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# The Managerial Study of Pro-Environmental Behavior in Luxury Hotel Industry: An Example of Reducing Disposal Amenities

Jing Yu and Azilah Kasim

***Abstract---*** *The appearance of pro-environmental measures has become a manifestation of the global trend in many industries, and hotel management is no exception. The reduction of guest room disposable amenities in hotel operation has seen much improvement and has become more effective in recent years. These are a commonly encountered practical measured toward lower carbon emissions, and consist of eco-friendly materials and supplies. However, it is not immediately clear how measures for the promotion of such efforts can be effectively taken by hotel residents. Drawing upon the notion of pro-environmental behavior from the hotel management side, this study investigated the reduction of guest room amenities, its acceptance from by guests, and the hotel's business performance obtained from data provided by luxury hotels in Guangzhou, China. To this end, a two-way ANOVA statistical model was utilized. In addition, this study empirically demonstrated primary results and implications, and suggests cost-saving methods for hotel operations.*

***Keywords---*** *Pro-environmental Behavior, Hotel Industry, Low Carbon Emission, Operations Management.*

## I. INTRODUCTION

As a key environmental problem, global warming as become a serious global issue and has attracted widespread attention from all segments of society (Baer & Singer, 2016; Harvey, 2018; Kasim, 2009) As part of the smokeless industry, tourism has a severe carbon emission problem(O. Idoko, & Kasim, A., 2018). Its carbon emissions account for 4.9% of the sea-level rise, and carbon dioxide emissions from tourism have been projected to continue to increase at an annual rate of 2.5% until 2035 (Hall, 2014). Low carbon development plays an important role in tourism research (O. Idoko & Kasim, 2019; Luo, Becken, & Zhong, 2018; Unger, Abegg, Mailer, & Stampfl, 2016). The carbon emissions of tourism mainly originate from tourist transportation and the hotel industry (Wu & Shi, 2011). Carbon emissions from hotels account for 21% of the carbon emissions in tourism, and form the second-largest source of carbon emissions in the tourism industry (X.Y. Wang, & Ruan, L.X., 2012). According to statistical data, a four-star hotel would produce 3.6-12 kg of waste per day on average, and the daily waste generated by hotel guests is 3 to 10 times that of ordinary families (D. Wang, 2014). In addition to that, the energy consumption of hotels is massive. The hotel industry in China consumes 3300.99 kg of standard coal per thousand yuan, and the energy consumption of each hotel guest is about 11 times that of the average urban resident (Hui Han, 2016). Faced with increasing carbon emission problems, the hotel, as one of the significant segments of tourism, cannot ignore its carbon emissions caused by its energy consumption. Based on this carbon-emission problem, the

*Jing Yu, Ph.D Candidate, School of Tourism, Hospitality and Environmental Management (STHEM), Universiti Utara Malaysia, Sintok, Malaysia. E-mail: yujing789@126.com*
*Azilah Kasim, Prof. Dr., School of Tourism, Hospitality and Environmental Management (STHEM), Universiti Utara Malaysia, Sintok, Malaysia.*

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low carbon management of hotels has started (Taylor, Peacock, Banfill, & Shao, 2010).

Previous related studies on low carbon management showed that the low carbon behavior of hotels can promote the development of sustainable business models (Ampu Harikrishnan & Kumari, 2019; Bianco, Righi, Scarpa, & Tagliafico, 2017; Chen & Deng, 2018). Among the low-carbon behavior studies, the reduction of disposable amenities had become a buzzword. The study by Zhao (2015) associated this to common behaviors. Xiong and Feng (2014) identified it as a basic environmental behavior. Hui Han (2016) associated it with general behavior. Although the reduction of disposals is popular in low carbon research, it is only one of the low-carbon behaviors. At present, few studies have separately described the role of the reduction of disposable amenities in hotel business performance. Research on low-carbon luxury hotel behavior could assist in achieving long-term business performance (Leonidou, Leonidou, Fotiadis, & Zeriti, 2013; Pereira-Moliner et al., 2015). As a specific part of low-carbon behavior, the impact of the reduction of disposable amenities on the hotel's business performance is the focus of this paper.

Previous studies also confirmed the importance of public participation and showed that it helped to achieve business performance of the hotel industry (Ali, Ryu, & Hussain, 2016; Heesup Han & Yoon, 2015). Low-carbon hospitality management practices require engagement of both hotels and guests, with the guest being seen as external stakeholders (Font & Lynes, 2018). The engagement of guests, which is known as guests' pro-environmental behavior, can also increase hotel performances by, e.g., increasing tourist satisfaction and loyalty (Chand & Ashish, 2014; Yusoff, Nejati, Kee, & Amran, 2018). However, previous research of the pro-environmental behavior of guests has mainly discussed the influencing factors, intentions, and awareness (Heesup Han & Hyun, 2018; Kiatkawsin & Han, 2017; Miller, Merrilees, & Coghlan, 2015). Very few studies examined the connections between pro-environmental behaviors and low-carbon hotel behaviors (Juvan & Dolnicar, 2016) or the influence of pro-environmental actions on the business performance of hotels. Therefore, this paper examined the relationships between guests' pro-environmental behavior, low-carbon behavior, and hotel business performance.

The remainder of this paper is structured as follows: Section 2 provides discussions of previous academic publications and constructs the research hypothesis. Section 3 introduces definitions and the methodology as well as the information on the study sample. Section 4 details the aspects regarding the available data from numerous luxury hotels in Guangzhou, the first-tier city in China, and provides the results obtained from the management perspectives on pro-environmental behavior and its influence on their customers. Section 5 offers several implications for the perceptions of hotel lodgers on hotels that decrease the supply of guest room amenities. Section 6 concludes the paper by stating pro-environmental behavior examples in hotel industry and suggesting future research directions.

## II. LITERATURE REVIEW

### *2.1 Decreasing Disposable Amenities*

Decreasing disposable amenities is a critical part of low-carbon behavior. The reason why low-carbon behavior is required is global warming (Puig et al., 2017). Human behaviors often rely on specific results rather than on certain information, suggestions, or low-carbon behavior. Despite the various definitions of low carbon behavior in

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academic fields, all have a similar connotation. The low-carbon behavior of hotels refers to specific measures of environmental protection especially when facing external pressures from the government, public, and consumers. In response, the corporate sector will fully utilize their resources to make eco-friendly strategies to both prevent and control environmental pollution, to realize a sustainable development (Alhussami, 2017; Leonidou, Christodoulides, Kyrgidou, & Palihawadana, 2017).

Decreasing disposable amenities is the most common low-carbon behavior by hotels (Kasim, 2004). As mentioned before, considering the external pressures of government and public, hotels (especially luxury hotels) are willing to engage in disposable reducing behaviors in response to a governmental low-carbon policy. In addition, from the managerial perspective, decreasing disposable amenities (such as disposable toiletries, and disposable tea or coffee bags) can optimize the hotel operating costs; therefore, most hotels are willing to implement it (Mak & Chang, 2019). In addition, many luxury hotels will leave a letter in the room for guests, advocating that customers reduce their use of bed sheets and bath towels in support of environmental protection. This measure cannot only indirectly support the low-carbon behavior of the hotel, but can also promote the low carbon concept to arouse the pro-environmental behavior of guests (Shin, Im, Jung, & Severt, 2018).

### *2.2 Guests' Response Extent to Pro-environmental Behavior*

Guests' pro-environmental behavior refers to guests who assume behaviors that harm the environment as little as possible or who can even make contributions to the ecological environment (Steg & Vlek, 2009). In the hotel industry, guests' pro-environmental behavior has been named eco-friendly behaviors of guests, i.e., the guests' willingness to protect the environment at their destination (Namkung & Jang, 2017). For example, turning off electric facilities in time, rejecting disposed goods, using recyclable bins, and reusing towels (Budovska, Torres Delgado, & Øgaard, 2020; Hsiao, Chuang, Kuo, & Yu, 2014; Scheibehenne, Jamil, & Wagenmakers, 2016).

Guests with pro-environmental awareness are not willing to take on all measures of eco-friendly behavior. Heesup Han, Hsu, and Lee (2009) pointed out that only a small portion of environmentally conscious guests actually purchase eco-friendly products in the marketplace because of both high monetary and non-monetary costs and the associated inconvenience, and the same is true for hotels. When exploring attitudes and behaviors of guests toward low-carbon practices in the lodging industry, Jauhari and Manaktola (2007) verified that guests with pro-environmental concerns preferred to make eco-friendly purchases. However, different guests have different environmental intentions. One the one hand, selected guests would like to participate in garbage classification, or use their own toiletries rather than disposable supplies, or reuse their bath towels (Shin et al., 2018). On the other hand, others who have high eco-awareness would like to contribute to low-carbon consumption (Paul, Modi, & Patel, 2016). For instance, although the price of a green hotel is higher than the price of other hotels, guests are willing to pay the extra money, similarly to low-carbon products and services (Miao & Wei, 2016). Therefore, hotels should pay more attention to those low-carbon services that are more acceptable for guests, independent of their cost.

### *2.3 Business Performance*

Business performance is a buzzword in the firm-performance field (Wamba et al., 2017). In previous

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performance studies, business performance has experienced three periods. The first period is cost evaluation, where cost control was the standard to evaluate performance (Brás, Gonçalves, & Faustino, 2014). The second period is financial evaluation. During this period, performance evaluation was based on financial statements (Shi, Connelly, & Hoskisson, 2017). The third period is the comprehensive evaluation. This refers to the expansion of financial evaluation. A comprehensive evaluation requires the consideration of non-financial items, such as reputation, market share, guest satisfaction, and the loyalty of the guest (Grissemann, Plank, & Brunner-Sperdin, 2013).

In the hotel industry, various methods are used to measure business performance (Chandra, 2014). At the early stage, scholars focused on financial evaluation, which originates from financial statements. For instance, Leonidou, Leonidou, Fotiadis, and Aykol (2015) reported that environmental dynamic capabilities can promote the development of financial performance. The indicators of this performance included profit, cost, and occupancy rate. Later, scholars started to consider value performance (non-financial) in business performance analysis (Lieder & Rashid, 2016). In that case, the evaluation of business performance not only had to focus on cost, profit, and customer service level, but also on customer satisfaction, customer loyalty, competitive advantages, and the social image (Hays & Ozretic-Došen, 2014; Pereira-Moliner et al., 2015; Wang, Wang, Xue, Wang, & Li, 2018). Consequently, it became necessary to classify business performance into financial (literature related to financial statement) and non-financial indicators (literature related to hotel performance) (Kim, Cho, & Brymer, 2013; Pnevmatikoudi & Stavrinoudis, 2016).

### *2.4 Decreasing Disposable Amenities and Business Performance*

As the most common low-carbon behavior in luxury hotels, decreasing disposal amenities plays an important role in business performance management. Pham, Tučková, and Jabbour (2019) studied green human resource management by four- and five-star hotels. They found that eco-friendly behaviors by employees (including the decrease of disposable amenities) could help hotels to increase their image. Moreover, Hilton initiated Hilton's "we care!" program, which was run from 2006 to 2008. This program involved more than 16,000 employees and created hotel-specific action teams that linked all employee levels. Decreasing disposals was identified as an efficient way to reduce the carbon footprint of the hotel. With the joint efforts of employees, Hilton has decreased the energy use per square meter by 15%, and both water use and carbon emissions per guest night by 8% each, and also achieved high social reputation. Leonidou et al. (2013) identified reducing disposal amenity behavior as a resource of environmental strategy, which could influence the financial performance (operating profits and market share) and market performance (customer satisfaction and loyalty, new customers). Moreover, many scholars mentioned the "One Towel Plan" in luxury hotels and agreed that the reuse of towels and sheets could help hotels to achieve low cost and high image value. It was also pointed out that the waste of one-time tea bags and coffee bags exerted negative influences on both the financial performance and environmental performance.

***Hypothesis 1:*** Decreasing disposable amenities exerts a positive effect on business performance

### *2.5 The Extent of Guests' Response to Pro-environmental Behavior and Business Performance*

Guests' response to hotel services is important for the hotel's business performance. The more the hotel understands the needs of its guests, the more it can increase guest satisfaction (Itoo & Rather, 2014; Robinot &

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Giannelloni, 2010). In addition, because of the varying degrees of guest pro-environmental awareness, hotels must fully consider the acceptance of hotel guests when providing low-carbon services. With regard to free low carbon services provided by hotels, guests have expressed their strong willingness to support and join the hotels' low-carbon activities. Many of the guests have said that the low-carbon signs and eco-friendly guidelines provided by hotels were user-friendly, and helped them to better learn about low-carbon knowledge and implement environmentally friendly behaviors (Kang, Stein, Heo, & Lee, 2012; Teng, Lu, & Huang, 2018). Many guests also said that they were happy to participate in low-carbon initiatives such as garbage sorting, rejecting waste food, and towel reuse, which they highly valued and were willing to share via mouth to mouth with their families and friends (Doran & Larsen, 2016; Heesup Han, Hwang, Lee, & Kim, 2019; Kristanti & Jokom, 2017). Moreover, (Robinot & Giannelloni, 2010) reported that tourists with green attitudes had high environmental service requirements and that a "basic" green attitude contributed to customer satisfaction.

According to existing literature, guests who value high pro-environmental behaviors are willing to pay extra to support the low-carbon management of hotels (Harms & Linton, 2016). For instance, Sánchez-Ollero, García-Pozo, and Marchante-Mera (2014) assessed 232 three-star, four-star hotels, and five-star hotels in southern Spain to study the impact of environmental protection measures on room prices. The research results showed that if a hotel implemented environmental protection measures, room prices would increase, but specific hotel customers were still willing to pay the increased prices. Furthermore, under the circumstance of publicity of eco-friendly behavior by media and low-carbon services of hotels, tourists are willing to consume or pay extra for green products in support of environmental protection from the perspective of food safety and safety of the living environment (Welsch & Kühling, 2009). These pro-environmental behaviors are conducive to new business development and brand building of hotels (Yadav, Dokania, & Pathak, 2016).

***Hypothesis 2:*** Guests' response extent to pro-environmental behavior exerts a positive effect on business performance

### *2.6 Decreasing Disposable Amenities and Guests' Response Extent to Pro-environmental Behavior*

Guests' response extent to pro-environmental behavior forms a basis for strategic low-carbon management decisions, particularly in the context of hotels (Fraj, Matute, & Melero, 2015). On the one hand, providing disposable amenities is a service for guests. Decreasing disposable items is also a service that advocates eco-friendly behaviors among guests. Several scholars mentioned that hotels advocated guests to refuse the use of disposable toiletries, and to reuse bath towels and bed sheets. All of these measures can arouse pro-environmental behaviors in guests (Heesup Han & Hyun, 2018). This pro-environmental behavior in guests of supporting the hotel to decrease disposable amenities not only helps the hotel to decrease carbon emissions and achieve environmental performance, but can also optimize the hotel's operating costs and improve the hotel's low-carbon management (Erdogan & Tosun, 2009; Wan, Chan, & Huang, 2017). Moreover, the hotel's low carbon service can awaken the guest's environmental awareness. Guests, as external stakeholders of the hotel, should join in the low-carbon activities and promote the low-carbon development of the hotel (Sánchez, López-Mosquera, & Lera-López, 2016).

On the other hand, Guests' pro-environmental behavior is a low-carbon requirement of hotel service (Heesup

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Han, Meng, & Kim, 2017). Specifically, guests who have a high awareness of eco-friendliness would like to reuse their bed sheets and reject the use of disposable toiletries. Moreover, they are also more likely to stay in hotels that do not offer disposable items. In that case, hotels (especially luxury hotels) will consider the guests' requirement of environmental protection to decrease disposable supplies (Shin et al., 2018). Moreover, luxury hotels also consider the guests' willingness to accept low-carbon services and products. As mentioned before, specific services and products of hotels require guests to pay extra. Thus, when providing paid services and products, hotels must fully consider the willingness of their guests to improve customer satisfaction and loyalty (Harms & Linton, 2016). Guests' response extent of pro-environmental behavior can help hotels to understand guest acceptance of new businesses and promote the development of new hotel business.

***Hypothesis 3:*** Decreasing disposable amenities *exerts* a positive effect on guests' response extent to pro-environmental behavior

***Hypothesis 4:*** Guests' response extent to pro-environmental behavior exerts a positive effect on decreasing disposable amenities.

## III. METHODOLOGY

### *3.1 Measurement*

*Decreasing disposable amenities*. Offering disposable amenities is an essential part of hotel operation. In the traditional sense, recyclable toiletries amenities, changing bedsheets and linens, and the provision of disposable tea or coffee bag and snacks, have been taken for granted as fundamental guestroom services. With regard to this factor, this study proposes to examine the extents of luxury hotels willingness to cooperate with the tourism sector toward decreasing these amenities. For example, whether or not encouragement solutions are employed such as promotion rebates for guests who bring their own toiletries, or who do not require to have their sheet and linen changed every day.

*Guest response extent to pro-environmental behavior*. This study examines the response extent of hotel's pro-environmental measures, which also reflect customer satisfaction and loyalty. With regard to this factor, this study concentrates on the lodging frequency of guests under the decreased disposable amenities and related services, especially counting the numbers of returning guests, using hotel-internal survey data.

*Hotels' business performance*. Apart from the hotel's level of commitment to pro-environmental policies and relevant behaviors, and the guest's extent of support, the comprehensive business performance (e.g., hotel room rates, operating income, operating cost, and catering income), was used as significant business indicator in this study. Whether the hotel and its guests can reach an agreement under the pro-environmental behavior measures is also a focus of this study.

### *3.2 Sample*

The sample used in this study consists of practitioners in the hotel industry. A self-administered questionnaire was selected as data collection method. This study surveyed selected decision-makers (general manager or vice general managers) of luxury hotels in Guangzhou, China, and the survey was conducted in person. A total of 70 sets

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was successfully delivered and 30 persons responded for a response rate of 30% (response rate = 42.8%). a Likert 1-to-5 rating scale (1 = strongly disagree to 5 = strongly agree) was employed in this survey. The questionnaire construction fully considered internal consistencies for each survey item, and prevented reliability and validity of less than the normal value (Cronbach's alpha value = 0.7).

Table 1 illustrates the identity of respondents. Of the 30 questionnaires that were received from top-level management respondents, 50% of the marketing respondents were male and the majority (52.3%) was between 40 and 49 years of age. In general, the marketing respondents were highly educated and most respondents (93.7%) have at least an undergraduate degree. Decision makers' age distribution mainly concentrated on 40 to 49 years (50.0%) and 50 to 59 years (26.7%). Most of respondents have rich top-management experiences (approximately 66.6%) of at least 7 years (70%). International and domestic brand hotels were equally represented. With regard to the years the hotel was established in Guangzhou city, most luxury hotels have operated for more than 16 years (approximately 66.6%). College education or above were more prevalent in the hotel management respondents (60%). International franchising brand luxury hotels had 70%. Each assessed hotel adopted pro-environmental measures, following the standards of the located region and their headquarters. More importantly, both surveyed management respondents agreed that business performance is highly related to the pro-environmental measures and customer responses.

Table 1: Identity of Respondents (*N*=30)

| *Item* | *Categories* | *Data of this survey* | | *Item* | *Categories* | *Data of this survey* | |
|---|---|---|---|---|---|---|---|
| | | *Number* | *Percentage (%)* | | | *Number* | *Percentage (%)* |
| *Gender* | Male | 15 | 50.0 | *Hotel brand* | Domestic | 9 | 30.0 |
| | Female | 15 | 50.0 | *attributes* | International | 21 | 70.0 |
| *Age* | 20-29 | 2 | 6.7 | *Years of hotel* | Less than 5 years | 2 | 6.7 |
| | 30-39 | 4 | 13.3 | *establishment* | 6 to 9 years | 2 | 6.7 |
| | 40-49 | 15 | 50.0 | | 10 to 15 years | 6 | 20.0 |
| | 50-59 | 8 | 26.7 | | 16 to 19 years | 10 | 33.3 |
| | 60 or above | 1 | 3.3 | | More than 20 years | 10 | 33.3 |
| *Education* | Primary school or below | 5 | 16.7 | *Experiences* | Less than 3 years | 2 | 6.7 |
| *Background* | Secondary school | 7 | 23.3 | *of the current* | 3 to 6 years | 7 | 23.3 |
| | College | 15 | 50.0 | *position* | 7 to 9 years | 11 | 36.7 |
| | Postgraduate | 3 | 10.0 | | More than 10 years | 10 | 33.3 |

## IV. RESULTS

A multivariate analysis of variance (MANOVA) technique was used to analyze the overall differences among reducing disposable amenities, guest's response extent of lodged hotel's pro-environmental behavior, and hotel business performance with a focus on the top-management decision-makers of the hotels.

Analysis of variance (ANOVA) was used to test the specific research hypotheses. Two-way ANOVA results along with the group means for all variables investigated are presented in Table 2. The results showed that the

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interaction between decreasing disposable amenities and the extent of the response of guests was significant (F = 5.18). In other words, whether decreasing disposable amenities influenced the acceptance of the hotel guests depends on the type of amenity the hotel employed decreased. To provide a more accurate answer, further simple main effect tests have been conducted.

Table 2: Analysis of variance: Reduce Disposable Amenities vs. Guest's Response

| *Variable* | *SS* | *dF* | *MS* | *F* |
|---|---|---|---|---|
| A: Reduce disposal amenities | 4.8 | 1 | 4.80 | 1.18 |
| B: Guest response extent | 101.4 | 2 | 50.7 | 12.46* |
| A ╳ B (Interaction) | 42.2 | 2 | 21.1 | |
| Errors | 97.6 | 24 | 4.1 | 5.18* |
| Total | 246.0 | 29 | | |

Table 3 shows the result of the simple main effect. Clearly, decreasing disposable amenities had a significant effect (F = 7.97, p < 0.05), Under each sub-variable, decreasing the supply of disposable tea and coffee bag was most strongly supported by hotel guests. With regard to guests' responses, charging for amenities had significantly lower acceptance than no cost.

Additionally, the extent of lodged guests' responses was also significant. With regard to guests' "charged for disposable room amenities" perceptions, the result showed that the intention to pay for toiletries was lower than for sheets and towels, but charges for beverages and snacks were accepted. On the other hand, with regard to "free of charge", guests found it acceptable when hotels provide disposable coffee and tea bags as well as snacks. According to the results, the hotel lodgers' preferences of room disposable amenities can be summarized in that the hotel can decrease amenities according to the following order: beverage and snacks > sheets and towels > toiletries. For the perspective of hotel logistic management, the result has also considered the purchase of amenities that can help to decrease operating costs and the spread of the idea of environmental protection.

Table 3: Summary of Simple Main Effects

| *Variables* | *dF* | *F* |
|---|---|---|
| A: Reduce disposal amenities | | |
| A1: Sheets and towels | 1 | 0.61 |
| A2: Toiletries | 1 | 2.98 |
| A3: Coffee, tea and snacks | 1 | 7.97* |
| B: Guest response extent | | |
| B1: Take charge | 2 | 5.51* |
| B2: Free of charge | 2 | 12.15* |
| Residual | 24 | |

## V. DISCUSSION

The present study offers several interesting findings with regard to the relationships between the adoption of pro-environmental measures by luxury hotel and the perceptions of guests with regard to whether disposable amenities are offered free of charge or cost something. The hotel's policy implementations, attitudes of managers, and different customer perceptions with regard to the cost of amenities, were considered in this study, which enables a more comprehensive perspective.

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The results of ANOVA showed that the average room, its services purchases, and their frequencies for each customer, identified guests who had a strong support or dislike to buy (or not buy) disposable room amenities. Three hypothesess have obtained significant support: first, decreasing room disposable amenities and guests' responses for hotel's performance was supported, according to the management interviewees' feedback. Second, in accordance with the type of provided amenity, hotels that do not offer disposable room amenities improved guests' autonomy. Consequently, guests can use self-owned room amenities and simultaneously contribute to the environment. Third, both variables have clear interactions, and the guests' perception of satisfaction is based on the type of room disposable amenity and practicality.

This result has also inspired business practices in hotel operations, e.g., the use of decomposable materials at room disposable amenities. Although this will increase the costs in the short-term, in the medium and long-term, in addition to improving environmental protection and reputation, service processes will be optimized accordingly. Moreover, the operating cost is also appropriately adjusted for different disposable products. The finding shows that hotel guests are not really concerned about disposable room beverages and snacks; therefore, hotels can consider decreasing the purchase of such items in their daily operations.

## VI. CONCLUSION

This study introduced the recent initiating pro-environmental policy in the Chinese hotel market. The acceptance of decreases of room disposable amenities and guests' responses were assessed via ANOVA. These results prove valuable information for the hotel industry and for hotel managers to identify the customer pulse in markets with fierce competition. These results also help to address future research directions of other related industries.

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