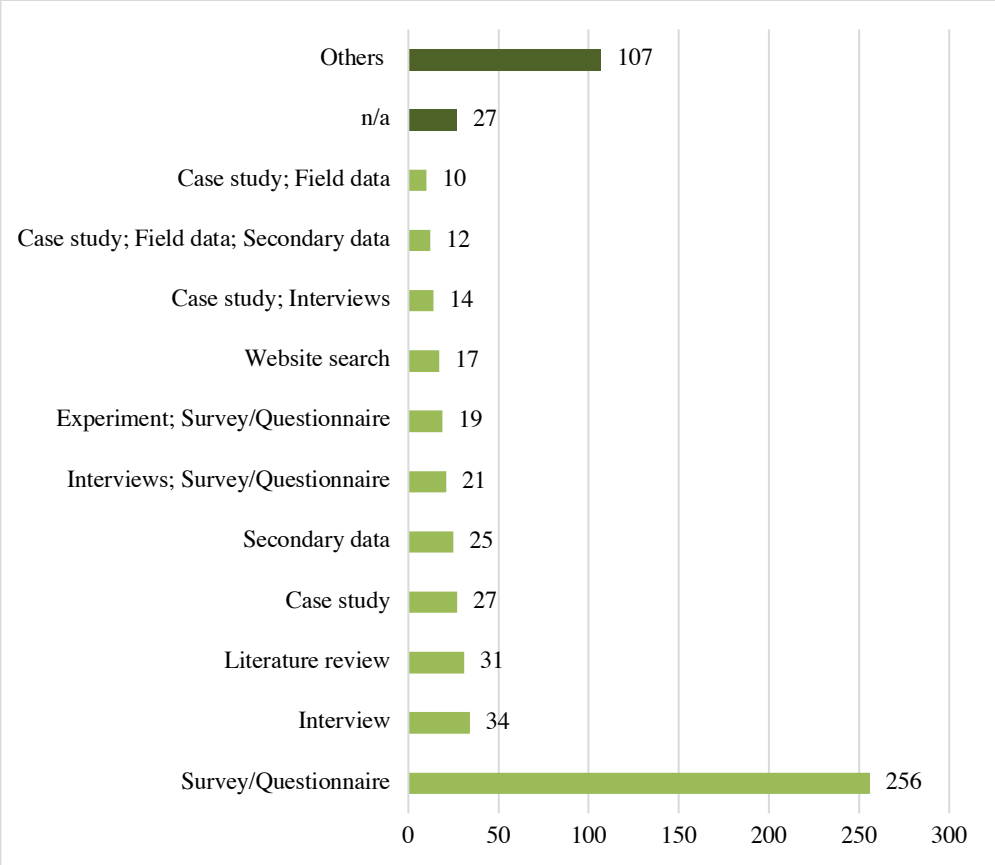


Figure 4.22 shows the different combinations of data collection methods that have been used by scholars investigating sustainability in the hotel industry. The most common combination is interviews and survey (21 papers) and the use of experiments jointly with the

[5] The sum may not correspond to the total of the eligible studies because in some studies more than one data collection method has been used.

survey/questionnaires (19 papers). Additionally, 14 papers combine case study methodology with surveys data collection method.

Figure 4.22 - Combinations of data collection methods



Additionally, this study analyses the sample population or the unit of the analysis of the papers focused on hotels sustainability. Considering that the same paper may have investigated more than one sample or unit of analysis, the sum of the occurrences is different from the total of the eligible studies. In this case it was decided to count the number of occurrences in the studies of a sample or unit of analysis and not the combination of these. In particular, for 56 studies it was not possible to identify a specific sample or analysis unit, often because they were conceptual or theoretical studies. The total of the occurrences was 682 and the percentages to follow will be based on this total (Figure 4.23).

Figure 4.23 - Sample/Unit of analysis[6]

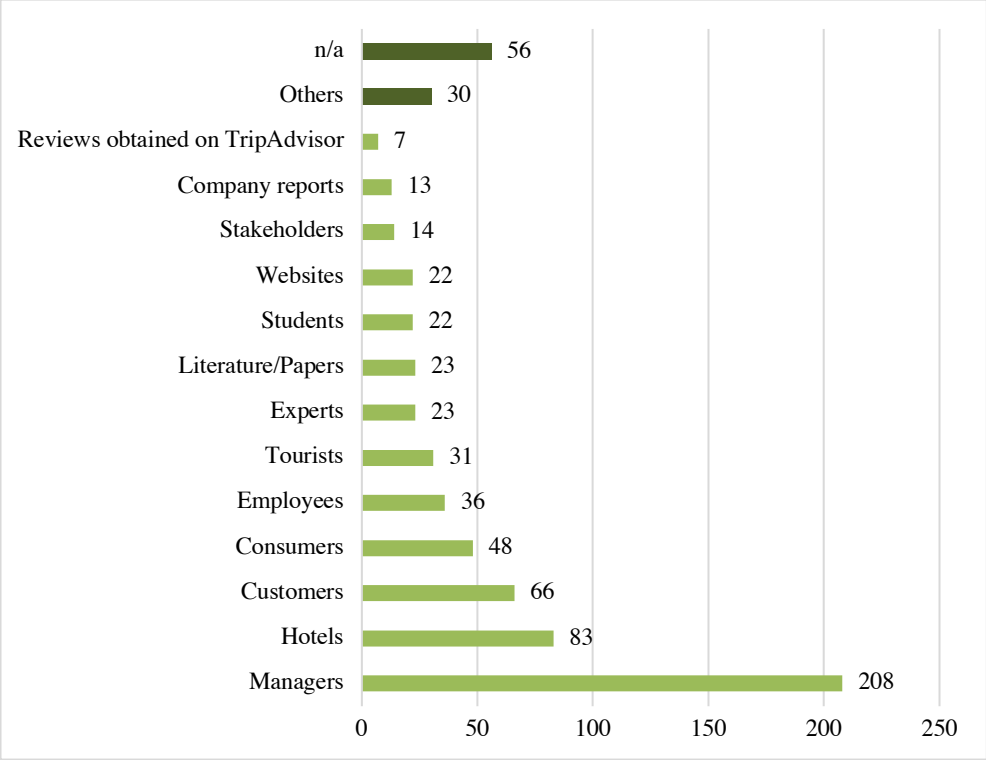


Figure 4.23 shows that in 30.50% of cases the researchers investigated the managers' perspective (208 occurrences) (e.g. E. S. W. Chan, 2013; H. J. Kim, Park, & Wen, 2015) and in 12.17% of the cases hotels have been selected as unit of the analysis (e.g. Bianco, Righi, Scarpa, & Tagliafico, 2017; W. W. Chan, 2009). Furthermore, a distinction was made between papers that study the perspective of consumers and the ones that study the customers/guests. In fact, in some studies the focus is on the potential consumers, while in others the perception of the hotel's guests is studied, i.e. those who have had experience of the service offered. From the analysis emerges that 66 papers have been dealing with the customers perspective (e.g. Martínez García de Leaniz, Herrero Crespo, & Gómez López, 2017; Warren, Becken, Nguyen, & Stewart, 2018) and 48 with the consumers one (e.g. Gao & Mattila, 2016; Jiang & Kim, 2015). Instead, employees have been the sample of 36 publications (e.g. Luu, 2017; Tian & Robertson, 2017) mainly from a behavioural point of view.

[6] The sum may not correspond to the total of the eligible studies because in some studies more than one sample or unit of the analysis has been analysed.

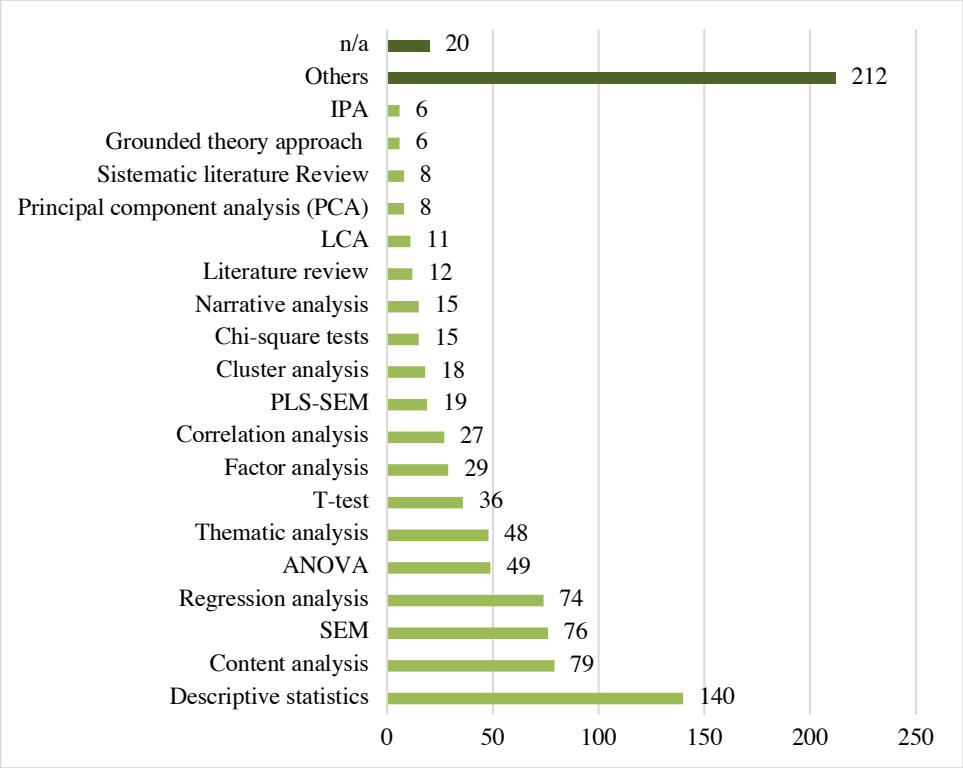
Moreover, tourists (31 occurrences) (e.g. Mazhenova, Choi, & Chung, 2017; Tussyadiah & Pesonen, 2018) and experts (23) (e.g. Hsiao, Chuang, Kuo, & Yu, 2014; Tzschentke, Kirk, & Lynch, 2004) have also been used as a sample.

Students samples, instead, have been used by scholars with a dual purpose, as a convenience sample in consumers behavioural studies (e.g. Slevitch, Mathe, Karpova, & Scott-Halsell, 2013; Tang & Lam, 2017) and as true objective of the analysis (e.g. Murray & Ayoun, 2011; Zizka, 2017). For example Goh, Muskat, & Tan (2017), explored the hospitality students' attitudes and perceptions towards sustainable practices in the hotel industry, highlighting the impact of these practices on their future career. Company website (22) (e.g. Gröschl, 2011; Ruiz-Lozano, De-los-Ríos-Berjillos, & Millán-Lara, 2018), company reports (13) (e.g. W. W. Chan, 2009; Nyahunzvi, 2013) and hotel's reviews on TripAdvisor (7) (e.g. Yi, Li, & Jai, 2018; Yu, Li, & Jai, 2017) have been used as sample of the investigation and mostly analysed through thematic and content analysis. Finally, also stakeholders perspective has been examined in 14 papers (e.g. Spenceley, 2019; Teng, Horng, & Hu, 2015).

4.9.5 Data analysis techniques

Subsequently, this study has examined the data analysis techniques applied in the reviewed articles. Figure 4.24 shows that the great majority of the studies used quantitative data analysis techniques, and this is coherent with the result of research methods structural dimension (Section 1.9.3). Particularly, 140 studies (15.42 %) used descriptive statistics to report the results of the investigations, often in combination with other data analysis techniques, 76 used Structural Equation Modelling (SEM) and 74 the regression analysis. Other very diffused data analysis techniques are the analysis of variance (ANOVA) (49), t-test (36), factor analysis (29) and correlation analysis (27). Furthermore, also Partial Least Squares Structural Equation Modelling (PLS-SEM) has been used in 19 studies (e.g. Aripin et al., 2018; Prud'homme & Raymond, 2013) confirming its momentum in hospitality research (F. Ali & Rasoolimanesh, 2018). However, also qualitative data analysis techniques have been used as Content analysis (79 occurrences) (e.g. De Grosbois, 2012; Reid, Johnston, & Patiar, 2017), Thematic analysis (48) (Nimri et al., 2017; Rishi et al., 2015), Narrative analysis (15) (e.g. Mahachi, Mokgalo, & Pansiri, 2015) and Grounded theory approach (6) (e.g. Alegre & Berbegal-Mirabent, 2016; Weaver et al., 2013). Finally, just one data analysis technique is not predominantly qualitative or statistical, the Life-cycle assessment (LCA) that occurs in 11 papers (e.g. Camillis, Raggi, & Petti, 2010; Castellani & Sala, 2012).

Figure 4.24 - Data analysis techniques - more than 5 publications[7]



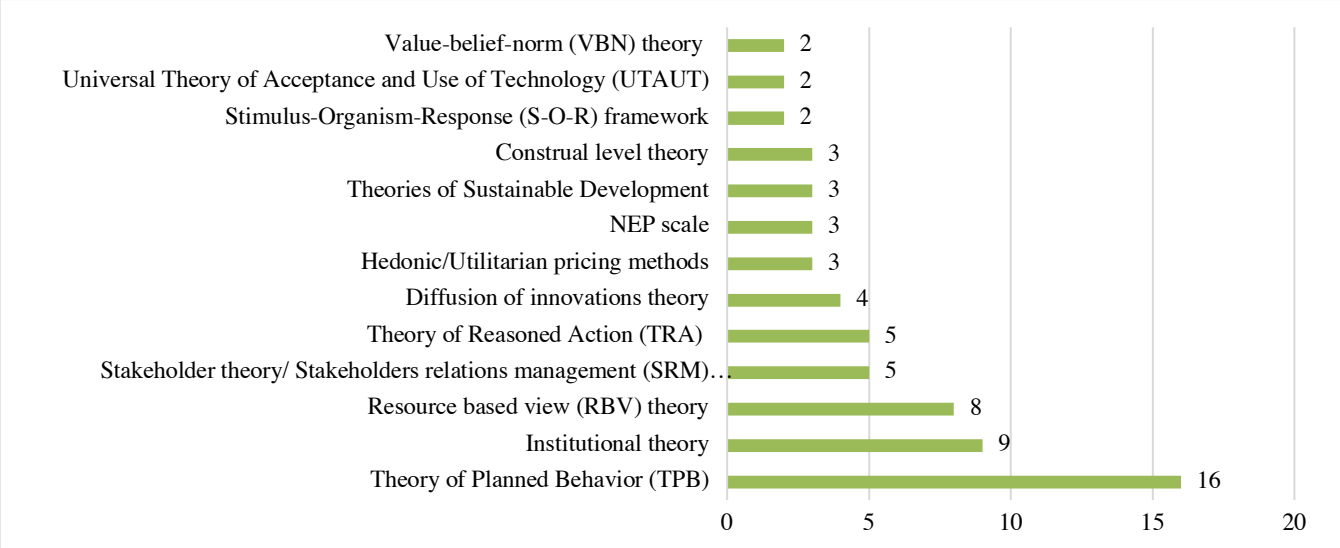
4.9.6 Theories and theoretical frameworks

The next step was to analyse the theories and theoretical frameworks used by the authors as a theoretical basis for their investigations. Only 12% (72 studies) of the analysed studies used a specific theory to develop the analysis. Of these studies, the great majority (72%) used a quantitative research method (e.g. Goldstein, Griskevicius, & Cialdini, 2007; Jiang & Kim, 2015), the 18 % a qualitative research method (e.g. Grazzini, Rodrigo, Aiello, & Viglia, 2018; Horng, Wang, Liu, Chou, & Tsai, 2016), 5 studies used a mixed method approach (e.g. Njite & Schaffer, 2017; Voytenko Palgan, Zvolska, & Mont, 2017) and 2 conceptual approach (e.g. Pérez & del Bosque, 2014; Wijesinghe, 2014). Figure 4.25 shows the most used theories by scholars in the context of sustainable accommodations. The most widespread theory is the Theory of Planned Behaviour (TPB) that has been used in 16 studies, followed by the institutional theory (8 studies), the Resource Based View (RBV) theory (7 papers) and the

[7] The sum may not correspond to the total of the eligible studies because in some studies more than one data analysis technique has been used.

Theory of Reasoned Action (TRA) (5 papers). The following paragraphs will explore these theories and their application on the context of green hotels in details.

Figure 4.25 - Theories and theoretical frameworks[8]

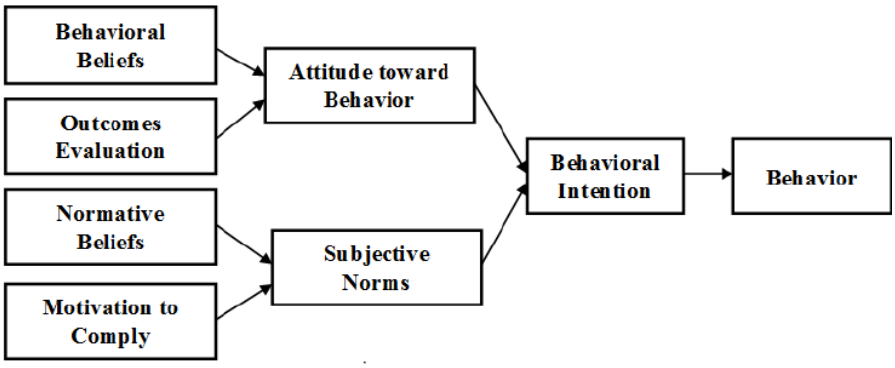


4.9.6.1 The Theory of Reasoned Action (TRA) and the Theory of Planned Behaviour (TPB)

Five papers used the **Theory of Reasoned Action (TRA)** introduced by Fishbein & Ajzen, (1975) to predict consumers behavioural intentions. This theory is built on the assumption that human behaviour is naturally rational, and individuals tend to make logical decisions based on the systematic use of information available to them. According to the TRA, behavioural intentions, which are the antecedents of the actual behaviour, are function of the attitude towards the behaviour and subjective norms. According to Ajzen & Fishbein (1980), attitude refers to "the degree of one's positive or negative evaluation of behaviour". The attitude towards the behaviour is determined by the behavioural beliefs, the possibility that a specific behaviour can generate certain results and produce specific outcomes, and the evaluation of these outcomes. Subjective norms, instead, consist of the pressure on the individual to conform to the expectations of people who are important to him/her (Ajzen, 1991). Subjective norms are influenced by the perceived expectation by individual or group who are important to the person and by the persons' motivation to comply with these expectations (Figure 4.26).

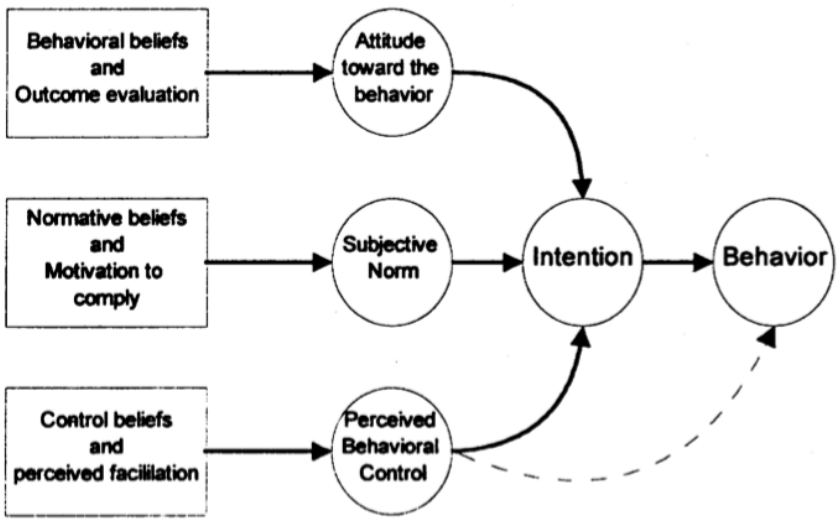
[8] The sum may not correspond to the total of the eligible studies because in some studies more than one data theory has been used.

Figure 4.26 - Theory of Reasoned Action



The **Theory of Planned Behaviour (TPB)** developed in the study of Ajzen (1991) is an extension of the Theory of Reasoned Action (TRA) with the addition of a new construct, which he called perceived behavioural control (Madden, Ellen, & Ajzen, 1992)(Figure 4.27). This construct has been defined by Ajzen (1991) as: "an individual's perception of the ease or difficulty of performing the particular behaviour". This perception is influenced by the difficulties that a subject considers as associated to a specific behaviour, in terms of resources and necessary skill (i.e. how difficult the behaviour are perceived to be), and the perception that the subject has to be able to successfully overcome the previous difficulties and perform the behaviour. High perceived behavioural control is associated with behaviour easy to perform, on the contrary, low perceived behavioural control with behaviour difficult to perform (Guyer & Fabrigar, 2015). TPB has been developed because it addresses better all the behaviours that are not under an individual's voluntary control.

Figure 4.27 - Theory of Planned Behaviour



These theories have been widely used by scholars in consumers' behaviour research, especially in the hospitality context.

Particularly, this analysis shows that TRA has been used five times in green hotel research.

TRA has been used in its pure form (e.g. Eslaminosratabadi, 2014; Sukhu & Scharff, 2018) or jointly with the TPB (e.g. L. Wang, Wong, Narayanan Alagas, & Chee, 2019). Additionally, Han & Kim (2010) extended the use of TRA and TPB adding service quality, customer satisfaction, overall image, and frequency of past behaviour variables to predict intention to revisit a green hotel. In the context of eco-label adoption in the hotel industry Leroux & Pupion (2018) built a model that comprise the TPB, the Neo-Institutional Theory, the TRA, and theory of entrepreneurial orientation.

The TPB is the most used theory in green hotels research. This theory has been used only in two papers in its original form to predict consumers choice for green hotels (e.g. A. Chen & Peng, 2012) and to explain the formation of hotel customers' intentions to visit a green hotel (e.g. Han et al., 2010). However, most of the times this theory has been extended or modified to include more or new variables. J. Wang, Wang, Wang, Li, & Zhao (2018) added perceived consumer effectiveness and environmental concern. Verma & Chandra (2018) included two additional constructs, moral reflectiveness and conscientiousness, to predict young Indian consumers' intention to visit green hotels. Altruism has been added by Y.-M. Teng, Wu, & Liu (2013) to predict Taiwanese consumers' intention of visiting a green hotel. Mohd, Norbayah, & Suki (2015), instead, modified the TPB comprising green hotel knowledge as moderating variable for returning tourists' propensity to stay in a green hotel. Moreover, M. F. Chen & Tung (2014) included environmental concern and perceived moral obligation to predict consumers' intention to visit green hotels.

Additionally, Y. Kim & Han (2010) extended the TPB by including environmental concerns, perceived customer effectiveness and environmentally conscious behaviours to explain customers' decision formation to pay comparable conventional-hotel prices for a green hotel.

Han & Yoon (2015) applied the Model of Goal-directed Behaviour (MGB), an extension of the TPB, by integrating several essential variables as environmental awareness, perceived effectiveness, eco-friendly behaviour and reputation to explore customers' eco-friendly behaviour. Finally, just one article applied the TPB with a qualitative research to explore Australian travellers' beliefs about staying in green hotels (e.g. Nimri et al., 2017).

4.9.6.2 The Institutional Theory and the Resource Based View (RBV) Theory

According to the **Institutional theory**, organizations are subject to social and cultural pressures that influence their practices and structures (Scott, 1983). These institutional pressures push organizations to adopt similar structures, strategies and processes (DiMaggio & Powell, 1983; Meyer & Rowan, 1977). Additionally, this theory has legitimacy as its main focus and states that one of the main goals of the organizations is to reach the social legitimacy. Legitimacy is defined by Suchman (1995) as: "*a generalized perception or assumption that the actions of an entity are desirable, proper, or appropriate within some socially constructed system of norms, values, beliefs, and definitions*". In acquiring this social legitimization organizations develop an "institutional isomorphism" defined by DiMaggio & Powell (1983) as a "*constraining process that forces one unit in a population to resemble other units that face the same set of environmental conditions*". This homogenization process is leaded by three institutional pressures: coercive, normative, and mimetic. The coercive isomorphism is defined by DiMaggio and Powell (1983) as: "*the pressures that can be exerted by other organizations on which an organization may be dependent, as well as, cultural expectations in which the organizations operate*". This type of pressures drives companies to comply with the rules and norms imposed by external forces. Mimetic isomorphism happens when organizations imitate other organizations in response to uncertainty (DiMaggio and Powell, 1983). Normative isomorphism is primarily associated with professionalization, this type of pressures is connected to the spread of ideas and professional standards of behaviour that assume a high degree of legitimacy, with a pivotal role of universities, schools, entrepreneurial and professional networks and consulting agencies (DiMaggio and Powell, 1983). In academic literature, institutional theory have been widely used to identify the drivers for environmental practices (Brammer, Jackson, & Matten, 2012; Siti-Nabiha, Wahid, & Ariffin, 2010).

The **Resource Based View (RBV) Theory** has its roots in the work of Penrose (1959) in which managerial resources has been found as primary driver of growth. The RBV theory recognize the firm's resources as main drivers of competitive advantage and business performance (Wernerfelt, 1984). These resources can be tangible (e.g., financial reserves, buildings, equipment) and intangible (e.g., technology, human resources, reputation) (Peteraf, 1993). According to Barney (1991) firm's sustained competitive advantage is based on its valuable, rare, inimitable, and non-substitutable resources. However, according to Hart (1995), the RBV

ignores the interaction between the firm and its natural environment so he postulates the Natural Resource Based View (NRBV). The NRBV is an extension of the RBV that underlines the importance of sustainable development, pollution prevention and product stewardship resources for firms' competitive advantage (Hart, Academy, & Oct, 1995; Hart & Dowell, 2011). Additionally, several studies assert the relation between firm resources and capabilities and the implementation of a proactive environmental strategy (Araǵon-Correa, Matías-Reche, & Senise-Barrio, 2004; Aragón-Correa & Sharma, 2003; Christmann, 2000).

In this review 8 papers used the RBV, of these only three papers used this theory exclusively (e.g. Graci & Dodds, 2008; Leonidou, Leonidou, Fotiadis, & Zeriti, 2013; Yusoff, Nejati, Kee, & Amran, 2018). Additionally, one paper used the NRBV jointly with the relation theory to explore the effects of eco-innovation, environmental orientation and supplier collaboration on hotel performance (Aboelmaged, 2018).

According to the results of this review, 4 studies combine the institutional and RBV theories to take into consideration both external and internal firm's factors (e.g. López-Gamero et al., 2011; Mzembe, Melissen, & Novakovic, 2018; Rivera, 2002; Shah, 2011).This combination provides a complete view for investigating environmental initiatives in firms (Clemens & Douglas, 2006; María Dolores López-Gamero et al., 2011). Moreover, 3 papers studied or tested the application of the institutional theory in the context of green hotel (e.g. Pusparini, Soetjipto, Rachmawati, & Sudhartio, 2018; Rivera, 2010; Sánchez-Fernández, Vargas-Sánchez, & Remoaldo, 2014). Finally, one paper used jointly the institutional pressure theory and the slack resource theory to test determinants of green activities in star hotels (T. Y. Hsiao et al., 2018).

4.9.6.3 Other theories

Besides the most common theories it is also significant to analyse other theories used by scholars in the study of green hotels. From the analysis emerges that two papers used the **Stakeholders relations management (SRM) theory** (e.g. Pérez & del Bosque, 2014; Pérez & Rodríguez del Bosque, 2014) and three the **Stakeholder theory** (e.g. Alberg Mosgaard, Kerndrup, & Riisgaard, 2016; Guix, Bonilla-Priego, & Font, 2018; Sánchez-Medina, Díaz-Pichardo, & Cruz-Bautista, 2016).

Moreover, the **Diffusion of innovations theory (DIT)** developed by Rogers (2003) was used in 4 studies. The author, that defines innovations as: "*ideas, practices, or concepts perceived*

as new to the potential adopters", identifies three major firm's motivation to adopt innovations: the characteristics of innovations, the characteristics of the organization, and the characteristics of the environment in which the organization operates. For what concern the characteristics of innovations he theorises that adopting an innovation is based on five characteristics of the innovation: relative advantage, compatibility, complexity, observability and trialability. Rogers (2003) stated that "individuals' perceptions of these characteristics predict the rate of adoption of innovations" founding that between 49% and 87% of variance in adoption is explained by these five attributes. Particularly, results from the analysis shows that DIT has been used in green hotel research to study the implementation of environmental sustainability practices from the managers' point of view, especially in countries and sectors in which these practices are relatively new (e.g. Best & Thapa, 2011; Horng, Liu, Chou, Tsai, & Hu, 2018; Le, Hollenhorst, Harris, McLaughlin, & Shook, 2006; Smerecnik & Andersen, 2011).

Additionally, the **hedonic and utilitarian values** have been used in 3 papers (Han et al., 2018; Sánchez-Ollero, García-Pozo, & Marchante-Mera, 2014; Soler, Gemar, & Sanchez-Ollero, 2018). Particularly, while the utilitarian value can be defined as "*the value that a customer receives from the functionality of a product/service*" the hedonic value is defined as "*the value that a customer receives in terms of subjective experiences of fun and playfulness*" (Babin, Darden, Griffin, & Darden, 1994; Holbrook & Hirschman, 1982). For example, in Han et al. (2018) hedonic and utilitarian values have been tested as mediators between guest perception of hotels green practices and their participation intention for green practices and loyalty towards the hotel.

The **New Ecological Paradigm (NEP) scale** conceptualized by Riley Dunlap (R. Dunlap, 2008; Riley E. Dunlap & Van Liere, 1978) has been used in 3 papers (e.g. Dief & Font, 2010; Gu, Ryan, & Chon, 2009; Tsai & Tsai, 2008). This scale is one of the most widely used to capture the environmental attitudes of the respondents (Ntanos, Kyriakopoulos, Skordoulis, Chalikias, & Arabatzis, 2019). Furthermore, some studies used the **sustainable development framework** to positioning their paper in the academic literature (3 papers) (e.g. Laeis & Lemke, 2016; Pérez & Rodríguez del Bosque, 2014).

Three studies dealing with sustainability communication in the hotel industry used the **Construal level theory (CLT)** (e.g. Grazzini et al., 2018; S. A. Lee & Oh, 2014; Teng & Chang, 2014). This theory proposed by Liberman & Trope (1998) hypothesize that psycological distance, in terms of time, space, probability and social distance, affects the way in which consumers mentally represent an event, object or an individual. According to CLT,

everything that is far from the consumer's direct experience, i.e. is psychologically distant from it, tends to be represented by the subject in an abstract and general way (high construal level). Conversely, everything that is close to the consumer's direct experience tends to be represented in a concrete and particular way (low construal level). This theory is particularly relevant in the context of sustainability in the hotel industry to frame sustainability messages for consumers. For example, Teng & Chang (2014) and S. A. Lee & Oh (2014) found a significant relation between hotel guests' green behaviour and the sustainability messages framed with different construal level (high vs. low). Additionally, Grazzini et al. (2018) found that messages framed on a more concrete level (low construal level) drive consumers to take part in sustainability practices.

The **Stimulus-Organism-Response (S-O-R) framework** teorized by Mehrabian & Russell (1974) postulates that: "*when an individual is exposed to an environmental stimulus (S), he/she generates internal states/evaluations (O), which then initiate responses (R). Internal states/evaluations (O) can mediate the relationship between stimuli (S) to individuals and the responses (R*)" (J. Wang, Wang, Xue, et al., 2018). In sustainable hotel research 2 paper use this framework to explore consumers behaviour towards green hotels. In Wang, Wang, Xue, Wang, & Li (2018) the stimulus was the hotel green image, the organism green satisfaction and green trust and the response the Word-of-mouth intention. In Su, Swanson, Hsu, & Chen (2017), instead, the stimulus was the perceived corporate social responsibility, the organism were consumption emotions and customer-company identification and the response the green consumer behaviour.

The **Universal Theory of Acceptance and Use of Technology (UTAUT)** was used in two studies. This theory is useful to determine consumers behavioural intention to use a technology in organizational contexts (Venkatesh, Thong, Statistics, Xu, & Acceptance, 2016). According to Venkatesh, Morris, Davis, & Davis (2003) four constructs determine behavioural intention and ultimately behaviour to use a technology (performance expectancy, effort expectancy, social influence and facilitating conditions) and four moderators (gender, age, experience, and voluntariness of use) (Venkatesh et al., 2003). Particularly, Chuang, Chen, & Chen (2018) used the Unified Theory of Acceptance and Use of Technology (UTAUT2) in combination with Sustainability Values (SVs) and the Theory of Planned Behaviour (TPB) to predict potential travellers' choices for sustainable hospitality businesses. Mejia (2018), instead, used UTAUT in a qualitative study aiming at exploring the drivers that affect green technology use behaviour in the hospitality industry.

Finally, as we can see in Figure 4.25, the **Value-belief-norm (VBN) theory** was applied in two studies (e.g. Choi, Jang, & Kandampully, 2015; Han, 2015). This theory developed by Stern, Dietz, Abel, Guagnano, & Kalof (1999) has its roots in the value theory (Schwartz, 1992), the norm-activation theory (Schwartz, 1977) and the New Ecological Paradigm (NEP) perspective (Riley E. Dunlap & Van Liere, 1978). The VBN theory hyphotesize a direct connections between five variables that are antecedents of environmental behaviour: values (biospheric, altruistic, and egotistic), ecological worldviews, adverse consequences for valued objects, perceived ability to reduce the threat, and personal norms (the sense of obligation to take pro-environmental actions) (Paul C. Stern, 2000). Paul C. Stern (2000) also hypotesize that several distinct types of environmentally behaviour exist: environmental activism, nonactivist public-sphere behaviors, private-sphere behaviours, and behaviours in organizations. Han (2015) combine the VBN theory and the TPB theory to study travellers' pro-environmental intentions in a green lodging. Moreover, Choi et al. (2015) used an extended version of the VBN (with subjective norms and green trust) to explore consumers' intentions to visit a green hotel.

4.9.7 Geographical Focus

In order to evaluate the areas where green hotels studies are more investigated, when possible the articles were classified according to the geographic focus. 87.5% of records investigate a specific geographic area. Of these, 20 studies concentrate their analysis in more than one country (e.g. Alonso-Almeida, Fernández Robin, Celemín Pedroche, & Astorga, 2017; G. Choi, Parsa, Sigala, & Putrevu, 2009). Figure 4.28 shows the geographical areas that have been most studied by scholars. USA, China and Spain have a pride of place among the countries under investigation. The USA have been investigated in 98 studies (e.g. Gilmore, Fuller, & Jo, 2014; Levy & Park, 2011) and China in 47 (e.g. W. W. Chan, 2009; Su et al., 2017). Spanish experiences in green hotels development have been the subject of 46 articles (e. g. Ayuso, 2007; Martínez García de Leaniz, 2015). Also others European countries have been quite studied as: Greece (26 articles) (e.g. Fotiadis, Vassiliadis, & Rekleitis, 2013; Kapiki, 2012), Italy (24) (e.g. Iraldo, Testa, Lanzini, & Battaglia, 2017; Raggi & Petti, 2006) and UK (14) (e.g. Stabler & Goodall, 1997; Taylor, Peacock, Banfill, & Shao, 2010).

Figure 4.28 - The ten most investigated geographical areas

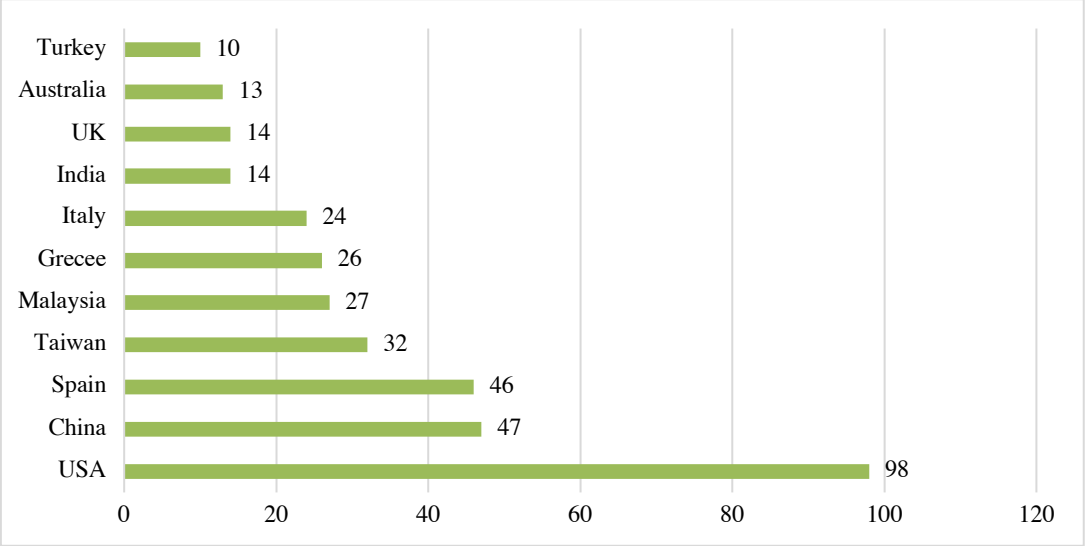
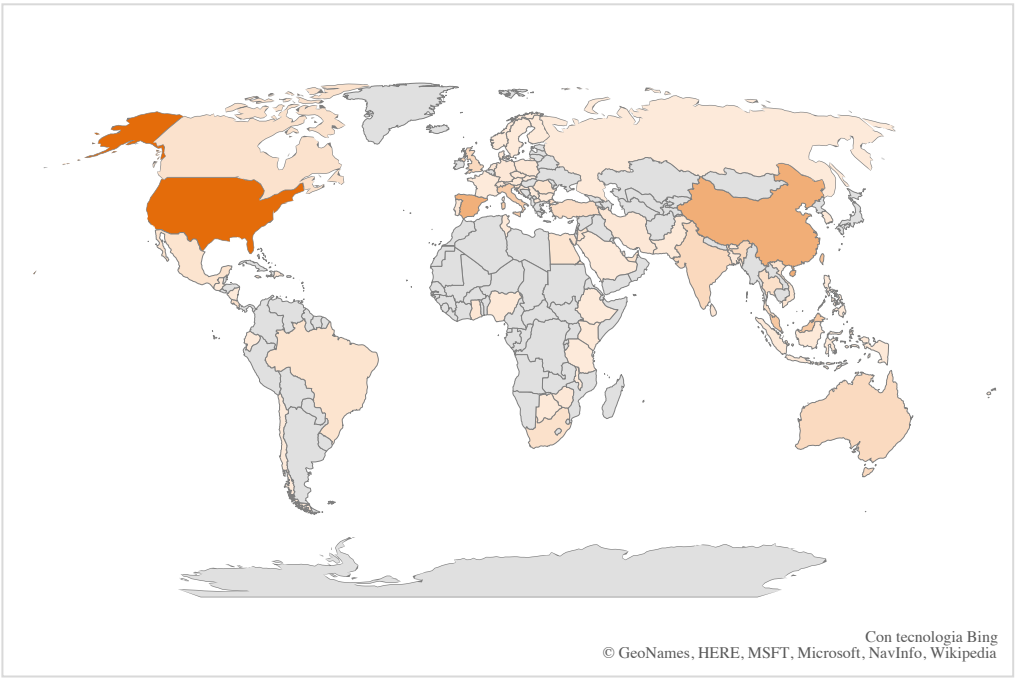


Figure 4.29 aims to provide an overview of the geographic areas investigated globally. It is interesting to note that in addition to the most investigated countries, scientific production on the subject has taken on a global character by studying even less "mainstream" countries on this topic. For example, Milder, Newsom, Sierra, & Bahn (2016) investigated the application of voluntary sustainability standards in 106 hotels based in Belize, Costa Rica, Ecuador, Guatemala, Mexico and Nicaragua.

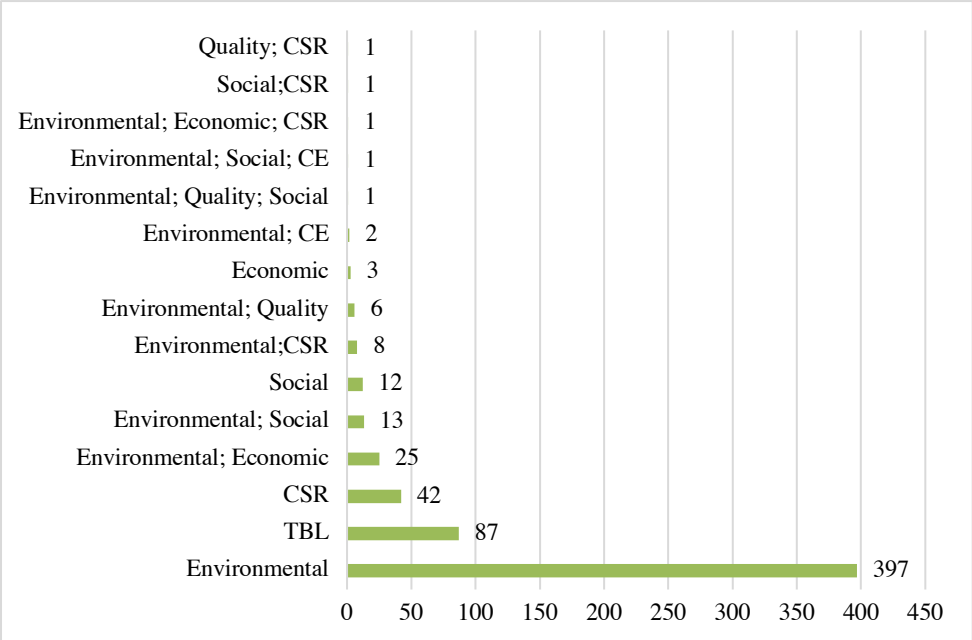
Figure 4.29 - Worldwide geographical focus



4.9.8 Sustainability approach

Articles were also analysed through the lens of the sustainability approach. Figure 4.30 shows that the 66.17 % of the papers have an environmental approach to sustainability (e.g. Kasim, 2015; Mensah, 2006). Often this environmental viewpoint is combined with economic (25 papers) (e.g. W. W. Chan & Ho, 2006; Woodworth, Mandelbaum, & McDade, 2014) or social (13) considerations (e.g. Kasim, 2005; Rezapouraghdam et al., 2018). Additionally, some papers only focus on the social (12 papers) (e.g. Alegre & Berbegal-Mirabent, 2016; Nicolaides, 2018) or the economic pillar (3 papers) (e.g. Jurigová Z., Tučková Z., 2016; Pratt, Suntikul, & Dorji, 2018).

Figure 4.30 - Sustainability approach



Scholars agree in recognizing Howard Bowen (1953) as the father of the Corporate Social Responsibility (CSR), in the text “Social Responsibilities of the Businessman” he recognizes companies as vital centres of power and attributes to them the task and duty of: "*pursuing those policies, taking those decisions or follow those policies that are desirable according to the objectives and values recognized by the company*"(Bowen, 1953). Additionally, Carroll (1979) elaborated a quadripartite vision of social responsibility. According to the author it includes: “*the expectations of an economic, legal, ethical and discretionary nature that the company has towards companies, in a given period*”. Carroll in the article "A three-dimensional conceptual model of social performance" graphically outlines, through a pyramid, the different

responsibilities that the company must carry out. At the base of the pyramid places economic responsibility, that is to create value and profit, aiming at underlining the pre-eminence of the economic function. The next level concerns the legal responsibilities, identified in respect of the overall legal system and the adoption of behaviours in compliance with the law. The third level introduces ethical responsibilities, or the obligation for the company to operate in a fair and just manner, aligning itself with the values of the society o market? In which it operates. At the last level there is the discretionary responsibility, which incorporates the concept of "corporate citizenship" introduced by McGuire, Sundgren, & Schneeweis (1988), when the company through voluntary activities operates for the welfare of society and for the "common good", trying to bring a qualitative improvement in the life of the community.

Moreover, the European Union offered another definition to CSR as: "*The voluntary integration of companies' social and ecological concerns into their business activities and their relationships with their stakeholders. Being socially responsible means not only fully satisfying the applicable legal obligations but also going beyond and investing 'more' in human capital, the environment, and stakeholder relations*" (European Commission, 2001).

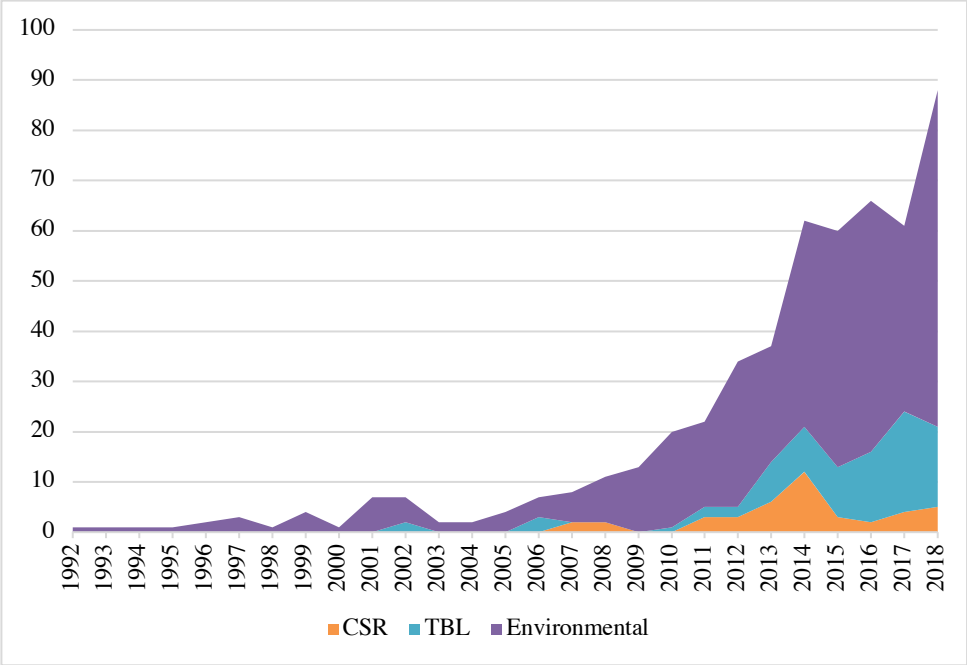
The Triple Bottom Line (TBL) approach, instead, created by Elkington (1994) as an accounting framework, incorporates the three dimensions of firm's performance: social, environmental and economic (Elkington, 1994, 1997). The TBL dimensions is also often associated with the three Ps: people, planet and profits.

Considering the outlined differences between these two concepts, two different analytical categories were created: The Corporate Social Responsibility (CSR) and the Triple Bottom Line (TBL). The TBL category has been used when economic, social and environmental aspects are explored in the study, eventually, 87 papers match these criteria (e.g. Assaf, Josiassen, & Cvelbar, 2012; Modica et al., 2018). CSR, instead, has been the focus of the analysis in 42 papers (e.g. Gao & Mattila, 2014; Luu, 2017). Moreover, some papers, even if focussed on CSR, maintained a strong attention on one or more sustainability pillars, for this reason I decided to maintain this information and combine CSR with these pillars (Figure 4.30). Additionally, some papers focus on quality (e.g. Al-Aomar & Hussain, 2018; Tarí, Claver-Cortés, Pereira-Moliner, & Molina-Azorín, 2010) and Circular Economy (CE) (e.g. Batle, Orfila-Sintes, & Moon, 2018; Kasim, Gursoy, Okumus, & Wong, 2014).

Figure 4.31 presents the chronological evolution of the environmental, CSR and TBL approach in the analysed studies. As pointed out also by Font & Lynes (2018) in tourism and hospitality

study CSR has gained research interests only in the last 10 years. A comprehensive approach to sustainability, conceptualized as CSR or TBL, has been used in these studies only recently but is growing over the years.

Figure 4.31- Chronological evolution of sustainable development dimensions explored



4.9.9 Research Focus

After answering the questions who, when, where, and how green research in the hotel industry has been approached this paper has tried also to answer the question what. The main research question I will try to answer in this section is: what are the most discussed topics by researchers in the study of green practices in hotels?

To do this the analytical category "research topic" has been elaborated. This analytical category has been conceived as a "tag category" since the same paper can address more than one topic. Figure 4.32 summarizing the most explored topics shows the count for each tag. The analysis showed that green practices (278 articles) and consumer's behaviour (154) are the most studied topics. The **green practices** category is often associated with one or more topics, as for example with consumer's behaviour (59) (e.g. Ham & Han, 2013; Yi et al., 2018), firm perspective (32) (e.g. Bagur-Femenías, Martí, & Rocafort, 2015; Molina-Azorín, Claver-Cortés, Pereira-Moliner, & Tarí, 2009) or manager's behaviour (28) (e.g. Bohdanowicz, 2005; H. J. Kim et al., 2015). **Consumers' behaviour** beside being mainly explored in the context of green and sustainable practices has been also associated with the marketing and

communication strategy (e.g. Penz et al., 2017), the eco-label and Environmental Management System (EMS) (e.g. Hanks, Zhang, Line, & McGinley, 2016; K. H. Lee, Lee, & Gunarathne, 2018) and towel reuse programs (e.g. Ljubica Knezevic Cvelbar, Grün, & Dolnicar, 2017; Dimara, Manganari, & Skuras, 2017).

The "**firm perspective**" category (84 articles) contains all those articles that analyse the implementation of sustainability from the point of view of the hospitality facilities, such as those that study the increase in performance or profitability due to the introduction of green practices. This category is often associated with eco-label and EMS (e.g. DeBoer, Panwar, & Rivera, 2017; Segarra-Oña, Peiró-Signes, Verma, & Miret-Pastor, 2012) or addressed from an economic point of view (e.g. Shieh, 2012; Singal, 2014).

Next, there is the **managers' behaviour** category (81 articles) often studied in combination with green or sustainable practices (e.g. Cvelbar & Dwyer, 2012; Park & Kim, 2014), eco-label/EMS implementation (e.g. Bonilla Priego, Najera, & Font, 2011; Geerts, 2014), energy conservation/efficiency (e.g. Cingoski & Petrevska, 2018; Maleviti, Mulugetta, & Wehrmeyer, 2012) or marketing/communication strategy (e.g. E. S. W. Chan, 2013; El Dief & Font, 2010).

The **eco-label/EMS** category is mostly a transversal category, often associated with a sub-topic. Different type of eco-label and certification for the hotel sector have been studies as for example the Rainforest Alliance standard (e.g. Milder et al., 2016), the LEED standards (Leadership in Energy and Environmental Design) (e.g. Robinson, Singh, & Das, 2016), the EU ecolabel (e.g. Dziuba, 2016) and the Green Globe (e.g. Bandara, Dissanayake, Karunasena, & Madhusanka, 2018). For the EMS category the most investigated environmental management systems are the ISO 14001 (e.g. W. W. Chan, 2009b; Segarra-Oña et al., 2012) and EMAS (e.g. Bonilla Priego et al., 2011).

The **sustainable operations management** category (60 papers) is composed of different sub-categories indicating the type of operation on which the paper focuses on. The main sub-categories are Water management (13 articles)(e.g. Deyà Tortella & Tirado, 2011; Kasim et al., 2014) waste management (12) (e.g. Pirani & Arafat, 2014; Radwan, Jones, & Minoli, 2010), emissions management (5) (e.g. Lai, Yik, & Man, 2012; Rashidi, Zubaidah, Syakirin, Zainul, & Lukman, 2015) and food waste management (5) (e.g. Juvan, Grün, & Dolnicar, 2018; Pirani & Arafat, 2016).

Initially, the **energy conservation/efficiency** category (57 articles) should have been part of the category sustainable operations management, however, after seeing the large number of

articles focusing on this topic, I decided to create a specific category. Mainly these articles are focused on the energy efficiency practices and opportunities for the hotel sector (e.g. Bianco et al., 2017; Nižić & Matoš, 2018), others are focused on the measurement of energy consumption (e.g. Becken, Frampton, & Simmons, 2001; Xydis, Koroneos, & Polyzakis, 2009). Some proposed an energy benchmarking approach (e.g. W. Chan, 2012; Xuchao, Priyadarsini, & Siew Eang, 2010), others the Building energy efficiency retrofit (BEER)(e.g. P. Xu, Chan, Visscher, Zhang, & Wu, 2015; P. P. Xu, Chan, & Qian, 2012). Additionally, there are also papers that explore the use of renewable source of energy and their application and feasibility in the hotel sector (e.g. Aagreh & Al-Ghzawi, 2013; Mahachi et al., 2015). Moreover, also the energy and environmental performance of hot-water production systems has been studied (e.g. W. W. Chan, Yueng, Chan, & Li, 2013; Michopoulos, Ziogou, Kerimis, & Zachariadis, 2017). In energy conservation/efficiency category there are also papers that explored tourists' intention to pay a premium for accommodation in a hotel with renewable energy sources and tourists' preferences for choosing to stay in hotels that implement energy saving practices or use renewable energy (e.g. Kostakis & Sardianou, 2012; Tsagarakis et al., 2011). Finally, Kahn & Liu (2015) explored the application of big data analysis to improve the energy efficiency of hotels.

Subsequently there is the **indicators/sustainability reporting** category (40 papers) (Figure 4.32). In this category there are papers dealing with the Environmental Accounting (e.g. Jankovi & Kriva, 2014) Environmental reporting (e.g. Guix et al., 2018; Nyahunzvi, 2013) and Indicators (e.g. Y. Ali, Mashal, Mohsen, & Mustafa, 2014; Rao et al., 2009). Particularly, Moreo, DeMicco, & Xiong (2009) developed the Environmental Score Card (ESC) for hospitality that can help hotels to quantify the environmental and financial impact of the company and the impact of specific environmental initiatives.

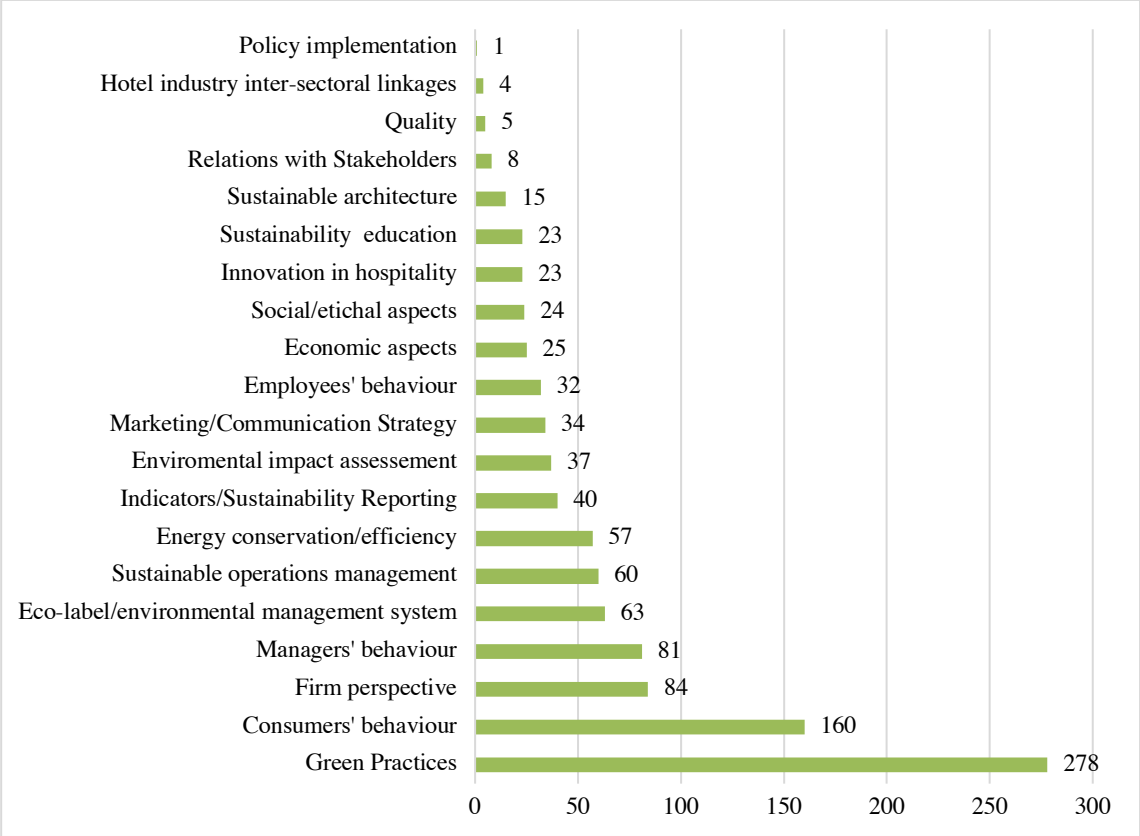
The **environmental impact assessment** category is composed by 37 papers. The most used methodologies to assess the environmental impact of the hotel sector are the LCA (e.g. Michailidou, Vlachokostas, Moussiopoulos, & Maleka, 2016; Rosselló-Batle, Moià, Cladera, & Martínez, 2010), the Carbon Footprint (e.g. De Grosbois & Fennell, 2011; Hu, Huang, Chen, Kuo, & Hsu, 2015; Lai, 2015) and the Ecological footprint (e.g. Castellani & Sala, 2012). Most of the paper in this category assess the environmental impact and the emission associated with the energy usage of the sector. However, Della Volpi & Paulino (2018) tried to assessed the materiality of accommodation services. Additionally, W. W. Chan & Lam (2001) provided an

estimation and the environmental accounting of municipal solid waste (MSW) produced by the hotel industry.

Following, the **Marketing/Communication strategy** has been discussed in 35 papers (Figure 4.32). The great majority of these works studied the hotels' "Green marketing strategy" (e.g. Punitha & Mohd Rasdi, 2013; Rosenbaum & Wong, 2015). Some of them studied specifically determinants factors (e.g. Vlad, Vasile, Macovei, & Tuclea, 2016) and drivers (e.g. Leonidou et al., 2013) for hotels to adopt green marketing-related activities. Green marketing has been studied both from the point of view of hotel's customer (e.g. E. S. W. Chan, 2014; Punitha, Abdul Aziz, & Abd Rahman, 2016) and hotel's managers perspective (e.g. E. S. W. Chan, 2013b). Additionally, E. S. W. Chan (2013a) explored the gap between hotel manager and customer perceptions of the relative importance of green marketing. Besides, Yadav, Kumar Dokania, & Swaroop Patha (2016) studied the influence of green marketing functions in building corporate image. Other studies analysed the hotel communication of green practices (e.g. Ettinger, Grabner-Kräuter, & Terlutter, 2018; Hsieh, 2012). Furthermore, several studies examined the role of message framing in hotel guests' recycling behaviour (e.g. Grazzini et al., 2018), in water conservation practices (e.g. Morgan & Chompreeda, 2015), in linen-reuse intentions (e.g. Blose, Mack, & Pitts, 2015; Goldstein et al., 2007) and participation in a hotels' sustainability programs (e.g. S. B. Kim & Kim, 2014; S. A. Lee & Oh, 2014).

The **employees' behaviour** category is composed by 32 articles. Of these a large part studied how to stimulate employees' pro-environmental behaviour (Tian & Robertson, 2017; Zientara & Zamojska, 2018). Some authors argued that workplace spirituality can promote employees' sustainable behaviour (Rezapouraghdam et al., 2018), others studied the moderating role of empathy (Islam et al., 2018), others the role of employee personal environmental beliefs (Chou, 2014). A great number of papers also studied the employees (S. H. Kim & Choi, 2013b; S. Y. Park & Levy, 2014) and future employees (Gligor-Cimpoieru, Munteanu, Nitu-Antonie, Schneider, & Preda, 2017) perception of green hotels practices. Dias-Angelo, Jabbour, & Calderaro (2014) explored whether human resource management practices, especially training, are supporting environmental management practices. On the other side Han & Hyun (2019) studied the role of mental health and well-being in the relationship between the implementation of nature-based solutions (NBS) and employee loyalty. Finally, Masa'deh et al. (2017) examined the employees' perception of implementing green management on hotel's economic and operational performance, finding a significant relationship.

Figure 4.32 - Research topics[9]



Economic and **social/ethical** aspects categories are composed respectively by 25 and 24 articles.

Economic aspects are general related to the cost analysis of different technological solutions (e.g. Dalton, Lockington, & Baldock, 2009; Lam & Chan, 2001) and to the impacts of environmental investments on hotel economic and financial performance (e.g. Accinelli, Brida, Carrera, & Pereyra, 2007; Singal, 2014). Particularly, Segarra-Oña et al. (2012) explored the effects of environmental certification investment to hotels' economic performance. Others articles evaluated the impact of investments for environmental management practices on hotel's rooms pricing (e.g. García-Pozo, Sánchez-Ollero, & Marchante-Mera, 2013; Sánchez-Ollero et al., 2014). Moreover, some papers also estimated the cost saving opportunities related to environmental management implementation (e.g. Iwanowski & Rushmore, 1994; Shieh, 2012).

[9] The sum may not correspond to the total of the eligible studies because in some studies more than one research topic has been explored.

Social aspects, instead, are mainly related to ethical considerations (e.g. Ogunyemi & Laguda, 2016; Ruiz-Lozano et al., 2018) and sustainable workforce practices (e.g. Davidson & Wang, 2011; Gröschl, 2011). Furthermore, Darcy (2010) investigated the accessibility criteria for people with disabilities in the accommodation sector.

The topic **innovation in hospitality** has been explored in 23 papers. This theme despite its importance, is not very explored. The great majority of the papers in this category is focused on the "Albergo diffuso" experiences (which I already discussed in Section 2.9.2). T. Y. Hsiao & Chuang (2016) discussed the role of green innovation on hotel's performance. Moreover, Voytenko Palgan et al. (2017) explored the sustainability framings of different sharing accommodation platforms. One paper also discussed the role of Big Data in implementing energy efficiency solution in hotels (Kahn & Liu, 2015). Some papers explored the drivers (e.g. Razumova, Ibáñez, & Palmer, 2015) and the main aspects (e.g. Saez-Martinez, Avellaneda-Rivera, & Gonzalez-Moreno, 2018; Wu, Liao, Tseng, & Chou, 2015) of eco-innovation in the sector. Additionally, Negruşa, Toader, Sofică, Tutunea, & Rus (2015) identified the gamification techniques used by hotels and hospitality facilities to improve their sustainable activities.

Twenty-three papers are focused on **sustainability education.** These papers are focused on the development sustainability education into hospitality program (e.g. Jurowski, 2002; Millar & Park, 2013). This is particularly important considering that as stated by Wade (1999) introducing sustainability concepts in hospitality program can lead students to be *"effective change agents and ensure the hospitality industry works for the sustainable vision*" .

The main research areas in the **sustainable architecture** category (15 articles) are accessibility for disable people (e.g. Capitaine, 2016), sustainable buildings (e.g. Sloan, Legrand, Kaufmann, & Belz, 2010), buildings energy efficiency (e.g. Xu et al., 2015) and landscape design to achieve higher carbon sequestration rate (e.g. Othman, Abu Kasim, Hashim, & Baharuddin, 2016; Othman, Abu Kasim, Hashim, & Mohd Noor, 2015).

Eight papers investigate the **"Relations with stakeholders"** mostly considering the stakeholder perspective of environmental management implementation in hotels (Sánchez-Medina et al., 2016; C. C. Teng et al., 2015). Alberg Mosgaard et al. (2016) applied the stakeholder theory to define the constellations of stakeholders for energy renovations.

Only five papers are focused on **quality** implementation in the hotel industry. Although, service quality is one of the main research streams of hotel and hospitality research, this topic is not

very explored in the context of green hotels. Two of these studied the jointly implementation of environmental and quality practices in the hotel sector (e.g. Raggi & Petti, 2006; Tarí et al., 2010). Benavides-Velasco, Quintana-García, & Marchante-Lara (2014) tested jointly total quality management (TQM) and corporate social responsibility (CSR) influence on business performance. Particularly, Garcia-Pozo, Sanchez-Ollero, & Marchante-Mera (2014) explored the combined effect of implementing environmental good practices and obtaining quality certifications on apparent labour productivity. Moreover, Al-Aomar & Hussain (2018) conducted an exploratory study on lean techniques and sustainable practices in the hotel supply chain.

The category "**hotel industry inter-sectoral linkages**" (4 papers) is related with the supply chain studies on this topic. Particularly, researchers have pointed out great opportunities to increase the sustainability of the supply chain within the hotel and the agriculture sector (e.g. Pratt et al., 2018; Thomas-Francois, von Massow, & Joppe, 2017; Thomas-Francois, Von Massow, & Joppe, 2017). Additionally, Lozano, Arbulú, & Rey-Maquieira (2016) pointed out that tour operators can be pivotal in the realisation of a sustainable tourism supply chain acting as coordinating agents.

Finally, one paper deal with the implementation of **policies** to drive the green practices implementation in hotels (e.g. Smith & Leonard, 2018).

4.10 Discussion

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. Furthermore, it is interesting to note that also other types of hospitality facilities have been studied jointly with hotels as B&B, resorts, guest houses, "alberghi diffusi" and casinos. Besides, also specific types of hotels have aroused the interest of scholars such as eco-labelled hotels, luxury hotels, 4- and 5-stars hotels and boutique hotels. Moreover, going to analyse the methodologies used by researchers from this study revealed a prevalence of quantitative analysis. This preponderance of quantitative studies has often been underlined as a lack of robustness in the literature, above all because in a few studies a specific theory has been applied. The lack of conceptual studies on the topic has led the research field to be seen as unstructured. As a consequence, often this lack of conceptual elaborations has impeded the uncover and the development of specific theories or theoretical frameworks for the field. The mostly applicative character of green hotels studies is also reflected in the results obtained from the data collection methods structural dimension analysis. The data collection methods most used by scholars to

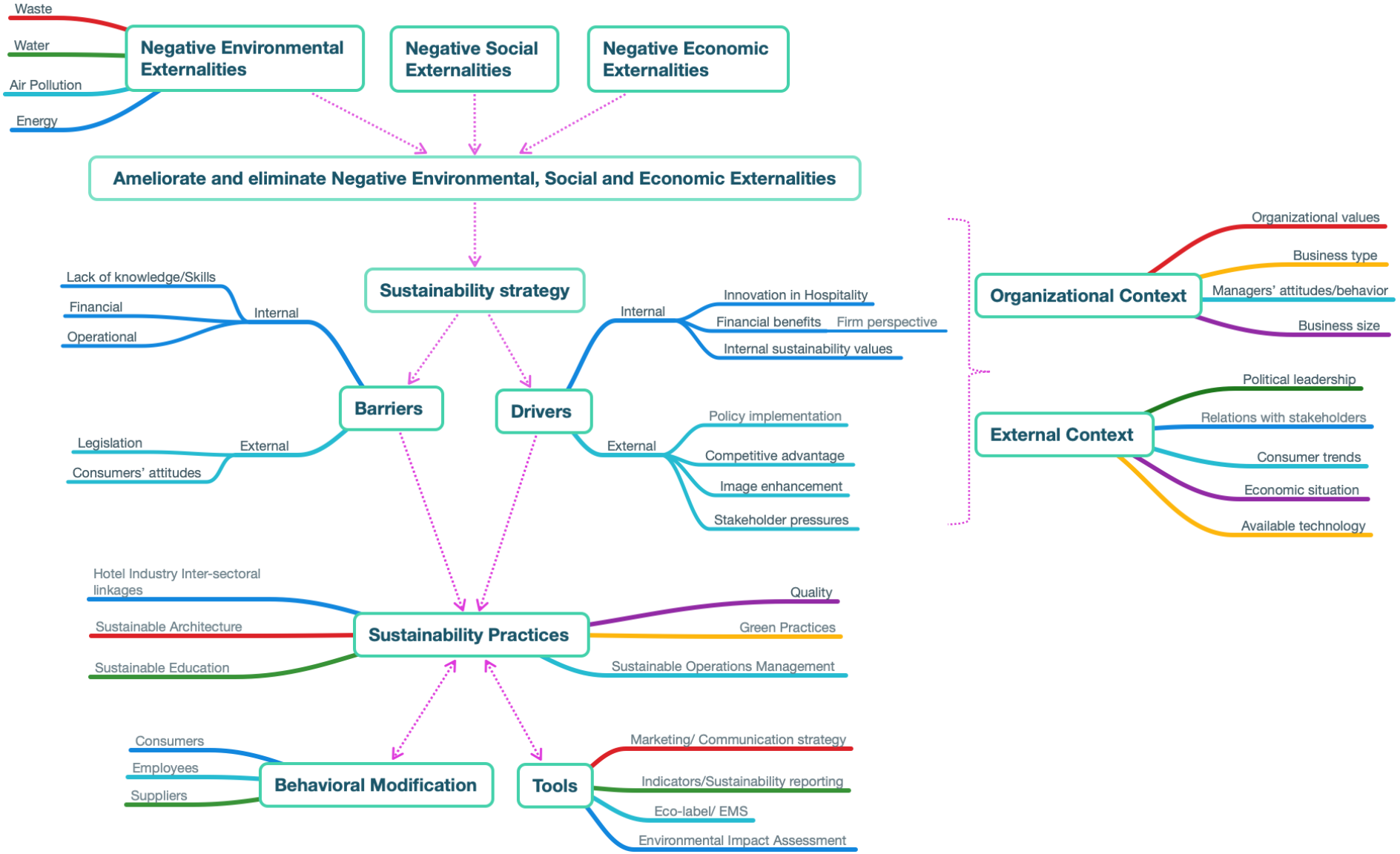
carry out their analyses are surveys/questionnaires, interviews and case studies. In most cases, these studies focused on analysing the topic from the point of view of managers of accommodation facilities or consumers and customers. Descriptive statistical analysis, structural equations model (SEM) (also in its variant Partial Least Square - Structural Equations Model (PLS-SEM)), content analysis and regression analysis are the most used data analysis techniques. Particularly, SEM and PLS-SEM have gained a momentum in the last years in hospitality and tourism research. Often the studies analysed are not supported or do not aim to support a specific theory. This is one of the most significant reasons why the studies in this area are considered not very robust. If in a first phase of development of this research area, these types of studies could also be of an exploratory type, to make a qualitative leap a framework or a theory should begin to be elaborated or be behind these analyses. However, from the analysis presented in this thesis, it emerged that some theories have been used in these studies. Most of the used theories aim to explain the behaviour of consumers or managers. In particular, the Theory of Planned Behaviour was used to explore the gap between attitude and behaviour. This type of gap has greatly interested scholars, and in particular, they have studied why even if consumers are inclined to choose a green hotel, these attitudes often do not materialize in a change in their buying behaviour. Instead, the institutional theory has often been used to explain the motivations and drivers of managers who choose to implement these green practices in their hotels. Moreover, going on to analyse the geographical focus of the papers and the nationality of the authors, I highlighted how these often coincides. This could mean that the case studies are close to the realities of the authors, but also that the research institutes or the universities that deal with tourism and hospitality are very close to the commercial realities and the hospitality companies. This collaboration between the hotel industry and universities can be a pivotal tool in the development of an innovative research sector interested in sustainability issues. With regards to the aspects of sustainability, conceptualized in its triple bottom line definition, the environmental pillar is prevalent. Social and economic aspects are almost absent and when they are present, they are investigated jointly with the environmental aspects or under the umbrella of the CSR or of a more comprehensive TBL approach. However, scholars should focus more on the social aspects of the sector as, especially in developing countries, these are particularly critical for its sustainable development. The large amount of work analysed (600) on the one hand has allowed us to highlight the trend and the patterns in this field of research, while on the other side inevitably makes difficult an operation of characterization on single papers or paper belonging to a specific topic. However, a synthesis operation is necessary to increase the value of this analysis,

to systematize the collected material and to give an overview of the main topics of this research area and how these are related to each other's. To this purpose, a framework for the review of green and sustainable research in the hotel industry has been elaborated (Figure 4.33). This framework has been developed as a synthesis between the main topics emerged from the SLR and a conceptual elaboration of the aspects related to the implementation of sustainable practices in the hotels emerged from the literature analysis. The first step for the framework elaboration was the work of Jackson (2010), in which the author elaborates a schematic framework whose starting point was the examination of how each lodging facility impacts the environment in which it operates (negative environmental externalities). In fact, according to Jackson (2010) in elaborating a green lodging strategy one has to bear in mind that: " *the overarching goal of any green management program should be to ameliorate, mitigate and eliminate these negative externalities associated with lodging operations through a combination of technical and behavioural solutions*". However, since this work has as its reference a TBL approach to sustainability, following Xu & Gursoy (2014) in the framework we have chosen as a starting point not only environmental but also social and economic externalities. So, the objective of the hotels should be to ameliorate and eliminate negative environmental, social and economic externalities of their operations through the implementation of a sustainability strategy. Subsequently, following the work of Mair & Jago (2010), the framework introduces the role of the organizational and external context in influencing the introduction of the sustainability strategy in the hotel. Mair & Jago (2010) suggested that organisational context (business type and size, industry sector and organisational values) and the external context (economic situation, consumer trends, available technology and political leadership) influence the levels of environmental sustainability of firms and their predisposition to adopt a sustainability strategy. These authors also suggest that organisations faced with several drivers and barriers (both internal and external) that exert pressure or impede the firm towards greening. Motivation and barriers for green practices in the hotel industry have been studied also by Alonso-Almeida et al. (2017). These authors identified external (clients demand and legal compliance) and internal (cost reduction/efficiency, and internal forces) motivation and internal (financial barriers, operational barriers and internal forces) and external (consumer attitude and legislation) barriers (Alonso-Almeida et al., 2017) to the implementation of hotels' green practices. The framework elaborated in this study synthesize the works of Mair & Jago (2010) and Alonso-Almeida et al. (2017) proposing a model in which the organizational context and the external context of the hotel represent the variables that influence the different types of motivations and barriers that can push or prevent a company

from developing sustainability practices. Then, the framework proposes the sustainability practices element that is composed by the different sub-topics emerged by the SLR (analysed in section 2.9.9). Finally, two-way relationships between sustainability practices and tools and between sustainability practices and behavioural modifications have been proposed. These relationships have been characterized as two-way because, if on the one hand the behavioural modifications are necessary in order to implement the sustainability practices, the latter are also ultimately responsible for behavioural modifications. The same goes for the instruments, if for example on the one hand the eco-label is a tool for the implementation of green practices it is also true that the eco-label serves to stimulate companies towards green management.

The main goal of this paper was to give an overview on how scholars deal with the topic of green hotels. The study is not free of limitations, principally due to its qualitative nature. Even though the research process was documented to produce a transparent review, the categorization of the information is necessarily affected by researcher bias. To mitigate this issue, the structural dimensions and analytical categories have been punctually described in the paper and, in most cases, have been retrieved from other studies that analysed literature on the topic. Another aspect relates to the choice to examine only articles published in journals, which does not allow the consideration of the grey literature that may offer an important contribution to the topic (Geissdoerfer, Savaget, Bocken, & Hultink, 2016). The large number of reviewed articles made the deep analysis of all the records in the database rather challenging. Moreover, due to synthesis needs, not all the articles for each analytical category selected are cited. Nevertheless, for each category some meaningful examples are provided. Limitations of the study may serve as a baseline for improving and stimulating future research on the topic.

Figure 4.33 - A research framework for the review of sustainability research in the hotel industry



Chapter 5 Delighting guests with sustainability: Guest insights of hotels' green practices

5.1 Introduction

In recent years, tourism has experienced a continued expansion and diversification to become one of the fastest-growing industries in the world, occupying a prominent role in the European economy. Globally, Europe has always been a very popular tourist destination and, according to the World Tourism Organization (WTO), five of its Member States (France, Spain, Italy, Germany and the United Kingdom) fall into the top ten destinations preferred by travellers in the world ranking for the year 2017 (UNWTO, 2018). However, the growth of the tourism sector goes hand in hand with its increasing environmental impact. Tourism activity and the environment have always had a complex and dual relationship: on the one hand, tourism depends on the environment to attract tourist flows, on the other the environment depends on tourism as it generates negative impacts on tourism ecosystem, with the risk of damaging it permanently (Correia, Ademir, Morbeck De Oliveira, & Garcia, 2016; Moeller, Dolnicar, & Leisch, 2011). It is therefore necessary to find a balance between the tourism sector and its environmental dimension, to simultaneously increase both the profitability of tourism and the quality of the ecosystem (Hunter, 1997). Tourism, as a dynamic industry subordinated to the changes in consumer preferences, has been influenced by the development of the concept of sustainability (N. Jarvis, Weeden, & Simcock, 2010b). In fact, part of the tourism demand has become more and more interested in a type of consumption that is sensitive to the environmental protection and to the respect of local populations' cultures (J.-S. S. Lee et al., 2010). Consumers are increasingly looking for environment-friendly lodging options but they are also feeling uninformed about whether hotels are truly eco-friendly (Rahman & Reynolds,

2017). After this change in consumption styles, all the actors of the tourism system (tourism industry, local populations, non-profit organizations and local bodies) have worked both for the identification of strategies to satisfy these new needs, and to communicate to the public this new sustainable approach to tourism, in order to make customers able to perceive the added value of their choices. The assimilation of the concept of sustainable tourism is a long and difficult process: in fact, it requires a gradual collective journey able to involve all the stakeholders operating in the tourist sector. To encourage this involvement, ecolabels are useful tools for hotel facilities, as they support the management in meeting specific environmental performance criteria and help increase the business success of the hotel, thanks to the positive effects they have on the green image of the facility. The Legambiente Turismo Ecolabel support tourism facilities in implementing green practices and in spreading sustainability values to customers and citizens. In this context, understanding how consumers perceive and evaluate environmental quality and eco-friendly practices in hotels, helps to plan and define win-win strategies for tourism sustainable management (Balouin, Rey-Valette, & Picand, 2014). In response to consumers increasing environmental concern, particularly when making a purchasing decision (Ham & Han, 2013), tourism facilities started "*to go green*" adopting more environmentally friendly practices. As a result of consumers' concern toward environmental sustainability, the hospitality industry is also developing voluntary-based tools to reduce its environmental impacts and to satisfy the increasing market segment of green customers. In this context, third-party certified ecolabels ensure hotel compliance with specific environmental performance criteria and offer a reliable communication to their guests. Starting with the analysis of literature, we propose a conceptual framework to investigate whether green practices implemented by the Italian "Legambiente Turismo" certified hotels contribute significantly to the formation of guest positive behavioural intention toward green hotels. Even if little research has been conducted on this topic, understanding the role of hotels environmental practices is pivotal in the hotel decision-making process and strategy. To clarify this point, a survey was conducted with guests of two Italian hotels awarded with the ecolabel and 335 questionnaires were usable and employed in the analysis, adopting Partial Least Square Structural Equation Modelling (PLS-SEM) to test the hypotheses.

5.2 Literature review and hypothesis development

5.2.1 Guest Environmental concern

Environmental concern has been defined as: "*the degree to which people are aware of problems regarding the environment and support efforts to solve them*"(R. E. Dunlap & Jones, 2002). Additionally, this concept according to Mat Said, Ahmadun, Hj. Paim, & Masud (2003) refers to "*a belief, stance and the degree of concern an individual hold towards the environment*". Another definition of environmental concern is provided by Y. ki Lee, Kim, Kim, & Choi (2014) that described this concept as a: "*general attitude toward environment that reflects the extent to which consumers are worried about threats to the environment*". In fact, the alternative use of environmental concern and environmental attitude is not uncommon in academic literature (Han & Hyun, 2018). Scholars have also studied the factors that triggered environmental concern defining four major approaches (Bamberg, 2003). The first is related to consumers specific background (i.e. age, income, education etc.) (R. E. Jones & Dunlap, 1992); the second expresses environmental concern as a function of the risks people attach to environmental problems (Slovic, 2016); the third sees it as developmental phenomenon (Brechin & Kempton, 1994); the fourth approach sees environmental concern as a : "*subset of morally tinged human concerns, rooted in universal values*" (Paul C. Stern, Kalof, Dietz, & Guagnano, 1995). Recently, consumers concern about environmental issues has increased sharply, also as a consequence of the Greta Thunberg international youth movement against climate change "#FridaysforFuture". Previous research has identified that eco-friendly behaviour is under the significant influence of consumers environmental concern (G. Choi et al., 2009; do Paço & Raposo, 2009; J.-S. S. Lee et al., 2010; Martínez García de Leaniz et al., 2017). Moreover, environmental concern has been found as a major determinant in consumers environmental responsible decision-making process and intentions formation (Diamantopoulos, Schlegelmilch, Sinkovics, & Bohlen, 2003; Han & Hwang, 2015; Han et al., 2018; Han & Yoon, 2015b; H. H. Hu, Parsa, & Self, 2010). However, the relationship between environmental concern and actual behaviour has showed inconsistency in scientific research remaining complex and nonconclusive (Njite & Schaffer, 2017). Some researchers suggest that environmental concern does not always translate into environmentally responsible behaviour.

Environmental concern often has been criticized of not being perfectly correlated with actual behaviour (Hedlund, 2011). In green hotels research, environmental concern has been extensively studied as moderator in guests decision-making process (Ham & Han, 2013; Han et al., 2018; Han & Yoon, 2015b). Additionally, in several studies environmental concern has been incorporated as additional variable with the aim to extend the theory of planned behaviour (TPB) (Mei-fang Fang Chen & Tung, 2014; J. Wang, Wang, Wang, et al., 2018). This connection is also established in tourism research, as to a greater environmental concern corresponds a positive attitude toward facilities committed to sustainability, expressed by an higher importance allocated to green practices (Mei Fang Chen & Tung, 2014; Wearing, Cynn, Ponting, & McDonald, 2002; Nor'Aini Yusof, Rahman, & Iranmanesh, 2015). Moreover, research has shown that environmental concern has a significant influence on the way customers evaluate green practices implemented in the hospitality industry (Njite & Schaffer, 2017; Nor'Aini Yusof et al., 2015).

In this context environmental communication is pivotal in boosting guests concerns towards the environmental issues. Hotels managers can enhance guest perceptions of hotel green practices through green marketing activities, using their environmental concern as a stimulus towards their appreciations. Han & Yoon (2015) found hotel visual marketing materials is significant in the formation of guest's environmental concern. Also Ham & Han (2013) have found environmental communication as an effective strategy to increase guests' environmental concern and to intensify the commitment of those guests already characterized by high levels of environmental concern. Additionally, a higher environmental concern also led guests to perceive clearly the hotel's effort to communicate these green practices, developing a more positive attitude and confidence (Han et al., 2010; Manaktola & Jauhari, 2007; Martínez García de Leaniz et al., 2017).

Bearing in mind these considerations and since environmental concern has been found as an important antecedent of an individual's eco-friendly purchasing behaviour, we hypothesize that the level of guest environmental concern has a significant impact on guest green practices performances evaluation (H1), and on perception of hotel environmental communication (H2).

H1: Guest environmental concern influences guest perception of hotel green practices

H2: Guest environmental concern influences guest perception of hotel environmental communication

5.2.2 Hotel environmental communication

Environmental communication is defined as: "*the process of communicating environmental information to build acceptance, reliability and partnerships, to raise awareness, and to use in decision making. The processes used and the content of environmental communication will vary with objectives and circumstances of the organization*" (Daddi, Testa, Battaglia, & Iraldo, 2011). The term green marketing refers to the '*holistic management process responsible for identifying, anticipating and satisfying the needs of customers and society, in a profitable and sustainable way'* (do Paço & Raposo, 2009). In some ways environmental communication may be considered as part of a wider marketing strategy to gain corporate objectives together with long-term goals of sustainable development. With increasing consumers demand for eco-friendly products, hotels are nowadays implementing different sustainability strategies to reduce their impact on the environment and, at the same time, they are working on always more effective ways to communicate to consumers these efforts (Hudson & Miller, 2005). In fact, through green marketing communication, green practices implemented by the hotel are more easily appreciated by guest (Gössling & Buckley, 2016; W. Wang et al., 2017). Indeed, some of the green practices implemented by the hotels are not always visible to guests (i.e. energy efficiency measure, renewable energy sources etc.) so highlighting specific content in the communication about these practices helps guest to appreciate them (S. A. Lee & Oh, 2014; Preziosi et al., 2019; W. Wang et al., 2017). Therefore, for hotels green marketing can be an effective way to disclose their efforts towards sustainability and can help to educate guests to develop a positive attitude toward green hotels (Martínez García de Leaniz, 2015; Prud'homme & Raymond, 2013; J. Wang, Wang, Xue, et al., 2018). Additionally, a well-structured green marketing strategy can help green hotels, to position it distinctly in the market place and to build a strong differentiation strategy (Manaktola & Jauhari, 2007). Hotels environmental communication can also help them to set up a good corporate image to consolidate their favourable position among consumers (J. Wang, Wang, Xue, et al., 2018). However, the hospitality industry is often been criticized to "greenwash" its environmental claim and

consumers are becoming more aware of the greenwashing phenomenon (Rahman, Park, & Chi, 2015). So hotels should use environmental communication carefully, enhancing their credibility and avoiding consumers to become sceptical about their environmental claims (H. Chen et al., 2019). Based on these findings, we hypothesized that hotel environmental communication is pivotal in the formation of guest perception of hotel green practices. Moreover, we might expect that environmental communication may serve as a crucial link to consolidate the significance of the relationship between guest environmental concern and guest perception of hotel green practices. The following hypotheses are tested:

H3: Hotel environmental communication influences guest perception of hotel green practices

H4: Hotel environmental communication mediates the relationship between guest environmental concern and guest perception of hotel green practices

5.2.3 Hotel green practices and guests' behavioural intentions

Green hotels are defined as those hospitality facilities "*that have made a commitment to various ecologically sound practices such as saving water, saving energy, and reducing solid waste*" (Manaktola & Jauhari, 2007). Similarly, the Green Hotel Associations (GHA) (2009) defined a green hotel as "*an eco-friendly lodging property that has implemented various green practices and institutes sound and environmentally friendly programs to protect the environment and reduce operational costs*". Several researchers devoted their studies to investigate the effects of these practices on consumers and particularly on consumers satisfaction and behavioural intentions (Susskind, 2014). As the green movement in the hotel industry is spreading, a growing number of hotels are investing in green practices and they want to know if their investments in eco-friendly practices will be repaid by more loyal and satisfied guests (Han & Kim, 2010).

Customer loyalty has been defined by Oliver (1997) as "*a deeply held commitment to rebuy or re-patronize a preferred product or service consistently in the future, despite situational influences and marketing efforts having the potential to cause switching behaviour*". To

increase customer loyalty is crucial for hotels long-term success (Han et al., 2018). Several researcher found that the implementation of green practices is a powerful mean to increase customer loyalty (Mei Fang Chen & Tung, 2014; Gao et al., 2016; Y. Kim & Han, 2010; Nor'Aini Yusof et al., 2015). Additionally, some scholars focused on the specific relationships between green practices and revisiting intention for green hotels (Han & Kim, 2010; Han & Yoon, 2015a; J.-S. S. Lee et al., 2010; Moise, Gil-Saura, & Ruiz-Molina, 2018). Others concentrate their attention on the influence of green practices on guest intention to recommend the hotel to others and word of mouth, founding a meaningful relationship (Han et al., 2009; Martínez García de Leaniz et al., 2017; J. Wang, Wang, Xue, et al., 2018). In particular, scholars also studied both the relation of sustainable practices on willingness to pay for them (Bastič & Gojčič, 2012; Chia-Jung & Pei-Chun, 2014; Sharma, Yadav, & Sharma, 2018) and for green hotels (Chang, Hsiao, Nuryyev, & Huang, 2015; J.-S. S. Lee et al., 2010; Line & Hanks, 2016; Manaktola & Jauhari, 2007). Particularly, Martínez García de Leaniz (2015) developed the concept of "green loyalty" defined as the "*consumer commitment to repurchase or otherwise continue using a green brand*". Martínez García de Leaniz (2015) found that guests tend to develop a specific kind of green loyalty toward the hotels that implemented eco-friendly practices. Considering the above considerations, this work tests weather a hotel with a higher rate of commitment toward green practices will lead guests to experience greater loyalty toward the hotel and toward the general category of green hotels. Thus, the following assumptions are formulated:

H5: Hotel environmental practices positively influence guest loyalty toward the hotel

H6: Hotel environmental practices positively influence guest loyalty toward green hotel

The relationship between environmental practices implemented by hotels and guest satisfaction still remain controversial even if it has been widely studied by scholars (Han, Hsu, Lee, & Sheu, 2011; H. Le, Trang, Lee, & Han, 2018; Y. Yusof, Jusoff, Ibrahim, & Awang, 2017). Consumers satisfaction is one of the main aim of the firms as it is pivotal in maintain firms

competitiveness (Nash, Thyne, & Davies, 2006), increase their market performances (G I Kassinis & Soteriou, 2003; Oliver, 1993) and financial success (Anderson, Fornell, & Lehmann, 1994). Numerous scholars have tested the influences of green practices and guest satisfaction (Ham & Han, 2013; Merli, Preziosi, Acampora, Lucchetti, & Ali, 2019; Merli, Preziosi, Acampora, & Ali, 2019; Prud'homme & Raymond, 2013; X. Xu & Gursoy, 2015; Y. Yusof et al., 2017). For instance, Berezan, Raab, Yoo, & Love (2013) tested the impact of the different sustainability practices on guest satisfaction. Han & Kim (2010) integrated satisfaction, together with other variables, in a Theory of Planned Behaviour model to investigate guest revisit intentions in green hotels. In contrast, Robinot & Giannelloni (2010) suggests that hotel green practices are considered by guest as a "basic" attribute and that it would be preferable to inform customers about environmental initiatives only if the hotel is able to deliver them properly and constantly, in order to limit the risk of being unfavourably evaluated on these attributes and therefore negatively influence their satisfaction. Accordingly, in this work I tested the impact of hotel green practices on hotel guest satisfaction.

H7: Hotel environmental practices positively influence guest satisfaction with the hotel

Considering the crucial role of customer loyalty for firms success, marketers should investigate its relationship with customer satisfaction (Fen & Lian, 2007; Han & Kim, 2010). In fact, satisfaction has been found positive related to repeat sales, positive word of mouth, and customer loyalty ((Fen & Lian, 2007). Indeed, satisfied customer are more likely to spread word of mouth and to revisit the green hotel (S. Lee, Sun, Wu, & Xiao, 2018). The academic literature suggests that customer satisfaction is an antecedent of customer loyalty (Boulding, Kalra, Staelin, & Zeithaml, 1993; T.-H. Lee, 2009; Martínez & Rodríguez del Bosque, 2013). Guest satisfaction with the green hotel and their loyalty toward it has been tested by several scholars (Gallarza & Saura, 2006; Gao et al., 2016; Kandampully & Suhartanto, 2003; George I. Kassinis & Soteriou, 2015; Y. J. Kim, Njite, & Hancer, 2013; R. Merli et al., 2019; Prud'homme & Raymond, 2013; X. Xu & Gursoy, 2015). In particular, Wang et al. (2018) and Sukhu, Choi, Bujisic, & Bilgihan (2019) found that guest satisfaction is positively related to their intention to recommend green hotels, the so called Word-of-Mouth (WOM). Also, Prud'homme & Raymond (2013) and Ramseook-Munhurrun, Seebaluck, & Naidoo (2015)

found customer satisfaction positively related to both return and recommendation intentions. Additionally, Martínez García de Leaniz (2015) and Han & Kim (2010) tested if guests tend to develop greater levels of loyalty toward a green hotel when they are satisfied with its performance. Nonetheless, the relationship between customer satisfaction and loyalty is not always so conclusive (Rudchenko & Martín, 2018). Fyall, Callod, & Edwards, (2003) and Faullant, Matzler, & Mooradian (2011) suggest that even satisfied customer can prefer to visit new destinations or hotels. Thus, this work tested the following hypothesis:

H8: Guest satisfaction is a significant antecedent of guest loyalty toward the hotel

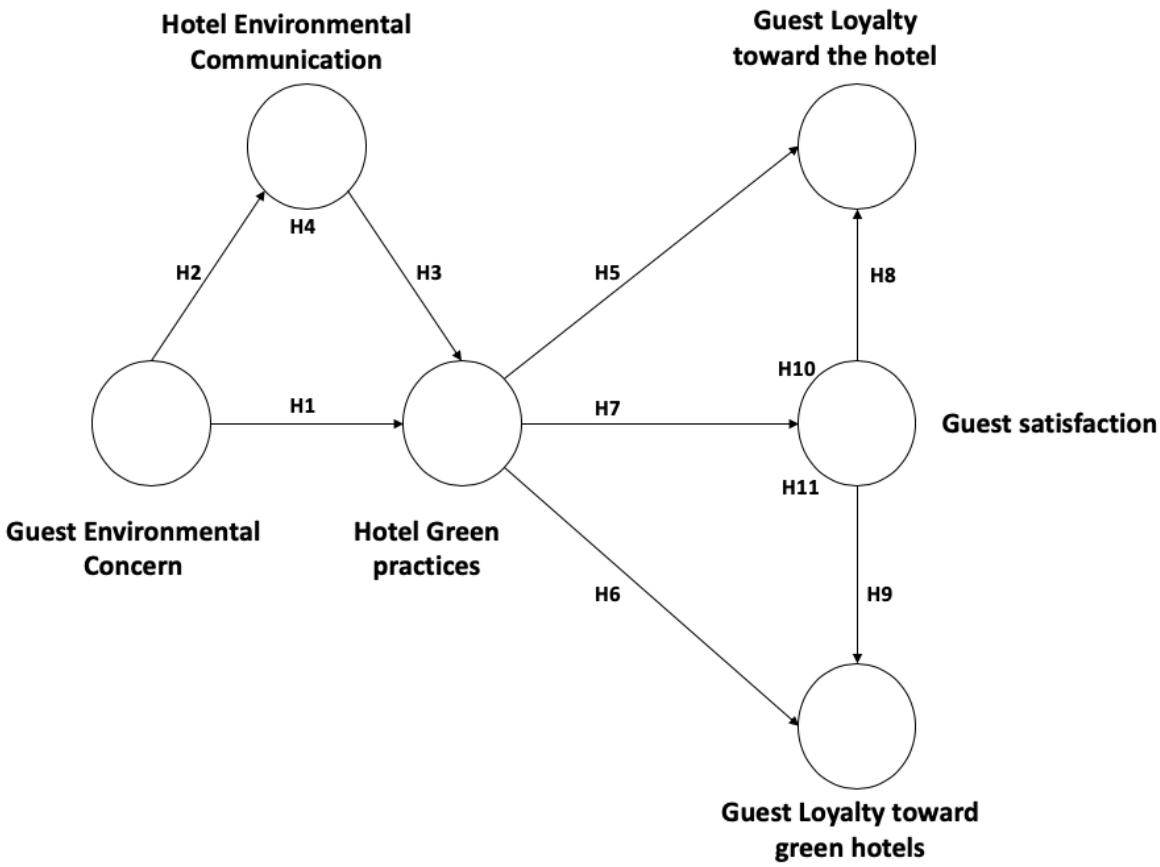
H9: Guest satisfaction is a significant antecedent of guest loyalty toward green hotels

Mediation occurs when an intermediate variable or mechanism transmits the effect of an antecedent variable to an outcome (Carrión, Nitzl, & Roldán, 2017). For instance, scholars have often investigated the role of mediator of satisfaction in the relation between perceived service quality and behavioural intentions (Cronin, Brady, Hult, & Tomas, 2000; Ekinci, 2003; Roberto Merli et al., 2019; Y. Yusof et al., 2017). Customer satisfaction has been found acting as mediator between service quality and loyalty in the context of hotels (Al-Rousan & Abuamoud, 2013; Olorunniwo, Hsu, & Udo, 2006; Osman & Sentosa, 2013; Wilkins, Merrilees, & Herington, 2009). Furthermore, researchers have found this relation significant also in the context of green hotels, suggesting that guest satisfaction is a mediator between environmental practices and loyalty toward green hotels (Han & Kim, 2010; Merli et al., 2019; Moise et al., 2018; X. Xu & Gursoy, 2015; Y. Yusof et al., 2017). Considering as above stated the following hypotheses are presented:

H10: Guest satisfaction mediates the relationship between hotel environmental practices and guest loyalty toward the hotel.

H11: Guest satisfaction mediates the relationship between hotel environmental practices and guest loyalty toward green hotels.

Figure 5.1 - Theoretical model and hypotheses



5.3 Research methods

5.3.1 Survey design

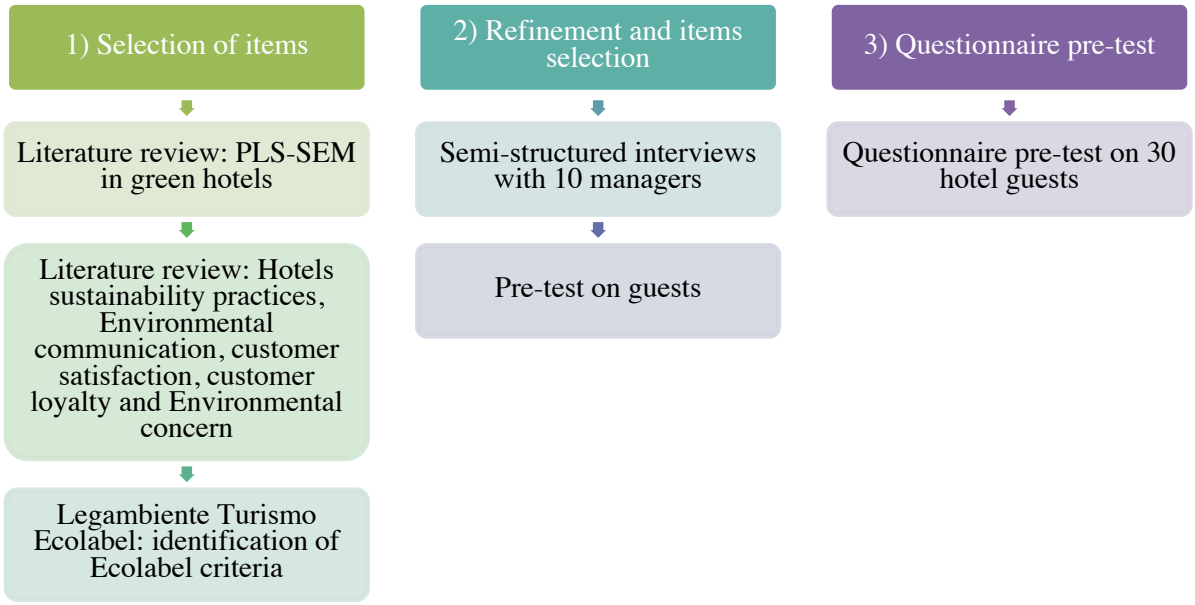
A survey was developed and administered to hotel guest to collect data and measure the constructs in the research model. The questionnaire was built following three main steps. Firstly, through an in-depth literature review of previous studies dealing with similar constructs, a preliminary list for the measurement scales was identified. Next, the list of items selected was streamlined with semi-structured interviews conducted with a panel of 10 managers of hotels awarded with the Legambiente Turismo eco-label. Interviews with hotel

managers allowed to drop redundant items, reduce the number of items and improve the semantic comprehensibility and the questions clarity.

Afterwards, the questionnaire was pretested with 30 hotel guests, randomly chosen, to assess the suitability of the questionnaire as an instrument of constructs measurement (Castellanos-Verdugo, Vega-Vazquez, Oviedo-Garcia, & Orgaz-Aguera, 2015). Results of this phase are minor changes on wording of sentences to improve readability and clarity of the questions. Finally, the questionnaire was reviewed and finalized by authors.

Figure 5.2 summarizes the process of identification and refinement of the items selected for the questionnaire.

Figure 5.2 - Survey instrument development process



In its final version, the questionnaire consisted of five sections. The first section aimed at the evaluation of guest environmental concern. The second to measure guest evaluation of hotel environmental communication. In these sections all items were measured with a 7-point Likert-type scale ranging from 1 (strongly disagree) to 7 (strongly agree). The third has as goal to measure guests' perceptions about hotel environmental practices, and is composed of 7 items adopted from previous studies (Bastič & Gojčič, 2012; Berezan, Raab, & Love, 2013; George

I. Kassinis & Soteriou, 2015; Levy & Park, 2011; Prud'homme & Raymond, 2013; To, Lam, & Lai, 2015; K.-S. Wu, Teng, & Huang, 2013; N. Yusof, Abd Rahman, Che Jamil, & Iranmanesh, 2014). The environmental attributes were also integrated with specific requirements that the hotel must satisfy to obtain the Legambiente Turismo eco-label, if such items were not identified in previous studies. Guests' evaluation of hotel environmental attributes was measured with a Likert-type scale ranging from 1 (poor performance) to 7 (excellent performance).

The fourth section consisted of six items to measure guests' overall satisfaction, loyalty toward the hotel, and loyalty toward green hotels. The two items measuring the overall satisfaction were retrieved from the study of Lai and Hitchcock (2016 and 2015). Measures of loyalty, expressed as revisit intention and word of mouth were shaped on Chi (2011), and Xu and Gursoy (2015) measures. Finally, to investigate loyalty toward green hotels, the scale was adapted from the studies conducted by Han et al. (2011), and Han and Kim (2010). Both satisfaction and loyalty were measured on a Likert scale ranging from 1 (strongly disagree) to 7 (strongly agree).

In the final section, guests' demographic information (age, gender, duration of the stay, type of trip), awareness of the hotel eco-label and previous experience with a green hotel were included (Han et al., 2011). Table 5.2 presents the measurement scales, with items mean values and standard deviation (scale 1 to 7). The questionnaire was first written in Italian and then translated into English. The two versions of the questionnaire were compared to make sure that the Italian and English questions conveyed the same meaning, and both were made available to participants. Survey questionnaires (Italian and English versions) are presented in Appendix A.

5.3.2 Data collection

After receiving the approval of the managers, 500 questionnaires were sent to two Italian hotels awarded with the Legambiente Turismo ecolabel. The hotel staff, once trained and informed about the research, were invited to distribute the questionnaire to all hotel guests during the check-out process. The survey was conducted during summer, this season is the most appropriate as it is the period of greatest influx of guests. Guests were selected using the

convenience sampling technique, which is widely employed into consumers related studies. A total of 373 filled questionnaires were collected with a response rate of 74.60%. 38 cases were excluded because incomplete or otherwise unusable (Bastič & Gojčič, 2012; Han et al., 2011). Eventually, 335 questionnaires were usable and employed for the subsequent analysis (210 from Hotel A and 125 from Hotel B). The minimum sample size in PLS-SEM should be ten times the largest number of formative indicators used to measure a particular construct or ten times the largest number of structural paths directed at a specific latent construct. As shown in Table 5.2, the largest number of indicators in the measurement model for one construct is seven. Therefore, the sample satisfies the required threshold (Joe F. Hair, Ringle, & Sarstedt, 2011).

5.3.3 Data analysis

Partial least squares structural equation modelling (PLS-SEM) was used to test the proposed hypotheses (Wold, 1982). PLS-SEM is a "regression-based" approach aimed at maximizing the explained variance of the dependent latent constructs (Joe F. Hair et al., 2011). Recently, PLS-SEM has gained a momentum in marketing and other business disciplines, increasing the number of studies utilizing this approach (Joseph F. Hair, Sarstedt, Pieper, & Ringle, 2012). Additionally, the empirical applications of PLS-SEM has been used to analyse structural research models in recent studies in the field of hospitality and tourism (F. Ali, Rasoolimanesh, Sarstedt, Ringle, & Ryu, 2018; do Valle & Assaker, 2015). Compared to traditional covariance-based structural equation modelling (CB-SEM), PLS-SEM is well-suited for assessing complex predictive models under conditions of non-normality and smaller sample sizes (J. Henseler et al., 2014). One of the reasons to choose PLS-SEM was that in the questionnaire the measures were developed with a Likert scale, and data have a non-normal distribution. PLS-SEM does not require any normality assumptions and handles non-normal distributions relatively well (Ali et al., 2018; Hair et al., 2011). Additionally, the presented research model has an exploratory nature, and while CB-SEM is better indicated for theory testing (Jörg Henseler, Ringle, & Sinkovics, 2009), PLS-SEM is more adapted for theory building applications to develop new models or conceptions (Joe F. Hair et al., 2011). Finally, PLS works well with the mediation analysis that is presented in this paper (Ali et al., 2018; Wynne W. Chin, 1998). In conclusion, variance-based SEM was preferred over covariance-based SEM

(Jöreskog, 1978), as it well-suits the characteristics of the investigation and the nature of the collected data (J F Hair, Hult, Ringle, & Sarstedt, 2014).

SmartPLS (V.3.2.8) software was employed to build models and assess their validity (Ringle, Wende, & Becker, 2015).

5.4 Results

This section presents the results of the analysis. First, information on the main characteristics of the profile of respondents, type of traveller and purpose of stay, guest information on the eco-label are provided (Section 3.4.1). Next, validity and reliability analysis of the measurement model are tested (Section 3.4.2). Finally, the hypotheses developed in Section 3.2 are tested through the structural models (Section 3.4.3).

5.4.1 Profile of respondents

The descriptive analysis of the sample shows that the 54.88% are males, while females are 45.12%. Most respondents were in the age range 30-39 (39.70%) and 40-49 (30.61%). Leisure travel is the most cited purpose of travel (76.17%), and almost half of the guests were travelling in couple (45.89%). Considering the nights of stay, the majority stayed at the hotel 3-5 nights (44.95%), 29.66% 1-2 nights, 22.32% 6-10 nights and only 3.06% stayed at the hotel for over 10 nights. Table 5.1 provides the main characteristics of respondents.

Table 5.1 shows the level of awareness respect to the hotel "Legambiente Turismo" ecolabel, almost half of the sample (46.55%) knew that the facility was certified. Of this percentage, the 50% had this information before visiting it. Moreover, only 31.65% declared to have had previous experiences in an ecolabel certified hotel (Table 5.1).

Table 5.1 - Guests' demographics and awareness of hotel ecolabel

Variable	**Range**	**Percentage**	**Variable**	**Range**	**Percentage**
Gender	Female	45.12%	**Purpose of stay**	Leisure	76.17%
	Male	54.88%		Business	23.83%

Age	18-29	12.73%	**Nights of stay**	1-2	29.66%
	30-39	39.70%		3-5	44.95%
	40-49	30.61%		6-10	22.32%
	50-59	10.30%		over 10	3.06%
	over 60	6.67%	**Hotel Eco-label awareness**	Yes	46.55%
Type of traveller	Single	15.07%		No	53.45%
	Couple	45.89%	**Hotel Eco-label awareness before visit**	Yes	50%
	Family	29.11%		No	50%
	Friends	7.19%	**Other experiences in eco-label hotels**	Yes	31.65%
	Others	2.74%		No	68.35%

5.4.2 Measurement model evaluation

For the model, as suggested by Hair et al. (2014) as well as Jarvis et al. (2003), we stated the reflective nature of the constructs under investigation (J.F. Hair et al., 2014; Stacie et al., 2007). This decision was mainly due to the following considerations: indicators have been conceived as manifestations of the construct; indicators shared a common theme; dropping an indicator does not alter the conceptual domain of the construct (J.F. Hair et al., 2014). The PLS-SEM model's assessment is composed by two stages: the evaluation of outer (measurement) and the evaluation of the inner (structural) model (J. F. Hair, Sarstedt, Ringle, & Gudergan, 2018).

The measurement model assesses that all constructs are correctly measured through the indicators (Klarner et al., 2013), and must be assessed for its reliability and validity.

Firstly, indicators reliability was examined. According to Hair et al. (2014) indicators' outer loading values should be higher than 0.708. Table 5.2 shows that in the model all indicators outer loadings for the reflective constructs exceed the suggested threshold value. Additionally, Cronbach's alphas for all constructs in this study ranged from 0.924 to 0.962 and the composite reliability ranged from 0.925 to 0.962, well above the suggested thresholds of 0.7 which

indicated satisfactory internal consistency of the measurement model (Bagozzi & Yi, 1988). In order to assess convergent validity, the average variance extracted (AVE) was calculated for each construct. Every construct had an AVE value well above the suggested threshold of 0.50 (Joseph F. Hair et al., 2018).

Table 5.2 - Measurement model evaluation results

Constructs/Indicators	Mean	St. dev.	Loading
Green practices (Env_perf) α= 0.953; CR= 0.953; AVE= 0.742; rho_A= 0.955			
The hotel implements water saving practices (e.g. the hotel encourages guests to ask for new linen only when necessary)	6.112	0.808	0.937
The hotel implements energy saving practices (e.g. automatic lights switching-off)	6.152	0.789	0.906
The hotel tries to avoid disposable or single-dose products	6.101	0.847	0.889
In the hotel, separated waste collection is available	6.218	0.798	0.768
The hotel uses environmental certified or green labeled products (e.g. toiletry products, paper)	6.096	0.846	0.800
The hotel provides its guests bicycles for free or for rent	6.157	0.862	0.845
The hotel cares about sustainability and adopts good practices of environmental management	6.207	0.847	0.874
Environmental Communication (Env_Com) α= 0.924; CR= 0.925; AVE= 0.755; rho_A= 0.927			
The hotel informs the guests about the good environmental practices implemented	6.006	0.856	0.881
The hotel provides its guests with information on how they can contribute to reduce the hotel's environmental impact	6.027	0.878	0.895
The hotel provides its guests with information on the environmental and cultural activities available in the area	6.030	0.929	0.900
The hotel provides information on public transportation	6.150	0.940	0.795
Environmental Concern (Env-Conc) α= 0.924; CR= 0.925; AVE= 0.805; rho_A= 0.931			
Environmental sustainability is one of the main problems for today's society	5.792	1.100	0.928
In everyday life, environmental sustainability is an important criterion in my choice of products and services	5.693	1.149	0.950
I am willing to pay more for environmentally sustainable products and services	5.625	1.163	0.807
Guest satisfaction (Sat) α= 0.962; CR= 0.962; AVE= 0.895; rho_A= 0.963			
I am satisfied with my experience in this hotel	6.048	0.950	0.940
My expectations have been satisfied	6.096	0.971	0.950
My experience in this hotel matches with what I would expect from my ideal hotel	6.030	0.984	0.949

Guest loyalty towards the hotel (Loy) α= 0.947; CR= 0.947; AVE= 0,.99; rho_A= 0.947			
I would come back again in this hotel	6.146	0.943	0.947
I would recommend this hotel in the future	6.150	0.955	0.950
Guest loyalty toward green hotels (Loy_env) α= 0.958; CR= 0.958; AVE= 0.920; rho_A= 0.959			
I would come back in a hotel that implements good environmental practices	6.006	0.997	0.974
I would recommend a hotel that implements good environmental practices	6.036	1.008	0.944
α= Cronbach's Alpha; CR= Composite reliability; AVE= Average Variance Extracted: Rho_A= reliability coefficient			

Next, both the Fornell-Larcker criterion (Table 5.3) and the Heterotrait-Monotrait (HTMT) ratios (Table 5.4) were assessed to ensure an adequate discriminant validity of the measurement model. The Fornell-Larcker criterion suggest that the square root of each construct's AVE should be greater than its correlations with other constructs (Fornell & Larcker, 1981). Table 5.3 shows that the square root of each AVE (shown on the diagonal in bold) is greater than the related inter-construct correlations in the construct correlation matrix, indicating adequate discriminant validity for all the reflective constructs.

Table 5.3 - Fornell-Larcker discriminant validity criteria

	Environmental Communication	**Environmental Concern**	**Green practices**	**Guest loyalty towards the hotel**	**Guest loyalty towards green hotels**	**Guest satisfaction**
Environmental Communication	**0.869**					
Environmental Concern	0.376	**0.897**				
Green practices	0.822	0.327	**0.862**			
Guest loyalty towards the hotel	0.442	0.561	0.424	**0.948**		
Guest loyalty towards green hotels	0.413	0.697	0.372	0.850	**0.959**	
Guest satisfaction	0.448	0.543	0.428	0.879	0.770	**0.946**

More recently, Jörg Henseler, Ringle, & Sarstedt (2015) suggested a new and more conservative tool to asses discriminant validity: the heterotrait-monotrait (HTMT) ratio of correlations. All values of the HTMT are below the suggested 0.9 threshold (Table 5.4), which confirms that there is no issue of discriminant validity (Jörg Henseler et al., 2015).

Table 5.4 - HTMT discriminant validity criteria

	Environmental Communication	Environmental Concern	Green practices	Guest loyalty towards the hotel	Guest loyalty towards green hotels	Guest satisfaction
Environmental Communication						
Environmental Concern	0.376					
Green practices	0.821	0.324				
Guest loyalty towards the hotel	0.443	0.563	0.421			
Guest loyalty towards green hotels	0.413	0.700	0.369	0.850		
Guest satisfaction	0.449	0.545	0.425	0.879	0.770	

5.4.3 Assessment of the structural model

The structural model examines the relationships in terms of weights and magnitudes between the endogenous and exogenous latent variables in the model (J.F. Hair et al., 2011). Prior to reporting the hypotheses testing results, it was essential to assess the predictive relevance of the exogenous constructs on endogenous constructs. The blindfolding procedure revealed that all the Stone-Geisser's Q^2 values were above zero, indicating the satisfactory predictive relevance of the structural model (Table 5.5). Next, the coefficient of determination (R^2) was calculated to evaluate the predictive accuracy of the model, that expresses the amount of variance in each endogenous latent variables which can be ascribed to all the exogenous latent variable connecting to it (K. K. Wong, 2013). Following Cohen (1988) guidelines, the rule of thumb for R^2 predictive accuracy are 0.02 for small effect, 0.15 for medium effect, and 0.35 for large effect. In the model we have medium effects for Environmental communication (R^2= 0.142) and Guest satisfaction (R^2=0.183) and large effects for Green practices (R^2=0.677), Guest loyalty towards the hotel (R^2=0.776) and Guest loyalty towards green hotels (R^2=0.595). Thus, the predictive power of the model was generally substantial (J. F. Hair et al., 2014).

Additionally, following the recent guidelines of Henseler et al. (2016) that suggest applying the standardized root mean square residual (SRMR) as the only approximate model fit criterion,

a SRMR value of 0,038 was calculated for our model, indicating a more than adequate model fit. A value of 0 for SRMR would indicate a perfect fit, and generally, an SRMR value less than 0.08 is recommended to be adequate for PLS path models (Jörg Henseler, Hubona, & Ash, 2016).

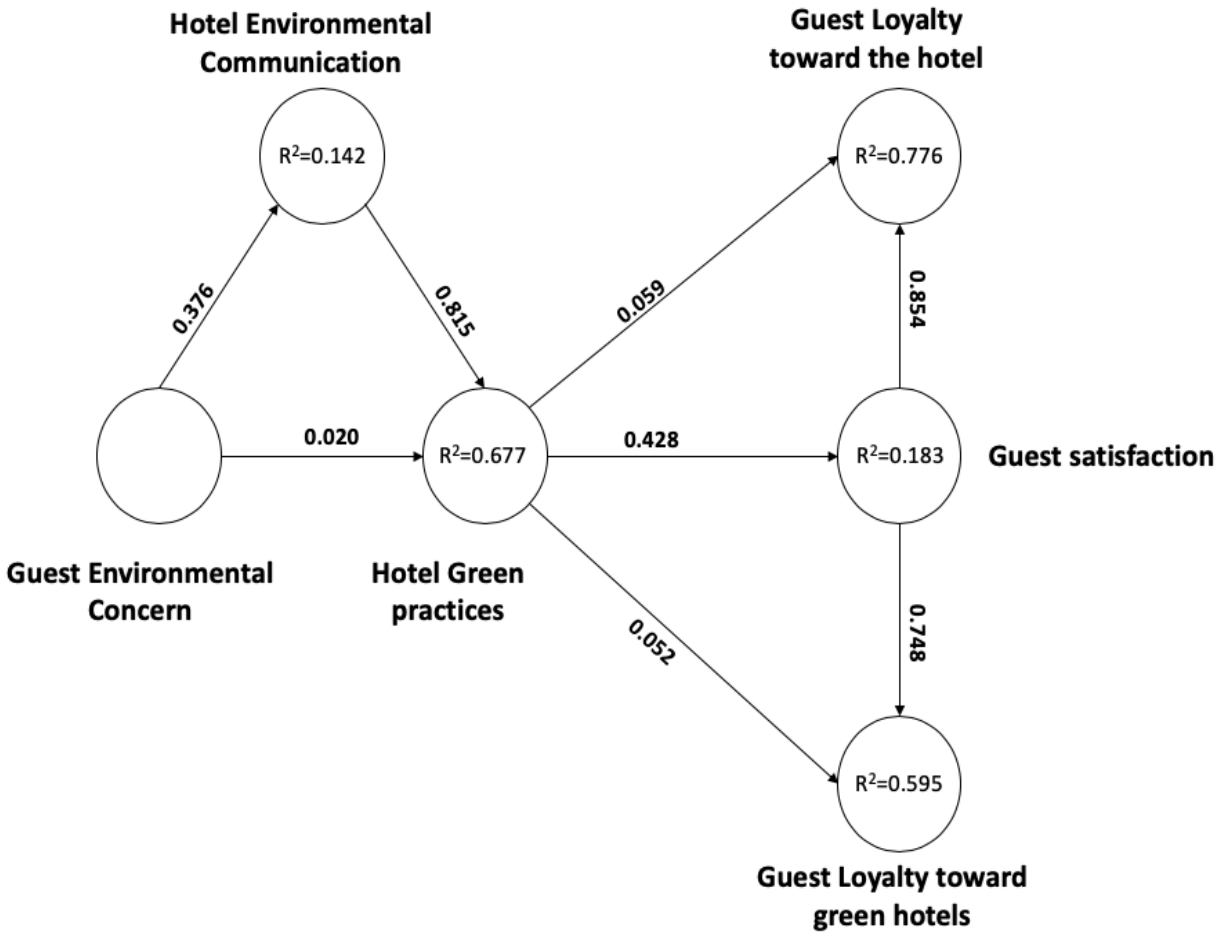
Finally, to test the structural model and the hypotheses, SmartPLS was used. Specifically, a consistent PLS bootstrapping, with 5,000 iterations, evaluated the statistical significances of the paths. The results of hypotheses testing are provided in Table 5.5. As we can see from the table, all hypotheses are accepted except for H1, H5 and H6. p values assess the significance of the relationships but fails to account for effect sizes. So the f^2, measuring relative impact of a particular exogenous construct on an endogenous construct, have been calculated. The guidelines of Cohen (1988) for effect size assessment, 0.02 for small, 0.15 for medium, and 0.35 for large effects, were followed. As displayed in Table 5.5, all the effect sizes were large (H3, H8, H9) or medium (H2, H7).

Table 5.5 - Model hypotheses statistics (bootstrapping) and endogenous constructs assessment (R^2, Q^2 and f^2).

Path coefficients and bootstrapping					
	Hypothesis	**Original Sample**	**T Statistics**	**P Values**	**f^2**
H1	Environmental concern → Green practices	0.020	0.484	0.628	0.001
H2	Environmental concern → Environmental communication	0.376	4.924	0.000***	0.165
H3	Environmental communication → Green practices	0.815	21.891	0.000***	1.763
H5	Green practices → Guest loyalty towards the hotel	0.059	1.284	0.199	0.013
H6	Green practices → Guest loyalty towards green hotels	0.052	1.051	0.293	0.005
H7	Green practices → Guest satisfaction	0.428	5.331	0.000***	0.224
H8	Guest satisfaction → Guest loyalty towards the hotel	0.854	21.009	0.000***	2.663
H9	Guest satisfaction → Guest loyalty towards green hotels	0.748	13.249	0.000***	1.130
*p < 0.05. ** p < 0.01. *** p < 0.001.					
Endogenous constructs assessment					
	R^2	**R^2 Adjusted**		**Q^2**	
Environmental communication	0.142	0.139		0.087	
Green practices	0.677	0.675		0.425	
Guest loyalty towards the hotel	0.776	0.775		0.640	
Guest loyalty towards green hotels	0.595	0.593		0.501	
Guest satisfaction	0.183	0.180		0.146	

Figure 5.3 provides a graphical description of the tested model.

Figure 5.3 - Structural model with β for path coefficients and R^2 for the exogenous constructs



5.4.4 Testing the mediation effect

The last step in the model assessment is to test the multiple mediations effect. A mediation effect arises when a direct causal relationship within an independent variable and a dependent variable is affected by a third variable (Baron & Kenny, 1986). In the context of SEM, a mediation occurs when a mediator variable affects the structural relationship between the exogenous and an endogenous construct (J F. Hair, Sarstedt, Hopkins, & G. Kuppelwieser, 2014). Different approaches on the evaluation of mediation exist, and there is no general consensus on preferable procedure to evaluate it in PLS-SEM (Bontis, Booker, & Serenko, 2007; J F. Hair et al., 2014). Previously, the most employed procedures were the Sobel test

(Sobel & Leinhardt, 1982) and the Baron and Kenny approach (Baron & Kenny, 1986). More recently, the effectiveness of these procedures has been widely criticized (Preacher & Hayes, 2008; Shrout & Bolger, 2002; Zhao, Lynch Jr., & Chen, 2010). Therefore, this paper analyses the mediation effect through a nonparametric bootstrapping approach testing the significance of the indirect effect proposed by Preacher and Hayes (2008) and Zhao et al. (2010). Following Carrión et al. (2017), the percentile bootstrap and bias-corrected bootstrap, with 5,000 resample, is calculated to test the specific indirect effects (Carrión et al., 2017). Results show that the mediations are significant (p values=0.000***), thus H4, H10, and H11 are accepted (Table 5.6).

Additionally, to determine the size of the indirect effect on the total effect, we calculated the Variance Accounted For (VAF), which evaluates the strength of the mediation (Helm, Eggert, & Garnefeld, 2010). VAF can varies between 0 and 100%, with values above 80% indicating full mediation, between 20 and 80% partial mediation, and below 20% no mediation effect. The VAF (Equation 1) determines the size of the indirect effect in relation to the total effect (J.F. Hair et al., 2014).

Equation 1- Variance Accounted For (VAF)

$$(1) indirect\ effect(a\ x\ b) = total\ effect\ (c) - \ direct\ effect\ (c')$$

$$VAF = \frac{a\ x\ b}{a\ x\ b + c'}$$

Table 5.6 shows that the VAF calculated for our relationship indicates all full mediation 93.88% for the Environmental communication as mediator between environmental concern and green practices and 86.08% and 82.02% for guest satisfaction as mediator between green practices and between respectively guest loyalty towards the hotel and guest loyalty towards green hotels.

Table 5.6 - Summary of mediating effect test

Hypothesis	**p-value (bootstrap)**	**Total effect**	**Direct effect**	**Indirect effect**	**VAF**	**Mediation**
H4: Environmental Concern → Environmental communication → Green practices	0.000***	0.327***	0.020	0.307***	0.9388	93.88%

H10: Green practices →Guest satisfaction → Guest loyalty towards the hotel	0.000***	0.424***	0.059	0.365***	0.8608	86.08%
H11: Green practices →Guest satisfaction → Guest loyalty towards green hotels	0.000***	0.372***	0.052	0.320***	0.8602	86.02%
*p < 0.05. ** p < 0.01. *** p < 0.001.						

5.5 Discussion

Results of this work are contributing to the wide body of literature concerning the role of green practices in influencing customer behavioural intentions. Both theoretical and practical implications can be drawn from the results obtained. Considering that the role of guest environmental concern and hotel environmental communication have been scarcely studied in the context of Italian environmental certified hotels, this work contributes to enrich the academic literature on the topic. Moreover, the construct of loyalty towards green hotels has been proposed, contributing to establish a new relationship between hotel green practices and this construct and enriching the literature of a new research concept. Eight out of the eleven research hypotheses tested in the research model proposed in this study were accepted.

- *Guest environmental concern does not influence guest perception of hotel green practices directly but through the hotel environmental communication that act as a mediator between these two constructs*

Results from the study led to reject the hypothesis according to which guests environmental concern directly influences their perception of hotel green practices. This result is in contrast to previous studies findings (e.g. Ham & Han, 2013; Njite & Schaffer, 2017). Academic literature on this topic mostly agreed in assigning at guest environmental concern a predictive role in determining guest appreciation of hotel green practices (Han and Kim, 2010; Manaktola and Jauhari, 2007), even if through a mediator role (Han et al., 2018). However, the research model confirms the full mediation role of hotel environmental communication in the relation between guest environmental concern and guest perception of hotel green practices (environmental communication mediates for the 93.88% the relation between these two

variables), confirming the hypothesis formulated in this study. This finding confirms the pivotal role of environmental communication in guest's appreciation of hotel green practices and its ability to exploit and transform the environmental concern of guests in appreciation for the efforts the hotel makes to improve its environmental impact. Through the environmental communication hotels can improve their green image, that has been found critical to assist consumers in forming a positive attitude towards green hotels (J. Wang, Wang, Xue, et al., 2018) and to enhance guest behavioural intention in terms of word of mouth and intentions to revisit the hotel (Lee et al., 2010; Martínez and Rodríguez del Bosque, 2013; Yusof et al., 2015). For hoteliers and practitioners, these findings should lead to rethinking their communication strategy. They should continuously inform customers about environmental problems and impacts, and through that strengthening guest environmental concern. Additionally, as stated by Kim and Han (2010) they should: "*constantly communicate the positive changes resulting from individuals' green actions effort and through persuasive communication channels, stressing the ability of each individual customer to decrease environmental deterioration*".

- *Guest environmental concern influences guest perception of hotel environmental communication*

This study confirms that guest environmental concern positively influences the evaluation of hotel environmental communication. This result is in line with R. Y. K. Chan (2004) and R. Y. K. Chan and Lau (2000) findings, in which consumers' environmental concern has been found to have significant influence on the effectiveness of environmental advertising. Moreover, it confirms that guests with strong concern for the environmental protection have a more positive response towards environmental advertising than consumers with weak environmental concern. Furthermore, K. Chan and Han (2014) found that consumers' environmental concerns had an impact on attitudes toward advertisements. Additionally, accordingly to Penz et al. (2017) and H. H. S. Hu, (2012), this study suggests that guest more concerned with environmental problems will better appreciate the efforts of hotel in communicating their environmental strategy and their actions to improve the environmental impacts of their activities. Moreover, environmental concerned guest will probably have more background information on environmental initiatives and certifications (Martínez García de

Leaniz et al., 2017) and this would lead to be more responsive towards hotel environmental claims and advertisement.

- *Hotel environmental communication influences guest perception of hotel green practices*

From the model proposed emerges that hotel environmental communication has a positive influence on guest perception of green practices implemented by the hotel. There are two main reasons for hotels to communicate their green practices: one is to enhance customers in supporting and participate in the hotel's in-room green programs (e.g. turning off the lights, reuse towels) (Grazzini et al., 2018; H. H. S. Hu, 2012; S. A. Lee & Oh, 2014); the other refers to increase guest knowledge and appreciation of hotel green practices (Leonidou, Leonidou, Fotiadis, & Zeriti, 2013; Punitha & Mohd Rasdi, 2013). In fact, Wang et al. (2017) found that guests are more likely to engage in the hotel environmental programs if the hotel's commitment is visible and communicated to customers. Some scholars argued that for customers is important not only what the hotel does, since they would rarely know about that, but what the hotel communicates that it does and how these messages are perceived (Ettinger et al., 2018; Öberseder, Schlegelmilch, & Murphy, 2013). Moreover, through the communications of hotel environmental strategy, guests can embody the motivations that led the hotel to adopt green practices and be involved in the hotel's green strategy. Terrier and Marfaing (2015) pointed out that hotel environmental communication can influence also guests environmental commitment and collaboration in mitigating environmental impacts (Terrier & Marfaing, 2015; Villarino & Font, 2015). Green communication can boost environmental friendly guests behaviour and reduce guests self-serving behaviours (S. A. Lee & Oh, 2014; Martínez & Rodríguez del Bosque, 2013). Hotel communication of the green practices implemented can also contributes to a positive impact on the corporate image (Ko, Hwang, & Kim, 2013) and green image (Martínez García de Leaniz, 2015; Yadav, Kumar Dokania, & Swaroop Pathak, 2016) that is crucial for firm long term success, providing competitive advantage and differentiation market position (Yeo & Youssef, 2010) and helping to increase sales, attract new investors and employees, and improve customer loyalty (Pina, Martinez, De Chernatony, & Drury, 2006). J.-S. S. Lee et al. (2010) found that green hotel's overall image favourably enhances guests' behavioural intentions, including willingness to pay a premium, word-of-

mouth and revisiting intentions. Particularly, J. Wang, Wang, Xue, et al. (2018) demonstrated that green image not only positively affects the consumers word-of-mouth intention about green hotels but also affects green trust and green satisfaction. These relations are especially true for millennials and female consumers that reached with the right communication channels may be the best targets for green hotels. Moreover, green hotel overall image and green image are central in building firms credibility (E. S. wa Chan, 2014), and for this reason hoteliers should choose the right communication strategy to increase credibility (Camilleri, 2018; Jameson & Brownell, 2012). This is particularly important since, if a hotel guest is confused about what the hotel's green practices are (Y. S. Chen & Chang, 2013) or sceptical about the motive for hotels to go green (Rahman et al., 2015), this may lead to distrust the hotel green efforts (H. Lee, Tun-Min, Catherine, & Li, 2016). In fact, nowadays consumers are also becoming more critical of hotels' green practices and increasingly aware of hotels' greenwashing propensities (Rahman et al., 2015) and this trend can negatively affect purchase intentions and behavioural intentions (Mostafa, 2006). For this reason, between hoteliers the phenomenon of "greenhushing" is spreading (Font, Elgammal, & Lamond, 2017). Hotels are under-communicating their sustainability practices to mitigate the negative consequences of a perceived greenwashing from customers and to avoid: "a potential disconnection between their perception of customer expectations and their own operational position concerning sustainability issues"(Font et al., 2017). In a similar research stream fits the contribution of Robinot and Giannelloni (2010) that suggested that a lack of environmental communication can reduces the risk of having environmental practices unfavourably evaluated by guests, which would lead to a potential guest dissatisfaction. In these context ecolabel and sustainability certification by third party can improve the overall image of the hotels and the credibility of their environmental claims, limiting the risk to be negatively judged by guest for greenwashing (Geerts, 2014; Rahman et al., 2015; S.W. Chan, 2013). Consequently, developing clear communication strategies in order to make ecolabels visible and salient to guests can help customers find their way around the environmental practices implemented and clearly understand what the hotel does for the environment and why it does it (Penz et al., 2017). Providing this type of information to guests can also contribute to raise their environmental awareness and concern (Martínez García de Leaniz et al., 2017). Moreover, Pérez and Rodríguez del Bosque (2014) and Martínez and Rodríguez del Bosque (2013) also

suggested to managers to disclosing information on key environmental performance indicators, as this may contribute to raise customer satisfaction and consequently loyalty as a way to establish a process of identification between the hotel and guests.

- *Hotel environmental practices positively influences guest satisfaction with the hotel that has been found as a significant antecedent of guest loyalty toward the hotel and toward green hotels*

Results from this study reveals a significant relation between hotel environmental practices and guest satisfaction. This results is in line with previous studies findings that hotel eco-friendly practices enhance guests satisfaction (Berezan, Raab, & Love, 2013; Gao & Mattila, 2014; G I Kassinis & Soteriou, 2003; S. Lee & Heo, 2009; Moise et al., 2018; X. Xu & Gursoy, 2015; Y. Yusof et al., 2017). Satisfaction has been defined by Yoon and Uysal (2005) as "*a delightful level of feeling arising from the ability of a product or service to satisfy consumers' needs, wants, and desires*". Guest satisfaction in one of the most studied construct in hospitality research (J. Wang, Wang, Xue, et al., 2018) because of its pivotal role in hotels success and competitive position on the market (S. Lee et al., 2018). Giannelloni (2010) investigated the role of hotel's green attributes on overall satisfaction. The study shows that all environment-related attributes, with one exception, fall in the "basic" category. This category contains attributes that have a negative effect on the formation of satisfaction if they are evaluated unfavourably, but that do not have a significant positive effect if they are favourably evaluated. Also Gao and Mattila (2014) found that green initiatives enhance consumer satisfaction when service quality is delivered properly. However, the positive impact of being green was not observed in service failure conditions. Moreover they suggests that consumer satisfaction in green hotels context is influenced by perceived motives, and guests are more satisfied with the hotel when they perceive that the hotel motive to go green is to help the society (public-serving) rather than to make more money (self-serving) (Gao & Mattila, 2014). Additionally, in the context of lodging industry, Slevitch, Mathe, Karpova, & Scott-Halsell (2013) investigated the role of "green" attributes in the formation of customer satisfaction. The study showed that the "green" attributes are facilitating attributes, considered as excitement attributes. However,

results also revealed that "green" attributes effect on customer satisfaction is moderated by core attributes performance (Slevitch et al., 2013).

The role of green practices in influencing satisfaction is particurarly important as satisfaction has been found as a significant antecedent of guest loyalty and guest behavioural intention towards green hotels (Gallarza & Saura, 2006; Gao et al., 2016; S. Lee et al., 2018; Prud'homme & Raymond, 2013; X. Xu & Gursoy, 2015; Y. Yusof et al., 2017). Particularly, J. Wang, Wang, Xue, et al. (2018) findings support the hypothesis that customer satisfaction is a significant determinant of repeat behaviour intentions such as word-of-mouth intention. Several scholars argue that customer satisfaction has often been related to guest revisiting intentions (Berezan, Raab, & Love, 2013; Han & Yoon, 2015b; Moise et al., 2018). Furthermore, results from this study confirms Martínez García de Leaniz (2015) and Shih (2018) findings that guest satisfaction is a significant determinant in the formation of customer "green loyalty", a specific type of loyalty directed towards the general category of green hotels.

- *Hotel green practices does not directly influence guest loyalty toward the hotel and toward green hotels; in fact guest satisfaction act as a full mediator between hotel environmental practices and guest loyalty toward green hotels and between hotel environmental practices and guest loyalty toward the hotel*

Contrary to other studies' findings the research hypotheses about the direct positive relation between green practices and guest loyalty towards the hotel and green hotels tested in this model have been rejected. Indeed, previous scholars' findings have suggested that hotel environmental practices would affect customer loyalty towards the hotel directly (Berezan, Raab, & Love, 2013; G. Choi et al., 2009; Gao & Mattila, 2014; Gao et al., 2016; Han & Kim, 2010; Jiang & Kim, 2015; G I Kassinis & Soteriou, 2003; J.-S. S. Lee et al., 2010; Line & Hanks, 2016; X. Xu & Gursoy, 2015) and that guests appreciating the green practices would also develop a favourable loyalty toward this type of hotels (Han et al., 2011; Martínez García de Leaniz et al., 2017; J. Wang, Wang, Xue, et al., 2018). However, this study found that customer satisfaction fully mediates the relationship between green practices and loyalty towards the hotel (for the 86.08%) and towards green hotels (for the 86.02%). These findings

have meaningful implications for hoteliers and practitioners since guest's loyalty towards the hotel pass through their satisfaction with the hotel. However, satisfaction with the hotel is a multi-attribute construct, only partially explained by environmental attributes, and influenced by several variables of service quality and consumers attitudes (Um, Chon, & Ro, 2006). In this sense, hoteliers should concentrate their efforts not only on green practices but also in delivering a high-quality service. Indeed, in case of a failure in service delivery of non-environmental attributes, satisfaction, and consequently loyalty, may decrease. Therefore, green practices may have a positive effect on satisfaction only as long as there is no service failure (Gao & Mattila, 2014).

5.6 Limitation and future research

This study has several weaknesses that should be pointed out. The first limitation refers to the sample size and the convenience sample choice. The sample of the analysis are 335 guests from two Italian "Legambiente Turismo" certified hotels. Therefore, study results may not be applicable to green hotels with different ecolabels or green certifications and in other destinations and countries. Consequently, scholars should handle findings carefully before generalizing. Moreover, as we chose the "Legambiente Turismo" ecolabel, the items selection reflects the criteria that hotels had to meet to be awarded with this specific ecolabel certification. Future investigations may need to expand the scope of the analysis to different ecolabels or green certification schemes. Another research stream to explore in the future could be the evaluation of the efficacy of specific ecolabels programs, also analysing the same research model in in non-certified hotels.

Additionally:

- the characteristics of the sample have not been considered in the analysis. This limitation may serve as an opportunity for further research to integrate the model to evaluate the role of green practices on customer satisfaction and loyalty considering different segments of the customer population and investigating as these factors impact on different type of consumers.

- it may be interesting to study hotel guests' nationality as control variable, testing its effect on environmental concern, satisfaction and loyalty.
- the measure for behavioural intention in this study is only related to word of mouth (WOM) and intentions to revisit, so willingness to pay (WTP) may be considered in further investigations.

Furthermore, considering the pivotal role of hotel environmental communication in determining guest appreciation of green practices future researches could investigate the effectiveness of different marketing strategies and environmental claims in generating guests' positive behaviours and how to successfully deliver the information to guests. Next, as service quality is a multi-attribute construct, the scope of the survey should be extended to the other hotel service attributes together with those linked to environmental sustainability. This would support both researchers and practitioners to better understand the simultaneous effect of green attributes, together with other service quality attributes, in the formation of customers' satisfaction and behavioural intentions. Finally, further research may investigate if and how the ecolabel certification represents an added value for hotel guests, contributing to stimulate positive behavioural intentions and a positive attitude toward ecolabel hotels.

Conclusions

Tourism is a significant contributor to environmental degradation and to greenhouse gases emissions (Pang et al., 2013). At the same time this industry is also one of the most exposed to the negative consequences of climate change (Gossling & Peeters, 2015; K. Smith, 1990). This is particularly relevant, considering that many of the tourist activities are based on the availability of natural ecosystems in good condition and accessible to tourists (C. Michael Hall, 2001; Y. Luo & Deng, 2008; Phillips & House, 2009). Indeed, Tucker (2001) argued that the tourism industry is facing a paradox "it destroys the object of its desire". Therefore, to ensure tourism long-term growth, a balance between economic advantages and environmental sustainability is needed (Ghosh & Datta, 2012; Mustapha, Zulkifli, & Awang, 2018).

In this context, the implementation of good environmental practices has become crucial into tourism facilities operations management (Erdogan & Baris, 2007; Mensah, 2006). Over the years, more and more hotels are integrating sustainability practices in the management of their operations, not only to develop a more eco-friendly business environment but also to reduce their operating costs (Yi et al., 2018). Literature shows that hotels go green for many reasons: economic benefits, improved employee organizational commitment, facing public scrutiny, improved investor relations and general social good (Prud'homme & Raymond, 2013).

Moreover, consumers are becoming increasingly aware of hotels environmental impact and seems to appreciate hoteliers' efforts towards sustainability. Green practices are particularly appreciated by tourists (Oroian et al., 2014), enhancing customer satisfaction and contributing to the formation of positive behavioural intentions (Han & Kim, 2010) and indirectly increasing firms' competitiveness. Considering these phenomena, many hotels have been proactive in adopting green practices and becoming greener, to attract eco-consciousness consumers and to improve their economic performance (J. Wang, Wang, Xue, et al., 2018). In fact, despite it is often considered as unsustainable, the hospitality industry has been a pioneer in implementing sustainability practices, introducing environmental accreditations and ecolabels. To gain success, green practices should reduce operational cost for tourism facilities (e.g. through water

and energy savings) and, concurrently, create value for customers (Robinot & Giannelloni, 2010b).

However, the major challenge that hoteliers, marketers and practitioners have to deal with is the consumers' "greenwashing" scepticism. Greenwashing refers to: "*intentionally misleading or deceiving consumers with false claims about a firm's environmental practices and impact*" (H. J. Wang, 2017). When consumers feel that a company claim is "greenwashed", they lose trust in that brand compromising brand equity. It is, therefore, crucial that companies' efforts are seen by consumers as a genuine commitment to sustainability and climate change mitigation. This is particularly critical for the hotel sector, where the term greenwash was created. The term was, indeed, coined by prominent environmentalist Jay Westerveld in a 1986 essay (Becker-Olsen & Potucek, 2013). The author critiqued the hotels industry practice of promoting the reuse of towels as part of a broader environmental strategy when, in fact, the only driver of the hotels was to promote a cost-saving measure (Orange, 2010). In this sense eco-labels and certification can contrast the "distortive effect" caused by greenwashing and the consequent mistrust of consumers as they provide accepted and recognized certification schemes that can assure to consumers credible and clear information (Font et al., 2017; F. Testa et al., 2015).

In recent years there has been a proliferation of scholars' publications on the topic. This thesis presented the results of a systematic literature review exploring the state-of-the-art of academic research on green practices in the hotel sector. The paper explores the body of literature with a systematic approach to provide an exhaustive analysis of the phenomenon with rigorous and reproducible research criteria. The revisited material consists of 600 articles collected through the Scopus database, and has been evaluated using specific structural dimensions to group literature into analytical categories. The systematic literature review has highlighted past, present and future lines of research on sustainability in the hotel industry. The analysis has shown as green hotels have been a hot topic over the last years approached with interdisciplinarity also from scholars with a non-hospitality curriculum. United States, the United Kingdom, and Spain are the countries that are dominating the academic conversation on the topic, establishing a dense network of collaboration among their scholars. Heesup Han has emerged as the most prolific and impactful author, with four of his papers among the 10 most cited documents on green hotels. Within the most cited papers this thesis highlighted a

prevalence of studies on consumer's behaviour towards green hotels. Authors have been particularly interested in evaluating the so called "attitude-behaviour gap", also through the lens of the Theory of Planned Behaviour (TPB) and the Theory of Reasoned Act (TRA). Indeed, consumers' attitudes towards green practices in the hospitality industry does not always emerge as a good predictor of their actual behaviour (Juvan & Dolnicar, 2014). This type of gap has gained scholars attention, because it can compromise the competitive advantages of the green strategy on the market. Moreover, from the literature review also emerged the prevalence of quantitative research methodology with a survey approach in this field of research. This aspect, together with the fact that in many cases these investigations are not supported by a strong theoretical elaboration, has often been emphasized as a lack of scientific robustness of the research field that fails to give a more coherent methodological and theoretical approach. Descriptive statistical analysis, structural equations model (SEM) (also in its variant partial least square-structural equations model (PLS-SEM)), content analysis and regression analysis are the most used data analysis techniques. Particularly, SEM and PLS-SEM have gained a momentum in the last years in hospitality and tourism research (F. Ali & Rasoolimanesh, 2018). Moreover, from the analysis emerged a coincidence between the nationality of the authors and the country in which the analysis is carried out, bringing out the territoriality of the investigations and suggesting the existence of a well-structured network of collaborations between universities and companies and between universities and initiatives implemented in the territory. Furthermore, as often highlighted in literature (dos Santos et al., 2017; Melissen, Koens, Brinkman, & Smit, 2016) the sustainability research in tourism and hospitality often privileged the study of the environmental aspects instead of applying a triple bottom line approach to the problem. Finally, this thesis presented a framework for the review of green and sustainable research in the hotel industry. Developed as a synthesis between the main topics emerged from the SLR and a conceptual elaboration of the aspects related to the implementation of sustainable practices in the hotels, this framework provided a synthesis operation with the aim of systematize the collected material and give an overview of the main topics of this research area and how these are related to each other's.

Subsequently, this thesis presents the results of a quantitative study with the aim to investigates how consumers perceive actions implemented by hotels towards environmental sustainability and what drives guests in appreciate the hotels' green efforts. Results of a survey carried out

through a questionnaire, targeted to the guests of two Italian hotel awarded with the Legambiente Turismo eco-label, have been presented. The research was carried out through a survey, by the means of a questionnaire that was built with a three-step procedure. Eventually, 335 questionnaires were usable and employed for the subsequent analysis. This thesis hypothesizes that hotels guests' environmental concern influences guests' perception of hotels green communication and green practices. Additionally, the positive influence of hotel's environmental communication on guests' perception of hotels green practices has been tested as well as its mediator role in the relationship between guest environmental concern and their perception of hotels green practices. Then, this thesis tested the existence of a direct significant relationship between hotel green attributes and customer satisfaction, loyalty and loyalty toward green hotels. Finally, it analyses the influence of guest satisfaction in determining positive guest behavioural intentions and its role as a significant mediator for guest loyalty towards the hotel and towards the general category of green hotels. The Partial Least Square Structural Equation Modelling (PLS-SEM) analysis leads to accept eight out of the eleven hypotheses tested. Results from the model testing show the role played by guest environmental concern in influencing guests' perception of hotels' green communication. This aspect is of great interest for hoteliers as it highlights that consumers concern about the environment led guests to perceive more clearly the hotel's effort to communicate these green practices (Han et al., 2010; Manaktola and Jauhari, 2007; Martínez García de Leaniz et al., 2017). Therefore, through the identification of these niche market, they can foster their results on the market by increasing customers' environmental concerns (Ham and Han, 2013) and by communicating to uninformed customers the negative impacts that non-environmentally certified hotel companies have on the environment (Martínez García de Leaniz et al., 2017). Moreover, the model also confirms that guest perception of hotel environmental communication has a positive influence in guest perception of green practices implemented. Consequently, to allow guests to understand and process the information associated to an ecolabel, hotels should develop communication strategies in order to make the eco-labels and their green efforts visible and salient to guests (Penz et al., 2017). As observed by Wang et al. (2017), communication support consumers to observe hotel's commitment to help the environment, visibly revealing the hotel efforts for environmental sustainability. The strategy for undertaking this path is to engage in environmental campaigns and green marketing (Dodds and Holmes, 2016), but also invest in

advertisement on existing sustainability programs (Ham and Han, 2013), such has the ecolabels ones. Managers may also collaborate with governments or local authorities to raise tourists' awareness by informing and educating them about the environmental impact of the tourism sector (Chen and Tung, 2014; Yusof et al., 2017). The model does not confirm the direct relationship between guest environmental concern and green practices appreciation, as this relation is fully mediated by hotels' environmental communication. Indeed, in order to be recognized, green practices need to be communicated (Gössling and Buckley, 2016; Wang et al., 2017), through a proactive green marketing strategy, addressed to all relevant stakeholders (Hudson and Miller, 2005). Moreover, as environmental communication mediates this relation, it is important to focus more on the creation of an identity between the guest and hotel, as well as on an affective relation, instead of just passively informing guests, as suggested by Lee et al. (2010) and Martínez and Rodríguez del Bosque (2013). This aspect has important implications for the sustainable management of the hotels, because results confirm that consumers with a high level of environmental concern will be more likely to have a positive attitude towards green practices that can facilitate the choice of ecolabel facilities as opposed to regular one (Han et al., 2009; Manaktola and Jauhari, 2007) and the development of positive behavioural intentions (Lee et al., 2011a). Additionally, results from the model testing suggest that the hotels environmental commitment is positively recognized by customers, influencing their satisfaction. However, this study found that customer satisfaction fully mediates the relationship between green practices and loyalty towards the hotel and towards green hotels and that there isn't a direct positive effect between hotels' green practices and loyalty towards the hotels and towards green hotels. These findings have meaningful implications for hoteliers and practitioners since guest's loyalty towards the hotel pass through their satisfaction with the hotel. Satisfaction with the hotel is a multi-attribute construct, only partially explained by environmental attributes, and influenced several variables of service quality and consumers attitudes (Um, Chon, & Ro, 2006). In this sense, hoteliers should concentrate their efforts not only on green practices but also in delivering a high-quality service. Indeed, in case of a failure in service delivery of non-environmental attributes, satisfaction, and consequently loyalty, may decrease. Therefore, green practices may have a positive effect on satisfaction only as long as there is no service failure (Gao & Mattila, 2014).

Considering the research questions stated in the Introduction Section this thesis successfully addresses the presented gaps and provide theoretical contribution to the environmentally related hospitality research, extending the previous research and enriching the body of literature on the theme. Several theoretical and practical implications aroused from the results obtained from both the Systematic literature review and the conceptual model prosed in this thesis, providing deeper understanding on this field of research and on the relationships among the constructs presented in the model. However, during the research process, that led to the elaboration of this thesis, some suggestions for future research lines emerged. In particular, from the systematic literature review emerged a preponderance of quantitative studies and consequently a myriad of variables investigated in different conceptual models from the scholars. Indeed, it would be interesting to develop a systematic analysis of the literature that would point out the most studied variables by researchers and the relationships explored between these variables. In particular, from the point of view of the variables, it would be interesting analysing the antecedents and the consequences of consumers satisfaction and behavioural change. Furthermore, from the systematic literature review, it has emerged that the social aspects of hotels' sustainability and tourism and hospitality sustainability are the least investigated by scholars. Therefore, future research lines should focus on assessing not only the social impacts of the sector but also on identifying the practices that hotels can implement to develop a more socially responsible business model. Additionally, considering the study carried out on green certification and on eco-labels in the tourism sector and given the decreasing numbers of this phenomenon, future studies should analyse the reasons for the abandonment of certifications by the tourism facilities. In particular, future studies should focus on the managers' point of view and analyse in depth the barriers and difficulties that motivated them to abandon the scheme and develop promotion and incentive actions for boosting the certification process. Another line of the research could focus on the analysis on the interrelations between the circular economy and the sustainable tourism implementation. The recent proliferation of studies inherent the circular approach to the business system has stimulated academic research by opening up new currents of research and leaving mostly unexplored others. The application of the CE concept in the tourism sector is still unexplored and more efforts should be done to understand the potentialities of Circular Tourism. Further research line objective could be the identification CE principles and business models applicable

in the tourism sector creating a framework for circular tourism, identifying the interrelations existing between the circular economy and the development of a more sustainable tourism. Finally, future studies could investigate the integration of ICT technologies and sustainability pillars for smart tourism destinations development that may enhances the tourism facilities management through competitive, smart and sustainable approaches. In this regard, environmental and economic sustainability are key aspect of smart tourism development and management and should be explored in-depth. Indeed, smart tourism may be an opportunity to enhance and develop local crafts and cultures, strengthen the vitality of the local community, improve tourist facilities and local awareness of economic value of its cultural and environmental heritage, in order to encourage firms, institutions, visitors and residents to safeguard it.

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Appendix A

Figure 5.4 - Legambiente Turismo Certificate

Figure 5.5 - Legambiente Turismo Brochure

Figure 5.6 - Legambiente Turismo Communication Material

Figure 5.7 - Biologic Breakfast Communication Material

Figure 5.8 - Legambiente Turismo In-room communication material

Figure 5.9 - Legambiente Turismo Decalogo

Appendix B

A. English version of the questionnaire

TOURISM AND SUSTAINABILITY

Dear Guest, Roma Tre University and Legambiente invite you to fill out this questionnaire, designed to assess the quality of services offered by hotels and to help make them more sustainable and environmentally friendly.

INSTRUCTIONS

The central column contains some attributes that customers would expect from a hotel. In the left column indicate how each attribute is important to your satisfaction during your stay. In the right column indicate for each attribute the performance of the hotel where you stayed.

Importance 1 = Unimportant 7 = Very important	**List of hotel attributes**	**Performance** 1 = Poor 7 = Excellent Na = Not applicable
	FACILITY: ROOM AND COMMUNAL FACILITIES	
1 2 3 4 5 6 7	The room is comfortable, adequately furnished and fitted	1 2 3 4 5 6 7 Na
1 2 3 4 5 6 7	The room is clean	1 2 3 4 5 6 7 Na
1 2 3 4 5 6 7	The room is quiet	1 2 3 4 5 6 7 Na
1 2 3 4 5 6 7	The in-room and hotel technologies (Wi-Fi, TV, telephone, wake-up call) are adequate and functional	1 2 3 4 5 6 7 Na
1 2 3 4 5 6 7	The communal facilities are comfortable and in good conditions	1 2 3 4 5 6 7 Na
	BREAKFAST	
1 2 3 4 5 6 7	The quality of the food offered for breakfast is adequate	1 2 3 4 5 6 7 Na
1 2 3 4 5 6 7	The choice of food & beverages for breakfast is adequate	1 2 3 4 5 6 7 Na
1 2 3 4 5 6 7	Organic or seasonal food are available for breakfast	1 2 3 4 5 6 7 Na
	STAFF	
1 2 3 4 5 6 7	The hotel staff is well-trained and prepared	1 2 3 4 5 6 7 Na

INSTRUCTIONS

The central column contains some attributes that customers would expect from a hotel. In the left column indicate how each attribute is important to your satisfaction during your stay. In the right column indicate for each attribute the performance of the hotel where you stayed.

Importance 1 = Unimportant 7 = Very important	**List of hotel attributes**	**Performance** 1 = Poor 7 = Excellent Na = Not applicable
1 2 3 4 5 6 7	The hotel staff is kind, careful and polite	1 2 3 4 5 6 7 Na
1 2 3 4 5 6 7	The hotel staff is always available when needed	1 2 3 4 5 6 7 Na
	SERVICES AND PRICES	
1 2 3 4 5 6 7	The hotel's reservation system is reliable and efficient	1 2 3 4 5 6 7 Na
1 2 3 4 5 6 7	The check-in/check-out procedures are efficient	1 2 3 4 5 6 7 Na
1 2 3 4 5 6 7	The quality of hotel service corresponds to the number of stars	1 2 3 4 5 6 7 Na
1 2 3 4 5 6 7	The services prices are adequate to the number of hotel stars	1 2 3 4 5 6 7 Na
	ACTIONS FOR ENVIRONMENTAL SUSTAINABILITY	
1 2 3 4 5 6 7	The hotel implements water saving practices (e.g. the hotel encourages guests to ask for new linen only when necessary)	1 2 3 4 5 6 7 Na
1 2 3 4 5 6 7	The hotel implements energy saving practices (e.g. automatic lights switching-off)	1 2 3 4 5 6 7 Na
1 2 3 4 5 6 7	The hotel tries to avoid disposable or single-dose products	1 2 3 4 5 6 7 Na
1 2 3 4 5 6 7	In the hotel, separated waste collection is available	1 2 3 4 5 6 7 Na
1 2 3 4 5 6 7	The hotel uses environmental certified or green labelled products (toiletry products, paper)	1 2 3 4 5 6 7 Na
1 2 3 4 5 6 7	The hotel provides its guests bicycles for free or for rent	1 2 3 4 5 6 7 Na
1 2 3 4 5 6 7	The hotel cares about sustainability and adopts good practices of environmental management	1 2 3 4 5 6 7 Na
	ENVIRONMENTAL COMMUNICATION	
1 2 3 4 5 6 7	The hotel informs the guests about the good environmental practices implemented	1 2 3 4 5 6 7 Na

INSTRUCTIONS

The central column contains some attributes that customers would expect from a hotel. In the left column indicate how each attribute is important to your satisfaction during your stay. In the right column indicate for each attribute the performance of the hotel where you stayed.

Importance 1 = Unimportant 7 = Very important	**List of hotel attributes**	**Performance** 1 = Poor 7 = Excellent Na = Not applicable
1 2 3 4 5 6 7	The hotel provides its guests with information on how they can contribute to reduce the hotel's environmental impact	1 2 3 4 5 6 7 Na
1 2 3 4 5 6 7	The hotel provides its guests with information on the environmental and cultural activities available in the area	1 2 3 4 5 6 7 Na
1 2 3 4 5 6 7	The hotel provides information on public transportation	1 2 3 4 5 6 7 Na

TOURISM AND SUSTAINABILITY

OVERALL SATISFACTION *Please express your level of agreement with the following statements*	1 = Totally disagree 7 = Totally agree
I am satisfied with my experience in this hotel	1 2 3 4 5 6 7
My expectations have been satisfied	1 2 3 4 5 6 7
My experience in this hotel matches with what I would expect from my ideal hotel	1 2 3 4 5 6 7
LOYALTY	1 = Totally disagree 7 = Totally agree
I would come back again in this hotel	1 2 3 4 5 6 7
I would recommend this hotel	1 2 3 4 5 6 7
I would come back in a hotel that implements good environmental	1 2 3 4 5 6 7
I would recommend a hotel that implements good environmental practices	1 2 3 4 5 6 7

LEGAMBIENTE TURISMO	**Yes**	**No**
Are you aware that this hotel has been awarded with the EU Ecolabel environmental certification?	☐	☐
If yes, did you know it before your arrival?	☐	☐
Have you already stayed in a tourist accommodation awarded with an environmental certification? (e.g. Legambiente Turismo, EU Ecolabel, ISO 14001 or other certifications)	☐	☐

ENVIRONMENTAL SUSTAINABILITY *Please express your level of agreement with the following statements*	1 = Totally disagree 7 = Totally agree
Environmental sustainability is one of the main problems for today's society	1 2 3 4 5 6 7
In everyday life, environmental sustainability is an important criterion in my choice of products and services	1 2 3 4 5 6 7
I am willing to pay more for environmentally sustainable products and services	1 2 3 4 5 6 7
SUSTAINABLE TOURISM	1 = Totally disagree 7 = Totally agree
Environmental sustainability practices are an important criterion in my choice of a tourism accommodation	1 2 3 4 5 6 7
The environmental certification is an important factor to consider when choosing a tourism accommodation	1 2 3 4 5 6 7
I am willing to pay more to stay in an environmentally certified tourism accommodation (es. European Ecolabel, Legambiente Turismo, ISO 14001 or other certifications)	1 2 3 4 5 6 7

GENERAL INFORMATION						
Gender	Male ☐	Female ☐				
Type of stay	Work ☐	Leisure ☐	Other ☐			
Education level	Primary school ☐	High school ☐	University ☐	Master or PhD ☐		
Number of nights	1-2 ☐	3-5 ☐	6-10 ☐	Over 10 ☐		
Type of guest	Single ☐	Couple ☐	Family ☐	Friends ☐	Colleagues ☐	Other ☐
Age	18-29 ☐	30-39 ☐	40-49 ☐	50-59 ☐	60-69 ☐	Over 70 ☐

Thanks for taking the time to participate in our research. The questionnaire is anonymous, and the data collected will be used in accordance with the current law directives on privacy.

B. Italian version of the questionnaire

INDAGINE TURISMO E SOSTENIBILITÀ

Legambiente Turismo e l'Università Roma Tre vi invitano a compilare il presente questionario, volto a valutare la qualità dei servizi offerti dalle strutture turistiche e ad aiutarci a renderle più sostenibili ed ecocompatibili.

ISTRUZIONI

Nella colonna di sinistra indicare quanto ogni aspetto è *importante per la sua soddisfazione* durante il soggiorno. Nella colonna di destra indicare per ogni aspetto la *valutazione dell'hotel* dove ha soggiornato.

Importanza del servizio 1 = Non importante 7 = Molto importante	**Aspetti del servizio**	**Valutazione del servizio** 1 = Scarso 7 = Eccellente Ng = Non giudicabile
	STRUTTURA: STANZA E SPAZI COMUNI	
1 2 3 4 5 6 7	La stanza è confortevole e adeguatamente arredata e attrezzata	1 2 3 4 5 6 7 Ng
1 2 3 4 5 6 7	La stanza è pulita	1 2 3 4 5 6 7 Ng
1 2 3 4 5 6 7	La stanza è silenziosa	1 2 3 4 5 6 7 Ng
1 2 3 4 5 6 7	La dotazione tecnologica della stanza e dell'hotel (Wifi, TV, telefono, servizio sveglia) è adeguata ed efficiente	1 2 3 4 5 6 7 Ng
1 2 3 4 5 6 7	Gli spazi comuni sono confortevoli e in buone condizioni	1 2 3 4 5 6 7 Ng
	SERVIZIO COLAZIONE	
1 2 3 4 5 6 7	La qualità del cibo offerto a colazione è adeguata	1 2 3 4 5 6 7 Ng
1 2 3 4 5 6 7	La colazione offre una adeguata varietà di cibo e bevande	1 2 3 4 5 6 7 Ng
1 2 3 4 5 6 7	L'hotel offre prodotti biologici e/o di stagione per colazione	1 2 3 4 5 6 7 Ng
	PERSONALE / STAFF	
1 2 3 4 5 6 7	Il personale è adeguatamente formato e preparato	1 2 3 4 5 6 7 Ng
1 2 3 4 5 6 7	Il personale è cortese, discreto ed educato	1 2 3 4 5 6 7 Ng
1 2 3 4 5 6 7	Il personale è sempre a disposizione quando necessario	1 2 3 4 5 6 7 Ng
	SERVIZI E PREZZI	

ISTRUZIONI

Nella colonna di sinistra indicare quanto ogni aspetto è *importante per la sua soddisfazione* durante il soggiorno. Nella colonna di destra indicare per ogni aspetto la *valutazione dell'hotel* dove ha soggiornato.

Importanza del servizio 1 = Non importante 7 = Molto importante	**Aspetti del servizio**	**Valutazione del servizio** 1 = Scarso 7 = Eccellente Ng = Non giudicabile
1 2 3 4 5 6 7	Il sistema di prenotazione dell'hotel è affidabile e preciso	1 2 3 4 5 6 7 Ng
1 2 3 4 5 6 7	Le procedure di check-in/check-out sono efficienti	1 2 3 4 5 6 7 Ng
1 2 3 4 5 6 7	La qualità dei servizi erogati durante il soggiorno è adeguata al numero di stelle dell'hotel	1 2 3 4 5 6 7 Ng
1 2 3 4 5 6 7	I prezzi sono adeguati al numero di stelle dell'hotel	1 2 3 4 5 6 7 Ng
	AZIONI PER LA SOSTENIBILITA' AMBIENTALE	
1 2 3 4 5 6 7	L'hotel adotta pratiche di risparmio idrico (es. invita a richiedere il cambio biancheria solo quando è necessario)	1 2 3 4 5 6 7 Ng
1 2 3 4 5 6 7	L'hotel adotta pratiche di risparmio energetico (es. spegnimento automatico illuminazione)	1 2 3 4 5 6 7 Ng
1 2 3 4 5 6 7	L'hotel cerca di evitare l'impiego di prodotti usa e getta o monodose/monoporzione	1 2 3 4 5 6 7 Ng
1 2 3 4 5 6 7	Nell'hotel è presente la possibilità di effettuare la raccolta differenziata dei rifiuti	1 2 3 4 5 6 7 Ng
1 2 3 4 5 6 7	L'hotel utilizza prodotti con certificazione ecologica/etichetta ambientale (es. prodotti da bagno, carta)	1 2 3 4 5 6 7 Ng
1 2 3 4 5 6 7	L'hotel fornisce biciclette gratuitamente o a noleggio	1 2 3 4 5 6 7 Ng
1 2 3 4 5 6 7	L'hotel è attento alla sostenibilità e adotta buone pratiche di gestione ambientale	1 2 3 4 5 6 7 Ng
	COMUNICAZIONE AMBIENTALE	
1 2 3 4 5 6 7	L'hotel informa gli ospiti sulle buone pratiche di sostenibilità ambientale che attua	1 2 3 4 5 6 7 Ng
1 2 3 4 5 6 7	L'hotel informa gli ospiti su come possono contribuire alla riduzione dell'impatto ambientale del loro soggiorno	1 2 3 4 5 6 7 Ng
1 2 3 4 5 6 7	L'hotel informa gli ospiti sulle attività naturalistiche e culturali della zona	1 2 3 4 5 6 7 Ng

ISTRUZIONI		
Nella colonna di sinistra indicare quanto ogni aspetto è *importante per la sua soddisfazione* durante il soggiorno. Nella colonna di destra indicare per ogni aspetto la *valutazione dell'hotel* dove ha soggiornato.		
Importanza del servizio 1 = Non importante 7 = Molto importante	**Aspetti del servizio**	**Valutazione del servizio** 1 = Scarso 7 = Eccellente Ng = Non giudicabile
1 2 3 4 5 6 7	L'hotel informa gli ospiti sul trasporto pubblico	1 2 3 4 5 6 7 Ng

INDAGINE TURISMO E SOSTENIBILITÀ

SODDISFAZIONE GENERALE *Indicare il grado di accordo con le seguenti affermazioni*	1 = Per niente d'accordo 7 = Del tutto d'accordo
Sono soddisfatto dell'esperienza in questo hotel	1 2 3 4 5 6 7
Le mie aspettative rispetto all'hotel sono state soddisfatte	1 2 3 4 5 6 7
La mia esperienza in questo hotel corrisponde a quella della mia struttura ricettiva ideale	1 2 3 4 5 6 7
FEDELTA'	1 = Per niente d'accordo 7 = Del tutto d'accordo
Tornerei in questo hotel	1 2 3 4 5 6 7
Raccomanderei questo hotel	1 2 3 4 5 6 7
Tornerei in un hotel che attua buone pratiche di sostenibilità ambientale	1 2 3 4 5 6 7
Raccomanderei un hotel che attua buone pratiche di sostenibilità ambientale	1 2 3 4 5 6 7

LEGAMBIENTE TURISMO	**Sì**	**No**
E' a conoscenza del fatto che l'hotel è in possesso della certificazione ambientale Legambiente Turismo?	☐	☐
Se sì, ne era a conoscenza prima del soggiorno?	☐	☐
E' già stato in una struttura ricettiva con una certificazione ambientale? (es. Legambiente Turismo, Ecolabel europeo, etc.)	☐	☐

SOSTENIBILITA' AMBIENTALE *Indicare il grado di accordo con le seguenti affermazioni*	1 = Per niente d'accordo 7 = Del tutto d'accordo
La sostenibilità ambientale è uno dei principali problemi da affrontare per la società attuale	1 2 3 4 5 6 7
Nella vita quotidiana la sostenibilità ambientale è un criterio importante nella scelta di prodotti e servizi	1 2 3 4 5 6 7
Sono disposto a pagare di più per prodotti e servizi sostenibili	1 2 3 4 5 6 7
TURISMO SOSTENIBILE	1 = Per niente d'accordo 7 = Del tutto d'accordo

Le buone pratiche di sostenibilità ambientale sono un criterio importante nella scelta della struttura dove soggiornare	1 2 3 4 5 6 7
La certificazione ambientale della struttura è un criterio importante nella scelta della struttura dove soggiornare	1 2 3 4 5 6 7
Sono disposto a pagare di più per alloggiare in una struttura turistica dotata di certificazione ambientale (es. Legambiente Turismo, Ecolabel Europeo)	1 2 3 4 5 6 7

INFORMAZIONI ANAGRAFICHE						
Genere	Maschio ☐	Femmina ☐				
Motivo viaggio	Lavoro ☐	Svago ☐	Altro ☐			
Livello d'istruzione	Elementari/Medie ☐	Diploma/Liceo ☐	Laurea ☐	Post-laurea ☐		
Notti di pernottamento	1-2 ☐	3-5 ☐	6-10 ☐	Oltre 10 ☐		
Tipo di viaggiatore	Singolo ☐	Coppia ☐	Famiglia ☐	Amici ☐	Colleghi ☐	Altro ☐
Età	18-29 ☐	30-39 ☐	40-49 ☐	50-59 ☐	60-69 ☐	70 e oltre ☐

Nel ringraziarla per il suo prezioso contributo le ricordiamo che il questionario è anonimo. I dati raccolti saranno trattati in modo aggregato nel rispetto della legge sulla privacy.