博 士 論 文

An Empirical Study of Exhibitions and B&Bs for Sustainable Tourism with SDGs

SDGsによる地域の持続可能なツーリズムのためのエキシビションとB&Bの実証的研究

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Abstract:

The 2030 Agenda for Sustainable Development, adopted by all United Nations Member States in 2015, provides a shared blueprint for peace and prosperity for people and the planet, now and into the future. At its heart are the 17 Sustainable Development Goals (SDGs), which are an urgent call for action by all countries - developed and developing - in a global partnership. The World Tourism Organization (UNWTO) attached to sustainable tourism and the economic significance, the SDGs have become the focus of researching the tourism contribution of sustainable development and the sustainability of the entire tourism industry. Therefore, this paper selects two types of sustainable tourism (exhibitions and B&Bs tourism), and conducts two aspects of empirical study (impacts and strategies) with SDGs 12.b as the target. First study is impacts study of exhibitions tourism with the SDGs 12.b target including **Chapter 4 and 5**. Second study is the promotion strategies of B&Bs (bed and breakfast) tourism with the SDGs 12.b target including **Chapter 6, 7 and 8**. Following the outbreak of COVID-19, it became significant to study how to improve the B&Bs tourism industry restart and recovery in the future; and the B&Bs tourism industry faced big challenges in improving its green and health strategies. Moreover, B&Bs are very important for the tourism industry in Japan, China and many other countries.

Chapter 4 used a philosophy method called knowledge archaeology and text mining to identify the relations between the Venice Architecture Biennale (in Italy) and the Pritzker

Architecture Prize. And it showed that the exhibition had positive impacts on architectural culture with the SDGs 12.b target. Two questions were posed in this part: (1) "Who is speaking" in the biennale and prize, respectively? (2) Do the biennale and curating change architectural thinking? Through knowledge archaeology, the domain-specific knowledge graphs of the Venice Architecture Biennale participants and the Pritzker Architecture Prize laureates are compared from three aspects: "persons," "words," and "Asia." Comparing the number, type, and nationality of exhibitors and laureates, the importance of the biennale and its influence on architectural development are confirmed. Results show that the thinking and curating of the Venice Architecture Biennale have influenced and changed who wins the Pritzker Architecture Prize. Moreover, Asian architects played increasingly important roles in the exhibition and prize process. Starting from the architectural exhibition, we can connect the entire architectural world.

Chapter 5 showed that the exhibition had positive impacts on promoting local economy and population with the SDGs 12.b target. This part collected panel data from 1900 to 2018 in Japan. These panel data were analyzed by descriptive statistics and a correlation analysis (a one-way ANOVA and a Pearson correlation analysis in SPSS26). The empirical analysis showed that the ETAT (Echigo–Tsumari Art Triennial) had positive impacts on sustainable tourism, economics, and the population; its correlations with Niigata were also clear.

Chapter 6 attempts to evaluate Ryokans through descriptive statistics from a tourism accommodation survey and customer satisfaction related CASBEE (comprehensive assessment system for built environment efficiency)-IPA (importance-performance analysis).

Through three progressive studies, three findings were obtained: (1) Ryokans are more flexible than hotels, have strong anti-risk capabilities, and have received more and more attention from tourists and support from the Japanese government; (2) improvement strategies for customer satisfaction after COVID-19 were provided from IPA; and (3) a dynamic evaluation model of green Ryokans was discussed, and may be employed in other countries and regions experiencing the same situation. The other study is attempts to empirically analyze green/healthy B&B promotion strategies for tourism recovery after the first wave of COVID-19 in China.

Chapter 7 is sustainable tourism strategies study with B&B for tourist satisfaction with the SDGs 12.b target in Zhejiang, China. The work/travel restrictions started from 20 January 2020, and work/after travel resumed from 20 February 2020 in Zhejiang, China. Data were collected from 588 tourists (who experienced B&Bs in Zhejiang, China) from a WeChat online survey, from 1 March to 15 March 2020.

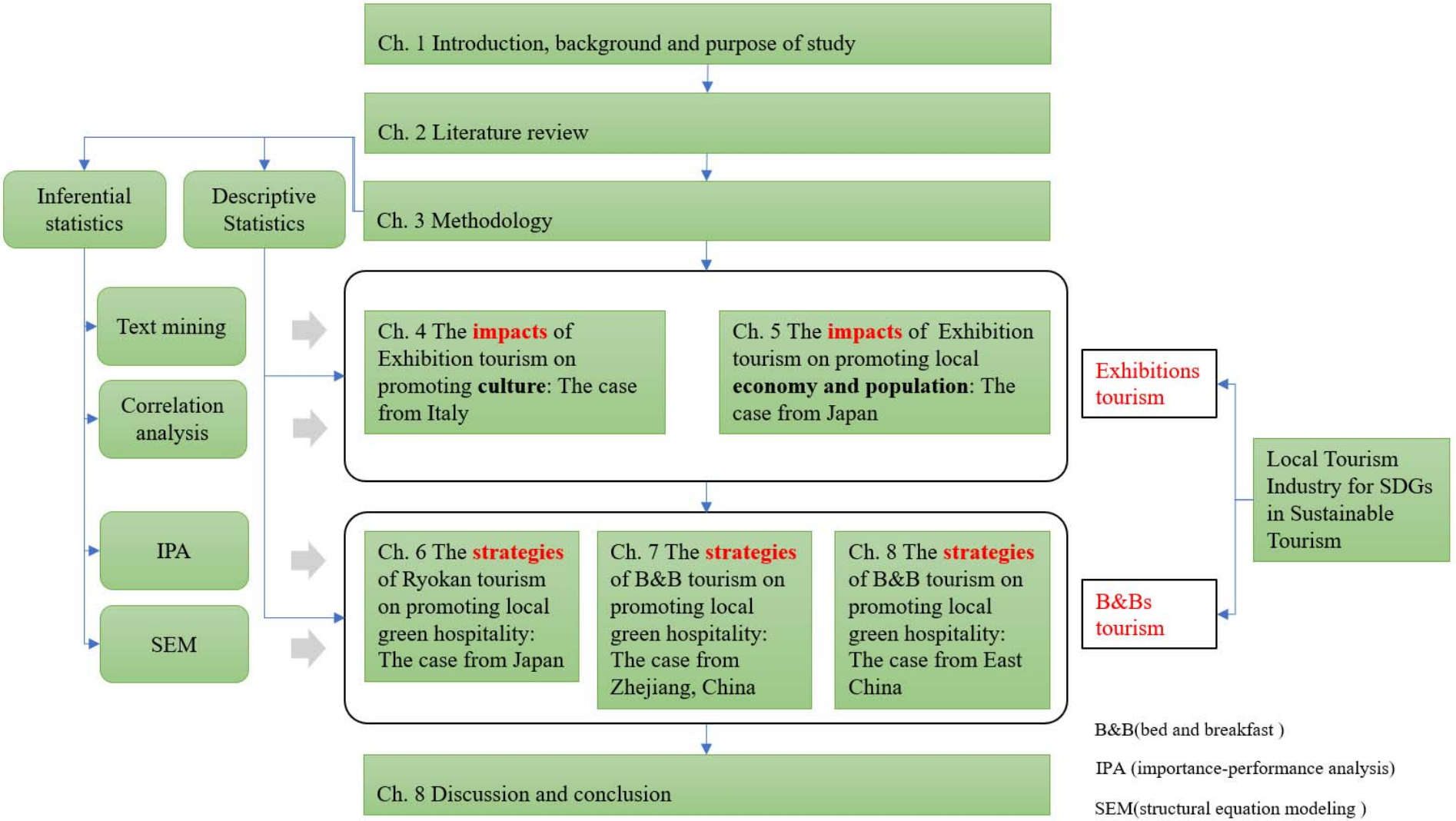
Chapter 8 is sustainable tourism strategies study with B&B for tourist loyalty with the SDGs 12.b target in East China. The survey was conducted during the first Chinese national holiday without travel restrictions. Confirmatory factor analysis (CFA) and structural equation modeling (SEM) were used for testing. The relationships observed among the green/healthy physical environment, well-being perception (WBP), tourist satisfaction (TS), and tourist loyalty (TL) provide a better understanding of how to support sustainable tourism recovery. Green/healthy B&B promotion strategies that focus on a green/healthy physical environment

after the health crisis can also be employed in other countries and regions experiencing the same situation.

This study generated results that are valuable from both academic and industry perspectives, as this field has not been extensively researched. The current paper also presents the theoretical and practical implications of the statistical results.

博士論文の構成

Structure:



Contents

1. Introduction

1.1. Background of Sustainable Development Goals (SDGs) and Purpose with Target 12.b

The 2030 Agenda for Sustainable Development, adopted by all United Nations Member States in 2015, provides a shared blueprint for peace and prosperity for people and the planet, now and into the future. At its heart are the 17 Sustainable Development Goals (SDGs) (Figure 1), which are an urgent call for action by all countries - developed and developing - in a global partnership. They recognize that ending poverty and other deprivations must go hand-in-hand with strategies that improve health and education, reduce inequality, and spur economic growth – all while tackling climate change and working to preserve our oceans and forests.

Figure 1. 17 Sustainable Development Goals (SDGs)

Sustainable development has become the main focus of tourism policymakers and tourism researchers including industry and destination marketing organizations, which has become self-evident (Hens et al., 2018). Sustainable development, combined with mainstreaming tourism, economic, and social responsibility, has been made as one of the main headings of the World Tourism Organization (UNWTO) target (Saarinen and Rogerson, 2014). The 17 Sustainable Development Goals (SDGs) are an urgent call for action by all countries. Among them, the No.12 is "Ensure sustainable consumption and production patterns". The No. 12.b is "develop and implement tools to monitor sustainable development impacts for sustainable tourism that creates jobs and promotes culture and products". Its indicator (12.b.1) is "number of sustainable tourism strategies or policies and implemented action plans with agreed monitoring and evaluation tools". Therefore, this paper selects two types of sustainable tourism industry (exhibition and B&B tourism), and conducts two aspects of empirical analysis (impacts and strategies) with SDGs 12.b as the target.

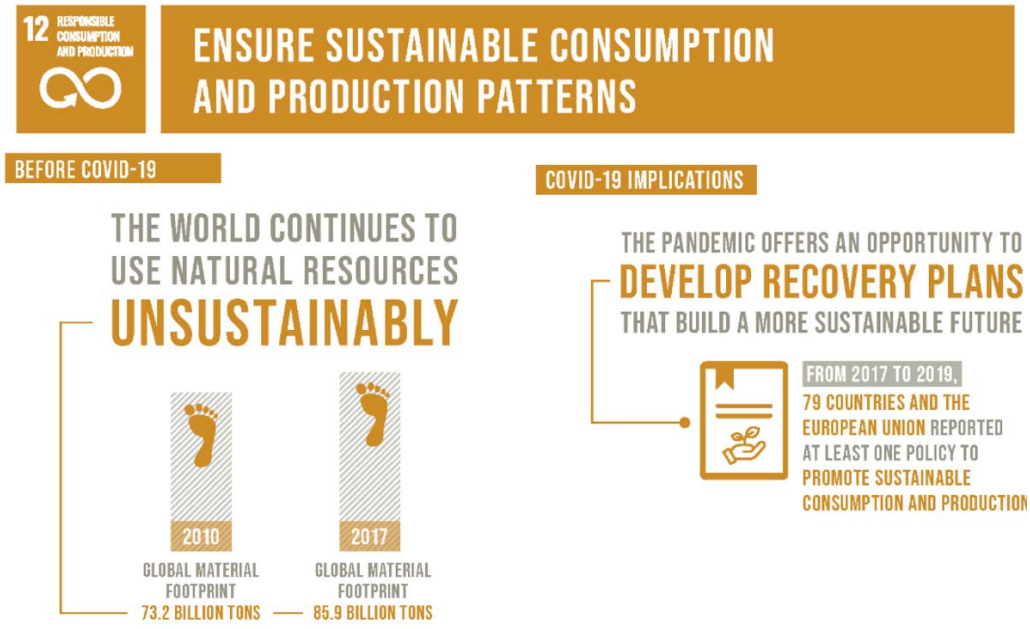


Figure 2. SDGs 12

Figure 3. The relations of SDGs 12 b and sustainable tourism with Exhibitions and B&Bs

Therefore, this paper selects two types of sustainable tourism (exhibitions and B&Bs tourism), and conducts two aspects of empirical study (impacts and strategies) with SDGs 12.b as the target (Figure 3). There are two purposes of this study: (1) First study is impacts study of exhibitions tourism with the SDGs 12.b target; (2) Second study is the promotion strategies of B&Bs (bed and breakfast) tourism with the SDGs 12.b target.

1.2. Sustainable Tourism: Exhibitions and B&Bs

Sustainable tourism is to visit locations without harming the local community and nature, and also to have a constructive impact on the environment, society, and economy of the country (Tang, 2011). As per the report of the WTO (World Tourism Organization) in 2018, international tourists spent $1.3 billion per day and a total of $462 billion in the year 2001 alone (Manzoor et al., 2019). The cultural amenities of a destination, such as museum exhibition and

art exhibitions, provide some of the main attractions for cultural tourists; moreover, exhibition has positive impacts on sustainable tourism (Cai et al., 2020c). On the other hand, the COVID-19 crisis created a window of opportunity (e.g., green/health physical environment of hospitality industry such as B&Bs and Ryokans) to change the development of the tourism industry (Hong et al., 2020). In the current study, exhibitions and B&Bs were chosen as the sustainable tourism types. Exhibition and B&B can be applied as a mean of the regional or global development focused on the sustainable tourism.

1.3. The Relationship of Exhibitions Tourism and SDGs

The rural events and exhibitions (Triennale/Biennale) were mainly aimed at local and regional revitalization, hoping to develop economic, change the shrinkage about population and aging population. Moreover, urban arts events and exhibitions (Triennale/Biennale) were mainly aimed largely at cultural development and revitalization (Takahashi, 2015).

1.3.1. Exhibition of VAB

Arata Isozaki, the 2019 Pritzker Architecture Laureate, was born in Ōita on Kyushu Island in Japan in 1931, prior to the onset of World War II. The jury judge of the Pritzker Architecture Prize said of Isozaki ("Arata Isozaki Named 2019 Pritzker Prize Laureate," n.d.):

> It is clear that he is one of the most influential figures in the contemporary world of architecture. He is constantly searching, not afraid to change, and try new ideas. His architecture is not only for architecture but also for philosophy, history, He has a deep understanding of both theory and culture. He does not bring imitations or collages, but

forges new paths, bringing East and West together. He has established generosity in supporting other architects and encouraging them to participate in competitions or collaborative works.

Conversely, Paolo Portoghesi curated the 1st Venice Architecture Biennale in 1980, titled "The Present of the Past." We thus need to know what signified the "Past" and how to present the past. This paper used Michel Foucault's philosophy method, Knowledge Archaeology[1] (Foucault, 1973, 1972), to observe the "History" and "Past" in architecture. The current paper compared the **Venice Architecture Biennale (VAB)** and **Pritzker Architecture Prize** horizontally (time series data of Biennale and Prize) and vertically (cross-section data between Biennale and Prize) from the perspectives of participants with displaying, exhibiting, curating, and creating value. The philosophical theory of knowledge archaeology and the analysis method of knowledge graph will show several different views of correlation from comparisons. Thus, the question about curating the whole world will be answered.

Hans Urich Obrist and Hou Hanru[2] described the "Fragments of the Past": "The future is always built on 'fragments of the past.' The Internet makes us thinking more about the present,

[1] Knowledge archaeology was first put forward by Michel Foucault, a French philosopher, historian of ideas, social theorist, and literary critic, in the book ***Les mots et les choses*** (French) in 1966. In his 1969 Book ***L'Archeologie du savoir*** (French), he clearly proposed to solve the subjectivity of historical research with the method of knowledge archaeology. Knowledge archaeology has the advantages of emphasizing document and discourse analysis and removing subjective factors.

[2] Hans Ulrich Obrist (born 1968) is a Swiss art curator, critic, and historian of art. Hou Hanru is an international art curator and critic based in San Francisco, Paris, and Rome.

and asking what is contemporary?" (Obrist, 2004) Giorgio Agamben [3] re-mentioned Nietzsche's **Untimely Meditations**: "A man who belongs to his or her own time may not be born at the right time. Because of this rotation and this era of missing, he or she is better than others to perceive and capture the era that truly belongs to him or her." Agamben defined this further:

> The contemporary means to a person that...his bright eyes are not obscured by the light of the age or century in which he is. Interestingly, this also reminds us: the darkness on the surface of the sky is actually the light that is heading towards us at full speed and fails to reach our light. Because the galaxy from which this light comes is constantly away from us at a speed faster than the speed of light. Achieving the contemporary means eternally returning to the present we have never reached.

This article attempts to analyze the fractures and discontinuities from the historical archives of the architectural "fragments of the past," the architecture exhibition, and the Pritzker Architecture Prize.

1.3.2. Exhibition of ETAT

From 1961 to 2019, Japan art exhibitions appeared one after another. After the recession in Japan during the 1990s, the number of Japan art exhibitions began to increase precipitously. The number of these exhibitions has particularly exploded since 2007. The purpose of these

[3] Giorgio Agamben is an Italian philosopher best known for his work investigating the concepts of the state of exception, form-of-life (borrowed from Ludwig Wittgenstein), and homo sacer. The concept of biopolitics (carried forth from the work of Michel Foucault) informs many of his writings.

many exhibitions is to revitalize their host areas (especially in sustainability) through art (Huhmarniemi, 2020). Thus, an important question is raised by this article: Did these art exhibitions have any positive sustainable impacts on their hosting areas?

Among these art exhibitions, the Echigo–Tsumari Art Triennial (ETAT) was chosen as the present case. Triennale means that the exhibition is held once every three years (Gasperini, 2010). The ETAT is one of the earliest and most important art exhibitions in Japan (Lam, 2015), as the ETAT has also had a big influence outside of Japan. The ETAT is also one of the largest art festivals in the world (Kitagawa, 2016). From 2000 to 2018, compelled by this exhibition (the ETAT), more than 2,640,126 people travelled to the host areas. The ETAT has generated exhibition-driven tourism income of more than 57,106 million yen over the past 20 years (Pearce, 2011).

One of the most famous global examples of the influence of exhibitions is Yiwu, China (Mu, 2010). The strategy of 'exhibition-driven trade' (the Yiwu model of China) has significantly encouraged the joint growth of both exhibitions and trade (Wang and Gooderham, 2014). These exhibitions may, however, exert both positive and negative impacts. The current paper proposes a relationship between sustainable tourism, economics, the population, and exhibition-driven tourism according to the following theoretical and empirical backgrounds.

First, previous studies have suggested that temporary exhibitions of modern art have a positive impact on tourism (Di Lascio et al., 2011). Therefore, if we want to quantitatively analyze the impact of exhibitions on sustainable tourism (i.e., exhibition-driven tourism), then the number of tourists is a clear and direct indicator (Dang et al., 2020; Dean et al., 2020; H.

Kim et al., 2019). Second, the tourism industry has emerged as a key force for sustainable (socioeconomic) development globally (Wakimin et al., 2018). Throughout the world, tourism and the travel sector are important economic areas (Wattanacharoensil et al., 2019). According to the previous studies by Hwang and his team, local people can have positive impacts on tourism (tourist destination loyalty; sustainable behaviors; eco-friendly behaviors, etc.) (Han et al., 2017a, 2017b; Nam et al., 2016). Thus, the corresponding sustainable economics pertain to the per capita income of the local people. Third, economic changes affect the population to some extent. There are also many theories that attempt to explain how economic growth and rising income levels affect fertility. Theories in this area include the children cost–benefit theories proposed and developed by H. Leibenstein and Gary S. Becker (Becker, 1965). However, this is a complicated problem. Japan's population is in decline (especially in rural areas like the hosting areas of the ETAT) (Nakamura et al., 2020; Wang and Fukuda, 2019). Therefore, the corresponding index in this paper uses the number of families as an indicator (although many factors could influence the number of families) (Han and Hwang, 2018; Hwang and Han, 2015).

1.4. The New Opportunity of B&Bs Tourism for SDGs after COVID-19

Corona virus disease 2019 (COVID–19) is a highly infectious disease with a long incubation period (WHO, 2020). It is the latest infectious disease to rapidly develop worldwide (Spagnuolo et al., 2020). Twenty-seven cases of the unknown virus were reported on 31st December 2019 (Lu et al., n.d.). An estimated 60 million residents of Wuhan and many other

cities in China were subjected to community containment measures from 23 January 2020. These large-scale types of actions have never been used in the past (even for SARS in China) (Wu and McGoogan, 2020).

In 2003, a window of opportunity to modify tourism development was opened by the crisis of SARS. Nature-based areas (e.g., B&Bs in the countryside) were likely to be the target destinations (Mouchtouri et al., 2019)(Han et al., 2020b). New motivations to travel to nature-based areas became evident with SARS (Sun et al., 2020). There was a potential marketing emphasis that nature-based tourism types (e.g., nature-based B&Bs) could be invigorated and expanded after the COVID–19 crisis (Zeng et al., 2005).

1.4.1. Ryokans

The negative impact of COVID-19 on the tourism and hotel industries in Japan and globally is even more serious than that of SARS (Qiu et al., 2020). At the end of May 2020, foreign customers decreased by 98.6% compared to the same period in 2019, while local customers decreased by 81.6%, and the total decreased by 84.8%. Therefore, it became significant to conduct research on the Japanese green accommodation industry, to examine how to improve the customer satisfaction for Japanese tourist accommodation after COVID-19, then to restart and restore the accommodation industry in time to welcome the 2021 Japan Olympic Games and for its longer-term development in the future. Ryokans were selected as the research target because they are more flexible than hotels, and have stronger anti-risk capabilities after COVID-19. For example, after the outbreak of COVID-19, the occupancy rate of Ryokans dropped by less than that of hotels. This situation is similar to the health crisis of the nuclear

leak in March 2011. Moreover, Ryokans have received more and more attention from tourists, and more and more support from the Japanese government (Choi et al., 2018; Seki and Brooke, 2012).

The global changes have exceeded our expectations following the outbreak of COVID-19. Therefore, the current paper attempts to establish a new dynamic green evaluation model for Ryokans (study 3) through descriptive statistics (study 1) from a tourism accommodation survey and CASBEE-based (comprehensive assessment system for built environment efficiency) IPA (importance-performance analysis) (study 2). CASBEE is evaluation model for green built environments. It has tools to evaluate building, cities, urban areas, houses, market promotions, and community health. However, CASBEE does not have a dedicated and independent evaluation system for hotels (especially Ryokans) (Hsiao et al., 2014). Many previous papers have found that green customer satisfaction has positive correlations with green buildings and hotels (Gao and Mattila, 2014; Wang et al., 2018)(Chen et al., 2015). CASBEE-based measurement items for a questionnaire survey of customer satisfaction with green Ryokans were identified by the Delphi method, with 11 green building experts included in this study. Although this process may be controversial, this study has taken a first step to try to fill the gaps in CASBEE for Ryokans, and change the original inherent evaluation model and evaluation system. The CASBEE-IPA based dynamic model can help improve Ryokans and tourism accommodation after COVID-19, and it can also be employed in other countries and regions experiencing the same situation.

On the other hand, among foreign tourists, the influence of Chinese tourists and the pursuit of Japanese Ryokans are increasing year by year. Chinese tourists are also at the TOP 1; their total annual consumption accounted for half of all foreign tourists' consumption in the past decade.

1.4.2. B&B in Zhejiang China

One of the important goals is to minimize the economic impact of the virus on a global scale (Chen, 2020). China, as the world's most populous nation and the world's second-largest economy, had already battled with an epidemic (SARS); at the time, however, it was 4% of the global total—it is now 17% ("Bloomberg Businessweek, Coronavirus Is More Dangerous for the Global Economy than SARS," 2020). Consumption during the first season in China will be greatly reduced: tourism (e.g., bed and breakfast (B&B)), hotels, catering, entertainment, and other traditional living service industries have suffered the most (Wang and Wang, 2020). Work resumption in China was raised step by step from 20 February 2020 ("Work resumption in China raises hope for virus-hit European economies," 2020).

The COVID–19 epidemic has been reported in many previous papers. Some researchers have reported the impact of COVID–19 on mental health in China (Li et al., 2020; Zhang, 2020). However, few studies have reported the impact of the bed and breakfast (B&B) industry, under COVID–19, on tourism in China, even though it has severely affected China and the rest of the world. B&Bs were very important for the tourism industry in China and many other countries and were especially welcomed by tourists in China, United States, and others (Jones and Guan, 2011)(Ye et al., 2019). Our paper is among one of the first studies to investigate the impact of

COVID–19 on tourist satisfaction with B&B in China. The time before/after satisfaction was before the work/travel restrictions (from 20 January 2020) until work/after travel resumption (after 20 February 2020). Data were collected from 588 tourists (who have experienced B&Bs in Zhejiang, China) from a WeChat online survey, lasting from 1 March to 15 March 2020. The adjusted importance (after COVID–19)–performance (before COVID–19) analysis (IPA) was used. The current study attempts to fill the research gap by investigating the changes in tourist satisfaction levels with B&Bs before/after COVID–19. Moreover, some suggestions are given to the B&B industry to recover after the COVID–19 crisis by an importance–performance analysis (IPA).

1.4.3. B&B in East China

In addition to daily travel for work, shopping, and leisure purposes, holiday travel has become increasingly important (Ettema et al., 2010). Bed and breakfast (B&B) tourism is one of the fastest-growing holiday travel industries and a driving force in many sustainable economies (Yang, 2019). Moreover, B&Bs are one of the most important types of accommodation in the tourism industry in China and many other countries, especially after the COVID-19 epidemic (Hong et al., 2020). Since February 20, 2020, East China has gradually resumed work. The SARS crisis (similar to the COVID-19 crisis) opened a window of opportunity for nature-based tourism destinations, as the green/healthy physical environment of B&Bs represents a popular destination, and this has resulted in changes to the development of the tourism industry (Wang and Wang, 2020). The SARS epidemic provided a new impetus to travel to natural areas (Mouchtouri et al., 2019). Marketing focused on nature-based B&Bs

will exhibit explosive growth after the epidemic (Sun et al., 2020). However, with regard to B&Bs, research conducted in the context of post-COVID-19 is insufficient. Thus, this article focuses on B&Bs in East China because based on the 2019 B&B market development report, the main market for B&Bs is in East China.

Some papers have studied the correlations between COVID-19 and B&Bs in China (Hong et al., 2020), but few have empirically analyzed the B&B context during the national holiday that followed the COVID-19 epidemic. Our study is one of the first to investigate the direct impact of the COVID-19 pandemic on the holiday tourist loyalty (TL) of Chinese B&B tourists. Research on design strategies for nature-based and health-related B&B tourism represent a new and important attempt to study post crisis decision-making for exhibition-driven sustainable tourism and cities. Additionally, research using variables that measure the correlations among the green/healthy physical environment, well-being perception (WBP), tourist satisfaction (TS), and tourist loyalty (TL) represents a new attempt to promote sustainable tourism recovery. The current paper found that design-based strategies (DBSs) and design environmental value (DEV) have a direct main impact on well-being perception (WBP), tourist satisfaction (TS), and tourist loyalty (TL); this represents the main novel finding of the present study.

2. Literature Review

2.1. SDGs and Sustainable Tourism

Recently some empirical papers show that, tourism is "**less sustainable**" than expectation (Hall, 2019)(Rutty et al., 2015). Hall (Hall, 2019) provided an anti–institutional perspective on the tourism sector approach to sustainable development goals and the framework of sustainable tourism. Ahmad et al. (Ahmad et al., 2019) studied the correlations between tourism and lower middle–income economies. Rutty et al.(Rutty et al., 2015) found that there were less emphasis on the environmental and social consequences than he positive economic impacts of tourism. After destinations such as Venice (e.g. as one of exhibition–driven tourism: Venice Biennale) produced a series of negative reactions to tourism growth, concerns about the contribution of tourism to sustainable development have also become issues of local scale (e.g. World Travel and Tourism Council (WTTC).

However, the World Tourism Organization (UNWTO) attached to sustainable tourism and the economic significance, the SDGs and millennium development goals (MDGs) have become the focus of researching the tourism contribution of sustainable development and the sustainability of the entire tourism industry

However, the World Tourism Organization (UNWTO) attached to sustainable tourism and the economic significance, the SDGs and millennium development goals (MDGs) have become the focus of researching the tourism contribution of sustainable development and the sustainability of the entire tourism industry (Saarinen and Rogerson, 2014)(Saarinen et al.,

2011). There are designated journals specifically for sustainable tourism, as well as a large number of texts and journal articles, which may account for about 5% of journal output (Hall et al., 2014). Sustainable tourism is a concept of visiting places without damaging local communities and nature and has a positive impact on health, environment, technological methods, and the economy (Kiatkawsin and Han, 2017). Some researchers studied the relationship between sustainable tourism and attitudes of tourist/ resident (Hsu et al., 2019). Other scholars studied the relationship between sustainable tourism with eco (Ruan et al., 2019). Although how to achieve this goal is still a controversial topic, empirical analysis for sustainable tourism actually needs more positive samples.

2.2. Exhibitions Tourism

"Exhibition-driven" means that something is influenced by an exhibition (Pearce, 2011); this phenomenon has been studied by many scholars. Mu et al. (Mu, 2010) and Wang et al. (Wang and Gooderham, 2014) showed the 'exhibition-driven trade' of the Yiwu model. Heald (Heald, 2010) worked in an exhibition-driven environment. Wardani (Wardani, 2019) developed a place for art archives, an exhibition-driven artist-run-space. Bunning et al. (Bunning et al., 2015) studied the development of a temporary exhibition-driven impact on the core offerings of the museum. However, there are few direct tourism studies on the influence of exhibitions in previous literature. Since this field has not been extensively researched, the present study generated results that are valuable from both academic and industry perspectives.

2.2.1. Exhibitions and Sustainable Tourism

First, the idea behind sustainable tourism is to visit locations without harming the local community and nature, and also to have a constructive impact on the environment, society, and economy of the country (Tang, 2011). Han and Hwang (Han et al., 2017a) studied the value-belief-emotion-norm model to promote customers' eco-friendly behavior. They also made a meaningful contribution to advancing eco-friendly activities (sustainable behaviors) for the sake of environmental protection behaviors (Han et al., 2017b). There is a consensus that tourism growth should be sustainable, although the question of how to achieve this remains a subject of debate (Gössling et al., 2005). Tourism can include transportation to the general area, local transportation, accommodations, leisure, entertainment, shopping, and nourishment (F. Deng et al., 2020). The features of sustainable urban tourism and factors of tourism shopping have been previously explored (Haoying Han et al., 2019).

Second, the current paper proposes a relationship between exhibition mechanisms and tourism brand effects (Andersen et al., 1997; Camarero et al., 2010; Fu et al., 2019). Kanwel et al. (Kanwel et al., 2019) examined the impact of destination image on tourists' loyalty and intention to visit in Pakistan. Han and Hwang investigated international medical travelers' post-purchase decision-making process by utilizing key concepts in medical tourism (e.g., first-time vs. repeat experiences) (Han and Hwang, 2018). The present study also proposes a relationship between healthcare and tourism (Dang et al., 2020). Medical tourism is largely believed to be a service that combines tourism activities (even exhibition-driven medical tourism) with medical services (S. Kim et al., 2019).

Third, as per the report of the WTO (World Tourism Organization) in 2018, international tourists spent $1.3 billion per day and a total of $462 billion in the year 2001 alone (Manzoor et al., 2019). The cultural amenities of a destination, such as museums, monuments, and art exhibitions, provide some of the main attractions for cultural tourists. Most research has focused on tourism demand and the influence of exchange rate and income on tourism revenue (Lim, 1997). Others have studied political impacts and used time series analyses.

2.2.2. Exhibitions and Culture

The rural arts events (Triennale/festivals) were mainly aimed at local and regional revitalization, hoping to develop economic, change the shrinkage about population and aging population. Moreover, urban arts events (Triennale/festivals) were mainly aimed largely at cultural development and revitalization(Takahashi, 2015).

First, events are dependent on positive perceptions of the destination and tourism products(Wise and Mulec, 2015), including art Triennale and festival. Events tourism may be associated with the specific spatial resources with attracting and planning related to natural and other tourist mental values (Getz, 2008). The first article specifically about event tourism in JTR published by J.R.B. Ritchie and Beliveau in 1974 (Getz, 2008). Kersulić et al. (Kersulić et al., 2020) reviewed the strategic planning sustainability elements from the wider sport-tourism events. Recently, the main arts festivals emerged as ‘bottom-up’ developed organically in both urban and rural areas (Quinn, 2010). Others studied rural tourism with a lifestyle, livelihood and artistic career (Prince, 2017). Wise et al. (Wise et al., 2017) studied the local tourism economy with a sense of rural community, potential industries opportunities, and

social impacts.. In Japan, the rural arts events (Triennale/festivals) were mainly aimed at local and regional revitalization, hoping to develop economic, change the shrinkage about population and aging population; Moreover, urban arts events (Triennale/festivals) were mainly aimed largely at cultural development and revitalization(Takahashi, 2015).

Second, the attitude of tourist was the main positive force to promoting the tourism economic (Ren et al., 2019)(Wang and Liu, 2020). Andersen et al. (Andersen et al., 1997) considered the image of Denmark held by the visitors of the art exhibition. Camarero et al. (Camarero et al., 2010) analyzed the four elements of brand equity with brand image/value, loyalty, and perceived quality in the art exhibition, and evaluates the state of art exhibitions held in the Spanish. Chen et al. (Chen et al., 2012) studied the satisfaction and service quality for the event promotion . Liu et al. (Liu and Huang, 2020) and Ruan et al. (Ruan et al., 2017) also examined the relationship between natural capital and tourism image. Fu et al. (Camarero et al., 2010) examined the basic dimensions of place attachment in the exhibition environment and their impact on participant satisfaction.

2.2.3. Exhibitions and Economics

First, the tourism industry remains an important source for the generation of income in formal and informal sectors in many countries (Malik et al., 2010). Hwang and Lee (Hwang and Han, 2015) claimed that economic growth and development is rapidly increasing in Korea due to a surge in elderly tourism. This increase shows that tourists feel inner satisfaction, which positively affects their future behavioral intentions (Hwang and Lee, 2019a).

Second, sustainable economic growth involves economic development that attempts to satisfy the needs of humans but in a manner that sustains natural resources and the environment for future generations (Dang et al., 2020; Manzoor et al., 2019). Vasylieva et al. (Vasylieva et al., 2019) investigated the relationships between the economic, social, and environmental dimensions of sustainable development. Wang et al. (Wang and Dai, 2019a) studied the theory of the circular economy and the problems existing in the development of the green exhibition in China. Azam and Sarker (Enzenbacher, 2019) explored the green tourism in the context of climate change towards sustainable economic development in the south Asian region. Wang et al. (Wang and Dai, 2019b) analyzed the influence of the exhibition industry on the ecological environment and proposed countermeasures.

Third, many previous studies have empirically supported the influence of conventions and exhibitions on economic growth. One of the earliest studies was an economic impact assessment of the tall mast sailing ceremony of Rhode Island by Della et al. in 1977 (Della Bitta et al., 1977). Dwyer et al. (Kim and Chon, 2009) believed that the impacts of conventions and exhibitions on the local economy are usually the largest. The selection of evaluation objects for empirical research usually focuses on specific exhibition activities and the overall exhibition industry. Research on the economic impacts of the overall exhibition industry in a specific area includes a study by Kim et al. (Haoying Han et al., 2019). Litvin et al. (Litvin et al., 2013) used a case study to describe the 'rising tide', which refers to the economic contribution from the increased hotel occupancy rate during a festival. Rephann (Kim and Chon, 2009) studied the impact assessment of economic activities during the construction and operational periods of

exhibition venues. An event may significantly increase local economic activity, but the net impact within the state may be less than the local effect, or even negative. However, the state effect often exceeds the national effect. Chhabra et al. (Kim and Chon, 2009) noted that festivals are usually a strategic choice for the development of many rural economies but that the economic impact of festivals depends on the characteristics of the festival, such as the number of days the festival is held and the characteristics of the local economy. Other scholars have studied the motivations and purposes behind conference and exhibition consumption (Jin and Weber, 2013; Rittichainuwat and Mair, 2012). However, the forms of these exhibitions (the impacts of conventions and exhibitions on economics) are mainly concerned with transactions; these studies include those by Crompton et al. (Crompton et al., 2001) and Kim et al. (Kim et al., 2010). It is a challenge to accurately measure the economic contributions of art exhibitions or exhibition-driven tourism.

2.2.4. Exhibitions and Population

First, the relationship between population growth and economic development is a problem that has been constantly changing in the field of population economics. This transformation is different in different periods. The most influential document on the relationship between population growth and economic development is “Population”, published by Malthus in 1798, whose findings imply that high community empowerment enables a community to establish successful sustainable tourism development through local people’s support for tourism (Khalid et al., 2019). For their empirical tests, data were collected from 280 tourists to Japan from South Korea (Nam et al. (Nam et al., 2016)). The authors found that local people could help enhance

tourist destination loyalty from a relational perspective. Hwang and Lee (Hwang and Lee, 2019b) used this study to show that all four dimensions (i.e., education, entertainment, esthetics, and escapism) have a positive influence on well-being perception, which, in turn, positively affects the outcome variables.

Second, as Japan's society ages, and due to its low fertility rate, city shrinkage has had a tremendously negative effect on the country's economic development. Over 85% of municipalities experienced population loss from 2005 to 2015 (Peng et al., 2019). The shrinking and aging of the Japanese population, coupled with continuous polarization effects towards urban centers, have led to a clear dissolution of the countryside (Nishino, 2012)(BOVEN, 2016). Population problems in the countries near Japan are the same (E. J. Kim et al., 2020), as shown by Hwang et al. (Hwang et al., 2018). Lastly, extraversion has played a moderating role in the relationship between suitable behavior and activity involvement. Hwang et al. (Hwang and Lee, 2019a) determined the important role of product knowledge as a moderator. Kalwar et al. (Kalwar et al., 2019) suggested the development of planning policies to stimulate agricultural industrial development in secondary cities and noted that the devolution of powers can help achieve sustainable development. Although the population has been studied for a long time in various fields, it remains a very important issue.

2.3. B&Bs Tourism

2.3.1. The Concept of B&B

First of all, apart from hotels and guesthouses, the most common form of accommodation is bed and breakfasts (B&Bs), which is a concept that originated in Europe (Nuntsu et al., 2004). These refer to small hotels that provide a non-commercial, home-like environment and only serve breakfast (Nuntsu et al., 2004). This also means that visitors or guests pay to stay in a private residence and interact with a local family (Lynch, 2005). B&Bs allow tourists to seek lodging for the night, especially when hotels and inns are unavailable in remote areas (Xiao et al., 2019). Second, the basic standards are different from other types of hotels are. The differences include B&Bs being small scale, family operated, and provide special services (L.-C. Chen et al., 2013). In recent years, the B&B industry has become a unique and rapidly growing industry in the hotel industry (Frazier, 2010). This operation attracts tourists with different standards than hotels (Hsieh and Lin, 2010).

2.3.2. New Opportunities for Green Hospitality after COVID-19

2.3.2.1. Crisis with a New Future

COVID-19 and SARS had a similar impact on tourism (Gössling et al., 2020). In 2003, SARS created a new opportunity in tourism development (Lam et al., 2003): nature-based areas became new target destinations (Mouchtouri et al., 2019)(Sun et al., 2020). Some previous papers also analyzed the annual growth rates in international tourists visiting Japan from the top ten countries between 2016 and 2018, and indicated that the annual growth rates of guests at rural and urban tourism accommodation in Japan were not equal (Nandy, 2020)(Karakawa, 2019). Previous papers also studied SARS and hospitality with a focus on Asia (e.g. Hong Kong, Singapore, Korea) (Chen et al., 2007; Henderson and Ng, 2004; Kim et al., 2005; Leung and

187 Lam, 2004). Before the outbreak of COVID-19, other epidemics such as H1N1 swine flu in
188 2009 were also studied in terms of the hotel industry response (Hung et al., 2018). After the
189 outbreak of COVID-19, some scholars studied the socio-economic implications of COVID-19
190 for the hospitality and tourism industry (Higgins-Desbiolles, 2020; Nicola et al., 2020); others
191 studied the marketing and management of COVID-19 in the hospitality and tourism industry
192 (Jiang and Wen, 2020; Karim et al., 2020). Wen et al. (Wen et al., 2020) stated that "disparate
193 research domains can cooperate on timely research endeavors, including but not limited to
194 COVID-19." Rivera (Rivera, 2020) stated that it (COVID-19) might temporarily immobilize
195 our collective activities, but will not limit research ideas. Some previous papers found
196 relationships between tourism and the crisis (e.g. COVID-19) in Japan (Wu and Shimizu,
197 2020)(Dąbrowski, 2020; Tashiro and Shaw, 2020)(Tashiro and Shaw, 2020): (1) a crisis causes
198 significant damage to tourism in Japan, but the negative impact reduces over time; (2) changes
199 in customer satisfaction after a crisis are different for tourists with different countries of origin;
200 and (3) the impacts of customer satisfaction at different destinations on travel intention change
201 after a crisis in Japan.

202 2.3.2.2. The Green Hotel Industry and Ryokans

203 In the past, experts have carried out research on many aspects of green hotels. Suki (Suki
204 and Suki, 2015) studied the green hotel from the perspective of consumers' environmental
205 behavior. Wu et al. (Wu et al., 2013) studied green B&B service innovation. In North America,
206 a major paper focused on the factor of sustainability and green B&Bs in Canada (Dodds and
207 Holmes, 2011; van Haastert and de Grosbois, 2010). In Asia, a major paper focused on eco-

208 marketing strategies in Taiwan (L. C. Chen et al., 2013; Kuo and Kuo, 2012). Moreover, some
209 previous papers have also studied the sustainable and green hotel evaluation model (van
210 Haastert and de Grosbois, 2010; Wang, 2009)(Mousavi et al., 2017). There were some different
211 definitions of Ryokans (there is currently no precise definition) in the previous studies (Kang
212 et al., 2004)(Guichard-Anguis, 2008)(Jimura, 2011)(Choi et al., 2018). A guesthouse is an
213 inexpensive type of accommodation for those staying in Japan for one month or longer who
214 want to avoid the hassle and the expense of renting and furnishing a conventional apartment.
215 Ryokans and minshuku are part of a whole range of accommodation options for travelers in
216 Japan. Far from being business hotels or Western hotels, Ryokans and minshuku (including
217 B&Bs) are a uniquely Japanese experience. Ryokans (旅館, literally "travel building") are
218 traditional Japanese inns. Although Ryokans have low occupancy rates and inbound guest ratios,
219 the independence of the Ryokan, internet availability, hot spring facilities, and the number of
220 World Heritage sites are effective in capturing demand (Morishita, 2020; Yoko and Takashi,
221 2020). However, few previous papers have focused on the study of a green Ryokan evaluation
222 model for post-COVID-19. Therefore, green Ryokans should be a focus after the COVID–19
223 crisis.

224 2.3.3. Crisis (e.g., COVID–19) impact on Chinese tourism and B&B

225 First, natural disasters and anthropogenic environmental problems (Giupponi et al.,
226 2020)(Serafini et al., 2020), as well as their potential to affect the image of destinations
227 (Michael Hall, 2010), have impacts on travel and tourism on various scales (Napoli et al., 2020).
228 According to world tourism organization (WTO), in 2003, tourism arrivals fell by 1.2% to 694

million (compared to the same period in 2002) in China, and hotel occupancy rates fell by 10% (Wilder-Smith, 2006).

Second, the number of tourists increased by 9.2% (the first two months of 2003) over the same period in 2002, and tourism revenue increased by 14.0%. After the outbreak of SARS, the number of tourists in March 2003 decreased by 6.5%, as compared to the same period in 2002. (Figure 4): the first monthly decrease in past decades (Zeng et al., 2005).

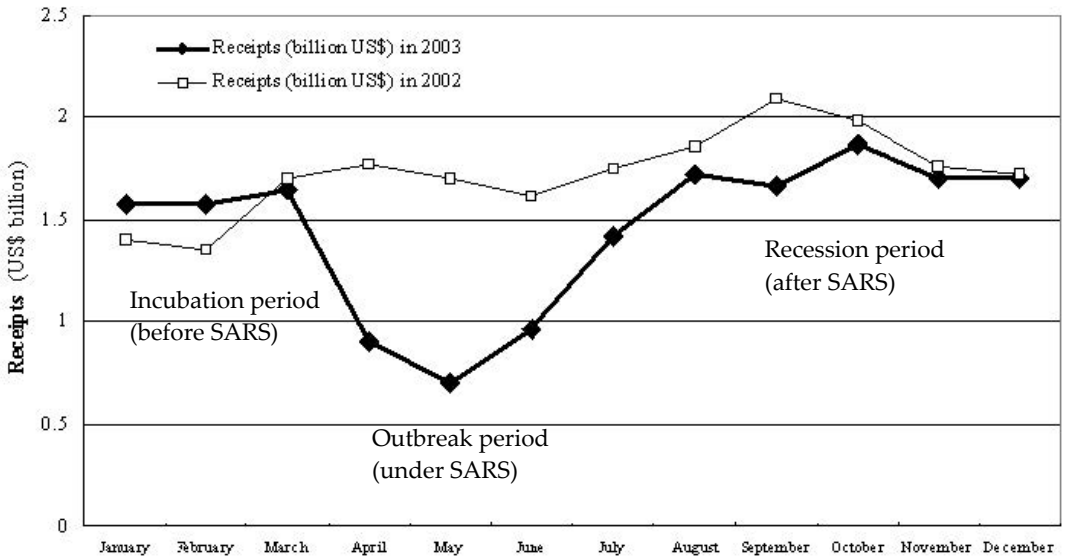


Figure 4**.** The impact of SARS on Chinese tourism between 2002 and 2003.

Third, how long does it take to repair the impacts of an infectious disease on tourism? The development of the crisis' events can be divided into three periods, according to the impact on tourist flow, including the incubation period, outbreak period, and recession period. The impact time of most crisis events is within one year; the impact period of a few events was around two years. Taking SARS as an example, the peak period of impact was from March to June 2003, and the entire impact period was about 1 year (Zeng et al., 2005). Taking the accommodation industry as an example, during 2003, single-store revenue of in high-star hotels declined significantly. B&B grew by 15.2% in 2003 and continued to grow, resulting in a 22% growth

245 in 2004. Therefore, the impact of SARS on B&Bs in tourism was basically eliminated about
246 half a year after the end of SARS (Wilder-Smith, 2006).
247 2.3.4. Tourism Resumption of Post-crisis(e.g., COVID–19)
248 First, the destination image is defined as an individual's mental representation and overall
249 perception of a particular destination (Fakeye and Crompton, 1991). Destination image and
250 tourist satisfaction are also important tools used by DMOs to actively research and manage the
251 perceptions of tourists about the destination (Paunovic, 2014)(Paunović, 2013). The key of the
252 before/after crisis themes that emerged included a lack of disaster-management plans, damage
253 to destination image and reputation. It also included the changes in tourist behavior during the
254 crisis (e.g., COVID-19) (Mair et al., 2016). To influence the destination choice decision-making
255 process and to condition the after-decision-making behaviors, including participation (Heesup
256 Han et al., 2019b), satisfaction, and future intention (e.g., sustainable mountain tourism
257 (Paunović and Jovanović, 2019)(Paunović and Jovanović, 2017)) to revisit (Lee et al., 2005).
258 The destination image is generally interpreted as impressions based on information processing
259 from various sources over time that results in a mental representation of the attributes and
260 benefits sought in a destination (Gartner, 1994).
261 Second, our focus on post-crisis recovery is required because much of the research relates
262 to tourism crisis (e.g., COVID-19) management (Wang and Ritchie, 2011). The recovery should
263 be taken as more than just an industry or economic approach, and should focus on pre-event
264 levels (Ritchie, 2008)(Cai et al., 2020a)(Cai et al., 2020d). The importance of the relationship

265 between marketing with tourist satisfaction and suggestions to repair destination images was
266 identified (Mair et al., 2016).

267 2.3.5. Holiday Travel and B&B Recovery after COVID-19

268 2.3.5.1. Holiday travel

269 In addition to daily travel for work, shopping, and leisure purposes, holiday travel has
270 become an increasingly important part of modern society (Ettema et al., 2010). Over the past
271 few decades, changes in family structure have resulted in more frequent holiday travel (Dellaert
272 et al., 1998). Because the choice of holiday destination is very complex, the structure and level
273 of holiday travel will vary depending on a variety of factors and motivations, and the choice of
274 a green/healthy travel mode is becoming increasingly common (Böhler et al., 2006). Following
275 the COVID-19 crisis, it has become particularly important to consider how the promotion of
276 green/healthy environments encourages tourist loyalty to holiday travel destinations (e.g., green
277 B&Bs) (Hong et al., 2020). The combination of the traveler's personal and social conditions
278 (e.g., partner and family preferences, economic status of the family) and external conditions
279 (e.g., weather conditions, natural environment, and the epidemic) determine holiday behavior
280 and holiday travel behavior (Mansfeld, 1992).

281 2.3.5.2. The health crisis and new opportunities for the B&B industry

282 The SARS crisis (which was similar to the COVID-19 crisis) opened a window of
283 opportunity for nature-based tourism destinations, as the green/healthy physical environment
284 of B&Bs render them popular destinations, and this has resulted in changes in the development
285 of the tourism industry (Wang and Wang, 2020). The SARS epidemic provided a new impetus

286 to travel to natural areas (Mouchtouri et al., 2019). Marketing focused on green/healthy B&Bs
287 will exhibit explosive growth after the COVID-19 epidemic (Sun et al., 2020). Society
288 (including its main industries and governments) will all be transformed after the COVID-19,
289 and it towards a more sustainable way is hoped (Sarkis et al., 2020)(de Sousa Jabbour et al.,
290 2020b). A reassessment of the structure of a supply with management is required in the recovery
291 process (Govindan et al., 2020). Decision-making processes regarding consumption patterns
292 changes in habits (e.g., the changes in tourist loyalty). Consumers behaviors (e.g. B&B) tend
293 to change after the COVID-19 crisis: (1) 34% of respondents would be willing for paying more
294 for local products, (2) 23% for ethical products, and (3) 25% for trusted brands (according to
295 EY Future Consumer Index) (Vautier, 2020). Therefore, a more sustainable consumption model
296 may arise (Sarkis et al., 2020)(Jabbour et al., 2020). Management decisions involving modes
297 of many industries should be reassessed in order to seek even more efficient solutions (Choi,
298 2020)(Akter et al., 2020). Scholars and managers should attempt to consider this transformation
299 through a positive lens (de Sousa Jabbour et al., 2020a)(Amankwah-Amoah, 2020).

300 2.3.5.3. Green B&Bs

301 Apart from hotels and guesthouses, the most common form of accommodation is the B&B.
302 B&Bs represent one of the most common types of small accommodation businesses in the
303 tourism and hospitality industry (Ye et al., 2019)(Lynch, 2005). The basic criteria for
304 distinguishing bed and breakfast hotels from other types of hotels include the following: (1)
305 they are operated by families; (2) they are small-scale; (3) guests have a certain degree of
306 communication with the owners; and (4) they provide special services (L.-C. Chen et al., 2013).

This type of small-scale operation attracts different tourists than those attracted to standard hotels (Hsieh and Lin, 2010). Recently, the B&B industry has become a distinct and fast-growing part of the sustainable tourism/hotel industry (Frazier, 2010). Green B&Bs combine local features with eco-friendliness, thereby creating an environment that supports the feeling of leisure, saves energy, and satisfies tourists' physical and mental needs (Tzschentke et al., 2008). These are also characteristics of green hotels (Merli et al., 2019), but there are differences. Green B&Bs may be characterized by a healthy environment (both indoor and outdoor), green architecture, green service and innovation, and green management (Wu et al., 2013).

3. Methodology

3.1. The Descriptive Statistics

Descriptive statistics can be used for data analysis in a visual and easy way to understanding (Oja, 1983)(Reid and Andereck, 1989). Hwang et al. (Hwang et al., 2020c) used descriptive statistics to study elderly tourism wellbeing perception and its outcomes. Some scholars studied the relationship between tourism and sustainability by descriptive statistics (Heesup Han et al., 2019b; Manzoor et al., 2019). And others studied the relationship between economics and tourism by descriptive statistics (Cai et al., 2020c)(Ramos et al., 2019). On the other hand, many scholars also studied the relationship between hotels and customer satisfaction using descriptive statistics (Hong et al., 2020)(Cândido, 2005)(Yin et al., 2020).

3.2. The Inferential Statistics

Many previous analyses used combined correlation, simple linear regression (SLR), and one-way ANOVA to analyze the inferential statistics of the relationship between multiple variables (Heung et al., 2010). It also used analyzed the correlations in tourism industry (Oja, 1983).

3.2.1. Text Mining

Text mining, also referred to as text data mining, similar to text analytics, is the process of deriving high-quality information from text. It involves "the discovery by computer of new,

previously unknown information, by automatically extracting information from different written resources." Written resources may include websites, books, emails, reviews, and articles. High-quality information is typically obtained by devising patterns and trends by means such as statistical pattern learning. According to Hotho et al. (2005) we can differ three different perspectives of text mining: information extraction, data mining, and a KDD (Knowledge Discovery in Databases) process. Text mining usually involves the process of structuring the input text (usually parsing, along with the addition of some derived linguistic features and the removal of others, and subsequent insertion into a database), deriving patterns within the structured data, and finally evaluation and interpretation of the output. 'High quality' in text mining usually refers to some combination of relevance, novelty, and interest. Typical text mining tasks include text categorization, text clustering, concept/entity extraction, production of granular taxonomies, sentiment analysis, document summarization, and entity relation modeling (i.e., learning relations between named entities).

Text analysis involves information retrieval, lexical analysis to study word frequency distributions, pattern recognition, tagging/annotation, information extraction, data mining techniques including link and association analysis, visualization, and predictive analytics. The overarching goal is, essentially, to turn text into data for analysis, via application of natural language processing (NLP), different types of algorithms and analytical methods. An important phase of this process is the interpretation of the gathered information.

A typical application is to scan a set of documents written in a natural language and either model the document set for predictive classification purposes or populate a database or search

359 index with the information extracted. The document is the basic element while starting with
360 text mining. Here, we define a document as a unit of textual data, which normally exists in
361 many types of collections.

362 3.2.2. Simple Linear Regression (SLR)

363 The paper used the SPSS26 (IBM, New York, United States). A correlation analysis is a
364 widely used method evaluating the relationship between two variables. A high correlation
365 means these relationship of variables are strong, (Franzese and Iuliano, 2019; Liang et al.,
366 2020; Yu et al., 2020). Two random variables (X and Y) are normally tested in the Simple
367 Linear Regression (SLR)(Pearson, 2011). P–value help researchers deciding reject or fail to
368 reject a hypothesis. If the p–value $<$ 0.05, the analysis is significant for the next step. Simple
369 linear regression and Pearson's correlation model (Y = a + bx) are calculated by the least square
370 method. This formulae for the slope (b) and the Y intercept (a) (Y = linearly related to x; r^2 =
371 the proportion of the total variance (s^2) of Y that can be explained by the linear regression of
372 Y on x; 1–r^2 = the proportion that is not explained by the regression; Thus 1–r^2 = s^2xY / s^2Y):

$$b = \frac{\sum_{i=1}^{n}(x_i - \bar{x})(Y_i - \bar{Y})}{\sum_{i=1}^{n}(x_i - \bar{x})^2} \quad (1)$$

$$a = \bar{Y} - b\bar{x} \quad (2)$$

$$b = \frac{\sum_{i=1}^{n}(x_i - \bar{x})(Y_i - \bar{Y})}{\sqrt{\sum_{i=1}^{n}(x_i - \bar{x})^2 \sum_{i=1}^{n}(Y_i - \bar{Y})^2}} \quad (3)$$

373 Using Fisher's z transformation are constructed for r by confidence limits. The null hypothesis
374 that r = 0 (i.e. no association) is evaluated using a modified t test (Armitage et al.,

375 2008)(Altman, 1990)). These belts represent the reliability of the regression estimate (the
376 tighter/ belt, the more reliable/ estimate) (Altman et al., 2013).

377 3.2.3. The One–Way ANOVA Analysis:

378 A one–way analysis of variance (ANOVA) was used to determine whether there were
379 any statistically significant differences between the means of three or more independent
380 (unrelated) groups. It is a technique that can be used to compare by an F distribution. A one–
381 way ANOVA compares the means between related groups and determines whether these
382 means are statistically significantly different from each other (Howell, 2009).

383 Step1: ANOVA. Independent elements number in the sum of squares indicated by
384 **degrees of freedom (DF)** The degrees of freedom for each component of the model are:
385 DF (Factor) $= r-1$, F Error $= n_T - r$, Total $= n_T - 1$ (n_T = total number of observations,
386 r= number of factor levels). **F–value** means that the degrees of freedom for the numerator are
387 $r-1$. The degrees of freedom for the denominator are $n_T - 1$. The **mean squares (MS)**
388 calculation for the factor/ error follows (MS=Mean Square; SS=Sum of Squares; DF=Degrees
389 of Freedom):

$$\text{MS Factor} = \frac{\text{SS Factor}}{\text{DF Factor}} \tag{4}$$

$$\text{MS Error} = \frac{\text{SS Error}}{\text{DF Error}} \tag{5}$$

390 Step2: Post Hoc Tests– Multiple Comparisons–LSD. Post Hoc Tests is for multiple
391 comparisons with a control. Minitab offers four different confidence interval methods for
392 comparing multiple factor means in one–way analysis of variance when equal variances

between the groups: Tukey's, Fisher's, Dunnett's, and Hsu's MCB. Fisher's Least Significant Difference (LSD) was used in the current paper for the individual error rate and number of comparisons to calculate the simultaneous confidence level for all confidence intervals ($\overline{Y_i}$ = sample mean for the i^{th} factor level; n_i = number of observations in level i; r=number of factor levels; s=pooled standard deviation or sqrt(MSE); n_T = total number of observations; **α**=probability of making **α** Type I error)

$$\overline{Y_i} - \overline{Y_{ij}} \pm t\left(1 - \frac{\alpha}{2};\ n_i - r\right) s \sqrt{\frac{1}{n_i} + \frac{1}{n_j}} \tag{6}$$

Step3: Mean Plots. Mean: The average of the observations at a given factor level (n_i = number of observations at factor level i; y_{ji} = value of the j^{th} observation at the j^{th} factor level)

$$\bar{x}_i = \frac{\sum_{j=1}^{n_i} y_{ji}}{n_i} \tag{7}$$

Figure 5 shows the sample of Mean Plots. The X axis represents the categorical variable X (time held), and the Y axis represents the continuous variable.

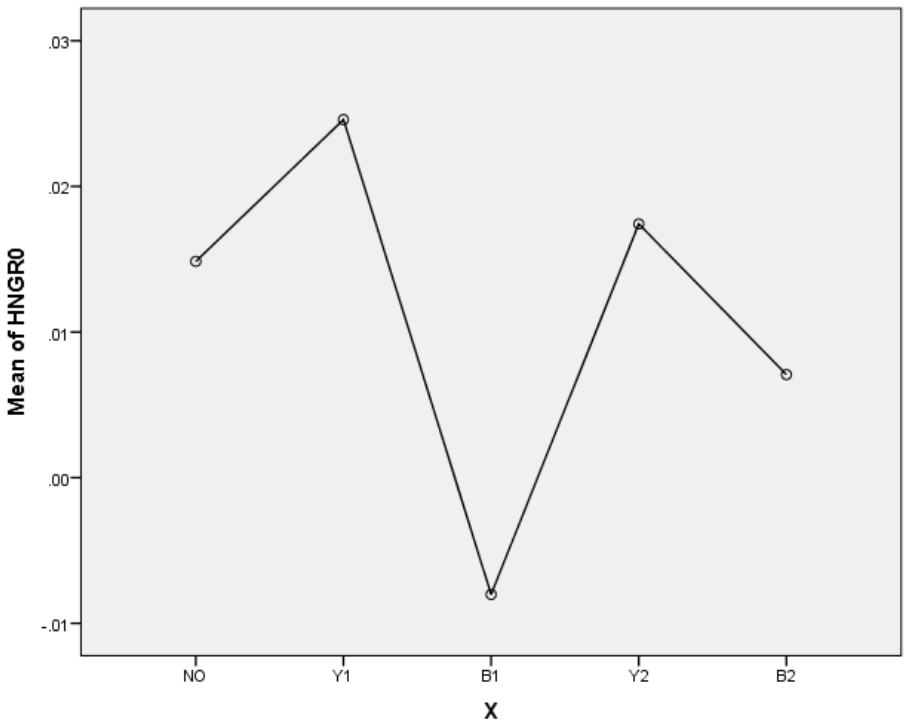


Figure 5. Sample of Mean Plots

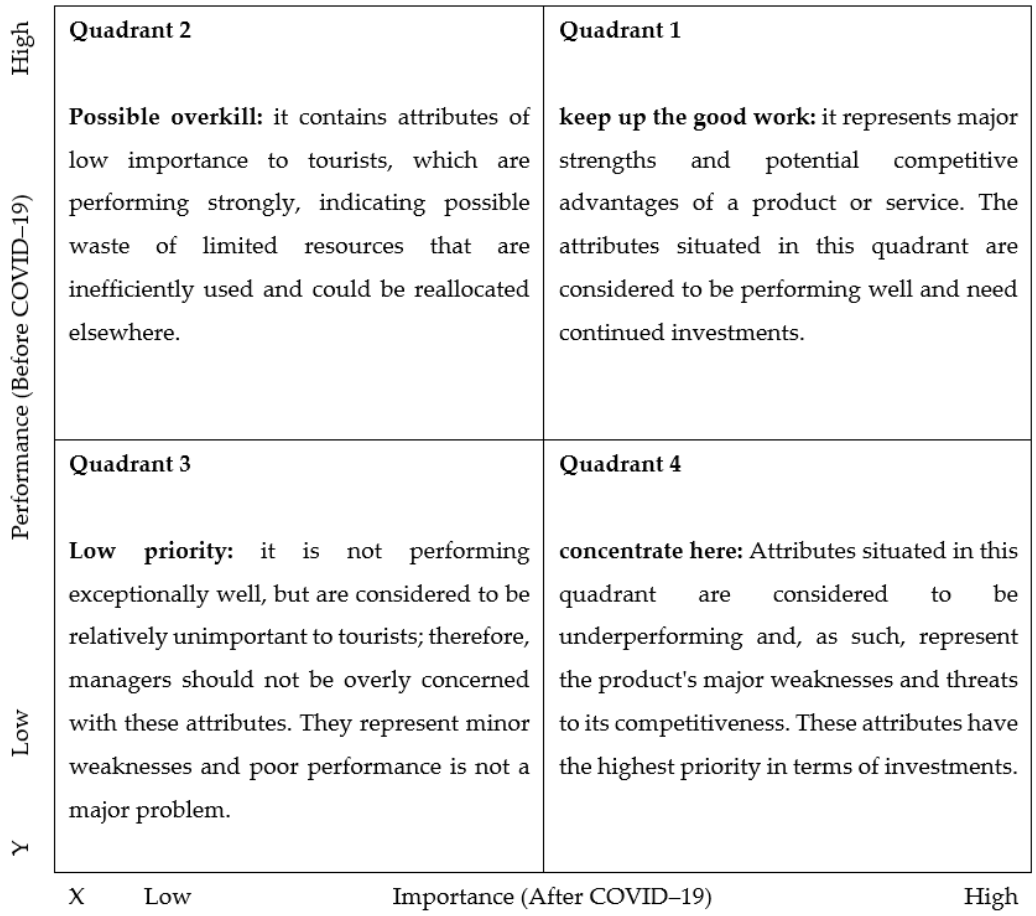
Step4: Descriptions. Standard deviation (SD) ($\overline{Y}_i$ = mean of observations at the i^{th} factor level; n_i = number of observations at the i^{th} factor level; y_{ji} = observations at the i^{th} factor level) follows:

$$s_i = \sqrt{\frac{\sum_{j=1}^{n_i}(y_{ji} - \overline{y}_i)^2}{n_i - 1}} \tag{8}$$

3.2.4. IPA and Its Threshold Selection

Importance–Performance Analysis (IPA) is a business research technique developed as a marketing tool to review and suggest new management strategies (Martilla and James, 1977). While it was originally developed for marketing purposes, its applications have expanded to various fields, including tourism (Jin and Park, 2019a)(Tang et al., 2019)(Hwang and Lee, 2019a), healthcare (Bi et al., 2019)(Han and Hwang, 2018), sustainable cities (Nicolas et al.,

2020), social and economic outcomes (Popa and Ștefan, 2019)(Hwang and Lee, 2019b), etc. The main goal of IPA is to diagnose the performance of different product or service attributes while facilitating data interpretation and providing practical recommendations for management (Dwyer et al., 2012). IPA can gain insight into which product or service area managers should be targeted by identifying the most critical attributes, strengths, and weaknesses (Abalo et al., 2007). The IPA technique combines measures of tourists' perceived performance and importance into a two-dimensional plot to facilitate data interpretation (Martilla and James, 1977). Thus, each quadrant in the standard IPA chart represents a different strategy that can help managers to identify areas of concern and necessary measures to increase tourist satisfaction (Matzler et al., 2004). Choosing the right attributes to measure importance and performance is essential for obtaining the best management decisions because these decisions rely on the information revealed from the selected attribute set (Oh, 2001a). Figure 6 shows the IPA model.



Note: IA = Importance (After COVID–19), PB = Performance (Before COVID–19)

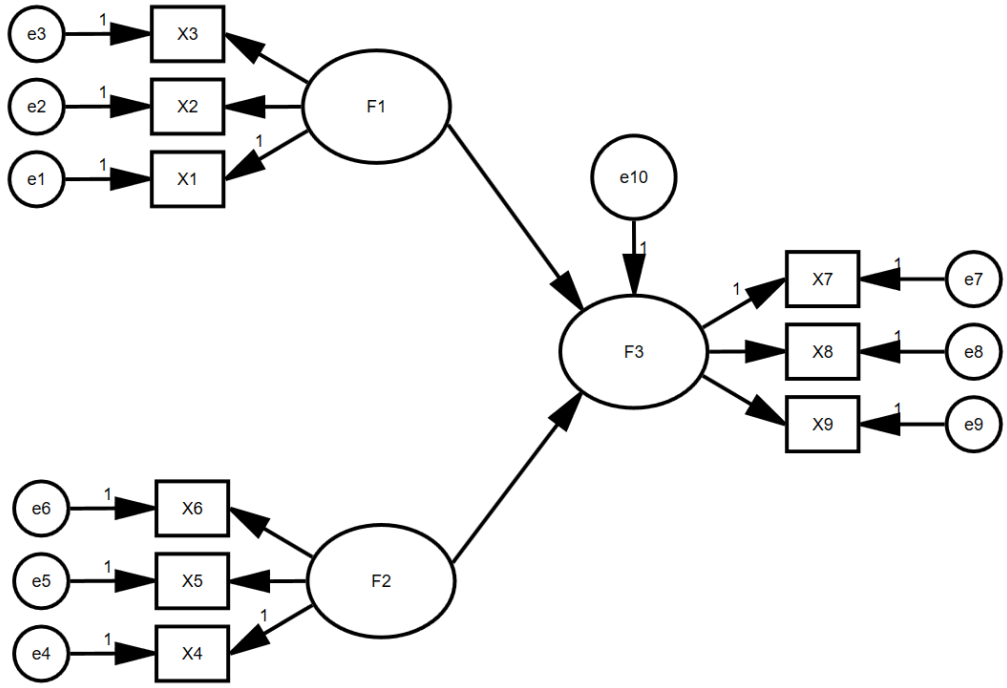
Figure 6**.** The importance–performance analysis model.

3.2.5. Sample Testing Model for CFA-SEM

We used confirmatory factor analysis (CFA) and structural equation modeling (SEM) to test the hypothetical model (Asif et al., 2019c). We also developed a measurement model that includes the research factors and their connections. We first implemented a measurement model to evaluate the component scores for all items. Second, CFA was used to check the validity of the discrimination. Third, SEM technology was used to evaluate the causal model. These steps were taken to confirm the validity and reliability of different types of causal models. Figure 7

437 shows an illustration of the sample structural equation model (observed items or

438 variables X_1, X_2… X_9 and underlying factors F_1, F_2, F_3 are represented).



439 Figure 7**.** Sample structural equation model.

440 Equations (1)(2)(3) show the measurement model:

$$Xi=\lambda iF1+ei;\ i=\overline{1,3} \quad (1)$$

$$Xj=\lambda jF2+ej;\ j=\overline{4,6} \quad (2)$$

$$Xk=\lambda kF3+ek;\ k=\overline{7,9} \quad (3)$$

441 where the variables X_1, X_2, X_3, and the coefficient F_1 linearly depend on the coefficients λ_1, λ_2,

442 λ_3, and e_1, e_2, e_3 is its measurement error. Similarly, regression (2), (3) is the linear relationship

443 of X_4, X_5, X_6 and F_2, and X_7, X_8, X_9, and F_3.

444 The structural model is given by the Equation (4):

$$F3=\beta 1F1+\beta 2F2+e_{10} \quad (4)$$

where β1, β2 are the regression coefficients between factors F1, F2 and F3 (with potential errors e_{10}).

Bootstrapping (maximum likelihood estimation) is used to test the assumption. Maximum likelihood estimation (MLE) aims to produce a predicted covariance matrix $\sum$ (as close as possible to the sample covariance matrix $\overline{\sum}$). The difference between $\sum$ & $\overline{\sum}$ is the minimization of the fitting function. Equation (5) is solved by an iterative procedure with a selected starting value:

$$f_{ML}=\ln \mid \overline{\sum} \mid -\ln \mid \sum \mid + tr\,[\overline{\sum}\sum^{-1}] - p \quad (5)$$

Where: p is the number of variables; determinants and traces summarize important information about the matrix $\sum$ & $\overline{\sum}$.

In addition, f_{ML} is used in the chi-squared ($\chi 2$, goodness-of-fit) test, which measures how well the model fits the sample (under the assumption of normality, the model is used to fit the exponent) (6):

$$X^2=f_{ML} \times (n-1) \quad (6)$$

Where n is the number of samples.

4. The Impacts of Exhibition Tourism on Promoting Culture: The Case from Italy

4.1. The Logical Model

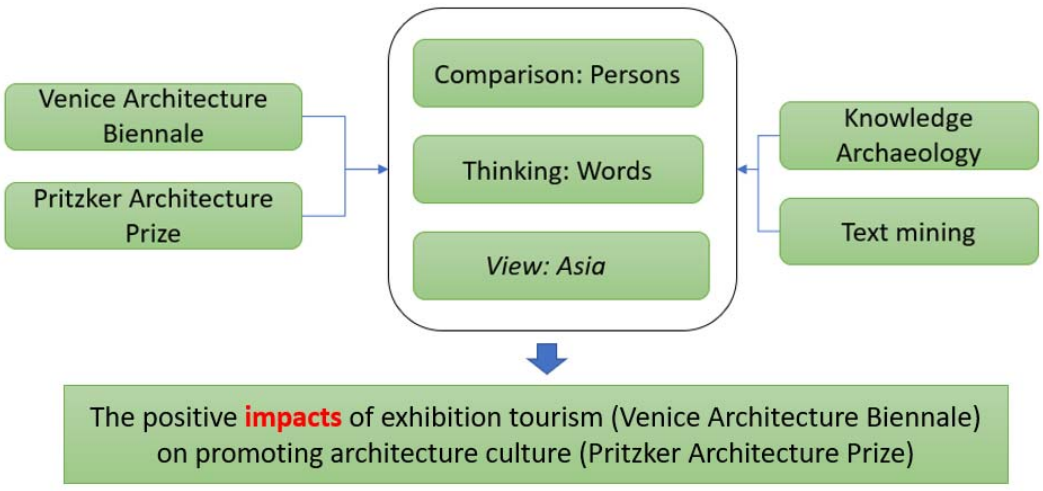
Chapter 4 used a philosophy method called knowledge archaeology and text mining to identify the relations between the Venice Architecture Biennale (in Italy) and the Pritzker Architecture Prize. And it showed that the exhibition had positive impacts on architectural culture with the SDGs 12.b target. It attempts to analyze the fractures and discontinuities from the historical archives of the architectural "fragments of the past," the architecture exhibition, and the Pritzker Architecture Prize.

The first question is "Who is speaking?[4]" (Foucault, 1970). This question came from Foucault's Knowledge Archaeology. "Who has a good reason to use this type of language among all speaking individuals? Who is the owner of this language? Who accepts his particularity and privileged status from this owner?" Thus, finding this "who" became the main objective of this study. We know that awards for architecture—especially the awards recognized by the authoritative institution (e.g. Pritzker Architecture Prize)—are a recognition of architects' design works. Therefore, before the architects' prizes are confirmed, in addition to the architectural design practice, where is the architect's display space? The answer is the

[4] This is another concept in knowledge archaeology: it means that in the whole discourse, who has a good reason to use this type of discourse? Who is the owner of this kind of discourse?

476 architectural exhibition. Thus, for architecture exhibitions and architecture prizes, "Who
477 speaks?"

478 The other question is “Can we ‘curate the whole world’” (Obrist, 2004)? The term
479 "curating" is derived from the Latin curare, meaning "care for the art in museums." The concept
480 of curating has evolved since then. Just as art is no longer confined to traditional categories,
481 curating is no longer confined to exhibits or art galleries. It has been extended to cross all
482 boundaries. The term curation, despite its definition being vague and specialized, is being
483 increasingly used. For example, people can "curate" websites, etc. It is time for us to rediscover
484 the pioneering history of art curation as a toolbox in 21st-century society. Moreover, John
485 Brockman's annual question on his Edge website, www.edge.org, was: “How does the Internet
486 change the way you think?” A follow-up question was put forth, “Can that thinking affect the
487 Internet?” It is called the “Edge Questions” (Hansen et al., 2019). In the same way, another
488 relative question began to emerge: Did the thinking of architecture exhibitions and curation
489 influence the development of architecture?



490 Figure 8 The logical model

491

492 *4.2.* Literature Review

493

494 McCann (McCann, 2010) reviewed Donald McNeall's The Global Architect: Firms, Fame
495 and Urban Form (McNeill, 2009) and found three points:

496 First, the book makes it clear how important image is to these élite design professionals. A
497 second issue is gender: Zaha Hadid is the only woman who is generally considered a
498 starchitect. Why and how is this the case? Third, the book also left me wondering about the
499 identities, practices, and global reach of other, differently oriented architects.

500 It shows that a connection between the Pritzker Prize and the Venice Biennale was a form
501 of professional recognition and observation of how these changes have occurred over the years.
502 The Venice Architecture Biennale, according to official statistics, was held for 16 sessions
503 (Table 1). The Venice Architecture Biennale was officially defined to start in 1980. Different
504 scholars have varied understandings of the timing of the first Venice Architecture Biennale.
505 Enzo Di Martino believes that the Venice Architecture Exhibition was first established in 1972
506 (Di Martino, 2005). The previous book believed that four years—1972, 1974, 1975, and 1979—
507 of important accumulations and preparations have played an important role (a process of
508 accumulation). During this period, except for the lack of a clear curator and curatorial theme in

509 1972, each Biennale[5] has had an independent theme and curator since 1975. However, if only
510 symbolically, the Visual Arts Section of the Venice Biennale directed by Vittorio Gregotti
511 hosted a first exhibition in 1975 that included both art and architecture; thus, it would be
512 incorrect to claim the 1972 exhibition as a first edition of the Architecture Biennale. It was a
513 background "when architecture became art" (Mandarano, 2020). Moreover, the Venice
514 Architecture Biennale should be contextualized in the inherent transdisciplinarity of the Venice
515 Biennale that started in 1932. Therefore, this paper identified the first Venice Biennale in 1980
516 and compared it with the Pritzker Prize.

517 Previous studies of the Venice Architecture Biennale include a study of the exhibition
518 content in a single year (Attiwill and di Venezia, 2018; Wenjun and Xuanbing, 2018), the
519 perspective of philosophy on the development of exhibition (Figueiredo, 2018)(Giamarelos,
520 2019), pavilion and architecture study (Greenaway et al., 2020)(Paine and Holden, 2019), and
521 history reviews (Cheng, 2018)(Paine and Holden, 2019). Dudley (Dudley, 2019) studied the
522 new categories of architectural sculpture and conceptual architecture. Mandarano (Mandarano,
523 2020) studied the Venice Architecture Biennale, Chicago Architecture Biennial, and Storefront
524 for Art and Architecture and highlighted the convergence between art and architecture and the
525 relationships between the public and the (built) environment.

[5] Biennale means an exhibition held every two years. It is most commonly used within the art world to describe large-scale international contemporary art exhibitions. In this paper, it refers to the Venice Architecture Biennale.

However, The Pritzker Architecture Prize was established by the Hyatt Foundation in 1979 and is awarded to a living architect every year to recognize the outstanding qualities of intelligence, imagination, and responsibility in architectural design. Art makes a lasting and outstanding contribution to the built environment and human nature. The Pritzker Architecture Awards were held for a total of 41 sessions (Table 2), with a total of 42 groups and 46 people between 1979 and 2019[6].

Previous research of the Pritzker Architecture Prize are mainly related to studies on the characteristics of the laureate architects and their works (Lingzhi and Mengjie, 2017)(WANG and LIU, 2017), a horizontal comparison between prizes and philosophy (KALAYCI and RAHMOUN, 2019)(RAHMOUN, 2018), and the history or official reports about the laureates each year (Mahdavinejad and Hosseini, 2019)(WANG and LIU, 2017)(Peltason and Yan, 2017). Moreover, the question of gender was largely studied within the Pritzker Architecture Prize in previous research (Stratigakos, 2016a)(Stratigakos, 2016b)(Walker, 2000). Among them, Heynen (Heynen, 2012) theoretically unraveled why the gender identity of “star architects” tends to be male with different factors: (1) the traditional architects' role has been gendered male through the “genius” concept; (2) the words used more “masculine” than “feminine” features; and (3) the authorship and profession self-conception benefits men more than women.

[6] "Group" takes architectural design firm as unit, such as Kazuyo Sejima & Ryue Nishizawa. Two architects from different "groups" won the Prize in 1988.

In summary, most of the previous studies on the Venice Architecture Biennale and the Pritzker Architecture Award were independent. There are few related studies comparing the two. Therefore, this article compares the biennale with the prize as well as studies their correlations from three aspects: persons, words, and Asia.

Table 1. The Information Summary of Venetian Architecture Biennale.

DATE	NO.	TITLE	CURATOR	NATION
1975	/	Visual Arts and Architecture	Vittorio Gregotti	Italy
1976.07.31-10.10	/	Europe-America, historic center-suburb	Franco Rgggi	Italy
1979.10.06-11.04	/	Architectural theater of the World	Paolo Portoghesi	Italy
1980.07.27-10.20	1	The Present of the Past	Paolo Portoghesi	Italy
1981.11.20-1982.01.06	2	Architecture in Islamic Countries	Paolo Portoghesi	Italy
1985.07.20-09.29	3	Progetto	Aldo Rossi	Italy
1986.07.18-09.28	4	Hendrik Petrus Berlage, Design	Aldo Rossi	Italy
1991.09.08-10.06	5	International Architecture Exhibition	Francesco Dal Co	Italy
1996.09.15-11.07	6	Sensors of the Future, the Architect as Seismograph	Hans Hollein	Austria
2000.06.18-10.29	7	Less Aesthetics, More Ethics	Massimiliano Fuksas	Italy
2002.09.08-11.03	8	Next	Deyan Sudjic	UK
2004.09.12-11.07	9	Metamorph	Kurt W · Foster	Italy
2006.09.10-11.19	10	Cities: Architecture and Society	Richard Burdett	UK
2008.09.14-11.23	11	Out There, Architecture Beyond Building	Aaron Betsky	USA
2010.08.28-11.22	12	People Meet in Architecture	Kazuyo Sejima	Japan
2012.08.29-11.22	13	Common Ground	David Chipperfield	UK
2014.06.07-11.23	14	Fundamentals	Rem Koolhaas	Netherlands
2016.05.28-11.27	15	Reporting from The Front	Alejandro Aravena	Chile
2018.05.26-11.25	16	Freespace	Yvonne Farrell and Shelley McNamara	Ireland

550 Table 2. The Information Summary of Pritzker Architecture Prize.

DATE	SEASON	LAUREATES	NATION	DATE	SEASON	LAUREATES	NATION
1979	1	Philip Johnson	USA	1999	21	Sir Norman Foster	UK
1980	2	Luis Barragán	Mexico	2000	22	Rem Koolhaas	Netherlands
1981	3	James Stirling	UK	2001	23	Jacques Herzog&Pierre de Meuron	Switzerland
1982	4	Kevin Roche	USA	2002	24	Glenn Murcutt	Australia
1983	5	Ieoh Ming Pei	USA	2003	25	Jorn Utzon	Denmark
1984	6	Richard Meier	USA	2004	26	Zaha Hadid	UK
1985	7	Hans Hollein	Austria	2005	27	Thom Mayn	USA
1986	8	Gottfried Boehm	Germany	2006	28	Paulo Mendes da Rocha	Brazil
1987	9	Kenzo Tange	Japan	2007	29	Richard Rogers	UK
1988	10	Gordon Bunshaft	USA	2008	30	Jean Nouvel	France
		Oscar Niemeyer	Brazil	2009	31	Peter Zumthor	Switzerland
1989	11	Frank O. Gehry	USA	2010	32	Kazuyo Sejima &Ryue Nishizawa	Japan
1990	12	Aldo Rossi	Italy	2011	33	Eduardo Souto de Moura	Portugal
1991	13	Robert Venturi	USA	2012	34	Wang Shu	China
1992	14	Alvaro Siza	Portugal	2013	35	Toyo Ito	Japan
1993	15	Fumihiko Maki	Japan	2014	36	Shigeru Ban	Japan
1994	16	Christian de Portzamparc	France	2015	37	Frei Otto	Germany
1995	17	Tadao Ando	Japan	2016	38	Alejandro Aravena	Chile
1996	18	Rafael Moneo	Spain	2017	39	Rafael Aranda&Carme Pigem&Ramon Vilalta	Spain
1997	19	Sverre Fehn	Norway	2018	40	Balkrishna Doshi	India
1998	20	Renzo Piano	Italy	2019	41	Arata Isozaki	Japan

551

552 *4.3.* Materials and Methods

553

4.3.1. Text Mining

Text mining, also referred to as text data mining, similar to text analytics, is the process of deriving high-quality information from text. It involves "the discovery by computer of new, previously unknown information, by automatically extracting information from different written resources." Written resources may include websites, books, emails, reviews, and articles. High-quality information is typically obtained by devising patterns and trends by means such as statistical pattern learning. According to Hotho et al. (2005) we can differ three different perspectives of text mining: information extraction, data mining, and a KDD (Knowledge Discovery in Databases) process. Text mining usually involves the process of structuring the input text (usually parsing, along with the addition of some derived linguistic features and the removal of others, and subsequent insertion into a database), deriving patterns within the structured data, and finally evaluation and interpretation of the output. 'High quality' in text mining usually refers to some combination of relevance, novelty, and interest. Typical text mining tasks include text categorization, text clustering, concept/entity extraction, production of granular taxonomies, sentiment analysis, document summarization, and entity relation modeling (i.e., learning relations between named entities).

Text analysis involves information retrieval, lexical analysis to study word frequency distributions, pattern recognition, tagging/annotation, information extraction, data mining techniques including link and association analysis, visualization, and predictive analytics. The overarching goal is, essentially, to turn text into data for analysis, via application of natural

575 language processing (NLP), different types of algorithms and analytical methods. An important
576 phase of this process is the interpretation of the gathered information.

577 A typical application is to scan a set of documents written in a natural language and either
578 model the document set for predictive classification purposes or populate a database or search
579 index with the information extracted. The document is the basic element while starting with
580 text mining. Here, we define a document as a unit of textual data, which normally exists in
581 many types of collections.

582

583 4.3.2. Knowledge Archaeology

584 When the method of history transitioned from restoring documents to studying the content
585 of the documents or to formulating the documents, its methodology crossed boundaries and
586 became an artificial and subjective history of knowledge and thought. Therefore, when "history
587 is written by the victors," history is no longer the original history, nor is it the original
588 appearance of this knowledge and ideas when they were first born. Michel Foucault proposed
589 a clear "Knowledge Archaeology" method: rejecting the use of historical methods in the study
590 of knowledge and thought, but reducing them to the discourse[7] itself. This is a background that
591 is formed, and restored only. People do not have to try to find the meaning behind them and do
592 not have to look for the ideas of their authors (Foucault, 1973, 1972):

[7] Discursive formation or discursive practice is from Foucault's Knowledge Archaeology. It first came from the study of Foucault's concept history and Walter Benjamin's Enlightenment on the mode of production and form.

It (Knowledge Archaeology) is only concerned with the discourse itself. Therefore, the method based on knowledge archaeology does not have to summarize and conclude. It also does not discard contradictions and individuality. Instead, it restores everything in the discourse itself, without thinking and evaluating. But it is in this process of reduction, in the process of returning our knowledge and thoughts (the original one) to discourse. We are able to recognize the knowledge and thoughts and return to rich, complex, uncertain, contradictory, disorderly, diffused pieces of knowledge and thoughts.

Back to the Domain-specific Knowledge Graph for Architecture Exhibitions and Awards. If a lot of history is that of being "murdered[8]," then this paper tries to research the real history of the Venice Architecture Biennale and the Pritzker Architecture Prize. This paper constructed the domain-specific knowledge graph (DKG)[9] of the Venice Architecture Exhibition and the Pritzker Architecture Prize. By directing and abstracting comparisons of the data between these two parts, the results will be directly presented.

"The artwork 'placed on display' by my environment was the architectural container… at the same time it was designed to be a display container for the viewers inside (observing themselves)…"(Graham, 1978). The exhibitions are considered primarily as institutions as a

[8] This word comes from *Knowledge Archaeology*. It means that real history is often subjectively misunderstood by people, leading to the "murder" of real history.

[9] Domain-specific-specific Knowledge Graph (DKG） has the characteristics of accurate quality, full scale and real-time, and is widely used in big data statistical processing and other related fields.

610 place (displaying, exhibiting, curating, and creating value) of interaction of exhibits, spatial
611 layout, presentation, and the accompanying text selection (Pešić, 2013) (Blau, 2010). Moreover,
612 architectural exhibitions are powerful enough (produce and expose new ways of knowledge and
613 thinking) to define the architecture research field beyond architecture's physical production
614 (KÖSE, 2019). Brown & Szacka (Alexandra Brown and Szacka, 2019) studied Boyarsky's
615 political and pedagogical project for the Architectural Association's AA125 exhibition during
616 the 1970s. However, offering multiple perspectives on the topic of architecture exhibition as an
617 environment with a crucial conceptual framework for understanding architecture exhibition
618 processes and practices (Alex Brown and Szacka, 2019). Moreover, some recent research shows
619 that the power of the exhibition goes far beyond the field of architecture and can affect the
620 revitalization and development of the field (Cai et al., 2020c, 2020b).
621 Szacka (Szacka, 2011) studied the first Venice Architecture Biennale (1980) and provided
622 an international stage with an enduring impact on architectural culture for postmodernism and
623 to this day. Moreover, Szacka (Szacka, 2012) first detailed historical accounts of the exhibition
624 (1980 Venice Architecture Biennale) and demonstrated a shift in three ways: (1) in the
625 development of architectural exhibitions as a "genre" of cultural manifestations, (2) in the
626 history of the Venice Biennale, and (3) in the history of postmodernism. The Venice Biennale
627 of Architecture is an integral part of contemporary architectural culture: (1) it is a vital dual
628 presence both as a register and in infrastructure; (2) it is a guide both for architecture and for
629 international audiences (Levy et al., 2010).
630

4.4. Comparison: Persons

From participating in exhibitions to getting prizes: The data analysis (1979-2019) (Figure 9) shows that 26 groups were awarded the Pritzker Prize after participating in the Venice Architecture Biennale. The number of winners (got the Pritzker Prize after participating in the Venice Architecture Biennale) accounted for 62% of the total laureates (more than half). James Stirling (1981 Laureate), Richard Meier (1984 Laureate), Hans Hollein (1985 Laureate), Aldo Rossi (1990 Laureate), and Alvaro Siza (1992 Laureate), all participated in the Venice Architecture Biennale. Among them, Rafael Moneo (1996 Laureate) participated in the exhibition and won the Pritzker Prize the same year. If you count the 6 laureates who participated in the Venice Architecture Biennale after they won the Prize, the total number of participants account for nearly 80% of the total laureates. The main part was postmodernist architecture[10] (Branscome, 2017)(Farrell and Furman, 2019)(Alexandra Brown and Szacka, 2019) (Figure 11): From the perspective of years (Figure 12), 8 architects participated in the Venice Architecture Biennale in 1996 and then won the Pritzker Architecture Prize. The number in 1976 was 5. From the analysis of the architectural side, the 1970s was the era of the rise of

[10] POSTMODERNISM IN ARCHITECTURE defined by RIBA: "Postmodernism is an eclectic, colorful style of architecture and the decorative arts that appeared from the late 1970s and continues in some form today. It emerged as a reaction to Modernism and the Modern Movement and the dogmas associated with it. By the 1970s Modernism had begun to seem elitist and exclusive, despite its democratic intentions. The failure of building methods and materials (shown in the collapse of Ronan Point, a tower block in east London in 1968) and alienating housing estates was a focus for architects and critics in the early 1970s."

postmodernist architecture. The movement reached its climax in the 1990s. Furthermore, it was found that 17 groups (out of 26 groups in total) could be classified as the architects of postmodernist architecture, accounting for nearly 80%.

From curating to laureates: Aldo Rossi was the first to win the prize as a curator. Winners of the Pritzker Architecture Awards including Hans Hollein, Kazuyo Sejima, Alejandro Aravena, and Rem Koolhaas were also curating the Venice Architecture Biennale. In other words, the curating influenced the direction of the Pritzker Architecture Prize. Moreover, 6 of the 42 laureates curated the Venice Architecture Biennale (Figure 10). Among them, Alejandro Aravena (2016 Laureate) and Kazuyo Sejima (2010 Laureate) were the curators of the exhibition in the same year when they won the Prize.

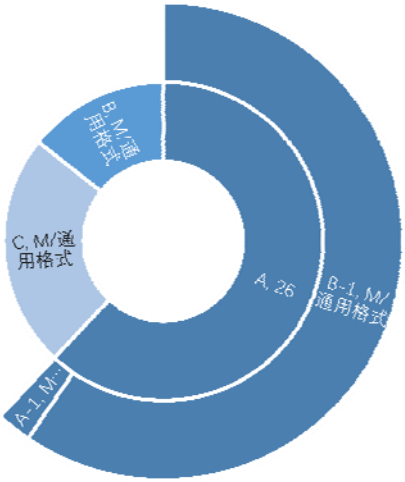


Figure 9 The data of participating in the exhibition and getting the prize

A: The number of participating in the exhibition before getting the prize

A-1: The number of participating in the exhibition and getting the prize in the same year

A-2: The number of others

B: The number of getting the prize before participating in the exhibition

C: The number of others

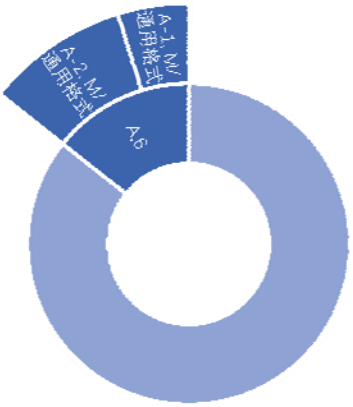


Figure 10. The data of curators

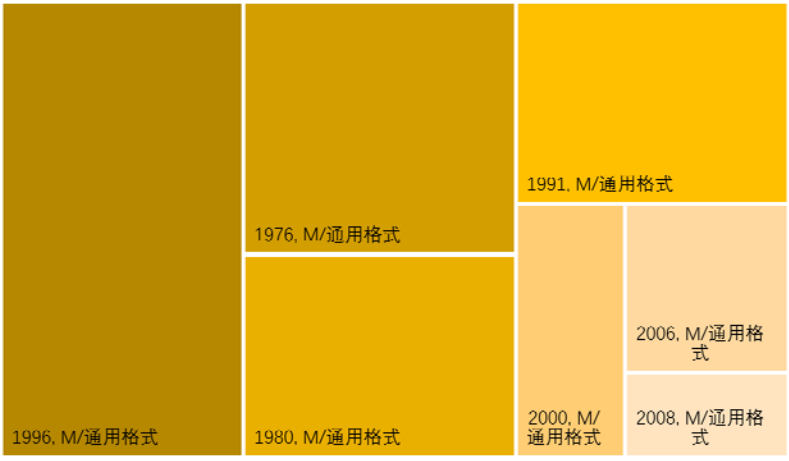
A: The number of curators of the Venice Architecture Biennale

A-1: The number of as a curator and laureate in the same year

A-2: The number of others

B: The number of others

Figure 11 The types of architects



669 Figure 12 The data of participating in the exhibition

670

671 *4.5.* Thinking: Words

672 Titles of the Venice Architecture Biennale and keywords of jury citation the Pritzker
673 Architecture Prize (

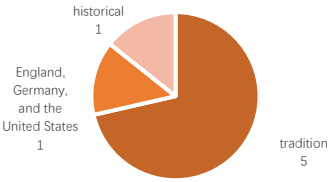
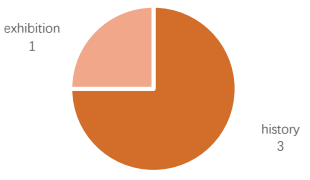
674 Table 3) [11] show that: analyzing the keywords of the Venice Architecture Biennale in
675 1976, 1980, 1991, 1996, 2006, and 2008 as a starting point. It was found that titles of Venice
676 Biennale of Architecture and keywords of the jury citation for the Pritzker Architecture Prize
677 and keywords with different occurrences are closely related and correspond one-to-one. And
678 the expressions about these words are the reproduction with the same meaning or the
679 reproduction with the same word. For example, the title of the 1976 Venice Architecture
680 Biennale (including James Stirling, Richard Meier, and the other three) is "Europe-America,
681 historic center-suburb." Then James Stirling' jury citation including the "tradition" and

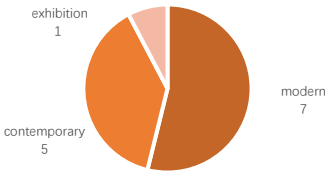
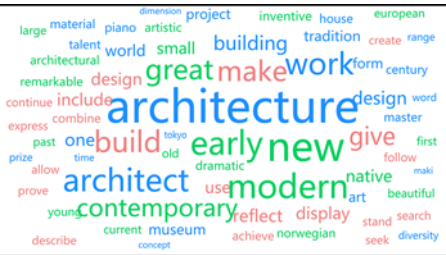
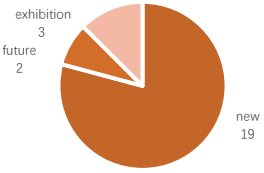
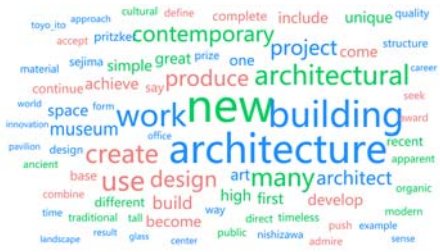
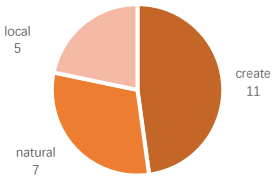
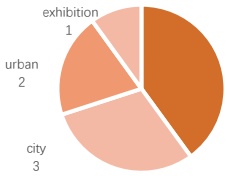
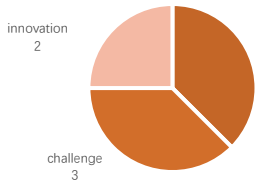
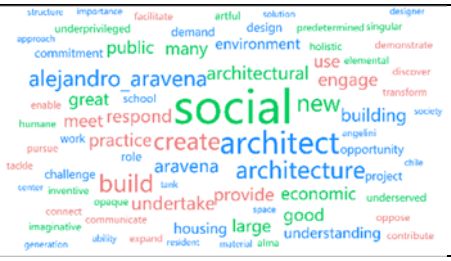
[11] From ***AIテキストマイニングの3つ*** which most used in Japan Utilize text mining tools.

"England, Germany, and the United States" when he won the Pritzker Architecture Prize in 1981.

And the title of the 1996 Venice Architecture Biennale (including Rafael Moneo, etc.) is "Sensors of the Future, the Architect as Seismograph." Then Rafael Moneo's jury citation including the twice "future" when he won the Pritzker Architecture Prize in 1981. Furthermore, in the keywords of the jury citation for the Pritzker Architecture Prize, the word "exhibition" appeared six times. However, it shows that the exhibition itself has a certain influence in Pritzker's evaluation criteria.

Table 3. Annual summary comparison of Titles of Venice Biennale of Architecture and Keywords of Jury Citation of the Pritzker Architecture Prize (Illustrated by author).

Years and Titles of Venice Biennale of Architecture	Keywords of Jury Citation of the Pritzker Architecture Prize		Laureates of the Pritzker Architecture Prize Who Participated the Venice Biennale of Architecture Before	
	Word frequency	Word cloud: n.(blue)/adj.(green)/v.(orange)		
1976 Europe-America, historic center-suburb			James Stirling	1981
			Richard Meier	1984
			Hans Hollein	1985
			Aldo Rossi	1990
			Alvaro Siza	1992
1980 The Present of the Past			Frank Gehry	1989
			Robert Venturi	1991
			Rem Koolhaas	2000
			Arata Isozaki	2019
1991 Intenational Achitecture Exhibition			Sverre Fehn	1997
			Renzo Piano	1998
			Jacques Herzog and Pierre de Meuron	2001

			Fumihiko Maki	1993
1996 Sensors of the Future, the Architect as Seismograph			Rafael Moneo Norman Foster Jorn Utzon Zaha Hadid Jean Nouvel Peter Zumthor Kazuyo Sejima and Ryue Nishizawa Toyo Ito	1996 1999 2003 2004 2008 2009 2010 2013
2000 Less Aesthetics, More Ethics			Shigeru Ban Rafael Aranda, Carme Pigem and Ramon Vilalta	2014 2017
2006 Cities:Architecture and Society			Richard Rogers Wang Shu	2007 2012
2008 Out There, Architecture Beyond Building			Alejandro Aravena	2016

693

694 *4.6.* View: Asia

695 First, by focusing on the Asian architects through an analysis of the domain-specific

696 knowledge graph of the Pritzker Architecture Prize Laureates, we find that there was a total of

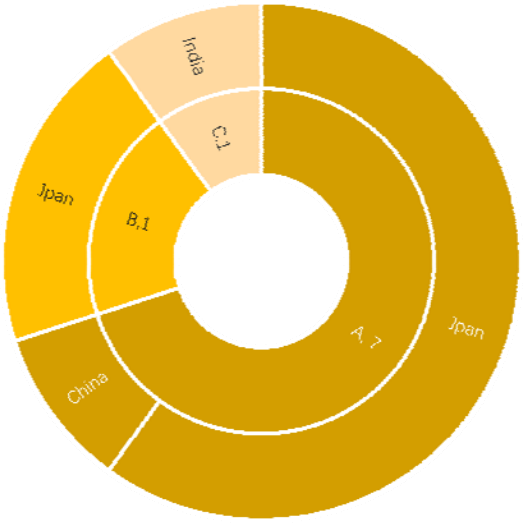
46 people[12] from 5 states (Figure 13). When countries are considered the statistical unit, we find that architects from Japan and the United States are both ranked No. 1 in the world, with 8 architects from each country. When ranking by continent, Asia comes in second, higher than North America and South America.

Second, 7 of the 10 architects who won the prize participating in the Venice Architecture Biennale later received the Pritzker Architecture Prize (Figure 14). The other two architects received the prize before participating in the exhibition. The ratio of the two is 90% of the total number. This confirms that Asian architecture has influenced architectural trends through architecture exhibitions once again. Among them, Metabolism[13] led by Japanese architects influenced the development of world architecture for a period of time (1960-1970) (Pernice, 2004). Japanese architect Kazuyo Sejima curated the Venice Architecture Biennale in 2010. Asian architects, as one of the curatorial forces, have recently begun to present themselves to the world.

[12] The United States: 8 people, Japan: 8 people, Spain: 4 persons, United Kingdom: 4 persons, Switzerland: 3 persons, Germany / France / Brazil / Italy / Portugal: 2 persons, China / Australia / Norway / Denmark / Netherlands / Mexico / Austria / Chile / India: 1 person.

[13] Metabolism was a post-war Japanese architectural movement that fused ideas about architectural megastructures with those of organic biological growth. It had its first international exposure during CIAM's 1959 meeting and its ideas were tentatively tested by students from Kenzo Tange's MIT studio.

710 Figure 13. Statistics of the regional distribution of the Pritzker Prize winners



711 Figure 14 The data of participating in the exhibition and getting the prize in Asia

712 A: The number of participating in the exhibition before getting the prize

713 B: The number of getting the prize before participating in the exhibition

714 C: The number of others

715

716 *4.7.* Discussion of Exhibitions- Venice

717 This article attempts to analyze the fractures and discontinuities from the historical
718 archives of the architectural "fragments of the past," the architecture exhibition, and the Pritzker
719 Architecture Prize.

720 The first question is "Who is speaking?[14]" (Foucault, 1970). This question came from
721 Foucault's Knowledge Archaeology. "Who has a good reason to use this type of language
722 among all speaking individuals? Who is the owner of this language? Who accepts his
723 particularity and privileged status from this owner?" Thus, finding this "who" became the main
724 objective of this study. We know that awards for architecture—especially the awards
725 recognized by the authoritative institution (e.g. Pritzker Architecture Prize)—are a recognition
726 of architects' design works. Therefore, before the architects' prizes are confirmed, in addition
727 to the architectural design practice, where is the architect's display space? The answer is the
728 architectural exhibition. Thus, for architecture exhibitions and architecture prizes, "Who
729 speaks?"

730 The other question is “Can we ‘curate the whole world’” (Obrist, 2004)? The term
731 "curating" is derived from the Latin curare, meaning "care for the art in museums." The concept
732 of curating has evolved since then. Just as art is no longer confined to traditional categories,

[14] This is another concept in knowledge archaeology: it means that in the whole discourse, who has a good reason to use this type of discourse? Who is the owner of this kind of discourse?

curating is no longer confined to exhibits or art galleries. It has been extended to cross all boundaries. The term curation, despite its definition being vague and specialized, is being increasingly used. For example, people can "curate" websites, etc. It is time for us to rediscover the pioneering history of art curation as a toolbox in 21st-century society. Moreover, John Brockman's annual question on his Edge website, www.edge.org, was: “How does the Internet change the way you think?” A follow-up question was put forth, “Can that thinking affect the Internet?” It is called the “Edge Questions” (Hansen et al., 2019). In the same way, another relative question began to emerge: Did the thinking of architecture exhibitions and curation influence the development of architecture?

5. The Impacts of Exhibition Tourism on Promoting Local Economy and Population: The Case from Japan

5.1. The Logical Model

Based on the above parameters, these three aspects (sustainable tourism, economics, and the population) and their corresponding data (number of tourists, per capita income, and household number) are used for the empirical research in this paper (Figure 15). In this way, the current study attempts to fill the related research gap by empirically investigating the correlation between sustainable tourism, economics, population, and exhibition-driven tourism.

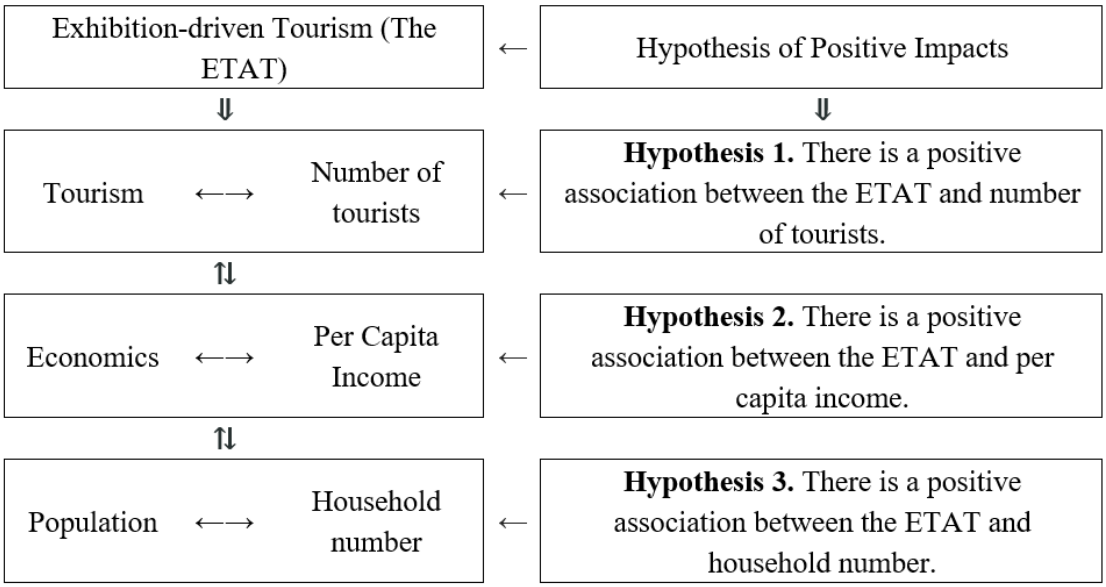


Figure 15. The logical model.

The purpose of this research is to study the correlations between sustainable tourism, economics, population, and exhibition-driven tourism. Descriptive statistics and a correlation analysis (a one-way ANOVA and a Pearson correlation analysis in SPSS26) were performed on the three hypotheses (Figure 1) and their panel data (Sarker et al., 2018). At the same time,

the conclusions of this paper provide some positive support and show the impact of Japanese art exhibitions. The hosting areas can achieve their goal of sustainable development through the direct impact of tourism via exhibition-driven tourism. The present study successfully fills this void (the correlation between sustainable tourism, economics, population, and exhibition-driven tourism).

5.2. Materials and Methods

5.2.1. From Japanese Art Festivals to ETAT

According to the statistics of this article, more than 120 art exhibitions were created in Japan from 1961 to 2019 (Figure 16). During this period, only seven exhibitions were closed after several sessions. Among them, new art exhibitions began to explode in 2007; 92% of these exhibitions were successful, according to the statistics (Figure 17).

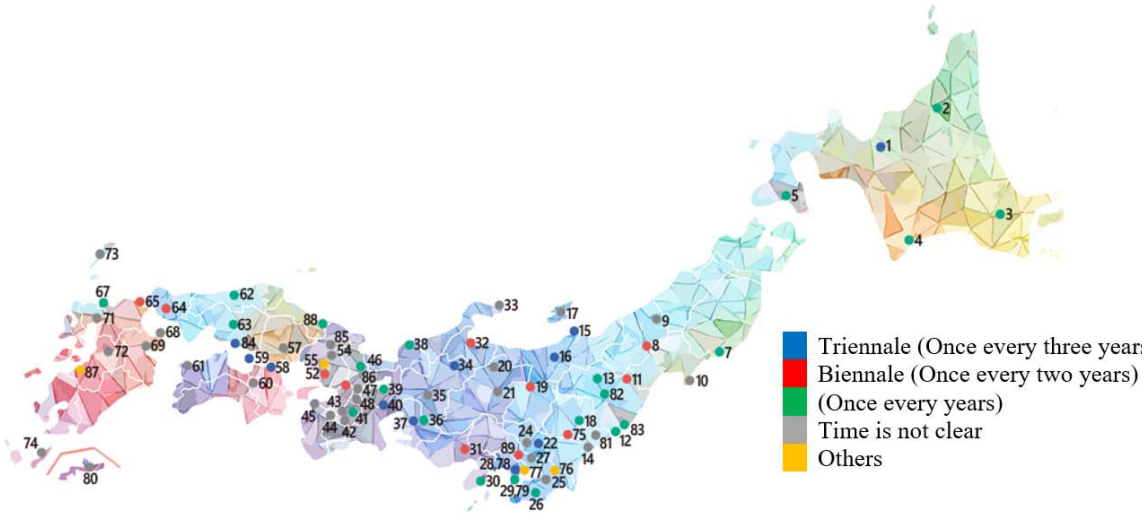


Figure 16**. A** map of Japanese Art Festivals.

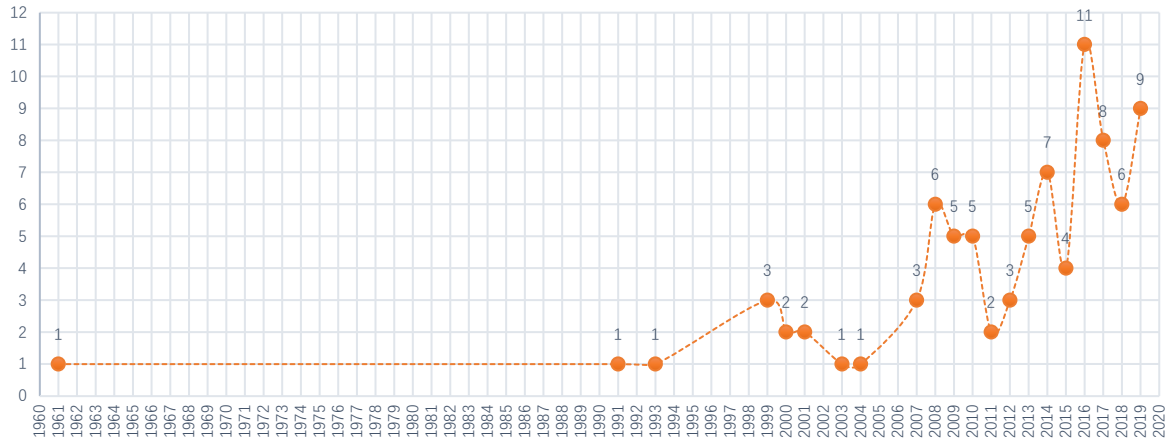


Figure 17. Statistics of the establishment time and number of art exhibitions (1961–2019).

5.2.2. The ETAT

Ever since the 1980s, culture has been recognized as an essential amenity to improve the general quality of life of urban centers and ex-industrial cities (Florida, 2004; Landry, 2012). Scholars have worked to comprehend the potential of art and culture in remote shrinking contexts (Bell and Jayne, 2010; Gibson, 2010; Matarasso, 2005). However, research on this matter is still at an early stage, and more in-depth studies would improve our general understanding of the topic (Duxbury and Campbell, 2011).

The ETAT has been described as unique in its quality and scale by media abroad and is highly regarded as a new model for art exhibitions. Community building through art has drawn attention as the 'Tsumari Approach' and has been referred to by curators and people in the art industry in the US, Europe, and Asia, as well as by the delegations of local governments, international conferences, and symposia ("About Triennale," n.d.). The ETAT emerged from a prefectural incentive that pushed regions to rely on the specificities of their environments to overcome socio–economic decline (Kitagawa et al., 2015; Klien, 2010).

Every three years, artists from all countries are invited to create site-specific pieces of artwork engaging with the specificity of the environmental, social, and cultural context of the Echigo–Tsumari areas (Table 4). Since the first iteration of the ETAT, more than a thousand interventions, including sculptures, sound works, theatrical productions, art installations, performances, musical shows, landscape designs, urban design projects, and architectural constructions, have been dispersed across this 762 km^2 area. The ETAT areas encompass Tokamachi, Kawanishi, Matsudai, Matsunoyama, Nakasato, and Tsunan, which are all a part of Niigata (Figure 18Figure 19).

Figure 18. Niigata in Japan.

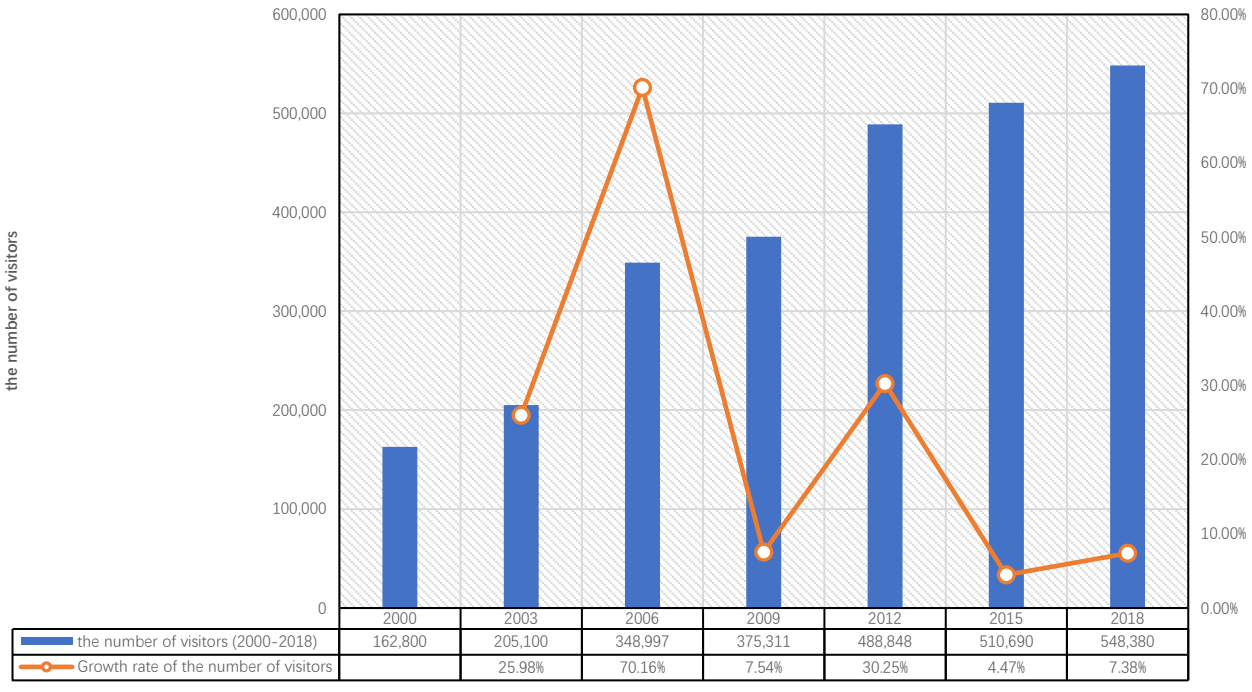
Figure 19**.** The Echigo–Tsumari Art Triennial (ETAT) areas.

Table 4**.** Some concepts of the ETAT.

Concept	**Main contents**
Humans are part of nature	As our civilization reaches its critical juncture, the rich nature of Satoyama's presence in Echigo–Tsumari can impel us to review our attitudes toward the environment, calling into question the modern paradigms that have caused so much environmental destruction.
Satoyama and Art	The nature and lifestyle of the Satoyama in the Echigo–Tsumari environment seems to inspire artists to recover the connections and collaborations that art once had but have almost been lost.
Cooperation beyond generations, regions, and genre	The artists' passion and openness to learning inspires local people who engage with the artwork, not as spectators, but as collaborators.
Festival	In addition to the Triennale itself, visitors can enjoy the Summer Festival ("Daichi-no-matsuri") and the winter "Snow Art Project", which coincide with local festivals and traditional events throughout

	the year. The “Daichi-no-matsuri” takes place in the years between the Triennale, welcoming visitors and opening various works of art to the public.
Events and performances	Performances and entertainment from all over the world are presented on the unique stage of Echigo–Tsumari set against the area’s artwork and terraced rice fields. Visitors can enjoy local expressions and entertainment.

803 Based on the statistics of the number of visitors from 2000 to 2018, it can be found that: (1)
804 The number of visitors has been increasing every year, indicating that the recognition and
805 influence of the ETAT itself are constantly increasing; (2) based on the annual growth rate, 2006
806 (with a growth rate of 70.16%) was the fastest-growing year, and the ETAT’s impact on these
807 areas is positive (Figure 20).



808

809 Figure 20. Changes in the number of visitors over the years (2000–2018).

810

Kitagawa (Kitagawa, 2016; Klien, 2010) explored the relationship between man and nature in this exhibition, while Boven et al. (Boven et al., 2017; Favell, 2011) researched how the ETAT features abandoned schools and how these schools can help deprecated areas achieve a cultural revival.

According to previous studies, the exhibition (Triennale) is rarely used as a social force to comprehensively evaluate and demonstrate its role in exhibition-driven tourism. Therefore, the current research attempts to fill this gap by empirically investigating the correlation between sustainable tourism, economics, population, and exhibition-driven tourism.

5.2.3. Panel Data Collection

Panel data contains observations of multiple phenomena obtained by the objects over multiple time periods. Thus, panel data clustering is an essential part of decision–making and expert analysis. (Islam, 1995)(Baltagi, 2008).Di Lascio et al. (Di Lascio et al., 2011) used panel data analysis to study the relationship between cultural tourism and temporary art exhibitions. Moreover, panel data is more informative than other types of data because they provide more variability, so its estimation is more efficient (Di Lascio et al., 2011). Panel data was used to analysis the impact of tourism on the economy by many studies. Naudé and Saayman (Naudé and Saayman, 2005) identified five main areas that are important for empirical research in tourism.. There are many different estimation methods available (Hsiao, 2014). Bhattarai (Bhattarai, 2019) found that fixed and random effects estimates indicate that

investment, not aid, is a factor that promotes growth when reviewing important applications of panel data models.

In this study, data were collected based on three aspects (number of tourists, per capita income, and household number), which are explained as follows (): (Table 51) The areas were divided into two types (the ETAT areas and Niigata). (2) Categorical data included the hosting year of the ETAT (2000/2003/ 2006/2009/2012/2015/2018) (hereafter YES), the years between the hosting of the ETAT (2001/2002/2004/2005/2007/2008/2010/2011/2013/2014/2016/2017) (hereafter BETWEENNESS), and the year before the hosting of the ETAT (1990–1999) (hereafter NO).

Table 5**.** Observed variables: Name, type, and data source.

Variables	Name	Type	Sources
X	The ETAT	Categorical [1]	ETAT Official website
YES	the hosting year of the ETAT		
BETWEENNESS	the year between the hosting of the ETAT		
NO	the year before the hosting of the ETAT		
Y1	Growth rate of number of tourists in ETAT areas [3]	Continuous	Our elaborations on NSY [2] data sets
Y11	Number of tourists in ETAT areas		
Y111	Number of tourists in Niigata		
Y1111	Growth rate of the number of tourists in Niigata [3]		
Y2	Growth rate of the per capita income in ETAT areas [3]	Continuous	Our elaborations on NSY data sets
Y22	Per capita income of ETAT areas (yen in thousands)		
Y222	Per capita income of Niigata (yen in thousands)		
Y2222	Growth rate of the per capita income in Niigata [3]		
Y3	Growth rate of household number in ETAT areas [3]	Continuous	

Y33	Household number in ETAT areas	Our
Y333	Household number in Niigata	elaborations on
Y3333	Growth rate of household number in Niigata [3]	NSY data sets

[1] Categorical (YES/BETWEENNESS/NO); [2] NSY = Niigata Statistical Yearbook; [3] Compared with the previous year.

5.2.4. Simple Linear Regression (SLR)

The paper used the SPSS26 (IBM, New York, United States). A correlation analysis is a widely used method evaluating the relationship between two variables. A high correlation means these relationship of variables are strong, (Franzese and Iuliano, 2019; Liang et al., 2020; Yu et al., 2020). Two random variables (X and Y) are normally tested in the Simple Linear Regression (SLR)(Pearson, 2011). P–value help researchers deciding reject or fail to reject a hypothesis. If the p–value $<$ 0.05, the analysis is significant for the next step.

5.2.5. The One–Way ANOVA Analysis:

A one–way analysis of variance (ANOVA) was used to determine whether there were any statistically significant differences between the means of three or more independent (unrelated) groups. It is a technique that can be used to compare by an F distribution. A one–way ANOVA compares the means between related groups and determines whether these means are statistically significantly different from each other (Howell, 2009).

5.1. Number of Tourists

5.1.1. The ETAT and Number of Tourists

First, according to the descriptive statistics, the annual change in the number of tourists in ETAT areas (Y11) can be seen intuitively (Figure 21). (1) There is a positive correlation between the tourist number (Y11) and the hosting year of the ETAT (YES). (2) In 2009, the number of tourists reached its highest peak (3,519,310 persons). (3) The maximum annual growth rate occurred in 2015.

Second, according to the one-way ANOVA analysis of the tourist numbers of ETAT areas (Y11), (1) Sig. <0.05, which indicates that there is a significant difference between YES, BETWEENNESS, and NO (Table 6). (2) According to the analysis of the difference between YES, BETWEENNESS, NO, and Y11 (Table 7Table 8Figure 22), the difference between YES and NO is the largest. The difference between YES and BETWEENNESS is medium, and the difference between BETWEENNESS and NO is the smallest.

The following conclusions can be summarized: (1) The hosting of the ETAT (YES or NO) has a significant impact on the tourist numbers. (2) The impacts on the tourist numbers during the two years between the hosting of the ETAT are not obvious. (3) This shows that the correlation between hosting the ETAT and the tourist numbers is positive and also illustrates the “rising tide” that exhibition-driven tourism brings to the tourism industry (Litvin et al., 2013).

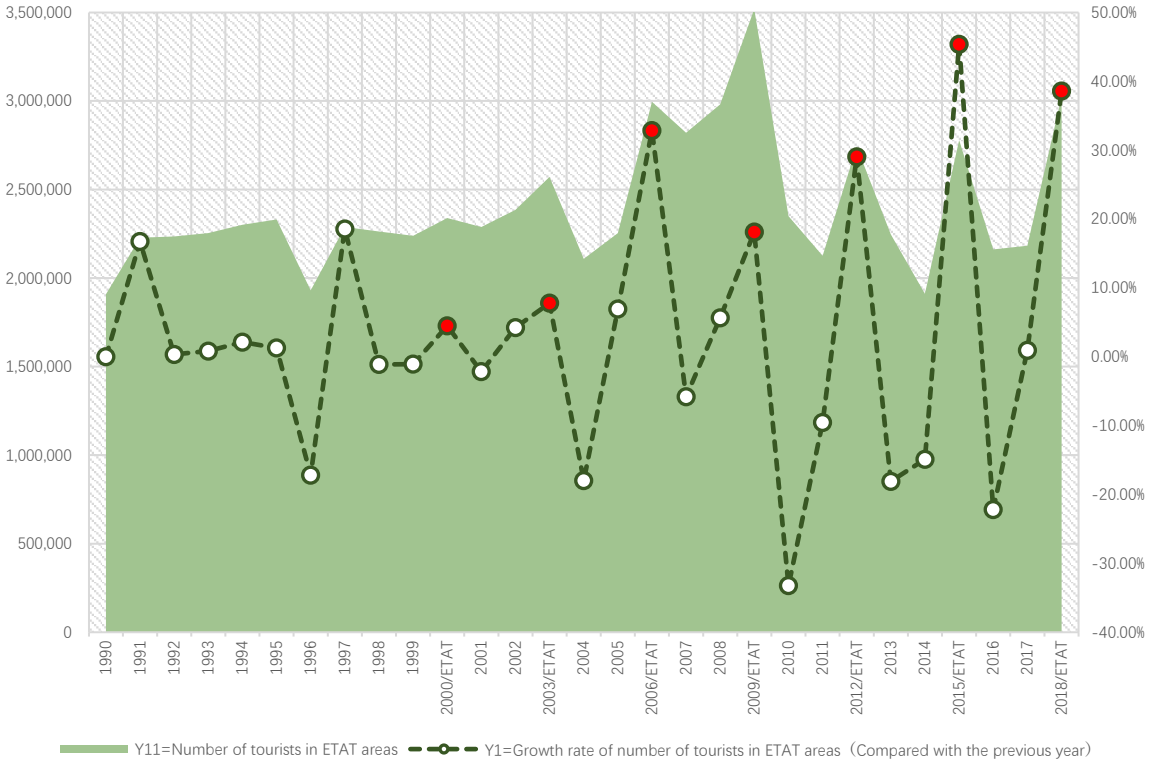


Figure 21. Tourist number and its growth rate in ETAT areas (1990–2018). Note: The red dots in the chart show that the annual growth rate increased (the hosting year of the ETAT).

Table 6. One-way ANOVA (Y11).

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	1,924,458,691,410	2	962,229,345,705	12.180	0.000
Within Groups	2,054,037,748,901	26	79,001,451,880		
Total	3,978,496,440,312	28			

Table 7. One-way descriptive statistics (Y11).

Variables	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
NO	102,197,479	150,206	47,499	2,090,027	2,304,930	1,908,400	2,330,450	
BETWEENNESS	122,317,784	300,873	86,854	2,126,618	2,508,950	19,114,950	2,979,990	
YES	7	2,852,618	377,537	142,695	2,503,454	3,201,781	23,386,700	3,519,210

Total	292,405,397	376,947	69,997	2,262,014	2,548,780	19,084,000	3,519,210

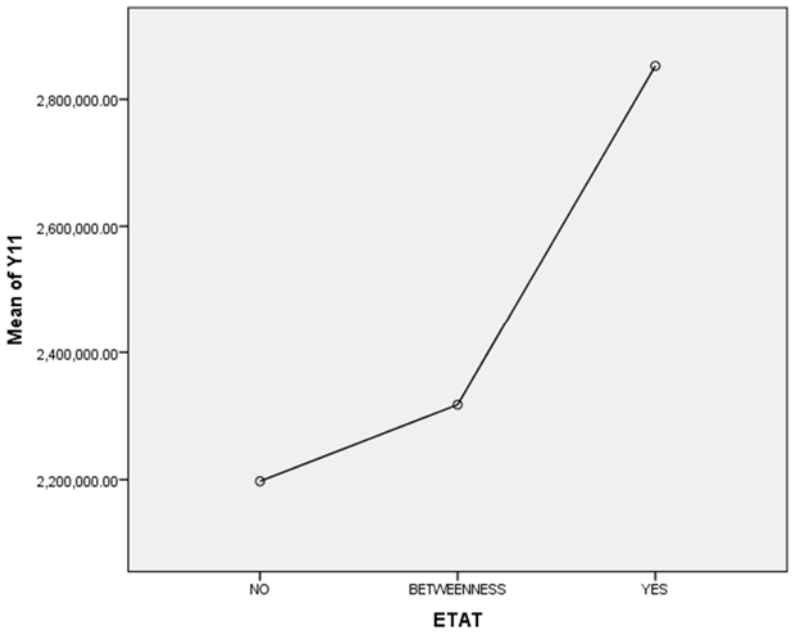


Figure 22. Mean plots.

Table 8. Post hoc tests: Multiple comparisons (Y11).

(I) ETAT	(J) ETAT	Mean Difference (I–J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
NO	BETWEENNESS	−120,305	120,347	0.327	−367,684	127,072
	YES	−655,139 *	138,513	0.000	−939,858	−370,420
BETWEENNESS	NO	120,305	120,347	0.327	−127,072	367,684
	YES	−534,833 *	133,676	0.000	−809,609	−260,057
YES	NO	655,139 *	138,513	0.000	370,420	939,858
	BETWEENNESS	534,833 *	133,676	0.000	260,057	809,609

* The mean difference is significant at a 0.05 level.

5.1.2. ETAT Areas and Niigata

First, according to the descriptive statistics, the annual changes in Y11 and Y111 can be seen intuitively (Figure 9). (1) In terms of quantity, Y111 increased starting in 1990. Its peak occurred in 1996 and 1997. Then, it began to decline; after 2004, it began to fluctuate. There was also a positive relationship between Y11 and Y111. (2) According to the annual growth rate, the change in Y1 was bigger than that in Y1111, but there has been a significant and positive relationship between Y1 and Y1111 since 2000.

Second, according to the Pearson correlation analysis between Y1 and Y1111 (Table 6; Figure 10), (1) the correlation is significant at a 0.01 level (two-tailed), which shows that the correlation model has a high level of credibility. (2) The correlation degree of the Pearson correlation between Y1 and Y1111 is 0.766 (≥0.5). The Pearson Correlation ranges between −1 and +1. If the linear correlation between Y1 and Y1111 is positive (i.e., higher levels of one variable are associated with higher levels of the other) then the results are >0. This indicates that there is a high correlation between Y1 and Y1111. A high correlation means that two or more variables have a strong relationship with each other, while a weak correlation means that the variables are hardly related (Pearson, 2011).

In summary, the result shows that (1) before the hosting of the ETAT, there was no particularly strong correlation between Y1 and Y1111. (2) After the EAT was held in 2000, there was a high correlation between Y1 and Y1111.

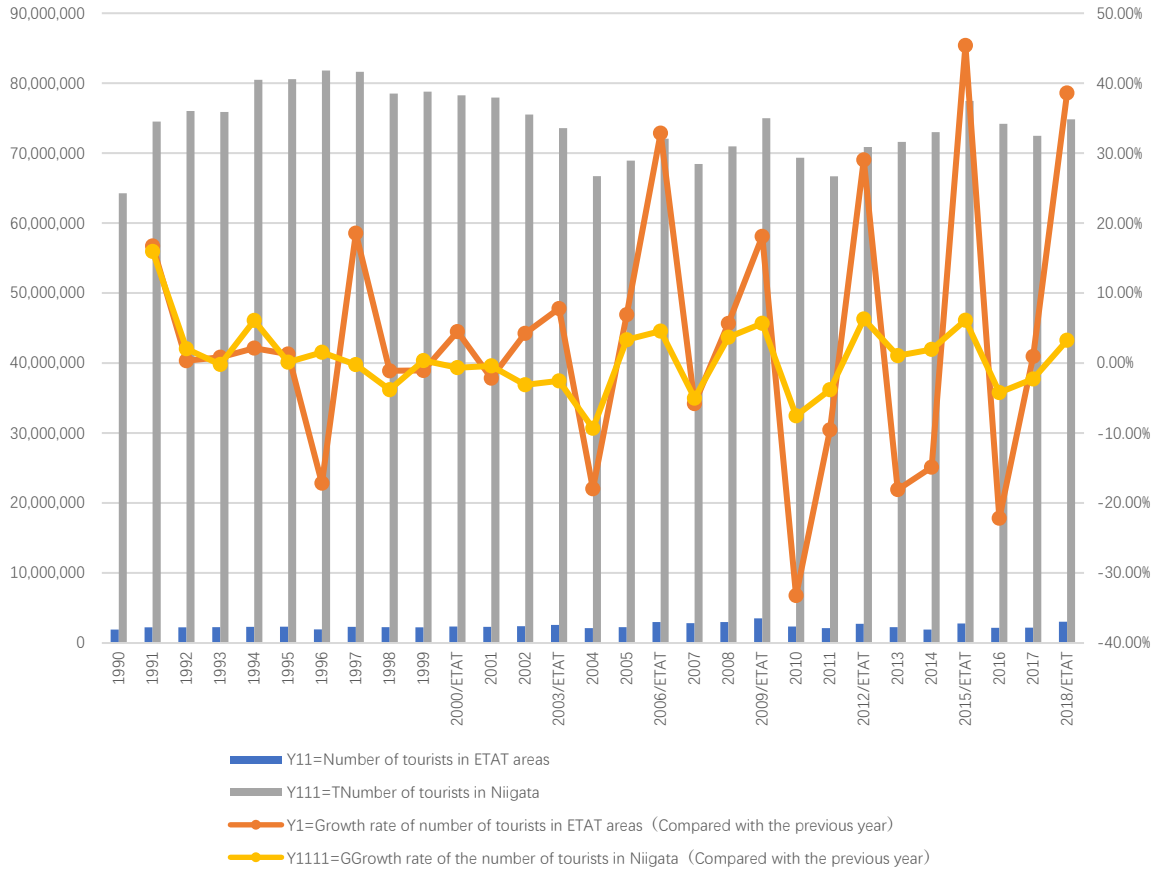


Figure 23 Number of tourists and its growth rate in ETAT areas (1990–2018).

Table 9. Correlations between Y1 and Y1111.

		Y1	Y1111
Y1	Pearson Correlation	1	0.766 **
	Sig. (two-tailed)		0.000
	N	19	19
Y1111	Pearson Correlation	0.766 **	1
	Sig. (two-tailed)	0.000	
	N	19	19

** Correlation is significant at a 0.01 level (2-tailed).

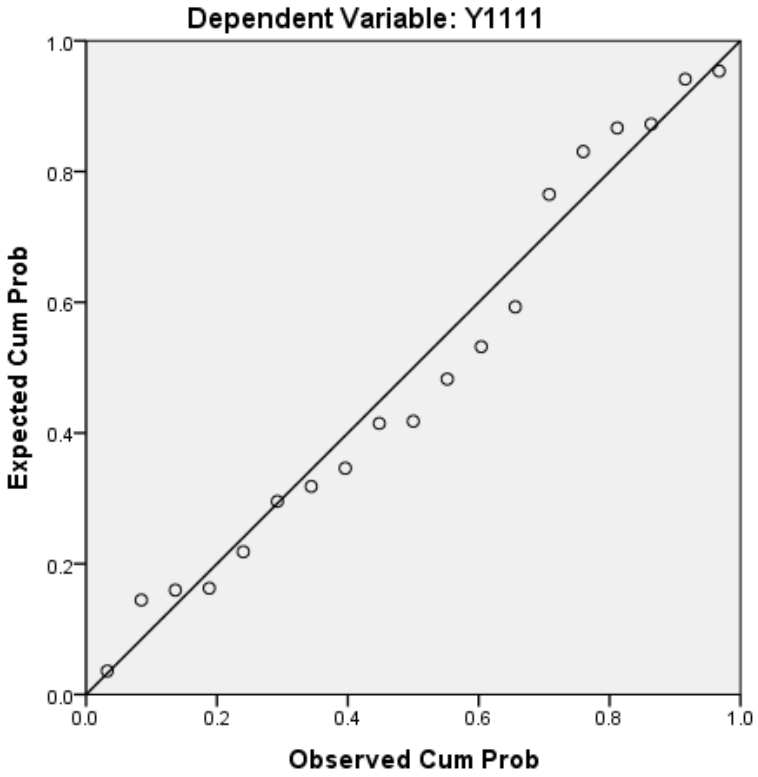


Figure 24**.** Normal P–P plot regression standardized residual.

Based on the above analysis, there is a positive correlation between the ETAT and the tourist numbers. On the other hand, this shows that the ETAT significantly increased the local tourist numbers. Moreover, these effects even exceeded those of the hosting areas.

5.2. Per Capita Income

5.2.1. Between the ETAT and Per Capita Income

First, according to the descriptive statistics, the annual change of the per capita income of ETAT areas (Y22) can be seen intuitively (Figure 25). (1) There is a positive correlation between Y22 and the hosting year of the ETAT (YES). (2) In 1996 and 1998, Y22 reached its highest peak (3519310 persons). (3) The maximum annual growth rate (Y2) appeared in 2015 (the same as Y1).

Second, according to the one-way ANOVA analysis on per capita income in the ETAT areas (Y22) (Table 10), (1) Sig. <0.05, which indicates that there is a significant difference between YES, BETWEENNESS, and NO. (2) According to the analysis of the difference between YES, BETWEENNESS, NO, and Y22 (Table 11Table 12Figure 26), the difference between BETWEENNESS and NO is the largest. The difference between YES and NO is medium, and the difference between YES and BETWEENNESS is the smallest.

The following conclusions can thus be summarized: (1) The hosting of the ETAT (YES or NO) has a significant impact on the per capita income. (2) The impacts on the per capita income between the two years of hosting the ETAT are obvious. (3) This shows that the correlation between hosting of the ETAT and per capita income is positive and also illustrates the "rising tide" that exhibition-driven tourism brings to the tourism industry (Litvin et al., 2013).

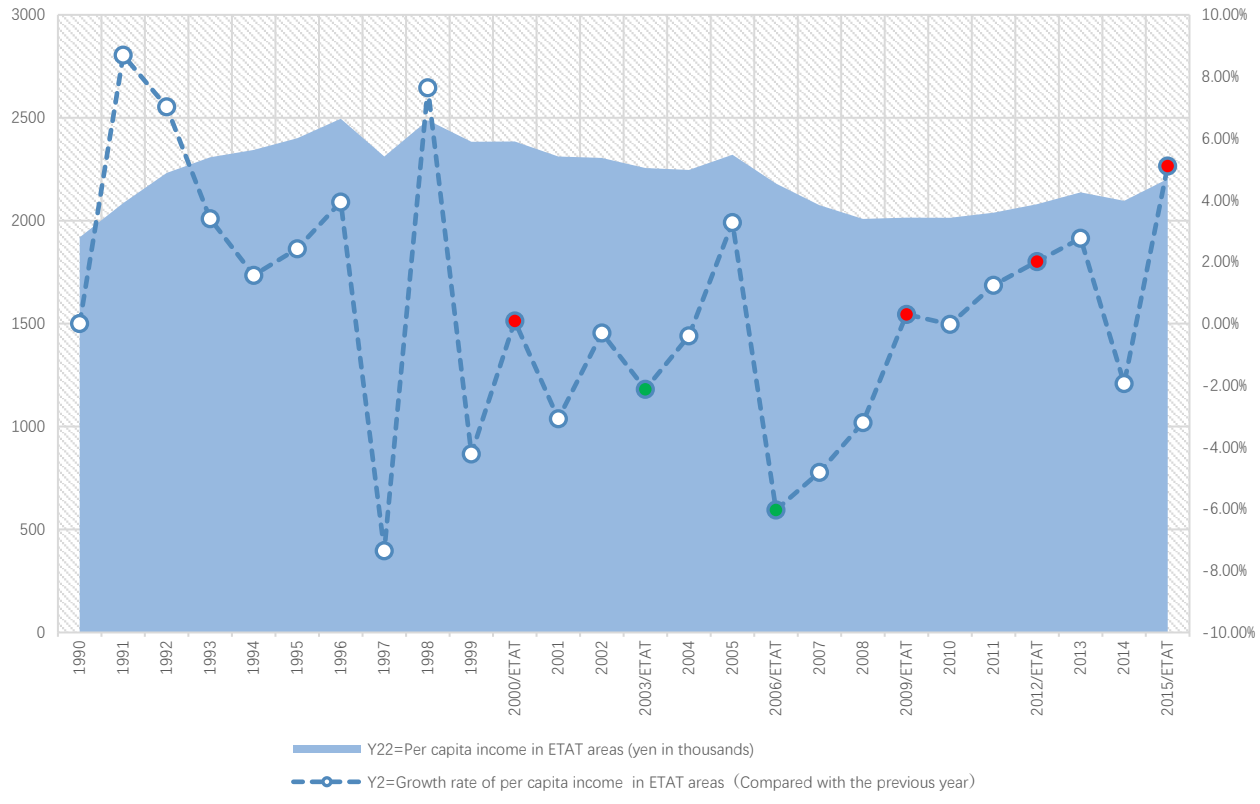


Figure 25. Per capita income and its growth rate in ETAT areas (1990–2018). Note: The red dots in the chart show that the annual growth rate increased (the hosting year of the ETAT). The green dot is negative.

Table 10. One way ANOVA (Y22).

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	173,367	2	86,683	5.259	0.014
Within Groups	362,624	22	16,482		
Total	535,991	24			

Table 11. Oneway descriptive statistics (Y22).

Variables	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
NO	9	2338	127.37473	42.45824	2240.6644	2436.4822	2085.49	2495.12
BETWEENNESS	10	2155	127.98682	40.47298	2063.6937	2246.8063	2008.50	2320.00
YES	6	2186	130.69341	53.35536	2049.1790	2323.4877	2014.50	2385.00
Total	25	2228	149.44229	29.88846	2167.0196	2290.3931	2008.50	2495.12

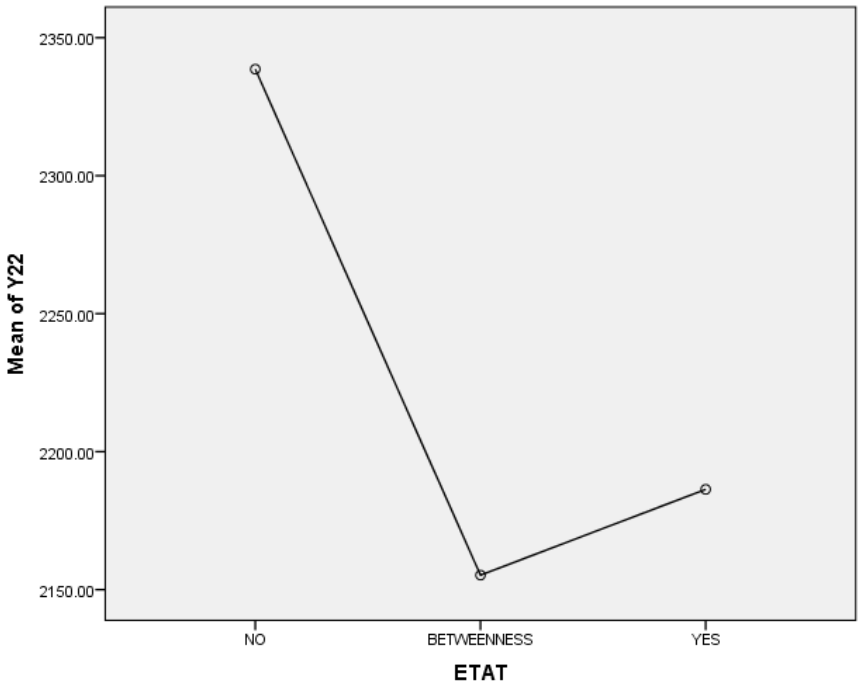


Figure 26. Means Plots.

Table 12. Post Hoc Tests: Multiple Comparisons (Y22).

(I) ETAT	(J) ETAT	Mean Difference (I–J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
NO	BETWEENNESS	183 *	58	0.005	60	305
	YES	152 *	67	0.035	11	292
BETWEENNESS	NO	−183 *	58	0.005	−305	−60
	YES	−31	66	0.644	−168	106
YES	NO	−152 *	67	0.035	−292	−11
	BETWEENNESS	31	66	0.644	−106	168

* The mean difference is significant at a 0.05 level.

5.2.2. The ETAT Areas and Niigata

First, according to the descriptive statistics, the annual changes in per capita income can be seen intuitively (Figure 27). (1) In terms of quantity, the Y222 increased starting in 1990. The peak occurred in 1996. Then, it began to decline; After 2000, it began to fluctuate. There was also a positive relationship between Y22 and Y222. (2) According to the annual growth rate, the change of Y2 was bigger than that of Y2222, but there has been a significant and positive relationship between Y2 and Y2222 since the year of 2000.

Second, according to the Pearson correlation analysis between Y2 and Y2222 (Table 13Figure 28), (1) the correlation is significant at a 0.01 level (2-tailed), which shows that the correlation model has a high level of credibility. (2) The correlation degree of the Pearson correlation between Y2 and Y2222 is 0.640 (≥0.5). The Pearson correlation ranges between −1 and +1. If the linear correlation between Y2 and Y2222 is positive (i.e., higher levels of one variable are associated with higher levels of the other) results (>0), then there is a high correlation between Y2 and Y2222 (A high correlation means that two or more variables have a strong relationship with each other, while a weak correlation means that the variables are hardly related) (Pearson, 2011).

To sum up, the results show that (1) before the hosting the ETAT, there was no particularly strong correlation between Y2 and Y2222. (2) After the ETAT was held in 2000, There was a strong correlation between Y2 and Y2222.

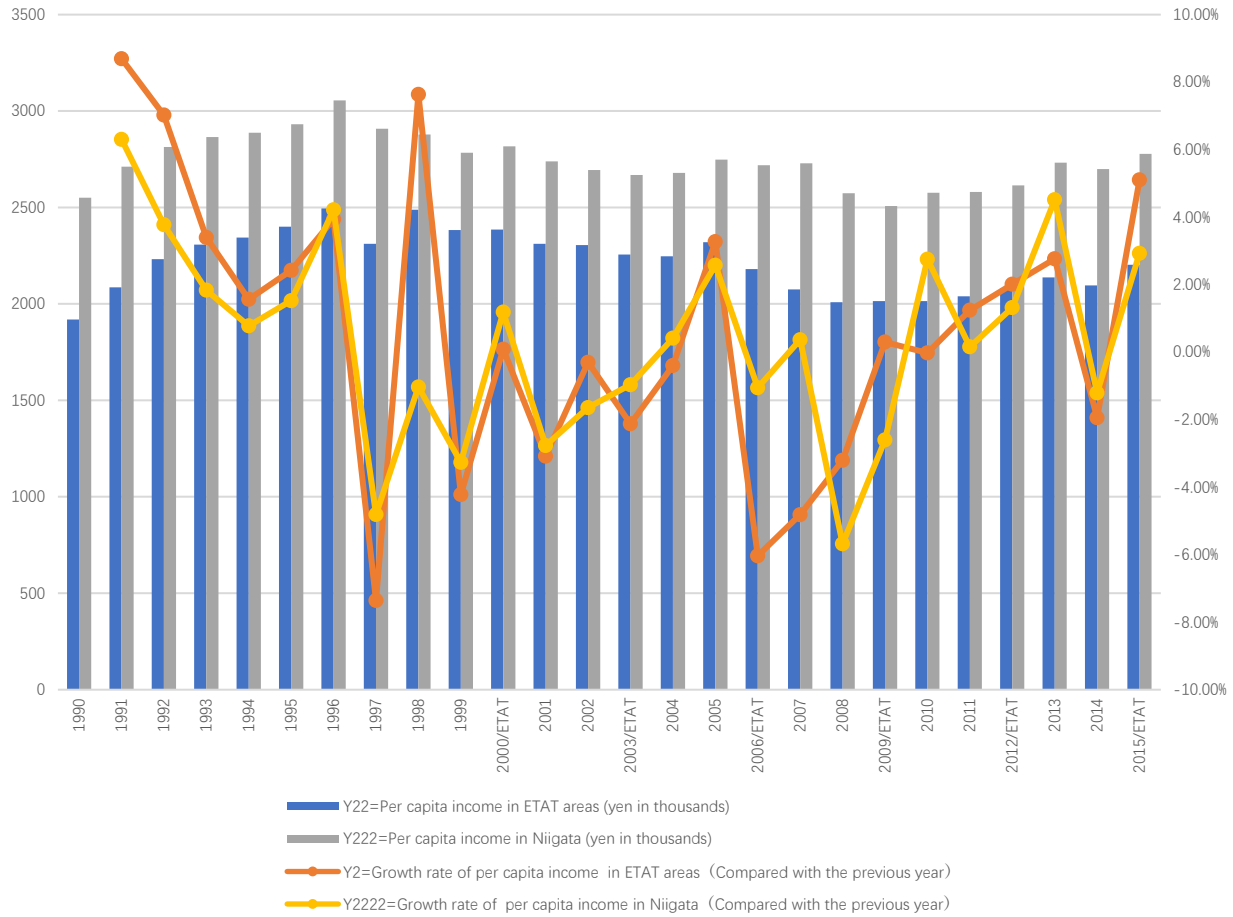


Figure 27. Per capita income and its growth rate in ETAT areas and Niigata (1990–2018).

Table 13. Correlations between Y2 and Y2222.

		Y2	Y2222
Y2	Pearson Correlation	1	0.640 **
	Sig. (2-tailed)		0.008
	N	16	16
Y2222	Pearson Correlation	0.640 **	1
	Sig. (2-tailed)	0.008	
	N	16	16

** Correlation is significant at a 0.01 level (2-tailed).

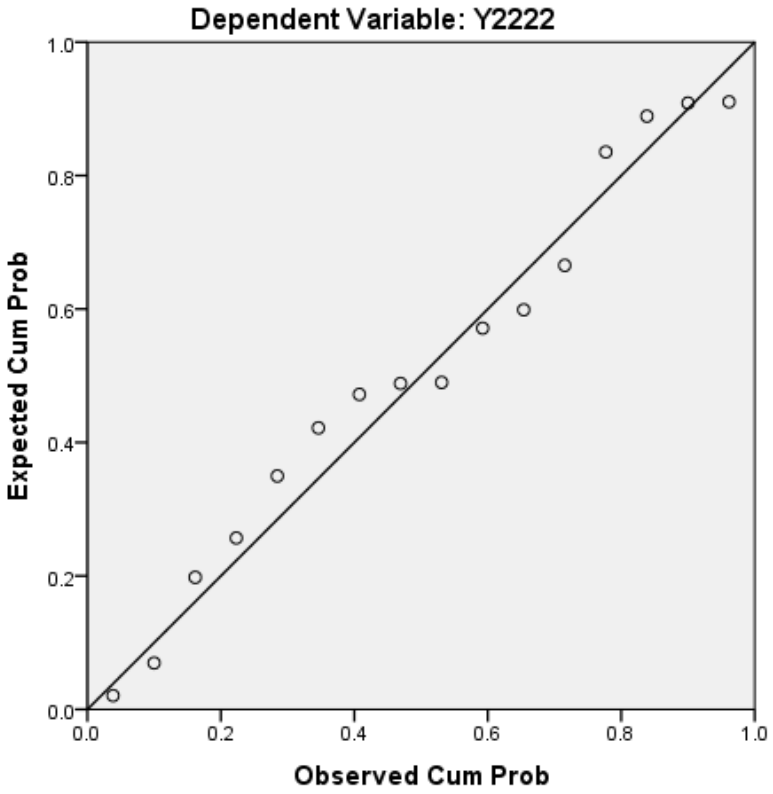


Figure 28**.** Normal P–P plot regression standardized residuals.

Based on the above analysis, there is a positive correlation between the ETAT and per capita income. On the other hand, this shows that the ETAT significantly increased local per capita income. Moreover, these effects even exceeded those of the hosting areas.

5.3. Household Number

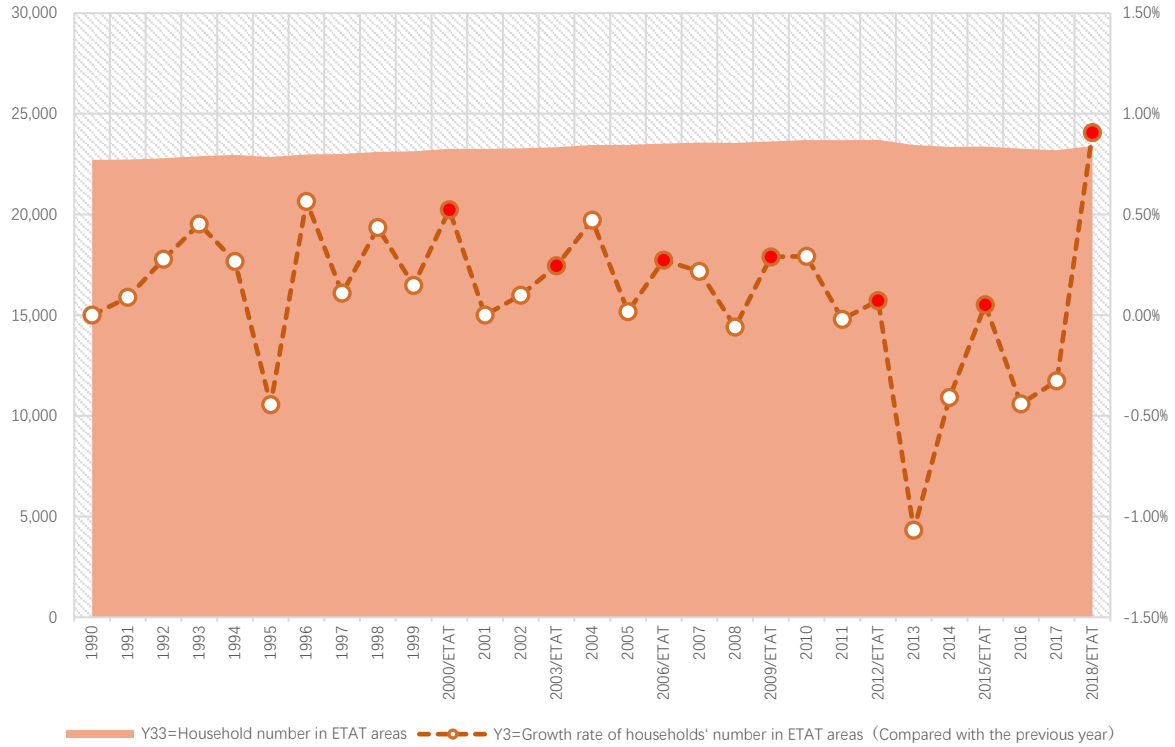
5.3.1. ETAT and Household Number

First, according to the descriptive statistics, the annual change of each household number in the ETAT areas (Y33) can be seen intuitively (Figure 29). (1) There is a positive correlation between the Y33 and the hosting year of the ETAT (YES). (2) In 2012, Y33 reached its highest peak (3,519,310 persons). (3) The maximum annual growth rate (Y3) appeared in 2018.

Second, according to the one-way ANOVA analysis of household numbers in ETAT areas (Y33), (1) Sig. <0.05, which indicates that there is a significant difference between YES,

994 BETWEENNESS, and NO (Table 14). (2) According to the analysis of the difference between
995 YES, BETWEENNESS, NO, and Y33 (Table 15Table 16Figure 30), the difference between YES
996 and NO is the largest, while the difference between BETWEENNESS and NO is medium. The
997 difference between YES and BETWEENNESS is the smallest.

998 We can thus present the following conclusions: (1) The hosting of the ETAT (YES or NO)
999 has a significant impact on the household number. (2) The impacts on the household number
1000 during the two years between the hosting of the ETAT are obvious. (3) This shows that the
1001 correlation between the hosting of the ETAT and the household number is positive. This also
1002 illustrates the “rising tide” that exhibition-driven tourism brings to the tourism industry (Litvin
1003 et al., 2013).



1004

1005 Figure 29. Household number and its growth rate in ETAT areas (1990–2018).
1006
1007 Table 14. One-way ANOVA (Y33).

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	1,832,318	2	916,159	35.584	0.000
Within Groups	669,412	26	25,746		
Total	2,501,730	28			

1008

1009 Table 15. One-way descriptive statistics (Y33).

Variables	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
NO	10	22,911	149	47	22,804	23,018	22,703	23,136
BETWEENNESS	12	23,431	168	48	23,323	23,538	23,185	23,689
YES	7	23,455	161	61	23,306	23,604	23,257	23,701
Total	29	23,257	298	55	23,144	23,371	22,703	23,701

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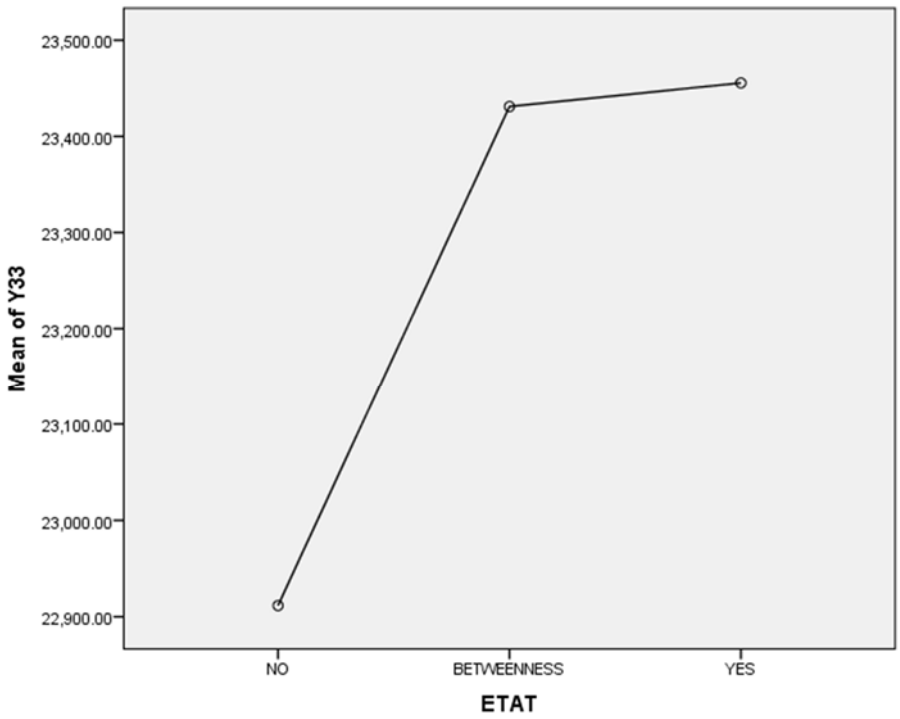


1011

1012 Figure 30. Mean plots.

1013

1014 Table 16. Post hoc tests: Multiple comparisons (Y22).

(I) ETAT	(J) ETAT	Mean Difference (I–J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
NO	BETWEENNESS	−519 *	68	0.000	−660	−378
	YES	−543 *	79	0.000	−706	−381
BETWEENNESS	NO	519 *	68	0.000	378	660
	YES	−24	76	0.750	−181	132
YES	NO	543 *	79	0.000	381	706
	BETWEENNESS	24	76	0.750	−132	181

1015 * The mean difference is significant at a 0.05 level.

1016 5.3.2. Differences between the ETAT Areas and Niigata

1017 First, according to the descriptive statistics, the annual changes in household number can
1018 be seen intuitively (Figure 31). (1) In terms of quantity, the Y33 and Y333 increased starting in
1019 1990. After 2000, it began to fluctuate. There was no positive relationship between Y33 and
1020 Y333. (2) According to the annual growth rate, the change of Y3 was bigger than that of Y3333,
1021 but there has been no significant and positive relationship between Y3 and Y3333 since the
1022 year of 2000.

1023 Second, according to the Pearson correlation analysis between Y3 and Y3333 (Table 17),
1024 (1) the correlation is significant at a 0.529 level (two-tailed) > 0.05 (generally, this is calculated
1025 at a confidence level, usually 95% (i.e., the significance level α is equal to 0.05)) (Pearson,
1026 2011). To sum up, the results show that there was no particularly strong correlation between
1027 Y3 and Y3333.

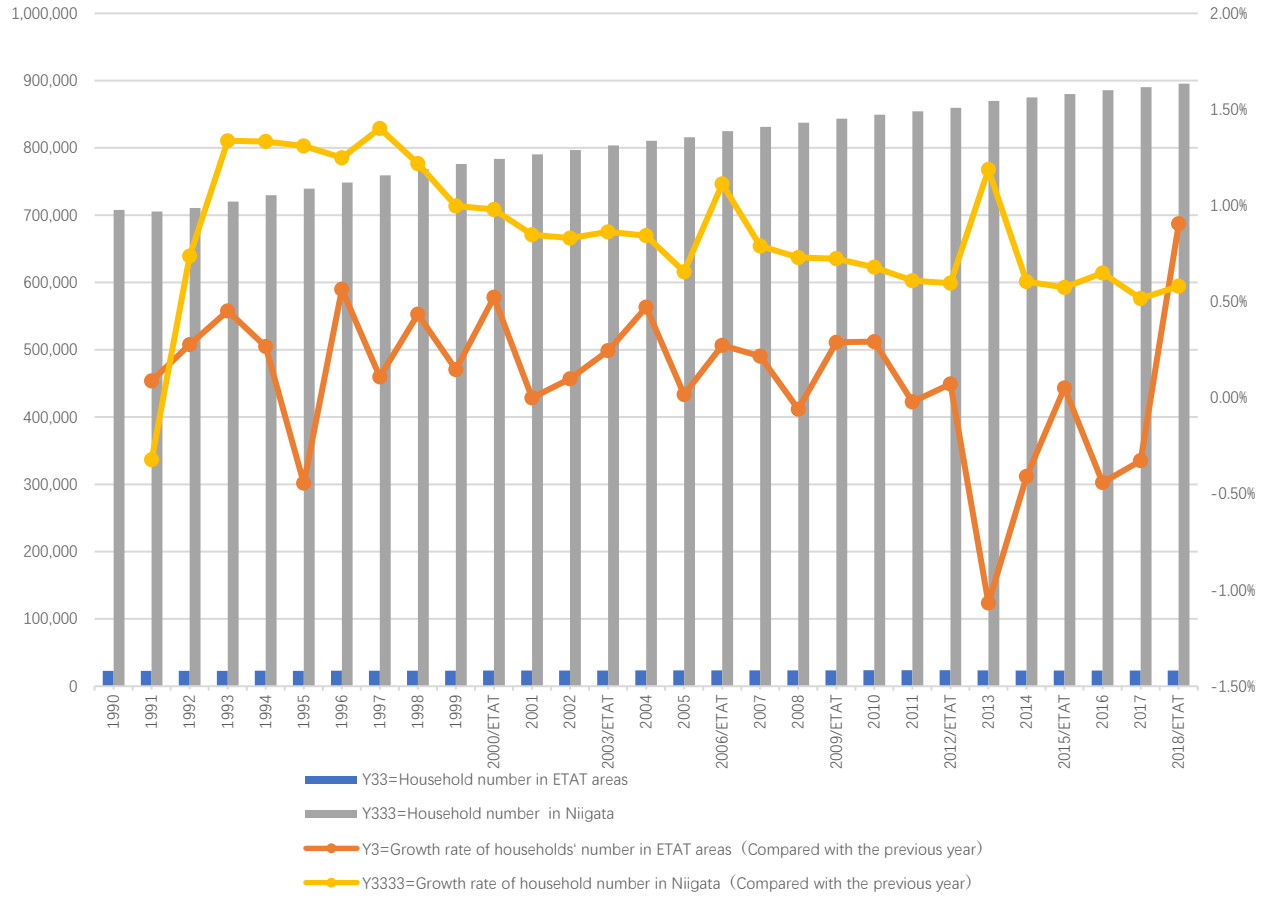


Figure 31. Household number and growth rates in ETAT areas and Niigata (1990–2018).

Table 17. Correlations between Y3 and Y3333.

		Y3	Y3333
Y3	Pearson Correlation	1	−0.131
	Sig. (two-tailed)		0.592
	N	19	19
Y3333	Pearson Correlation	−0.131	1
	Sig. two-tailed)	0.592	
	N	19	19

Therefore, based on the above analysis, there is a positive correlation between the ETAT and household number. On the other hand, this analysis shows that the ETAT significantly increased the local per capita income, but no effects exceeded those of the hosting areas.

5.3. Impactions, Limitations and Future Research-ETAT

The logical model was developed based on a comprehensive literature review and empirical evidence. The question (did these art exhibitions have some positive sustainable impacts on the hosting areas?) should be rethought. If we were to do nothing to declining rural areas, then everything in those areas would disappear (including all the green and beautiful environments). Even if we one day desired to return to nature, it would be extremely difficult to fix the environment destroyed by humans. Indeed, even if we were involved in exhibition-driven tourism, such as the ETAT, we would not be able to pull these areas out of their recessions and allow them to grow positively. However, if we try to maintain a sustainable environment based on exhibition-driven tourism, we can have positive impacts on these areas. The present study suggests that this model (exhibition-driven tourism) can be successfully used in Japan and other areas (with similar conditions) as a sustainable form of tourism (and an economic green model) that can also positively affect the local population.

First, the total population and labor force (15–65 years old) in the entire area are still declining (Klien, 2020). The Triennale has not halted this negative phenomenon (Borggreen and Platz, 2019). However, we find that decreases in the total population and labor force in other rural areas (and even urban areas) are a common phenomenon across Japan (Wang and Fukuda, 2019). Thus, the positive changes in household number represent a positive impact of exhibition-driven tourism (the ETAT) in these areas (although there are many influences behind the number of families).

Second, based on the above analysis, there is a positive correlation between the ETAT and the three studied aspects (sustainable tourism, economics, and population). Further, the results show that the ETAT significantly increased local sustainable tourism, economics, and the population. These effects even exceeded those of the hosting areas. However, for the population, the impact of the hosting area on the larger area is not obvious.

Third, this article has studied the positive impacts of exhibition-driven tourism (the ETAT) based on three aspects (sustainable tourism, economics, and population) only. The data on these aspects may be affected by some other social and economic events. However, the result from the data analysis provides evidence on the impacts of the relationship between exhibition-driven tourism (the ETAT) and the three studied aspects. Thus, we suggest that researchers in other parts of Japan and on other continents work together to produce similar studies, thereby creating a worldwide body of literature examining the phenomena related to the effects of certain types of festivals on key community variables.

Finally, the current study employed some nonprobability approaches, such as descriptive statistics and a correlation analysis (a one-way ANOVA and a Pearson correlation analysis in SPSS26). Even though these methods are widely used in the tourism industry, it is difficult to represent the overall impacts of exhibition-driven tourism. Hence, future studies should use a greater sampling range.

6. The Strategies of Ryokan Tourism on Promoting Local Green Hospitality: The Case from Japan

6.1. The Logical Model

The global changes have exceeded our expectations following the outbreak of COVID-19. Therefore, the current paper attempts to establish a new dynamic green evaluation model for Ryokans (study 3) through descriptive statistics (study 1) from a tourism accommodation survey and CASBEE-based (comprehensive assessment system for built environment efficiency) IPA (importance-performance analysis) (study 2). CASBEE is evaluation model for green built environments. It has tools to evaluate building, cities, urban areas, houses, market promotions, and community health. However, CASBEE does not have a dedicated and independent evaluation system for hotels (especially Ryokans) (Hsiao et al., 2014). Many previous papers have found that green customer satisfaction has positive correlations with green buildings and hotels (Gao and Mattila, 2014; Wang et al., 2018)(Chen et al., 2015). CASBEE-based measurement items for a questionnaire survey of customer satisfaction with green Ryokans were identified by the Delphi method, with 11 green building experts included in this study. Although this process may be controversial, this study has taken a first step to try to fill the gaps in CASBEE for Ryokans, and change the original inherent evaluation model and evaluation system. The CASBEE-IPA based dynamic model can help improve Ryokans and tourism accommodation after COVID-19, and it can also be employed in other countries and regions experiencing the same situation.

On the other hand, among foreign tourists, the influence of Chinese tourists and the pursuit of Japanese Ryokans are increasing year by year. Chinese tourists are also at the TOP 1; their total annual consumption accounted for half of all foreign tourists' consumption in the past decade. Therefore, this paper selected Chinese tourists as the survey object. This paper used Questionnaire Star (Changsha Ranxing Information Technology Co., Ltd., Changsha, China) to make questionnaires and send them through social software, such as WeChat (Tencent, Shenzhen, China). Each questionnaire had a 1–5 RMB red envelope as a reward for the respondent. The data was selected from 357 travelers who had experienced Ryokans in Japan before COVID-19. The IPA was used as the principle tool of questionnaire design and analysis. Through three progressive studies, three findings were obtained (**Figure 32**).

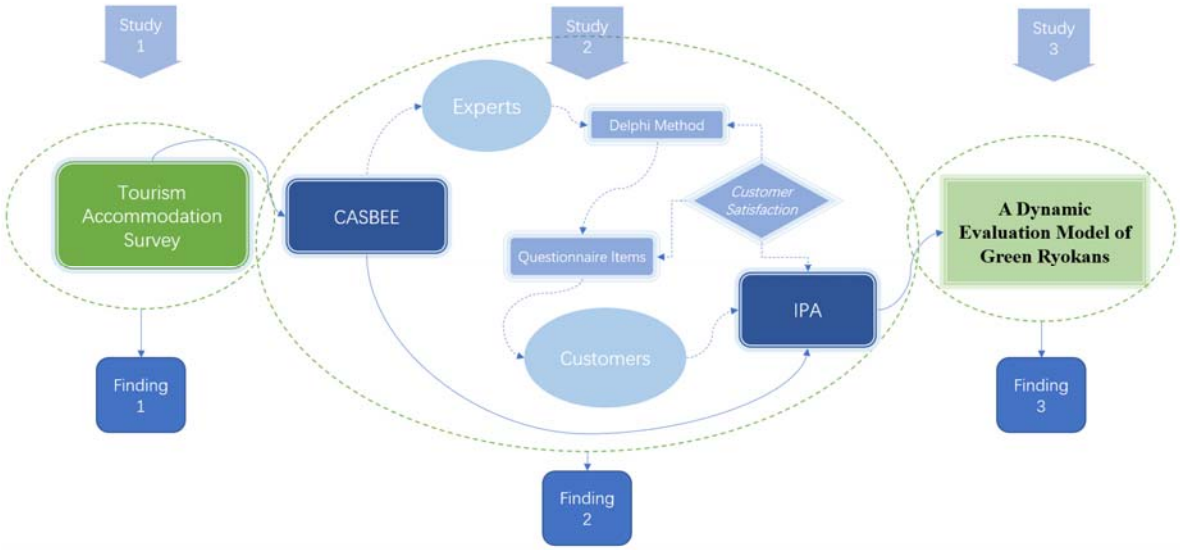


Figure 32. The logical model.

6.2. Literature Review

6.2.1. Green Customer Satisfaction with Recovery

Green satisfaction is the level of satisfaction related to customers' green consumption, green needs, environmental demands, and sustainable expectations (Chen, 2010)(Moro et al., 2020b). Green satisfaction also has positive correlations with green hotels in previous studies (Gao and Mattila, 2014; Wang et al., 2018). Moreover, Chen et al. (Chen et al., 2015) found that satisfaction has positive correlations with green buildings' indoor environmental quality and green perceived quality. In the tourism industry, customer satisfaction is an important aspect of customer service (Jin and Park, 2019b)(Hwang et al., 2020b)(Moro et al., 2020a)(Moro et al., 2020b). Some scholars pointed out that service is linked to satisfaction, because service directly affects people (Nam et al., 2016). The satisfaction of tourists is an important factor for tourists' determination to visit attractions again (Kanwel et al., 2019)(Ahani et al., 2019)(Hwang et al., 2020b). After a survey of 412 overseas tourists at Taiwan's international hotels, it was found that consumer sentiment, tourist complaints, perceived value, and service quality are related to customer satisfaction (Deng et al., 2013). Therefore, promotion of green satisfaction is important for post-crisis recovery. Akinci et al. (Akinci and Aksoy, 2019) and Han et al. (Han and Hyun, 2017) studied the destination decision-making of satisfaction with spatial health and revisit intention. Jung et al. (Jung and Seock, 2017) studied the relationships among service recovery and customer satisfaction and word-of-mouth.

6.2.2. Green/Healthy Environment for Green Accommodation

Nature-based solutions have various results that are beneficial to the health of individuals and society as a whole. These can include reducing stress, enhancing physical exercise, reducing health inequality, improving mood/emotion, reducing stress, increasing happiness,

increasing mental health, improving air quality, reducing noise, and improving water quality (Han et al., 2020b)(Hens and Hens, 2018)(Thinh et al., 2015). Green spaces or interiors in buildings (e.g., natural lighting through glass windows, indoor green walls, indoor green spaces, and green decorations) and green outdoor natural environments (e.g. mountains, rivers, good air quality, and forests) are important for sustainability.

6.2.2.1. Green Indoor Environment

Over the past decade, design-based research has proven its potential in the sustainable tourism industry (Wang and Hannafin, 2005)(Hoang et al., 2018). This method is suitable for technology-enhanced learning environment research and design (Wang and Hannafin, 2005). As more and more travelers gravitate toward environmentally responsible products, efforts to "green" operations (e.g. cycleway in sustainable tourism) have become increasingly important (Yeh et al., 2019). The design environmental value has long been regarded as an important part of tourist behavior and sustainable tourism. The relative importance of conceptual design relative to basic design or detailed design has been widely recognized, because it plays an important role in determining the basic characteristics and development costs of products (Umeda et al., 1996).

6.2.2.2. Green Outdoor Environment

The health-related outdoor environment was described in previous papers. The post-modern western society of the early 21st century witnessed the revival and remodeling of the health sustainable tourism industry based on new ideologies, concepts, spaces, and services; it was an affirmation of a new low-carbon approach (Bi and Zeng, 2019). Given its increasingly

important role in today's society further research is required, especially in terms of needs, motivations, and images (Gustavo, 2010).

6.2.2.3. Green Service Quality

The concept of the green physical environment in tourism accommodation includes all aspects of the interaction between the guests and the internal physical environment of the accommodation, which is particularly important because it may be a factor in service quality, product performance, and quality (Lee et al., 2018; Lee and Cheng, 2018). Similarly, the successful implementation of green service quality in accommodation management is also crucial because it can improve the mental health and well-being of travelers and employees (Winter et al., 2020)(Chow et al., 2019). Specifically, the experience can be mainly defined as the perceived travel quality centered on the similarity between expected performance and actual performance. Once tourists decide on or arrive in their travel destination, travel motivation may affect their evaluation of travel quality. For example, Honma and Hu (Honma and Hu, 2012) analyzed Japanese hotel efficiency, and found that greater distance from an international airport has negative effects. Kang et al. (Kang* et al., 2004) studied hotel and Ryokan guests in Japan, and found positive relationships between service quality and customer satisfaction.

6.2.3. Evaluation Study of Hotels

Previously, some experts have carried out research on many aspects of the evaluation of hotels (van Haastert and de Grosbois, 2010; Wang, 2009)(Mousavi et al., 2017). Based on probability distribution and earth mover's distance, Xia et al. (Xia et al., 2020) studied a novel technique for automatically evaluating the competitiveness of hotel brands. Deng et al. (Z. Deng

et al., 2020) evaluated the efficiency of hotels by the superefficient slacks-based measure model in China. Ullah et al. (Ullah et al., 2019) used some selected factors (specifically hotel rating, rental price, location, and quality of services) to study an evaluation model with online hotel booking for customer satisfaction. Some previous studies analyzed the effect of service quality on customer behavioral intentions and customer satisfaction at hotels and Ryokans (Choi et al., 2018; Kang et al., 2004; Karakawa, 2019). However, overall, there have been few evaluation studies on Ryokans.

6.3. Materials and Methods

6.3.1. Ryokans in Japan

Japanese tourism accommodation is divided into two major categories (with or without "hotel" in the name) and six sub-categories (**Figure 33**) (without "hotel" in the name: Guesthouse, Minshuku, Ryokan. With "Hotel": Resort Hotel (リゾートホテル), City Hotel (シティホテル), Business Hotel (ビジネスホテル). Figure 48 shows the occupancy rate of different accommodation styles from January 2011 (the Great East Japan Earthquake and the Fukushima nuclear leak health crisis occurred in March 2011) to May 2020. There were some different definitions of Ryokans (there is currently no precise definition) in the previous study (Kang et al., 2004)(Guichard-Anguis, 2008)(Jimura, 2011)(Choi et al., 2018). A Guesthouse is an inexpensive type of accommodation for those who are staying in Japan for one month or longer, and who want to avoid the hassle and the expense of renting and furnishing a conventional apartment. Ryokans and Minshuku are part of a range of accommodation options

for travelers in Japan. Far from business hotels or Western hotels, Ryokans and Minshuku (including B&B) are a uniquely Japanese experience. Ryokans (旅館, literally "travel buildings") are traditional Japanese inns. There are about 60,000 across the Japanese island chain. Minshuku are the equivalent of Guesthouses or B&Bs, and there are about 20,000 in Japan. They are usually owned by farmers in the countryside or mountains, or are fishermen's houses by the sea, sometimes in very remote places, but mostly near hot springs. Therefore, Guesthouses, Minshuku, and Ryokans are all called “Ryokans” in the current paper (**Figure 33**). All the data sources were from the Institute for Building Environment and Energy Conservation (IBEC (“http://www.ibec.or.jp/CASBEE/cas_nc.htm,” n.d.)） and Japan Tourism Agency (JTA (“https://www.mlit.go.jp/kankocho/en/page06_000001.html,” n.d.)), then the data were analyzed and studied by the current paper.

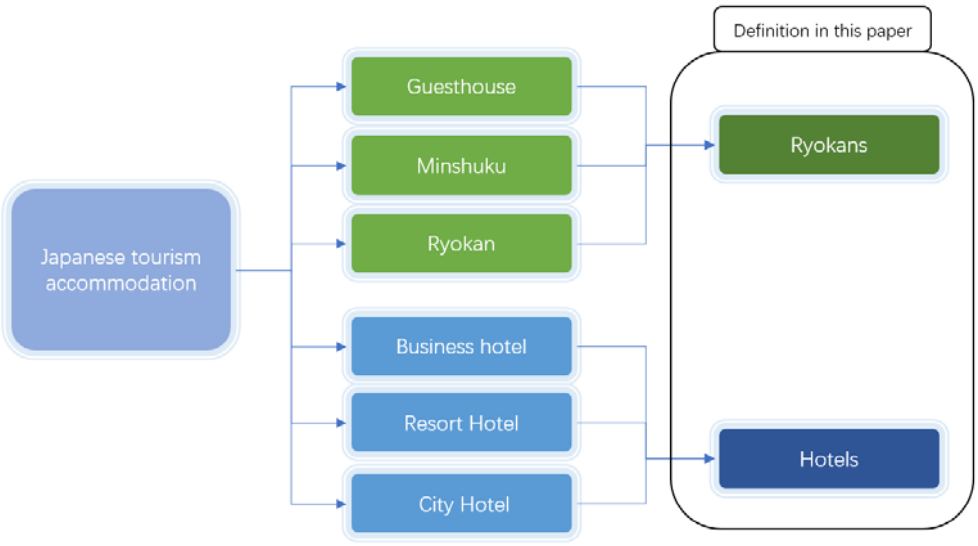


Figure 33. Types of Japanese tourism accommodation and definitions in this paper.

6.3.2. CASBEE Analysis

The Comprehensive Assessment System for Built Environment Efficiency (CASBEE) is evaluation model for built environments. CASBEE was established in the Japan Sustainable Building Consortium (JSBC) in 2001. It has been designed to both enhance the quality of people's lives and to reduce the lifecycle resources of everything from a single home to a whole city. Consequently, more and more CASBEE schemes are now being deployed all over Japan. After 20 years of development, there are eight different tools in the CASBEE system (**Figure 34**). Compared with the evaluation systems of other countries, CASBEE has the most application scenarios. It has tools used to evaluate buildings, cities, urban areas, houses, market promotions, and community health. However, CASBEE does not have a dedicated and independent evaluation system for hotels (especially Ryokans).

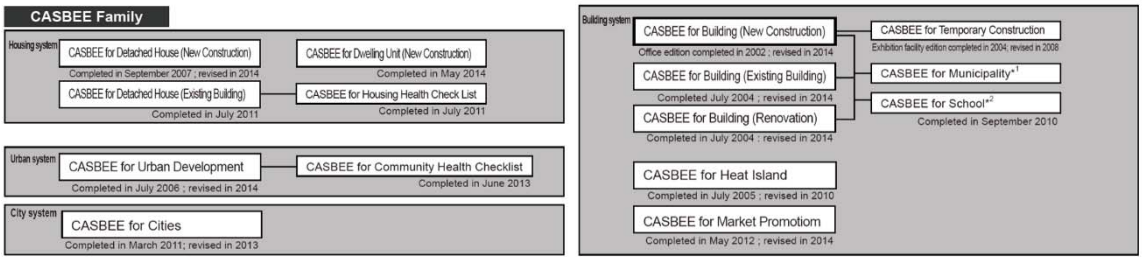


Figure 34. Framework of the CASBEE family ("http://www.ibec.or.jp/CASBEE/cas_nc.htm," n.d.).

Promotion of sustainability is one of the great challenges facing humankind. Since the building industry started to move toward the promotion of sustainable building in the latter half of the 1980s, various techniques to evaluate the environmental performance of buildings have been developed. In previous papers, some researchers have compared the main evaluation tools with the BREEAM (Building Research Establishment Environmental Assessment Method), LEED (Leadership in Energy and Environment Design), GB Tool (Green Building Tool), and

CASBEE (Kawazu et al., 2005) (**Figure 35**). CASBEE has more advantages in evaluating indoor and outdoor built environments, and quality of service (Sasatani et al., 2015; Yong-yi and Zhang, 2011).

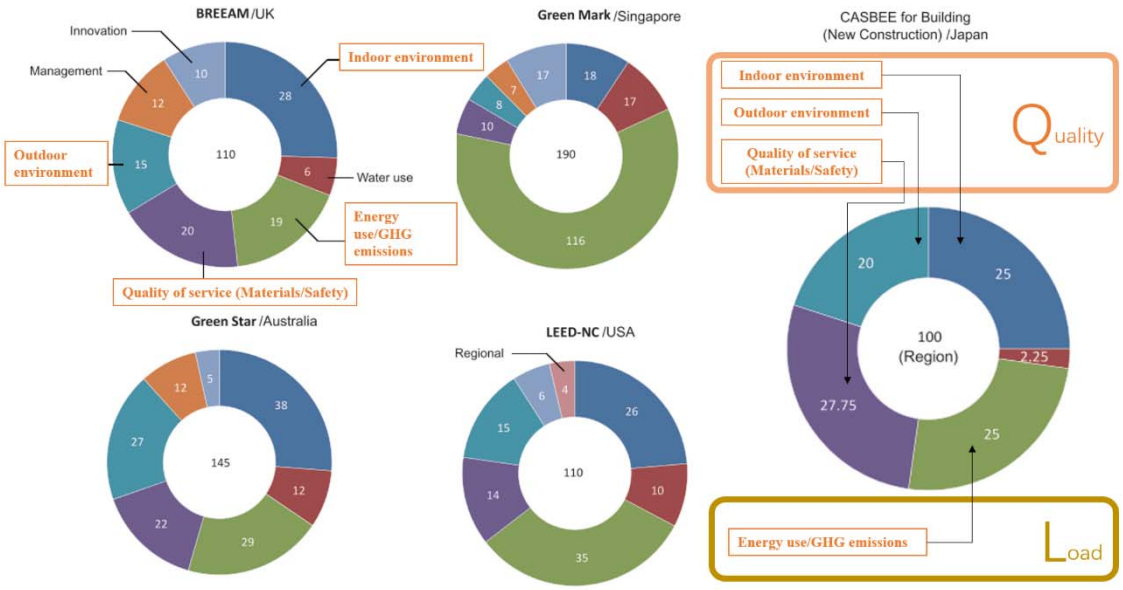
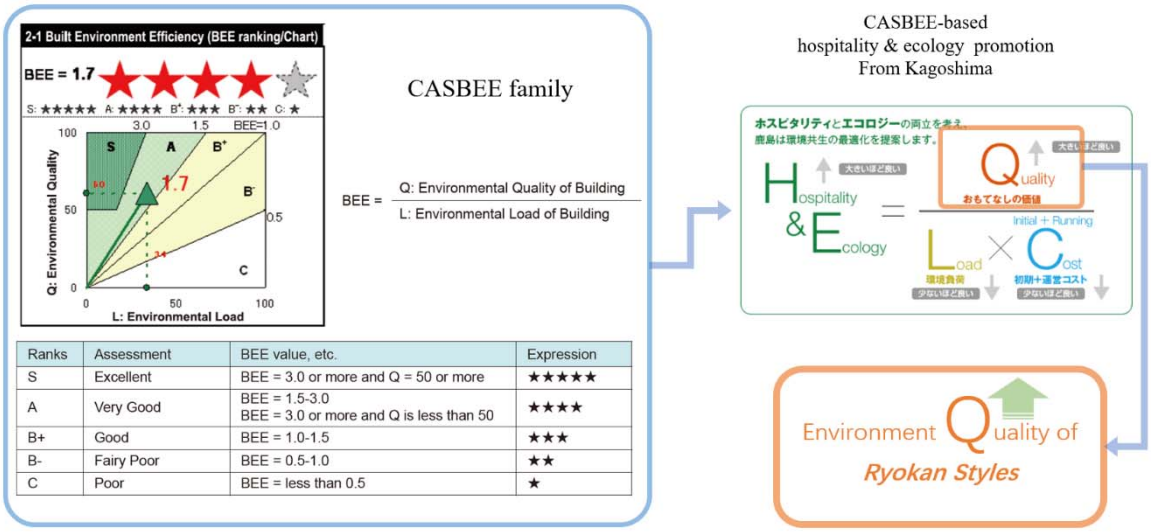


Figure 35. Weights assigned to assessment items per tool (pie chart) ("http://www.ibec.or.jp/CASBEE/cas_nc.htm," n.d.).

Built environment efficiency (BEE) represents the ratio of Q (Environment Quality of Building) and L (Environment Load of Building). BEE can be divided into five categories according to the score. Kagoshima (Kagoshima City was the first city to become Japan's "Future Environmental City" and "SDGs Future City" at the same time) has launched an evaluation formula called "hospitality & ecology" suitable for the hospitality industry on this basis (**Figure 36**). Therefore, the goal of this paper is to consider how to increase the Q value (because the L value is mainly energy consumption and carbon emissions, etc.; it is not in the scope of this

article). The improvement of the Q value is mainly based on the investigation and research of customer satisfaction.



Ranks	Assessment	BEE value, etc.	Expression
S	Excellent	BEE = 3.0 or more and Q = 50 or more	★★★★★
A	Very Good	BEE = 1.5-3.0 BEE = 3.0 or more and Q is less than 50	★★★★
B+	Good	BEE = 1.0-1.5	★★★
B-	Fairy Poor	BEE = 0.5-1.0	★★
C	Poor	BEE = less than 0.5	★

Figure 36. Built environment efficiency (BEE) and the CASBEE-based hospitality & ecology formula ("http://www.ibec.or.jp/CASBEE/cas_nc.htm," n.d.).

6.3.3. Delphi Method and Questionnaire Items

The Delphi method is considered a collective technique whose purpose is to obtain the most reliable consensus of the expert group through a series of intensive questionnaires with controlled feedback. (Dalkey and Helmer, 1963). The subsequent application of this technology removed the mandatory consensus-seeking restrictions, so today it can be defined as a social research technology whose purpose is to use a group of experts to obtain reliable collective opinions. Hsiao et al. (Hsiao et al., 2014) studied and established an environmental management system for green hotel evaluation by the Delphi method. It is a way to establish communication between a group of people who can provide valuable advice to solve complex problems (Linstone and Turoff, 1975). It shows the design logical of the Delphi method, and selection

process of 30 research variable items. CASBEE-based measurement items for the questionnaire survey of green Ryokan customers satisfaction was identified (**Figure 37**, **Table 18**).

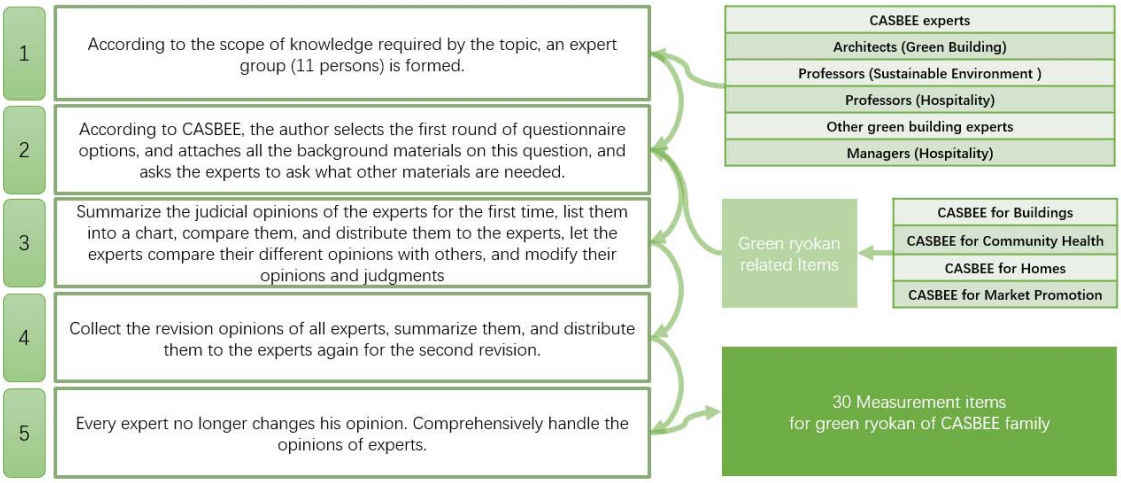


Figure 37. The design logical of the Delphi method and selection process of 30 research variable items.

Table 18. CASBEE-based measurement items for green Ryokans.

NO.	Items	Sources from CASBEE family		
Q1	**Indoor environment (comfortable, healthy and safe)**	BD	MP	H
	Sound environment	BD		
1	Sound insulation	BD		
2	Sound absorption	BD		
	Thermal comfort	BD		
3	Room temperature control (preventing summer heat, preventing winter cold)	BD	MP	H
4	Humidity control	BD		
5	type of air conditioning system (fresh air)	BD		
	Lighting & illumination	BD		
6	Use of daylight	BD	MP	
7	Anti-glare measures	BD		
8	Comfortable illuminance level	BD		
	Air quality	BD		
9	Ventilation/natural ventilation performance	BD	MP	
10	Operation (materials to maintain safe interior indoor air quality (IAQ))	BD		
	View			
11	Good view/visual environment		MP	

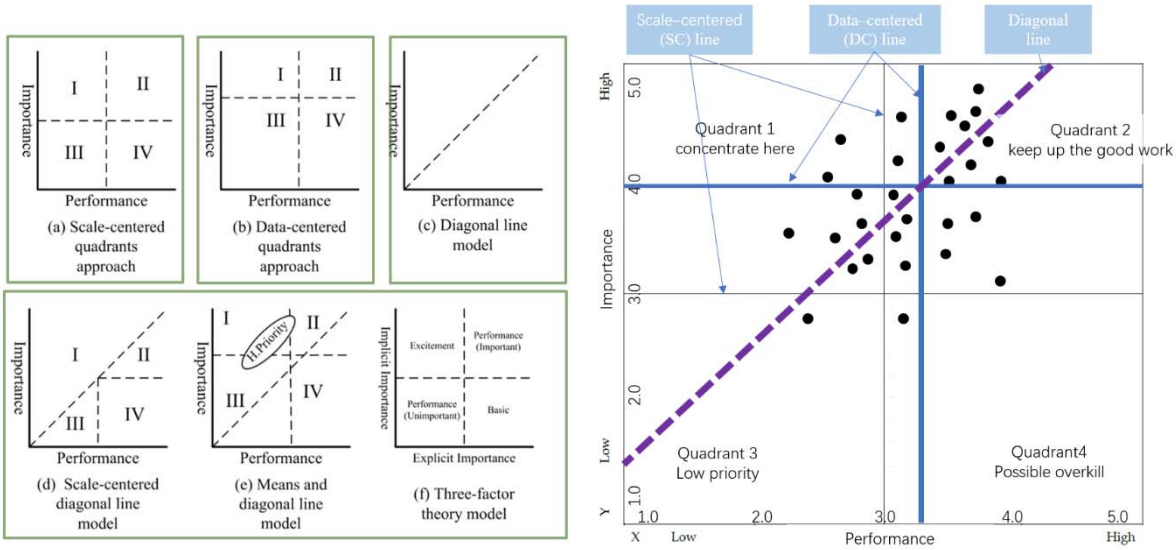
Q2	**Outdoor environment (on-site) (biodiversity/site use) (richer townscape and ecosystem)**	BD	MP	H	CH
	Preservation & creation of biotope	BD			
12	Good biological environment	BD		H	
	Townscape & landscape	BD			
13	Consideration of the townscape and landscape	BD		H	CH
	Local characteristics & outdoor amenity	BD			
14	Attention to local character & improvement of comfort	BD			
15	Utilizing regional resources and inheriting the regional housing culture			H	
	Health, Safety, and Security				
16	Safety and security of the region			H	
17	Comfortable sound environment				CH
18	Thermal comfort/improvement of the thermal environment on site	BD			CH
19	Good nature air quality				CH
Q3	**Quality of service (materials/safety)**	BD	MP	H	CH
	Service ability	BD			
20	Functionality & usability (smart device)	BD			
21	Amenity (Public transportation accessibility)	BD	MP		CH
22	Good maintenance	BD			
	Durability & reliability	BD			
23	Earthquake resistance/high earthquake resistance, seismic isolation, etc.	BD	MP		
24	Occupant comfort for space within virtual boundaries	BD			
25	Reliability	BD			
	Flexibility & adaptability	BD			
26	Flexible spatial margin	BD			
	Health, safety, and security			H	CH
27	Countermeasures against chemical contaminants/natural energy		MP	H	CH
28	Proper planning for ventilation			H	CH
29	Precautions against crime			H	CH
30	Natural disaster risk management		MP		

Note: BD= CASBEE for Building, MP= CASBEE for Market Promotion, H= CASBEE for House, CH= CASBEE for Community Health

6.3.4. IPA and Its Threshold Selection

Importance performance analysis (IPA) is a research technique designed to check and recommend management strategies (Martilla and James, 1977). The key of IPA is to diagnose

1263 the performance/importance of different service attributes and provide practical suggestions for
1264 improving management (Dwyer et al., 2012). Abalo et al. (Abalo et al., 2007) studied the
1265 measures of tourist perceived performance and importance in two-dimensional graphs. Each
1266 IPA chart quadrant represented different strategies for helping tourism managers promote
1267 customer satisfaction (Oh, 2001a). One of the issues of IPA is choosing the best site to divide
1268 the quadrant thresholds (Bacon, 2003). First, the data-centric (DC) method uses the actual data
1269 average level as the critical point (Alberty and Mihalik, 1989). Second, the scale-centric (SC)
1270 also can provide a simpler description (Ziegler et al., 2012). Others have used diagonal lines
1271 (DL) or isolines (IRL) (Ziegler et al., 2012). Compared with the previous method, IRL is a more
1272 suitable method for measuring the difference between the pre-performance and post-importance
1273 (satisfaction prediction) level (Sever, 2015). According to the IPA in the tourism review by Lai
1274 and Hitchcock (Lai and Hitchcock, 2015), most researchers (about 80%) used the DC and the
1275 average of actual importance and performance level in hotel tourism research. Therefore, the
1276 DC is used for specifying thresholds (satisfaction of exhibition visitors before/after COVID-
1277 19) (**Figure 38**).



1278 **Figure 38.** The line of different thresholds within the IPA plot.

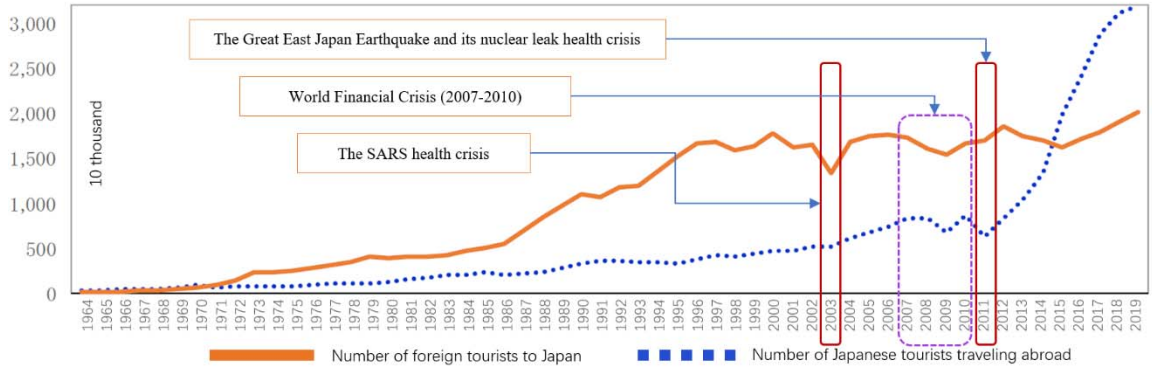
1279

1280 *6.4.* Results (Study) 1: Tourism Accommodation Survey with Descriptive Statistics

1281 6.4.1. Japan Tourism Accommodation Analysis before/after COVID-19

1282 6.4.1.1. Number and Percentage of Tourists

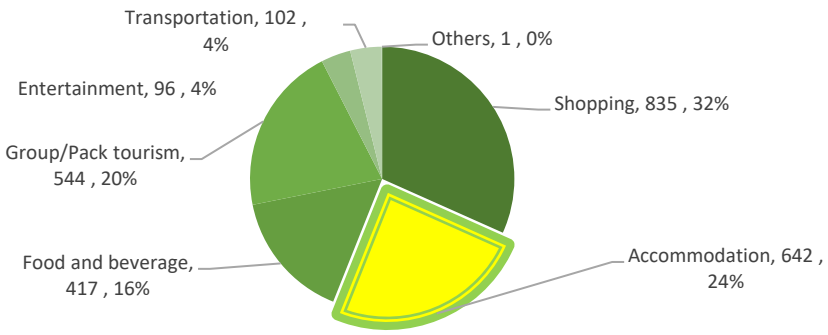
1283 This part selected the number of foreign tourists and Japanese tourists traveling abroad
1284 from 1964 to 2019 in Japan (**Figure 39**). It shows three obvious travel crises after 2000, which
1285 led to different decreases in the number of tourists. The number of foreign tourists traveling to
1286 Japan has risen sharply since the health crisis of the Fukushima nuclear leak in 2011. This shows
1287 that Japan's national policy of "Tourism Nation Promotion Basic Law" from 2003 has achieved
1288 obvious results after two crises in eight years.



1289 **Figure 39.** The numbers of foreign tourists coming to Japan and Japanese tourists traveling
1290 abroad ("https://www.mlit.go.jp/kankocho/en/page06_000001.html," n.d.).

1291 Tourism accommodation is one of the most important sectors in Japan's tourism industry.
1292 According to the statistics of annual tourism consumption of foreign tourists in the last decade
1293 (2010–2019) (Figure 40), tourism accommodation costs ranked second (shopping consumption
1294 was first), accounting for more than 1/5 of the total consumption. The consumption of tourism
1295 accommodation reached 6.8 billion US dollar in 2019. Therefore, tourist accommodation
1296 should receive more attention. Figure 41 shows the annual tourism consumption of foreign
1297 tourists. Figure 42 shows the countries and regions with a large percentage of foreign
1298 accommodation customers from 2010–2019 in Japan. The first was mainland China. China,
1299 Taiwan, and South Korea are all countries and regions adjacent to Japan, and their sum
1300 exceeded half of the total. This shows that tourists from neighboring countries and regions
1301 (especially mainland China) are very important to tourist accommodation in Japan. We need to
1302 fully consider the needs of tourists from neighboring countries.

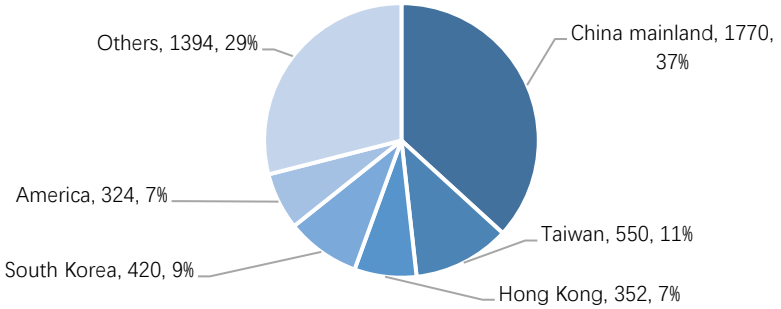
1303



1304 **Figure 40.** Annual tourism consumption types of foreign tourists (2010–2019) (Billion)

1305 (selected from the Japan Tourism Agency).

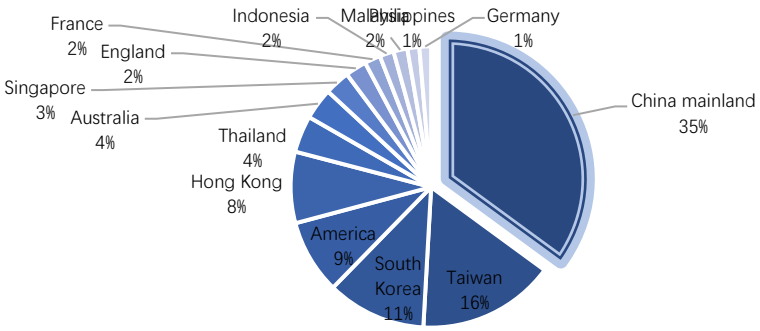
1306



1307 **Figure 41.** Annual tourism consumption of foreign tourists (2019) (Billion yen) (selected

1308 from the Japan Tourism Agency).

1309



1310 **Figure 42.** The main countries and regions with a large percentage of foreign

1311 accommodation customers from 2010–2019 in Japan.

Figure 43 shows the numbers of foreign and Japanese customers using tourism accommodation. Moreover, it compares the percentages of foreign tourists to Japan's domestic tourists in May 2018, May 2019, and May 2020 (after the COVID-19 outbreak), which were 21.3%, 23.3%, and 1.3%, respectively. It shows that Japanese customers were more common than foreign customers. After the COVID-19 break in Japan from February 2020, the number of foreign tourists plummeted. The ratio of local customers to foreign customers reached 77:1. This shows that, in Japan, as in many other destinations around the world, domestic demand has sustained the tourism accommodation sector in these months of the COVID-19 pandemic.

On the other hand, Figure 44 shows the growth rate of foreign and Japanese customers (compared with the same month in 2019). It also shows that the negative impact of the COVID-19 outbreak (in the early stages) on foreign customers was greater than on local consumers. However, as the local outbreak began, the situation deteriorated sharply. At the end of May 2020, foreign customers decreased by 98.6% compared to the same period, while local customers decreased by 81.6%, and the total decreased by 84.8%. Before COVID-19, the growth rate of foreign customers in tourism accommodation statistics was much higher than that of Japanese tourists. The highest growth rate was 35.6% in January 2019, and the lowest was 12.2%. The highest growth rate of Japanese tourists was only 17.3%, and the lowest was –0.9%. This also shows that the national strategy of "tourism-building" established by the Japanese government in 2003 is correct. However, according to the above analysis, the impact of COVID-19 on the number of foreign tourists is much more serious than the impact on Japanese tourists. Therefore, there is an urgent need to conduct research on the Japanese green

accommodation industry to determine how to improve customer satisfaction with Japanese tourist accommodation after COVID-19, and then to restart and restore the accommodation industry in time to welcome the 2021 Japan Olympic Games and promote longer-term development in the future.

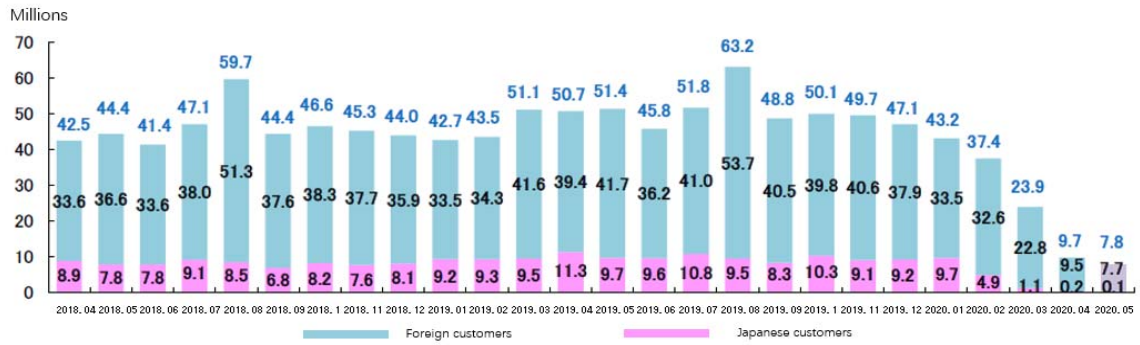


Figure 43. The numbers of foreign and Japanese customers of tourism accommodation ("https://www.mlit.go.jp/kankocho/en/page06_000001.html," n.d.).

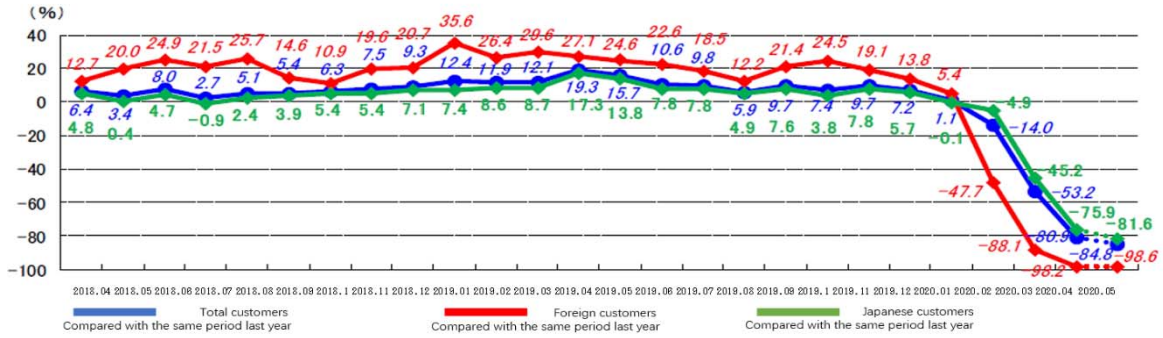


Figure 44. Growth rate of foreign and Japanese customers of tourism accommodation ("https://www.mlit.go.jp/kankocho/en/page06_000001.html," n.d.).

Figure 45 shows the number of visits by tourists and the percentage of tourists in different locations. Among the areas that tourists do not tend to visit repeatedly are the traditional three major cities (urban tourism centers) of Osaka, Nagoya, and Tokyo. Among the areas repeatedly visited by tourists (more than two times), the proportion has declined. The re-visiting ratio of

Hokkaido (a tourist destination with snow and a natural landscape) and Fukuoka (a hot spring resort Ryokan destination) has increased significantly. Figure 47 shows the rank by the difference in occupancy rate compared 2019/04 with 2020/04. Basic analysis of this shows that the higher the usual occupancy rate, the faster the occupancy rate will drop after a health crisis. It shows that nature-based destinations increase customer satisfaction, and that urban tourism has no obvious advantage in terms of garnering repeat visits by tourists in Japan.

Percentage of tourists
> 20%
> 15%
> 10%
> 5%
> 1%
< 1%
> 10 times
2-9 times
1/once

Figure 45. Number of visits by tourists to tourist accommodation, and the percentage of tourists in different locations (2010–2019).

6.4.1.2. Occupancy Rate

In terms of regional accommodation occupancy rates in Japan, this paper compared the data with 2003 (the SARS health crisis), 2011 (the Great East Japan Earthquake and its nuclear radiation crisis), and 2019 (the year before COVID-19) (**Figure 46**). It shows that in the year of the SARS outbreak, although the number of foreign tourists decreased (mainly Chinese tourists), the overall impact was not significant (because there was no SARS outbreak in Japan). However, the situation in 2011 was much worse than in 2003 (although there was no global health crisis). Due to the Great East Japan Earthquake and the health crisis caused by the nuclear leak, the rate of accommodation in 2011 dropped sharply across the country (except for the central areas of Tokyo and Osaka). Basic analysis of this shows that the local crisis (especially the health crisis) had a much greater negative impact on tourism accommodation than crises in neighboring countries (because foreign tourists and Japanese tourists were both unwilling to travel).

> 70%
66%-70%
61%-65%
56%-60%
51%-55%
46%-50%
41%-45%
35%-40%
< 35%
2019
2011
2003

Figure 46. Occupancy rate of tourism accommodation in the cities in Japan in 2003/2011/2019: SARS (2003) and the Great East Japan Earthquake and Fukushima nuclear leak health crisis (2011).

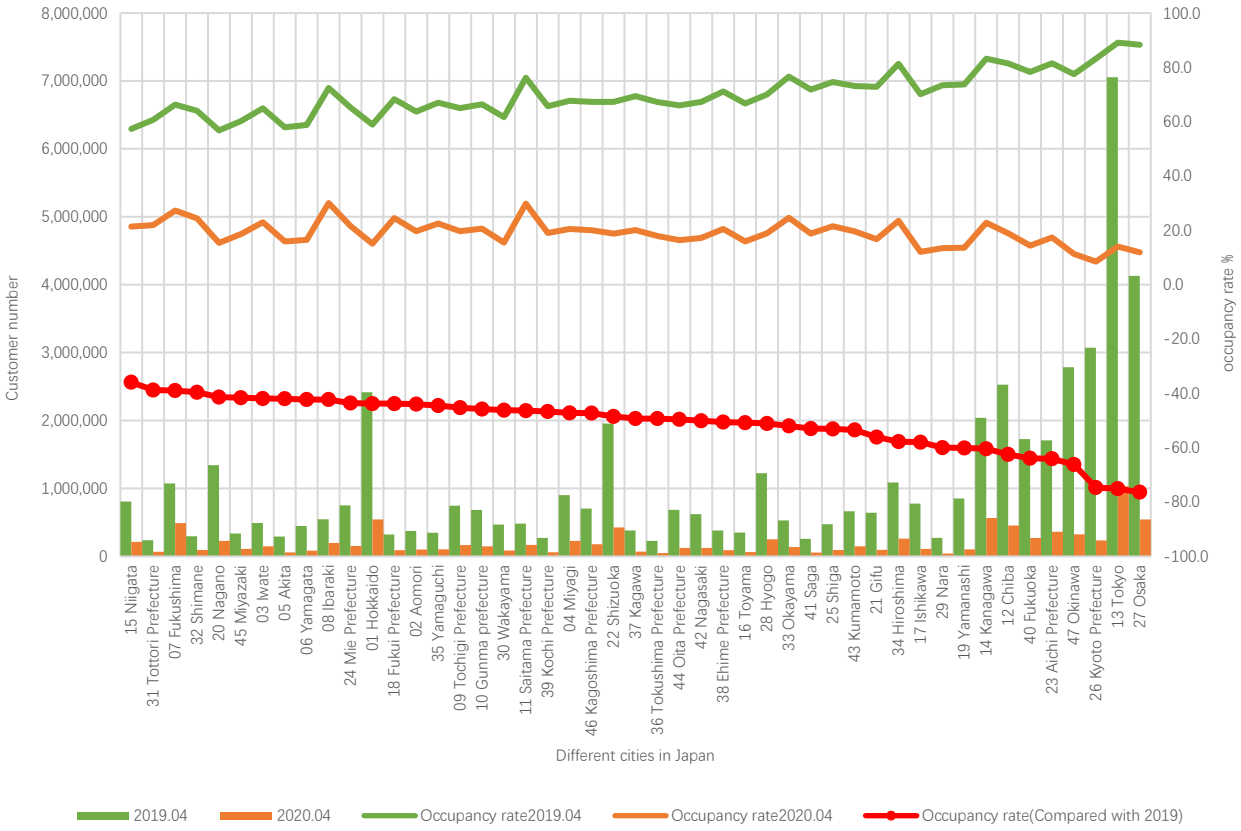


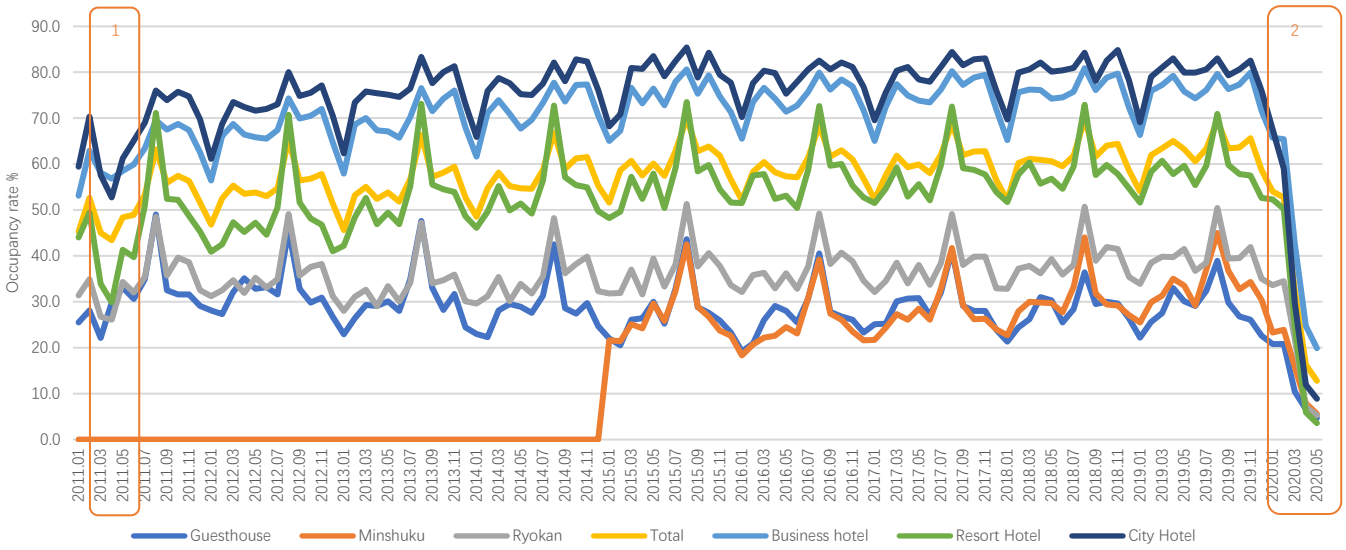
Figure 47. Rank of the difference in occupancy rate compared 2019/04 with 2020/04 of tourism accommodation.

6.4.2. Finding 1: Advantages of Ryokans after COVID-19 in Japan

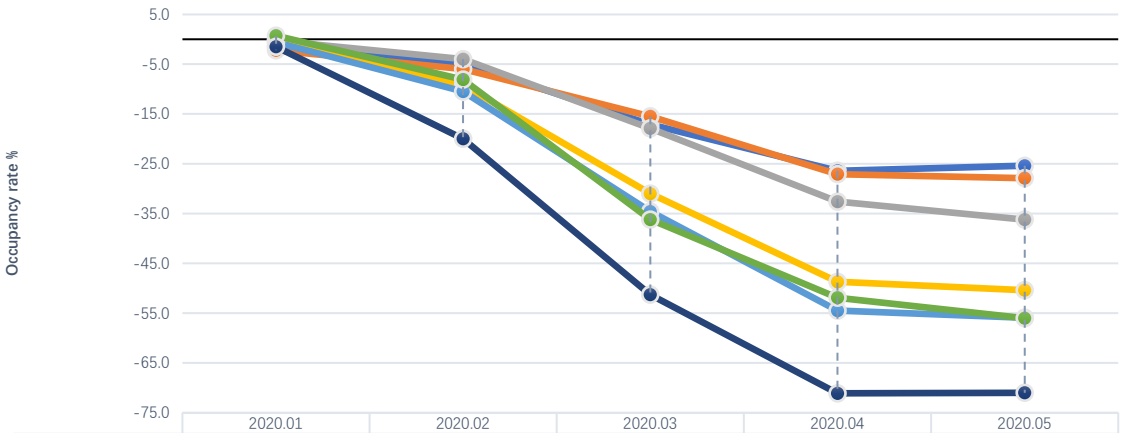
As can be seen from the following analysis chart (Figure 48, Figure 49), the occupancy rate of Ryokans is usually lower than that of hotels. However, after the outbreak of COVID-19, the occupancy rate of Ryokans dropped much less than that of hotels. This situation also occurred in the health crisis of the nuclear leak in March 2011 (Figure 48). This shows that Ryokans have certain advantages in times of crisis.

In the tourism industry, apart from hotels and guesthouses, the most common form of accommodation is the bed and breakfast (B&B) (Nuntsu et al., 2004). This means that visitors or guests pay to stay in a private residence, interacting with the landlord family (Lynch, 2005). This small-scale operation method attracts tourists differently from standard hotels (Hsieh and Lin, 2010). Hara (Hara, 2014) reviewed Japan tourism and hospitality management, considering both challenges and solutions. Unlike the concept of "sofa guests" in Europe and America, Japanese Ryokans have a very long history. They first appeared in the 15th century. They provide convenience for people traveling between cities (Chi and Han, 2020), similarly to ancient Chinese inns. Subsequently, as the domestic tourism industry developed, and more and more Japanese people traveled in families, the rural areas, hot springs, and ski resorts were not suitable for building large-scale hotels, so the locals expanded and transformed their residences for profit (Murayama and Parker, 2012).

Among these two types, hotels (Resort Hotels, City Hotels, And Business Hotels) have relatively standardized industry standards. These have also received more research attention all over the world. However, Guesthouses, Minshuku, and Ryokans are becoming more and more important to Japan’s tourist accommodation. Especially after 2003, the Ryokan Business Law was deregulated nationwide. The operation of Ryokans is strongly encouraged and supported by the Japanese government. Ryokans could play an important role in the restart and recovery of Japanese tourism accommodation.



1397 **Figure 48.** Occupancy rate of different accommodation styles (2011.01–2020.04).



	2020.01	2020.02	2020.03	2020.04	2020.05
Guesthouse	-1.4	-4.8	-17.1	-26.4	-25.4
Minshuku	-2.2	-6.0	-15.5	-27.1	-27.9
Ryokan	-0.3	-4.0	-17.9	-32.6	-36.2
Total	0.0	-9.2	-31.0	-48.7	-50.4
Business hotel	-0.6	-10.5	-34.6	-54.5	-55.9
Resort Hotel	0.7	-8.1	-36.2	-51.9	-56.0
City Hotel	-1.5	-20.0	-51.3	-71.1	-71.0

1398 **Figure 49.** Occupancy rate under COVID-19 (compared the same months in 2019) of tourism

1399 accommodation.

1400 *6.5.* Results (study) 2: CASBEE-IPA

1401 For this, we used the Delphi method to select and confirm items related to the "green

1402 Ryokan style" from the CASBEE family. Then, this study used the confirmed items to conduct

1403 a questionnaire survey.

6.5.1. Data Collection

Based on the previous survey/analysis of Japanese tourism and tourist accommodation, among foreign tourists, the influence of Chinese tourists and the pursuit of Japanese Ryokans are increasing year by year (Chinese tourists' annual consumption accounts for half of all foreign tourists' consumption). Therefore, this paper selected Chinese tourists as the survey object. This study used Questionnaire Star (Changsha Ranxing Information Technology Co., Ltd., Changsha, China) to make questionnaires and send them through social software such as WeChat (Tencent, Shenzhen, China) (a sample questionnaire is showed in Appendix A). Each questionnaire had a 5 RMB red envelope as a reward for the respondent. Finally, the data on the webpage of Questionnaire Star was downloaded and summarized. The data was selected from 357 travelers who had experienced the Ryokans in Japan before COVID-19. A Likert scale was used to measure the tourists' expectations before checking in, with the five optional levels: from 1 = strongly disagree to 5 = strongly agree. A total of 30 items for tourists' expectations of B&Bs were included in the questionnaire. All measurement items used in this study are shown in Table 19, which describes the demographics of the respondents.

Table 19. Profile of survey respondents (n = 357).

Variable	N	Percentage
Gender		
Male	171	48%
Female	186	52%
Age		
25 ~ 35	164	46%
36 ~ 45	82	23%
46 ~ 55	64	18%
56 ~ 65	21	6%
Other	29	8%

Variable	N	Percentage
Educational Level		
Associate's degree	39	11%
Bachelor's degree	193	54%
Graduate degree	111	31%
Other	14	4%
Occupation		
Civil servant	11	3%
Company employee	125	35%
Student	61	17%
Professional	50	14%
Self–employed	46	13%
Other	64	18%

1420 6.5.2. Finding 2: Improvement Strategies after COVID-19 from IPA

1421 SPSS 26 statistical software (IBM, New York, USA) was used for questionnaire analysis.
1422 The questionnaire reliability calculation was based on Cronbach's alpha coefficient. An alpha
1423 greater than 0.7 means "high reliability", and greater than 0.5 means "reliable". The
1424 questionnaire had an alpha of 0.974, indicating relatively high and acceptable reliability
1425 (Hwang et al., 2020c). The questionnaire also showed sufficient content validity, standard-
1426 related validity, and structural validity (Table 20, Table 21).

1427 **Table 20.** Validity statistics.

		Number	%
Cases	Valid	357	100
	Excluded	0	0
	Total	357	100

1428 **Table 21.** Reliability statistics.

Cronbach's Alpha	Number of Items
0.974	30 Expect-Importance 30 Past-Performance

1429

1430 According to the IPA framework, the average response to the importance and performance
1431 of 30 attributes were analyzed, as shown in Table 22. Most of the importance and performance
1432 means were found to be significantly different (Sig. 2–tailed) at the <0.01 level (NO. 15, 24
1433 <0.05). Variables in each category are ranked in order by importance.

1434 The analysis results are shown in Table 22 and Figure 50). First, these items are in the high
1435 priority area (Score 4): NO.6, 9, 10, 11 (indoor environment); 12, 18, 19 (outdoor environment);
1436 23, 30 (quality of service). For example, these items need to be given high priority attention
1437 after COVID-19: (NO.6) use of daylight, (NO.6) ventilation/natural ventilation performance,
1438 (NO.6) operation (materials to maintain safe interior indoor air quality (IAQ), and (NO.6) good
1439 view/visual environment. Second, these items are in the priority area (Score 3): NO. 2, 3, 7
1440 (indoor environment); 20, 21, 22, 28 (quality of service). Third, these items are in the medium
1441 priority area (Score 2): NO. 1, 4, 5, 8 (indoor environment); 13, 16, 17 (outdoor environment);
1442 26 (quality of service). Fourth, these items are in the low priority area (Score 1): NO. 15
1443 (outdoor environment); 24, 25, 27, 29 (quality of service).

1444 **Table 22.** Rank, means of importance, and performance and paired sample T test (df =357).

	NO.	Paired Differences (I-P)					t	Sig. (2-tailed)	I	P	Correlation
		Mean	Std. Deviation	Std. Error Mean	95% [a] Lower	95% [a] Upper					
Q1	1	1.120	1.523	0.080	0.962	1.278	13.918	0.000	4.770	3.650	0.632
	2	0.964	1.671	0.088	0.790	1.137	10.914	0.000	6.090	5.120	0.811
	3	0.844	1.625	0.086	0.675	1.013	9.819	0.000	6.410	5.570	0.791
	4	0.729	1.262	0.067	0.598	0.860	10.929	0.000	4.830	4.100	0.718
	5	2.693	1.453	0.077	2.542	2.844	35.053	0.000	5.470	2.780	0.632
	6	2.478	2.523	0.133	2.215	2.740	18.577	0.000	6.220	3.740	0.441
	7	0.953	1.749	0.092	0.771	1.134	10.304	0.000	6.380	5.430	0.764
	8	1.500	2.543	0.134	1.236	1.764	11.159	0.000	4.670	3.170	0.411
	9	3.455	1.761	0.093	3.272	3.638	37.130	0.000	6.240	2.780	0.418
	10	2.961	1.474	0.078	2.808	3.114	38.012	0.000	5.780	2.820	0.607
	11	2.179	0.858	0.045	2.090	2.268	48.070	0.000	5.970	3.790	0.856
Q2	12	1.564	1.917	0.101	1.365	1.764	15.439	0.000	5.660	4.100	0.755
	13	1.598	1.372	0.073	1.455	1.740	22.033	0.000	4.420	2.830	0.820
	14	0.687	1.538	0.081	0.527	0.847	8.451	0.000	5.910	5.220	0.807
	15	–0.260	2.278	0.120	–0.497	–0.023	–2.158	0.032	4.650	4.910	0.859
	16	0.478	2.480	0.131	0.220	0.735	3.645	0.000	4.620	4.140	0.745
	17	0.939	1.244	0.066	0.809	1.068	14.273	0.000	4.320	3.380	0.757
	18	1.422	1.780	0.094	1.237	1.607	15.112	0.000	5.490	4.070	0.817
	19	2.483	1.152	0.061	2.364	2.603	40.802	0.000	6.460	3.970	0.677
Q3	20	1.176	1.721	0.091	0.997	1.355	12.926	0.000	6.000	4.830	0.835
	21	1.578	2.022	0.107	1.368	1.788	14.770	0.000	5.990	4.410	0.704
	22	1.142	1.754	0.093	0.960	1.325	12.327	0.000	5.850	4.710	0.807
	23	1.930	2.277	0.120	1.693	2.167	16.038	0.000	5.810	3.880	0.607
	24	–0.327	2.412	0.127	–0.578	–0.076	–2.564	0.011	4.850	5.180	0.573
	25	–0.592	2.211	0.117	–0.822	–0.362	–5.069	0.000	4.830	5.420	0.690
	26	1.662	1.888	0.100	1.466	1.858	16.659	0.000	5.390	3.730	0.780
	27	–0.696	2.024	0.107	–0.906	–0.485	–6.503	0.000	4.540	5.230	0.745
	28	0.939	1.683	0.089	0.764	1.113	10.554	0.000	6.200	5.270	0.806
	29	–0.709	2.196	0.116	–0.938	–0.481	–6.113	0.000	4.830	5.540	0.670
	30	2.142	2.276	0.120	1.906	2.379	17.809	0.000	5.990	3.850	0.600

1445 Note: [a] Confidence Interval of the Difference. All factors loadings are significant at $p < 0.01$

1446 (NO. 15/24 < 0.05).

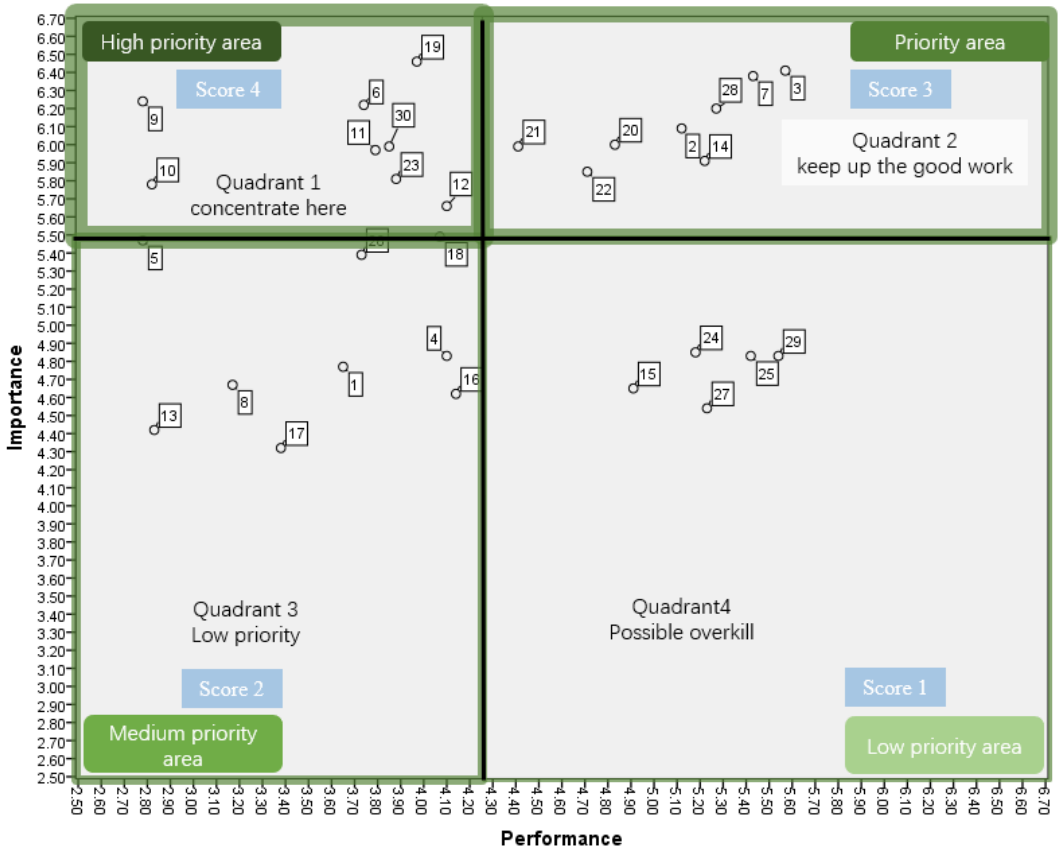


Figure 50. The Importance-Performance analysis.

6.6. Results (study) 3: A Dynamic Evaluation Model of Green Ryokans

6.6.1. Weights Analysis

Table 23. Items and weights.

Items		NO.	Quadrant	Score [b]	Weights [c]
Q1	Q1-1	1	Quadrant2	2	6.06%
25.00%	Q1-2	2	Quadrant3	3	9.09%
	Q1-3	3	Quadrant3	3	9.09%
	Q1-4	4	Quadrant2	2	6.06%
	Q1-5	5	Quadrant2	2	6.06%
	Q1-6	6	Quadrant4	4	12.12%
	Q1-7	7	Quadrant3	3	9.09%
	Q1-8	8	Quadrant2	2	6.06%
	Q1-9	9	Quadrant4	4	12.12%
	Q1-10	10	Quadrant4	4	12.12%
	Q1-11	11	Quadrant4	4	12.12%

Q2	Q2-12	12	Quadrant1	1	5.26%
20.00%	Q2-13	13	Quadrant2	2	10.53%
	Q2-14	14	Quadrant3	3	15.79%
	Q2-15	15	Quadrant1	1	5.26%
	Q2-16	16	Quadrant2	2	10.53%
	Q2-17	17	Quadrant2	2	10.53%
	Q2-18	18	Quadrant4	4	21.05%
	Q2-19	19	Quadrant4	4	21.05%
Q3	Q3-20	20	Quadrant3	3	11.54%
27.75%	Q3-21	21	Quadrant3	3	11.54%
	Q3-22	22	Quadrant3	3	11.54%
	Q3-23	23	Quadrant4	4	15.38%
	Q3-24	24	Quadrant1	1	3.85%
	Q3-25	25	Quadrant1	1	3.85%
	Q3-26	26	Quadrant2	2	7.69%
	Q3-27	27	Quadrant1	1	3.85%
	Q3-28	28	Quadrant3	3	11.54%
	Q3-29	29	Quadrant1	1	3.85%
	Q3-30	30	Quadrant4	4	15.38%

Note: [b] based on the IPA, the total score for each part (Q1/Q2/Q3) is 10; [c] weighted average, the total weights for each parts (Q1/Q2/Q3) is 100%.

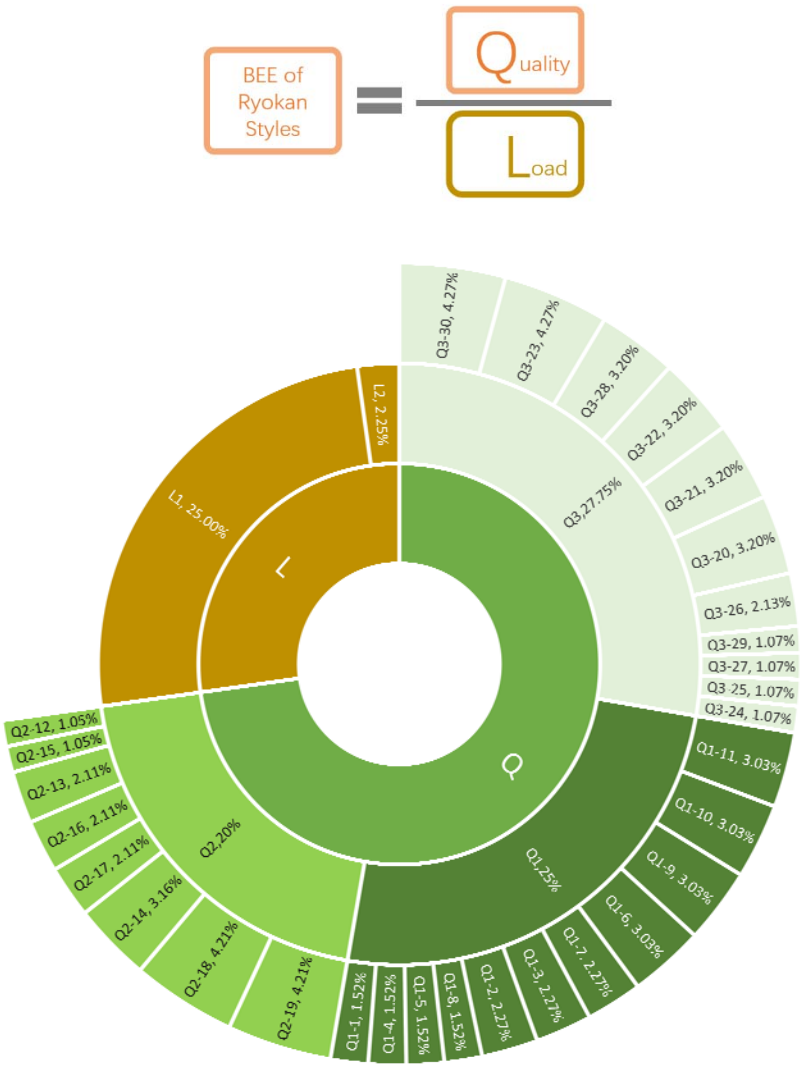


Figure 51. The evaluation model of green Ryokans.

Based on the weighted average of the score of the IPA, the new weights of items were identified, and then the "Q value" items and weights of the new "evaluation model of green ryokans" was obtained (Table 23, Figure 51). Because the L value is mainly energy consumption and carbon emissions, it is not in the scope of this article (**Figure 51**). For example, Q3-23 and Q3-30 have the biggest weights among all the items. This shows that in the subsequent evaluation and scoring, these two items need to be paid more attention. On the other

hand, Q2-12 and Q2-15 have the smallest weights among all the items. This shows that these two items can be paid less attention.

6.6.2. Finding 3: Improvement Strategies after COVID-19 from IPA

The weights were determined according to the IPA of customer satisfaction, which is a dynamic process. This study established a new dynamic evaluation model of Ryokans: (1) items remain basically unchanged (unless other new crises or changes occur); (2) the weight of items can change according to different regions or different customer groups (for example, if hotels specialize in attracting tourists from a certain country, then a new weight can be determined based on the IPA survey and analysis of tourists' satisfaction in this country). This is another huge advantage of the Ryokan style of non-standard hotels—flexibility. This may be the biggest research discovery and contribution of this article.

6.7. Impactions, Limitations and Future Research- Ryokan

Implications for Theory: First, hotels have relatively standardized industry standards. They have also received more research attention all over the world. However, Guesthouses, Minshuku, and Ryokan are becoming more and more important to Japan's tourist accommodation market (Karakawa, 2019). Ryokans are more attractive to tourists, and have lost less after crises than hotels. Ryokans could play an important role in the restart and recovery

of Japanese tourism accommodation. Therefore, this study chose green Ryokans as the object of study.

Second, strategies for promoting green Ryokans at different levels are proposed in Study 2. These strategies supplement the gaps in research related to green Ryokans. These strategies could help improve customer satisfaction in tourism accommodation after COVID-19, and further promote the 2021 Japan Olympic Games. Moreover, Study 3 used the CASBEE combined with the Delphi method and IPA in a novel way.

Implications for Practitioners and Policy Makers: The changes in the world have exceeded our expectations, especially after the outbreak of COVID-19. Therefore, a new dynamic green evaluation model for Ryokans needed to be established. Although this process may be controversial, this study has taken the first step to try to fill the gaps in CASBEE for Ryokans, and change the original inherent evaluation model and evaluation system. The findings in this article will help to guide operators/practitioners in the Ryokan industry to get market research support for improvement measures as soon as possible. At the same time, it also has a policy support role for the government or non-governmental policy-makers in the Ryokan industry. For health-related Ryokans, the highest priority with regards to promotion strategies designed to elicit customer satisfaction following COVID-19 is designing a green built environment.

Limitations and Future Research Directions: Due to limited human and material resources, the sample of the research objects in this paper was limited to Chinese tourists (the largest number and top consumers of the foreign tourists visiting Japan). The current paper shows that in Japan, as in many other destinations around the world, domestic demand has sustained the

tourism accommodation sector in these months of the COVID-19 pandemic. Therefore, in future we plan to investigate the top 10 countries and regions of tourists visiting Japan, and combine their satisfaction ratings with Japanese domestic tourists to compare the differences and summarize the similarities. This study hopes to develop a more comprehensive hotel dynamic evaluation model in the future.

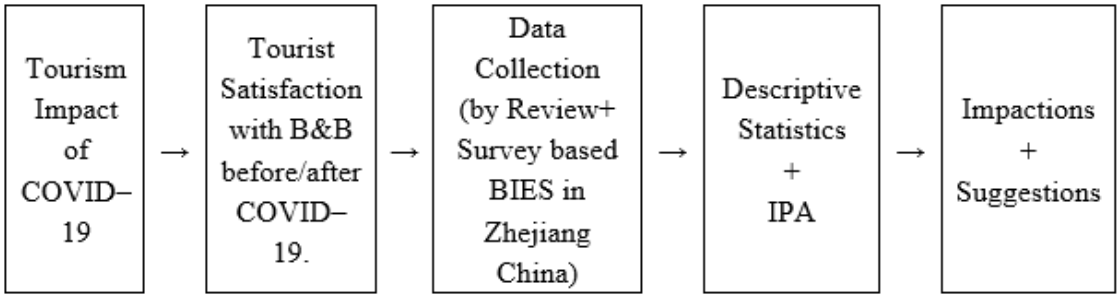
7. The Strategies of B&B Tourism on Promoting Local Green Hospitality: The Case from Zhejiang, China

7.1. The Logical Model

Thus, this article focuses on B&Bs in Zhejiang, China. There are two reasons for this: (1) the COVID–19 epidemic improved in Zhejiang. From January 23 to April 1, 2020, there was only one death in Zhejiang. No medical staff were infected. There were also no new confirmed cases from the residents for more than 14 consecutive days. Zhejiang resumed work gradually from February 20, 2020 ("http://www.xinhuanet.com/politics/2020-02/20/c_1125598806.htm," n.d.). (2) According to a B&B market development report in 2019, the main force of the B&B was from Zhejiang ("https://caijing.chinadaily.com.cn/a/201910/24/WS5db16cbca31099ab995e7a64.html," n.d.).

Figure 52 shows the logical model. First, this study was carried out to measure the intervening influence of B&Bs before/after COVID–19 on the correlations with tourist satisfaction levels in Zhejiang, China (Hussain et al., 2019)(Kanwel et al., 2019). There were 588 responses that were selected (who have experienced B&B in Zhejiang, China) for the analysis. Second, descriptive statistics and an importance–performance analysis (IPA) were used to measure the impact of B&B before/after COVID–19 on tourist satisfaction levels in Zhejiang. IPA is a business research technique developed as a market tool to examine and suggest management strategies (Martilla and James, 1977). IPA prioritizes management suggestions regarding the optimal allocations that should improve tourist satisfaction. Thus, it

could be a valuable practical tool for management decisions (Sever, 2015). Third, some suggestions are given to the B&B industry to recover after the COVID–19 crisis by an importance–performance analysis (IPA). Moreover, suggestions of crisis preparedness and disaster–management strategies for future research are given (Mair et al., 2016). The purpose of this article was to help the B&B industry to adapt to resumption after the COVID–19 crisis.



Notes: B&B = Bed and Breakfast, BIES = B & B industry evaluation standard, COVID–19 = Corona Virus Disease 2019, IPA = importance–performance analysis, IA = Importance (After COVID–19), PB = Performance (Before COVID–19), QN = Question Number, TS = tourist satisfaction.

Figure 52**.** The logical model.

7.2. B&B in Zhejiang and tourist satisfaction

7.2.1. B&B in Zhejiang

This study was carried out in Zhejiang, China. As the most popular B&B rural tourist destination in China, the area receives more than 23.52 million tourists. From January 1, 2015, to December 14, 2019, the Baidu index results showed that the top 10 B&B provinces and cities were Zhejiang, Guangdong, Sichuan, Jiangsu, Beijing, Shanghai, Shandong, Henan, Chongqing, and Hubei. It shows that Zhejiang was the most concerned about B&Bs. Most of these areas are economically developed provinces and cities. According to the B&B Market

Development Report in 2019, the main force of the B&B was from Zhejiang Province, and accounts for about 60% of tourists, which is consistent with the search results of the area where B&Bs are present (Yang, 2019). The highest media coverage about B&Bs in China was in Zhejiang from January 2015 to February 2018. The topics of media concern ranged from the rapid development of B&Bs and the reference of B&B experience, to the problems arising in the development of B&Bs, and lasted until the introduction of B&B standards, which indicates that the development of B&Bs in China will enter a stable development stage from the initial stage of rapid growth without supervision (Yang, 2019).

7.2.2. Tourist Satisfaction

Various definitions of satisfaction have been proposed in the literature. In the tourism sector, tourist satisfaction (TS) is an essential aspect of the tourist services sector (Kozak et al., 2004). As services directly impact people (Forte et al., 2018), some researchers have indicated that services are linked to tourist satisfaction. Tourist satisfaction, as a marketing tool, plays a key role in the construction of strategies in the tourism market (Hau and Omar, 2014). Furthermore, satisfaction is vital for successful destination marketing (Berardelli et al., 2019), as well as a service organization (Kozak and Rimmington, 2000). The feelings of displeasure regarding tourists is a sign of dissatisfaction (Agyeiwaah et al., 2016), while tourists who enjoy visiting are satisfied (Chen and Chen, 2010)(Cai et al., 2020c). Therefore, tourist contentment is a considerable factor for tourists in making up their minds to visit again or not (Nam et al., 2016)(Kalwar et al., 2019)(Hwang and Kim, 2019).

1567 Enhancing tourist satisfaction is a key strategy that leads to the success of companies in the
1568 hotel (Hyun and Perdue, 2017)(Hyun et al., 2011), catering (Hyun and Kang, 2014)(Hyun,
1569 2009), and tourism industries (Choi and Chu, 2001). The quantitative approach with surveys
1570 was extensively adopted by scholars to study the multiple determinants of tourist satisfaction
1571 (K.-H. Lee et al., 2020). For instance, Deng et al. (Deng et al., 2013) surveyed 412 overseas
1572 tourists in Taiwan and found tourist complaints and service quality were related to tourist
1573 satisfaction. Kim et al. (Kim et al., 2006) gathered the opinions of 317 tourists from Beijing
1574 and discovered that convenience, safety, and technological inclination were the main factors
1575 that influenced tourist satisfaction. As a unique style of accommodation, it was inappropriate
1576 to employ the factors identified in other contexts directly to B&B during our investigations
1577 (Chen, 2015)(Hwang et al., 2015)(Hwang and Lee, 2019c).
1578
1579 *7.3.* Materials and Methods
1580
1581 7.3.1. Explanation of Questionnaire
1582 This study was carried out to measure the intervening influence of B&Bs before/after
1583 COVID–19 on its relationship with tourist satisfaction in Zhejiang, China. We used WeChat
1584 (Tencent, Shenzhen, China) for this online survey in Zhejiang, China. We received 1120
1585 answers to the questionnaire. However, there were 588 responses from people who have
1586 experienced B&Bs in Zhejiang before the COVID–19 that were selected for the analysis. The
1587 responses were collected from 1 March to 15 March 2020.

The questionnaire consisted of 30 factors, from the expectation of B&Bs before check-in, to the perception of facilities after check-in (Hwang et al., 2019). Likert's five-point scale was used to measure tourists' expectations before check-in, with five optional levels (G.-L. Wang et al., 2012): (1) Importance (After COVID–19): “5 = very important”, “4 = important”, “3 = so–so”, “2 = unimportant”, and “1 = very unimportant”. Appendix A shows the sample questionnaire (Dressler and Paunovic, n.d.)(Dressler, 2017). (2) Performance (Before COVID–19): “5 = very good”, “4 = good”, “3 = so–so”, “2 = not good”, and “1 = bad”.

7.3.2. Questionnaire Items

In addition to people's natural awareness and sharing awareness, the development of home-stays is more about providing experiential services for tourists than is provided by basic accommodation services (Åke Nilsson, 2002). Some researchers constructed an experiential scale to tap into tourist experiences in the accommodation industry (Oh et al., 2007)(Deng and Lee, 2019). The determinants of consumer satisfaction with B&B establishments were studied and a hierarchical structure of these determinants was built. Thus, with the intention of bridging this gap, we aspired to develop a multiple-item scale to measure tourist opinions about B&Bs before/after COVID–19.

Ten determinants of tourist satisfaction were identified (Chen et al., 2017). Based on previous research and B&B industry evaluation standards (BIES) in China (Table 24, Figure 53), a number of factors were generated. All the factors were assessed for content and face validity by a panel of experts from two institutions affiliated with the authors (Lyu and Hwang, 2015)(Hwang et al., 2018).

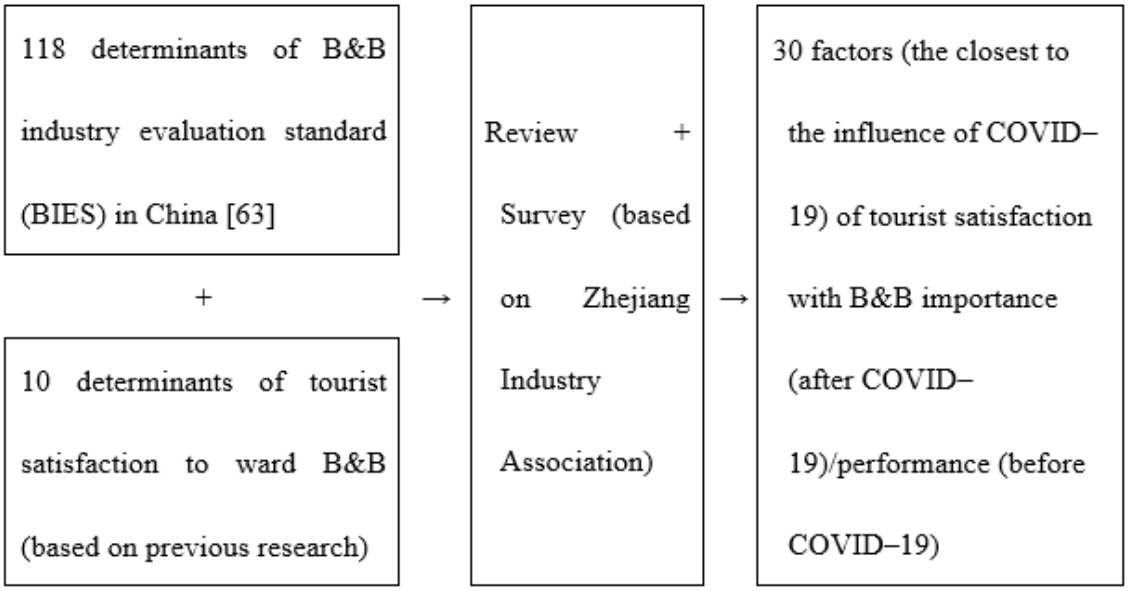


Figure 53 Logic of selection of the 30 questionnaire factors.

Table 24 The 30 items to measure B&B experience before/after COVID–19.

Determinants of tourist satisfaction to ward B&B (based on previous research)	**30 factors: importance (after COVID–19)/ performance (before COVID–19)**	**QN**
B&B Location (Xiao et al., 2019)(Chen et al., 2017)(Ye et al., 2019)	Location and nearby facilities are safe & good.	1
Facility Quality (Xiao et al., 2019)(Chen et al., 2017)(Ye et al., 2019)	The kitchen & dining room are clean and tidy.	2
	The leisure area is clean and tidy.	3
	Other service rooms are clean and tidy.	4
	Buildings are intelligent (e.g. semi–self–service management).	5
	Places or items for cleaning and disinfection are provided to tourists.	6
	The building is safe and reliable.	7
Room Quality (Xiao et al., 2019)(Chen et al., 2017)(Ye et al., 2019)	The emergency facilities are complete (such as: first aid kit, escape equipment).	8
	The shading performance is good (e.g., opaque curtains).	9
	The rooms have plenty of natural light.	10
	Split air conditioners are used in guest rooms.	11
	Rooms are naturally ventilated.	12
	The rooms are spacious and clean.	13
	The natural landscape outside the window is good.	14
	The privacy of rooms is good.	15
	Contingency plans are developed and can be exercised regularly.	16

Determinants of tourist satisfaction to ward B&B (based on previous research)	30 factors: importance (after COVID–19)/ performance (before COVID–19)	QN
Service Quality (Parasuraman et al., 1988)(Han et al., 2020a)	Green consumption is encouraged and environmental protection measures are implemented.	17
Specialties (Chen et al., 2017)(Han and Hyun, 2018a)	The indoor and outdoor transition spaces are natural and beautiful (e.g., gallery frames, awnings, balconies).	18
	The outdoor space is large and natural (e.g. courtyard, terrace, roof garden).	19
	The proportion of public space is large.	20
	The layout of the rooms is scattered.	21
	Rooms of Single B&B are few and exquisite.	22
	The local culture is attractive.	23
Surrounding Environment (Kimes and Fitzsimmons, 1990)	The local people around the B&B are kind.	24
	The environment around the B&B is rural and natural.	25
Consumption Emotion (Havlena and Holbrook, 1986)(Hyun and Han, 2015)	The B & B atmosphere is good (e.g., leisurely, warm).	26
	The experience and interaction in the space is good.	27
Expectation Fulfillment (Syaqirah and Faizurrahman, 2014)	B&B matches the expectations.	28
Perceived Value (Zeithaml, 1988)	B&B is an important part of travel.	29
Satisfaction (Oliver, 2014)(S. Lee et al., 2020)	Satisfaction with the B&B.	30

Note: IA = Importance (After COVID–19), PB = Performance (Before COVID–19), QN = Question Number

1612

1613 3.2.2. Location of the Discriminating Thresholds within the IPA Plot.

1614 The best place to divide the graph into quadrant thresholds is one of the biggest problems
1615 in IPA applications (Bacon, 2003). The choice of threshold is almost a matter of judgment
1616 (Azzopardi and Nash, 2013)(Ziegler et al., 2012). However, their subjective positions has led
1617 to inconsistencies in existing IPA research results (Ziegler et al., 2012).

1618 First, the data-centric (DC) method uses the actual data average of the observed importance
1619 and performance level as the critical point. Therefore, scholars have proposed another solution

(Alberty and Mihalik, 1989)(Guadagnolo, 1985)(Hollenhorst et al., 1992). That is, they set the mean of the experience gained from the data as the intersection (Lai and Hitchcock, 2015).

Second, some authors suggested that the SC method is more transparent when interpreting research results, and usually provides a simpler description than using actual data methods (Ziegler et al., 2012). However, using the scaling method has a serious drawback, that is, in addition to the fact that it is not driven by actual data, it also tends to record the high importance level of all the attributes. The latter means that, regardless of the characteristics of the interviewees, it turns out that this is the determinant of their expectations and opinions (Araña and León, 2013). Each survey will have the same discrimination threshold. Incorrect threshold settings may lead to misleading and conflicting management recommendations (Sever, 2015).

Third, other researchers used diagonal lines (DL) or so-called isolines (IRL) to divide the plot into two separate areas (Azzopardi and Nash, 2013). The point on this 45° upward line indicates an attribute with the same importance and performance level; compared to the subjective threshold selection method, the IRL method can be said to be a more suitable method for identifying the area of interest because it directly focuses on satisfaction and importance grade difference (Sever, 2015). Rial et al. (Rial et al., 2008) simplified this method by empirical means and a diagonal line with discrepancies. The difference in attributes (distance from the diagonal) is considered to be a priority in improving the service (Lai and Hitchcock, 2015).

Linear relationship (or linear association) is a statistical term used to describe the linear relationship between variables and constants. Mathematically speaking, the linear relationship satisfies the equation:

$$y = mx + b. \tag{1}$$

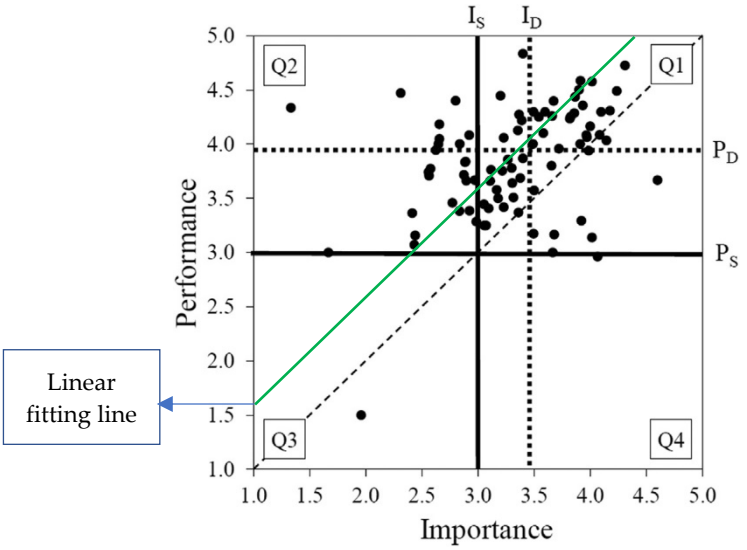
In this equation, "X" and "Y" are the two variables associated with parameters "m" and "B". Graphically, y = m x + B is drawn on the X-Y plane with the slope "m" and y-intercept

"B". When x = 0, y-intercept "B" is just the value of "Y". Calculate the slope "m" from any two separate points (x1, Y1) and (X2, Y2), as follows:

$$m = (x2 - x1)/(y2 - y1). \quad (2)$$

However, compared to the standard IPA chart (with four quadrants), it produces less information, provides limited identification ability, and therefore has limited interpretation ability. Therefore, it limits the usefulness of IPA (Sever, 2015).

The actual means of importance and performance are likely to differ in most cases, and therefore, require study-specific adjustments to the scales in order to interpret the importance and performance ratings (Oh, 2001b), as well as the relative interpretation of attributes within the importance and performance ratings. Most researchers use DC and average values of the actual importance and performance level when determining the threshold value of tourism research (Lai and Hitchcock, 2015). IRL directly focuses on differences in satisfaction (Before COVID–19) and importance (After COVID–19) ratings. Therefore, this article uses the method of DC+IRL when specifying the thresholds of the impact before/after COVID–19 on tourist satisfaction with B&B (Figure 54).



Note: Graphical comparison of scale–centered ($I_S - P_S$) and data–centered ($I_D - P_D$) approaches in identifying the IPA quadrants.

Figure 54 The thresholds of IPA

4.1. The Descriptive Statistics

4.1.1. Profile of Survey Respondents

Table 1 describes the respondents' demographic profile. Among the 588 tourists, 55.78% were women and 44.22% were men. The majority of the participants ranged from 25 to 35, accounting for 45.92% of the samples. Most of the respondents had a bachelor or graduate degree (51.02%, n = 300), followed by graduate degrees (32.31%, n = 190). With regards to monthly income, 45.92% (n = 270) reported that their annual income was between $801 and $1200.

Table 25**Table 2.** Profile of survey respondents (n = 588).

Variable	N	Percentage
Gender		
Male	260	44.22%
Female	328	55.78%
Age		
25 ~ 35	270	45.92%
36 ~ 45	122	20.75%
46 ~ 55	114	19.39%
56 ~ 65	36	6.12%
Other	46	7.82%
Educational Level		
Associate's degree	68	11.56%
Bachelor's degree	300	51.02%
Graduate degree	190	32.31%
Other	30	5.10%
Monthly income (US dollar)		
< 500	36	6.12%

501–800	114	19.39%
801–1200	270	45.92%
1201–2000	122	20.75%
> 2001	46	7.82%
Occupation		
Civil servant	20	3.40%
Company employee	202	34.35%
Student	84	14.29%
Professional	96	16.33%
Self–employed	78	13.27%
Other	108	18.37%

4.1.2. Reliability and Validity Analysis

The statistical software of SPSS 26 (IBM, New York, United States) was used in the questionnaire analysis (Asif et al., 2019c)(Asif et al., 2019a). The calculation of the questionnaire's reliability was based on the Cronbach's Alpha coefficient. An α larger than 0.7 indicates "highly reliable" and larger than 0.5 "reliable" (Cronbach, 1951)(Haoying Han et al., 2019)(Asif et al., 2019b). The α for this questionnaire was 0.978, which indicated a relatively high and acceptable reliability (G.-L. Wang et al., 2012)(Jin and Park, 2019a). The questionnaire also proved satisfying in terms of the content validity, criterion-related validity, and construct validity (Table 26Table 27).

Cronbach's alpha is a function of the number of test items and the average inter-correlation among the items. It showed the formula of the Cronbach's alpha below (Cronbach, 1951):

$$\alpha = \frac{N*\bar{c}}{\bar{v}+(N-1)*\bar{c}}. \quad (3)$$

Here, N is equal to the number of items, $\bar{c}$ is the average covariance between the item-pairs, and $\bar{v}$ is equal to the average variance. It can be seen from this formula that, if you increase the number of items, you will increase Cronbach's alpha. In addition, if the correlation between the

average items is low, the alpha will be low. As the correlation between the average items increases, Cronbach's alpha will increase (keeping the number of items unchanged).

Table 26. Validity statistics.

		Number	%
Cases	Valid	588	100
	Excludeda	0	0
	Total	588	100

Table 27. Reliability Statistics.

Cronbach's Alpha	Number of Items
0.978	30IA+30PB

Note: IA = Importance (After COVID–19), PB = Performance (Before COVID–19)

4.1.3. Importance–Performance Scores

The mean responses for the importance and performance of the 30 attributes were analyzed in accordance with the IPA framework and are shown in Table 28. Most of the importance and performance means were found to be significantly different (Sig. 2–tailed) at the <0.01 level (QN. 23/25/28/29/30 <0.05) (Heesup Han et al., 2019a). Variables in each category were ranked in order by Paired Differences (IA–PB) (Hwang and Han, 2015)(Han et al., 2017b).

Table 28. Rank, means of importance, and performance and paired samples (N=588).

	Paired Differences (IA–PB)			IA		PB		Pearson Correlation	Sig. (2–tailed)
QN	Mean	Rank	Std. Deviation	Mean	Rank	Mean	Rank		
21	0.833	1	1.342	4.020	30	3.918	24	0.299	0.000
11	0.769	2	1.271	4.510	15	4.228	17	0.370	0.000
6	0.697	3	1.114	4.595	11	4.456	8	0.426	0.000
22	0.507	4	1.196	4.197	27	4.095	20	0.446	0.000
16	0.493	5	1.037	4.449	19	4.398	12	0.547	0.000
5	0.459	6	1.043	4.374	23	4.048	21	0.555	0.000

12	0.350	7	0.827	4.731	5	4.578	1	0.539	0.000
8	0.337	8	0.922	4.442	22	3.949	23	0.541	0.000
13	0.327	9	0.871	4.102	28	3.874	27	0.655	0.000
19	0.282	10	0.845	4.558	14	4.456	9	0.596	0.000
17	0.272	11	0.805	4.592	12	4.466	7	0.677	0.000
20	0.228	12	1.057	4.463	18	4.327	14	0.537	0.000
1	0.221	13	0.740	4.650	8	4.429	10	0.649	0.000
4	0.214	14	0.728	4.765	1	4.415	11	0.605	0.000
10	0.207	15	0.696	4.306	26	4.116	19	0.635	0.000
3	0.194	16	0.665	4.561	13	3.793	29	0.642	0.000
18	0.190	17	0.741	4.446	20	4.344	13	0.727	0.000
7	0.187	18	0.682	4.704	6	4.558	2	0.669	0.000
9	0.163	19	0.686	4.476	17	4.204	18	0.736	0.000
2	0.153	20	0.634	4.738	3	4.531	4	0.665	0.000
15	0.146	21	0.662	4.371	24	3.864	28	0.661	0.000
14	0.139	22	0.684	4.446	21	3.612	30	0.688	0.000
27	0.136	23	0.780	4.599	10	3.901	25	0.631	0.000
24	0.126	24	0.762	4.082	29	4.003	22	0.623	0.000
28	0.102	25	0.891	4.701	7	4.514	6	0.701	0.006
29	0.102	26	0.722	4.633	9	4.296	16	0.755	0.001
25	0.102	27	0.717	4.738	4	4.524	5	0.728	0.001
26	0.102	28	0.678	4.340	25	3.881	26	0.693	0.000
30	0.078	29	0.773	4.483	16	4.320	15	0.709	0.014
23	0.051	30	0.711	4.738	2	4.544	3	0.726	0.042

4.2. Importance (after COVID–19)–Performance (before COVID–19) Analysis (IPA)

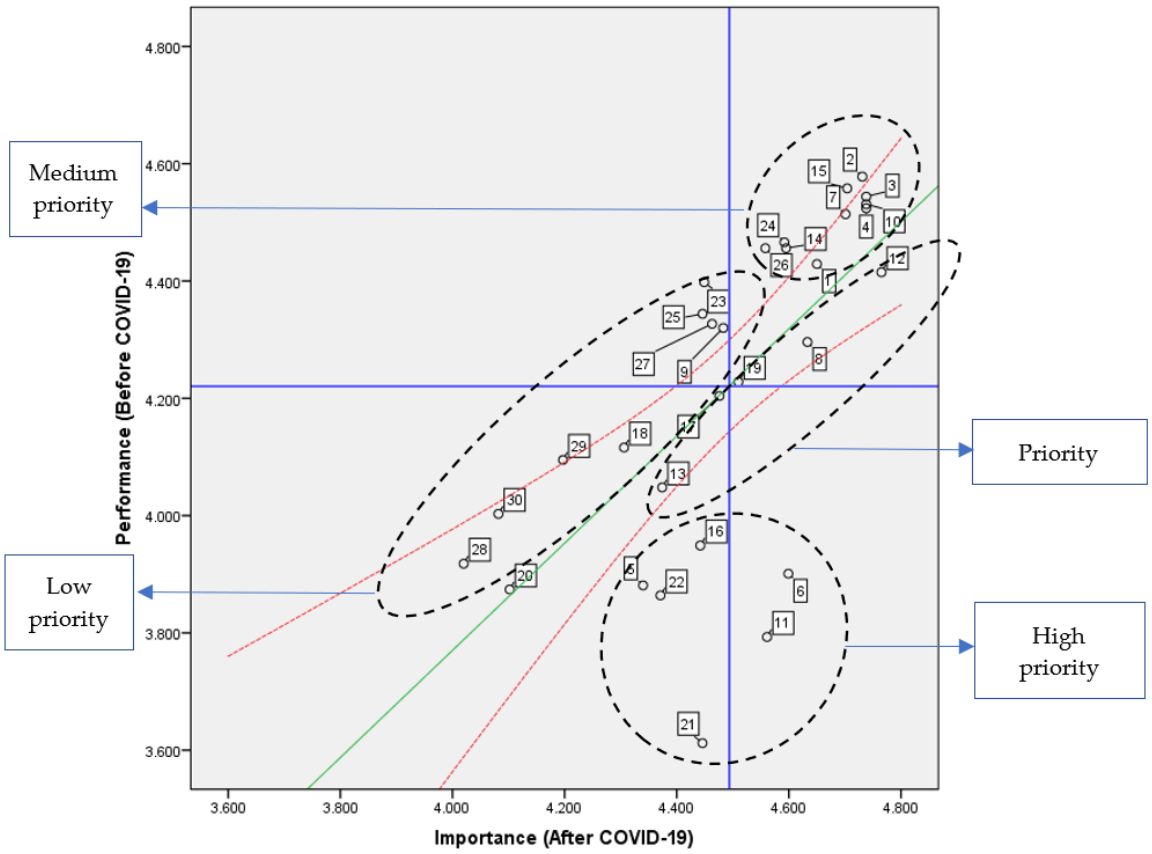
Figure 55 shows the results of IPA. High priority area (part of Quadrant 4+3): (4) the 'concentrate here' area; (3) the 'low priority' area. The attributes in this quadrant were considered to perform poorly and therefore represent the main weakness of the product and a threat to its competitiveness. In terms of investment, these attributes have the highest priority (Dwyer et al., 2012). Rank by paired differences (IA–PB): (1)"The layout of the rooms is scattered", (2) "Split air conditioners are used in guest rooms", (3) "Places or items for cleaning and disinfection are provided to tourists", (4) "Rooms of Single B&B are few and exquisite",

(5) “Contingency plans are developed and can be exercised regularly”, and (6) “Buildings are intelligent (e.g., semi–self–service management)”.

Priority area (part of Quadrant 1+3): (1) the ‘keep up the good work’ area; (3) the ‘low priority’ area. It represents the main and potential competitive advantages of a product or service. Attributes in this quadrant are considered to be performing well and investment needs to continue. Rank by paired differences (IA–PB): (7) “Rooms are naturally ventilated”, (8) “The emergency facilities are complete (such as: first aid kit, escape equipment)”, (9) “The rooms are spacious and clean”, (10) “The outdoor space is large and natural (e.g. courtyard, terrace, roof garden)”, and (11) “Green consumption is encouraged and environmental protection measures are implemented”.

Medium priority area (part of Quadrant 1): (1) the ‘only keep up the good work’ area. The importance and performance of these factors (e.g., “location and nearby facilities are safe and good”, “other service rooms are clean and tidy”) were good.

Low priority area (part of Quadrant 2+3): (2) the ‘possible overkill’ area; (3) the ‘low priority’ area. Their performance was not particularly good, but they were considered relatively unimportant to tourists; therefore, managers should not pay too much attention to these attributes. They represent a slight weakness, and poor performance is not a big problem. These factors are not important in this article (e.g., “the indoor and outdoor transition spaces are natural and beautiful (e.g., gallery frames, awnings, balconies)”, “the shading performance is good (e.g., opaque curtains))”.



Note:

(1) Data–centered (DC) line

(2) Fit method: Fit line = Linear

(3) Confidence intervals: Mean = Mean of Paired Differences (IA–PB)

Figure 55. The importance (after COVID–19)-performance (before COVID–19) analysis model.

7.4. Implications and Suggestions for B&B in Zhejiang

First, to the best of our knowledge, this study is among the first to uncover the impact of COVID–19 factors influencing tourists' satisfaction with B&Bs. Second, from the perspective of methodology, DC and IRL were combined with content analysis to sort and guide the complexity of the relationship between variables, which has certain value for future research. Third, some suggestions would be given to the B&B industry to recover after COVID–19 by

the importance–performance analysis (IPA). Our study extends this research area from the traditional B&B context and adds knowledge to the post–COVID–19 B&B tourism management area.

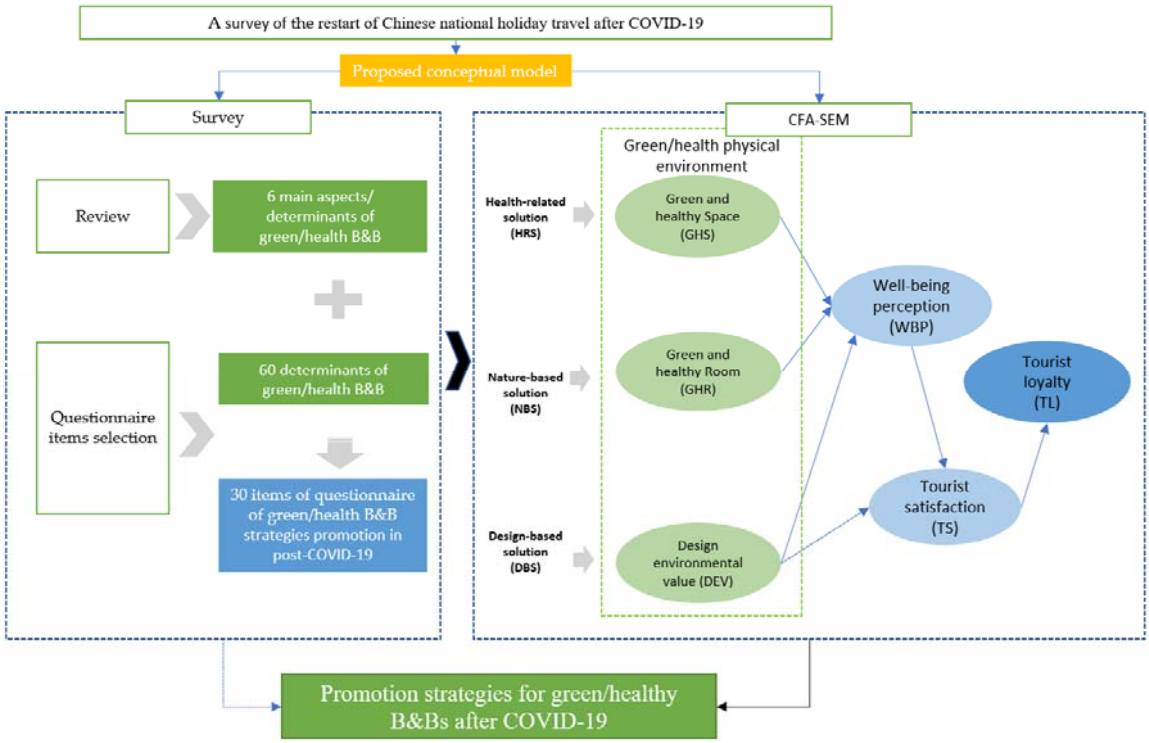
This study also has practical suggestions for B&B operators in making marketing strategies after COVID–19. As our results show, psychological factors can directly affect the satisfaction of consumers after Covid-19. The managers of B&Bs should consider the following factors in the "High priority area" and "Priority area". Compared to before COVID–19, tourists were more concerned with the natural and safe experience associated with B&Bs after COVID–19. These are some suggestions to improve consumption experience.

High priority Suggestions: Suggestions for the rank by paired differences (IA–PB): (1) "The layout of the rooms is scattered". This shows that, after the COVID–19 epidemic, tourists prefer scattered room layouts. Centralized room layouts need to be reconsidered. (2) "Split air conditioners are used in guest rooms". At present, central air conditioning has been used by many B&Bs. However, after COVID–19, this is not an ideal choice. (3) "Places or items for cleaning and disinfection are provided to tourists" and (4) "Rooms of Single B&B are few and exquisite". At present, there are more and more rooms in many B&Bs (single) and the scale is getting larger. This is obviously inappropriate for B&B tourism after the COVID–19 epidemic and it needs to be changed. (5) "Contingency plans are developed and can be exercised regularly". These measures were not paid enough attention before the outbreak. It needs to be focused on after the COVID–19 epidemic. (6) "Buildings are intelligent (e.g. semi–self–service

1753 management)". The intelligentization will be a trend in the future. It also needs to be focused
1754 on in B&Bs.
1755 Priority Suggestions: Suggestions for the rank by paired differences (IA–PB): (7) "Rooms
1756 are naturally ventilated", (8) "The emergency facilities are complete (such as: first aid kit,
1757 escape equipment)", (9) "The rooms are spacious and clean", (10) "The outdoor space is large
1758 and natural (e.g., courtyard, terrace, roof garden)", and (11) "Green consumption is encouraged
1759 and environmental protection measures are implemented". The suggestion in this part is that
1760 more attention should be paid to nature and green areas in the B&B tourism after COVID–19.
1761 Just like after SARS in 2003, people tended to go to places with nature-based areas rather than
1762 urban vacations (Wang and Wang, 2020)(Xiao et al., 2019).
1763

8. The Strategies of B&B Tourism on Promoting Local Green Hospitality: The Case from East China

8.1. The Logical Model



Note (abbreviations in this article): health-related setting (HRS); nature-based solution (NBS); design-based strategy (DBS); green and healthy space (GHS); green and healthy room (GHR); design environmental value (DEV); well-being perception (WBP); tourist satisfaction (TS); tourist loyalty (TL).

Figure 56. The logical model.

Figure 56 shows the logic model. First, the current study used a review, a survey, and hypotheses as the main logics. First, the review and analysis were based on the B&B industry

evaluation standard (BIES) and observations related to green/healthy physical environments of B&Bs from previous papers (Han et al., 2020b). Second, the hypotheses were based on a review of the relations between the following pairs of variables: health-related setting (HRS)/green and healthy space (GHS), nature-based solution (NBS)/green and healthy room (GHR), design-based strategy (DBS)/design environmental value (DEV), well-being perception (WBP), tourist satisfaction (TS), and tourist loyalty (TL) (Vujcic et al., 2017)(Van der Werff et al., 2013)(J. J. Kim et al., 2020). Third, the survey was developed with input from the East China B&B Industry Association and a team of experts. Last, the current paper used confirmatory factor analysis (CFA) and structural equation modeling (SEM) tests to test the hypothetical model. The data were collected during the first Chinese national holiday after the COVID-19 epidemic. The promotion strategies related to nature-based and health-related B&B tourism that are discussed in the current paper are a priority and a necessity for promoting the recovery of tourism following the epidemic.

The current paper attempts to empirically analyze promotional strategies for green/healthy B&Bs that are designed to support tourism recovery in East China following the COVID-19 health crisis. Thus, this paper empirically examined tourist loyalty to green B&Bs during the first national holiday after tourism activities resumed in China (China was the first country to resume travel after the first wave of COVID-19). Based on our predictions and analyses, the green strategies discussed in this article could be used as a reference for other countries. These sustainable green design strategies can also be employed in the future in countries and regions that experience the same climate conditions.

1798

1799 *8.2.* Hypothesis (H) Conceptual Model

1800 Based on previous papers about the green/healthy physical environment of green B&Bs
1801 and green loyalty, the Chinese B&B industry evaluation standard (BIES) focuses on 6
1802 determinants of green sustainability and health: (1) facility quality: health-related setting (HRS)
1803 and green and healthy space (GHS), (2) facility quality: nature-based solution (NBS) and green
1804 and healthy room (GHR), (3) specialties: design-based strategy (DBS) and design
1805 environmental value (DEV), (4) expectation fulfillment: well-being perception (WBP), (5)
1806 consumption emotion: tourist satisfaction (TS), and (6) perceived value: tourist loyalty (TL)
1807 (Wu et al., 2013)(Hong et al., 2020)(Chen, 2013)(Chen, 2015)(Chen et al., 2017)(G.-L. Wang
1808 et al., 2012). shows the proposed conceptual model.

COVID-19 opened a window of opportunity for nature-based tourism (Wang and Wang, 2020), such as the green/healthy physical environment of B&Bs.

↓

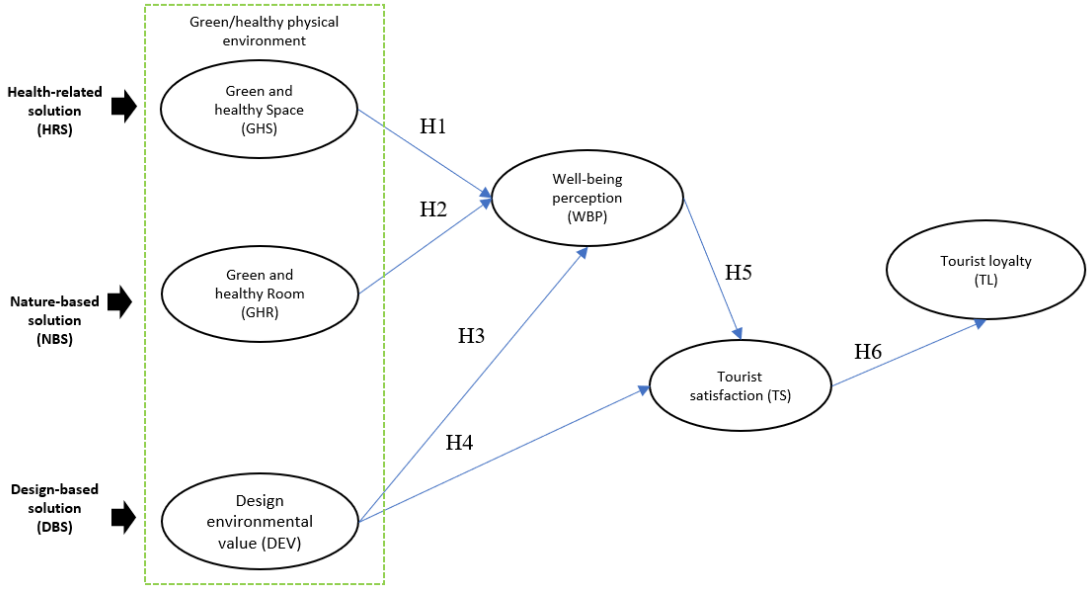


Figure 57. Proposed conceptual model.

8.2.1. Green/Healthy Physical Environment of Green B&Bs during Holiday Travel after COVID-19

This study attempted to explore the specific role of the green environment (physical and mental) as a nature/health solution in the tourist retention process. The green environment includes actions that support nature, the provision of solutions to a range of health challenges, and the provision of sustainable social, economic, and environmental benefits for sustainable B&B tourism (Swarbrooke, 1999)(Devuyst et al., 2001).

8.2.1.1. From a health-related setting (HRS) to a green and healthy space (GHS)

Health-related settings (HRSs) are described in the previously mentioned papers. Postmodern Western society of the early 21st century witnessed the revival and remodeling of the healthy/sustainable tourism industry based on new ideologies, concepts, spaces, and services, which were mainly expressed in terms of ideals relating to the tourists' wellbeing. The desire for health is dominant, and this has been affirmed through a new low-carbon approach (Bi and Zeng,

2019). Given the increasingly important role of green/healthy tourism in today's society, more research is required, especially with regard to tourists' needs and motivations and tourists' perceptions of sustainable tourism (Gustavo, 2010).

8.2.1.2. From nature-based solutions (NBSs) to green and healthy rooms (GHRs)

Nature-based solutions (NBSs) bring a variety of outcomes that are beneficial to the health of individuals and society as a whole (e.g., reductions in stress, pollution, noise, and health inequality; increases in happiness/mental health; the enhancement of physical exercise; reductions in waste; and improvements to air and water quality)(Han et al., 2020b)(Thinh et al., 2015). In addition, the concept of the green physical environment in B&Bs includes green spaces in buildings (e.g., natural lighting through glass windows, indoor green walls, indoor green spaces, and green decorations) and green outdoor natural environments (e.g., mountains, rivers, good air quality, and forests) (Bauduceau et al., 2015)(Faivre et al., 2017)(Xu et al., 2019). Green physical environments and existing outdoor environments may be another essential element of NBSs. The successful implementation of NBSs in B&B management is also crucial because it can improve the mental health and well-being of travelers and employees (Winter et al., 2020)(Chow et al., 2019).

8.2.1.3. From design-based strategies (DBSs) to design environmental value (DEV)

Green design-based strategies (DBSs) are described in the previously mentioned papers (L. L. Wang et al., 2012)(Masuwan and Lertwattanaruk, 2020)(Huang et al., 2020). Over the past decade, the design-based approach has proven its worth in the sustainable tourism industry (Wang and Hannafin, 2005). This method is suitable for both research on and design of the

technology-enhanced learning environment (Wang and Hannafin, 2005). As an increasing number of travelers express preferences for eco-responsible products, efforts related to "green" operations (e.g., cycleways in sustainable tourism) have become increasingly important (Yeh et al., 2019). Perception plays an important role in determining the costs of products (Umeda et al., 1996). In the current paper, we propose design-based solution factors based on tourists' green behaviors to support green satisfaction (Umeda et al., 1996). The term "design environmental value" is used together with "biosphere value". Once tourists decide on their travel destination, travel motivation may affect their positive evaluation of travel quality.

8.2.2. Well-Being Perception (WBP) in Green/Healthy Environment

People are increasingly at risk of mental health problems in modern society, and these can include anxiety, depression, and stress (Kamimura et al., 2018). Therefore, mental health problems can be a heavy burden for a hotel (e.g., B&B) industry (Han and Hyun, 2019). The influence of a green environment on personal wellbeing is a crucial concept in consumer behavior and health-related and sustainable tourism (Radic et al., 2020). An increasing number of studies have shown that the natural atmosphere can help improve the well-being of individuals (Hwang and Lee, 2019b). That is, if travelers feel happy, healthy, calm, relaxed, peaceful, or rejuvenated when using products (e.g., staying in a B&B), their quality of life will be improved (Kim et al., 2016). Travelers often purchase when they experience happiness while patronizing services (Kiatkawsin and Han, 2019). In view of this, people have widely adopted the concept of well-being in the study of various sustainable tourism environments (e.g., B&Bs) (Ponnusamy et al., 2020).

In the past few years, an increasing number of studies have linked green space and HRSs, NBSs, and DEV with mental and physical health and well-being (Vujcic et al., 2017). The findings of these studies indicate that a green atmosphere can lead to multiple positive health outcomes, such as the reduction of depression and mental anxiety and the increase of happiness (Saleem et al., 2020). The green spaces developed based on HRSs and NBSs and natural environments can improve mental health and well-being (Pietilä et al., 2015). The green environment can also increase the number of outdoor leisure activities and daily outings in which people participate (Hens and Boon, 1999). Some papers have studied the role of HRSs, NBSs, and DEV in self-assessed health in a leisure environment (van den Bosch and Sang, 2017)(Dao et al., 2019). Many recent studies have also shown the important relationship between the green physical environment developed through HRSs, NBSs, and DEV and mental health and well-being (Richardson et al., 2017). Thus, the green/health physical environment of green B&Bs with positive characteristics and an overall positive image may aid in promoting a positive perception of well-being. This will be helpful for B&B recovery following the health crisis.

- **H1: The presence of green and healthy spaces (GHSs) in B&Bs positively influences well-being perception (WBP).**
- **H2: The presence of green and healthy rooms (GHRs) in B&Bs positively influences well-being perception (WBP).**
- **H3: The design environmental value (DEV) of B&Bs positively affects well-being perception (WBP).**

8.2.3. Tourist Satisfaction (TS) with Green/Healthy Environment

In the tourism industry, tourist satisfaction is an important aspect of customer service (Jin and Park, 2019b)(Pizam et al., 2016). Some scholars have pointed out that service is linked to satisfaction because service directly affects people (Nam et al., 2016). As a marketing tool, tourist satisfaction plays a key role in attracting public interest and the construction of strategies for promoting local development and services in the sustainable tourism market (Ryu and Han, 2011). Traveler satisfaction is influenced by destination marketing and how services are organized (Chen and Chen, 2010)(Cai et al., 2020c). Thus, tourist satisfaction is an important factor in tourists' determination to visit an attraction again (Kanwel et al., 2019). Sustainable tourism research has been concerned with predicting future sustainable tourism behaviors by means of tourist satisfaction models. People who hold a positive image of a destination and who are satisfied will often recommend the destination to others (Koo et al., 2020). Tourist satisfaction causes more satisfied tourists to return and recognize more destinations, thus promoting sustainable and healthy tourism (Hens and De Wit, 2003). A survey of 412 overseas tourists at Taiwan international hotels found that consumer sentiment, tourist complaints, perceived value, and service quality were related to tourist satisfaction (Deng et al., 2013). Improving tourist satisfaction is a key strategy in the success of companies in the sustainable B&B tourism industry (Choi and Chu, 2001)(Liu et al., 2020).

“Do hotels' “green” attributes contribute to tourist satisfaction?” Yes! (Robinot and Giannelloni, 2010). The relationship between design environmental value (DEV) and tourist satisfaction is positive (Ryu et al., 2012). Travelers who insist on environmental value are

generally more sensitive to the eco-friendly atmosphere and pay more attention to nature (Nguyen et al., 2016). The overall satisfaction or pleasure of the travelers is determined by whether the travel experience meets the traveler's expectations, desires and needs (Dressler and Paunovic, 2019). Higher perceived service quality levels will increase tourist satisfaction (Masri et al., 2020). Although the travel experience is temporary and complex, if the characteristics of travel meet the needs of the traveler, then the traveler will have a positive and satisfactory experience (Paunovic, 2014).

Previous studies have investigated the role of well-being perception and self-assessment of mental health in clarifying the personal assessment and decision-making processes. The results indicate that a positive atmosphere and the quality attributes of sustainable tourism increase travelers' happiness and improve their mental health and have a significant impact on satisfaction and loyalty (Song et al., 2019). Travelers' who experience a positive sense of wellbeing based on quality will give a satisfactory evaluation of their overall leisure experience. Green space is a key element in the self-assessment of mental health and well-being, which can significantly improve tourist satisfaction. The findings of the abovementioned studies indicate that the green atmosphere of a building influences occupants' health perception and emotional comfort, which in turn stimulates their satisfaction with the internal environmental quality of the building (Nguyen et al., 2016).

- **H4: The design environmental value (DEV) of B&Bs positively affects tourist satisfaction (TS).**

- **H5: Well-being perception (WBP) with regard to B&Bs positively influences tourist satisfaction (TS).**

8.2.4. Tourist Loyalty (TL) and Green/Healthy Environment

Chen (Chen, 2013) found that green perceived value can have a direct positive impact on green loyalty via green satisfaction (e.g., green-based well-being perception with green-based tourist satisfaction). Maintaining relationships and increasing the number of loyal tourists within an industry is critical to long-term success (Hyun, 2009). Many scholars of previous sustainable tourism studies have studied factors that affect tourist loyalty, as they have long been regarded as an important part of the success of each destination (Chen, 2019). Highly loyal tourists repeatedly buy services/brands and have a positive attitude and brand loyalty. Some scholars have asserted that perceived value, perceived quality, influence, desire, and satisfaction are critical to building tourist loyalty (Al-Ansi and Han, 2019). Loyalty can be described as a firm level of commitment by tourists to buy preferred services or brands consistently in the future (Hwang et al., 2020a). Behavioral loyalty (tourist loyalty includes both attitude and behavioral loyalty) is reflected by a person's purchase frequency, while the attitude aspect is represented by a person's psychological attachment to a particular service or brand. In the holiday travel industry, people are generally more inclined to develop green loyalty based on recommendations from their families. Tourist satisfaction involves the evaluation of the consumer experience with services based on the difference between previous and subsequent consumption experiences (Han and Hyun, 2018b). In this case, tourists' satisfaction with a brand is a fundamental factor in increasing repeat travelers (retention rates) and loyalty,

enhancing attachment to the brand, and strengthening the relationship between the B&B and travelers. Some scholars have insisted that there is a significant correlation between tourist satisfaction, tourist attachment and tourist loyalty (Meng and Han, 2018).

H6: Tourist satisfaction (TS) with a B&B positively influences tourist loyalty (TL)

8.3. Materials and Methods

8.3.1. CFA-SEM

We used confirmatory factor analysis (CFA) and structural equation modeling (SEM) to test the hypothetical model (Asif et al., 2019c). We also developed a measurement model that includes the research factors and their connections. We first implemented a measurement model to evaluate the component scores for all items. Second, CFA was used to check the validity of the discrimination. Third, SEM technology was used to evaluate the causal model. These steps were taken to confirm the validity and reliability of different types of causal models.

8.3.2. Measures and Questionnaire Items

To bridge this gap, we hope to develop a multiitem scale to measure the perceptions of B&B visitors after the first wave of COVID-19. The measurement items and study variables were adopted from the literature review, questionnaire items obtained in selection step 1 (based on the B&B industry evaluation standard/BIES of China), and questionnaire items obtained in selection step 2 (with the help of the East China B&B Industry Association and expert team) (Oh et al., 2007)(Deng and Lee, 2019)(Chen et al., 2017). **Figure 58** shows the logic of the

identified 30 research variables. The East China B&B Industry Association and expert team is a private group composed of homestay owners and homestay designers. First, based on previous papers, 5 main aspects or determinants of green/healthy B&Bs were selected (as mentioned in the literature review). Second, based on the B&B industry evaluation standard (BIES) of China, 60 determinants (related to the promotion of green/healthy B&Bs) were selected. Third, the top 30 items were selected according to the score the experts assigned to them. Next, the measures were modified to adapt them to the current study. A five-point Likert scale (G.-L. Wang et al., 2012) from the questionnaire was used to measure tourists' expectations before checking in; the response options ranged from 1 = strongly disagree to 5 = strongly agree. Thirty items related to tourists' expectations of the B&B were included in the questionnaire. All measurement items used in this study are shown in Table 29 (Chen et al., 2017)(G.-L. Wang et al., 2012). All items generated from the English literature were translated into Chinese by the author.

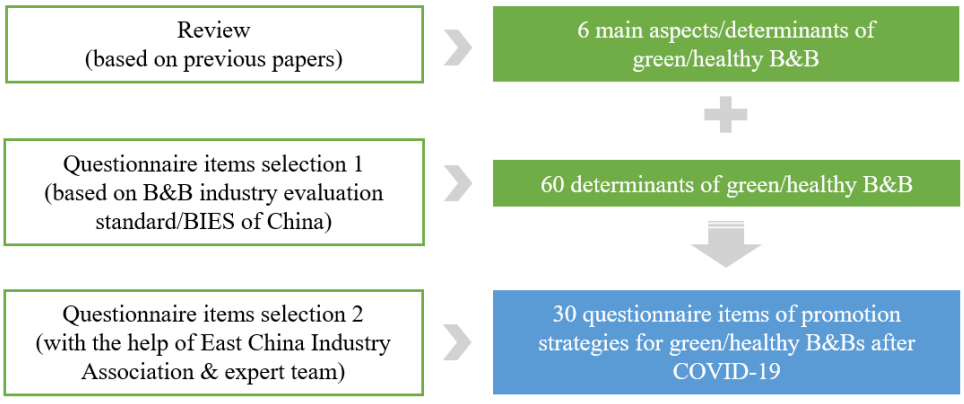


Figure 58. The logic of 30 research variables selection

Table 29. Measurement items

QN	Constructs and Scale Items	Factor Loading [1]
	Facility Quality → HRS → GHS (Vujcic et al., 2017)(Saleem et al., 2020)(Pietilä et al., 2015).	
1	Safe/good location and nearby facilities.	0.808
2	Clean/tidy kitchen and dining room.	0.897
3	Clean/tidy leisure areas.	0.950
4	Clean/tidy rooms.	0.943
5	Intelligent building promotions (e.g., semi-self-service management).	0.641
6	Cleaning/disinfection of places/items for tourists.	0.793
7	Safe/reliable building/construction.	0.905
8	Completed emergency facilities (such as first aid kit, escape equipment).	0.829
	Room Quality → NBS → GHR (van den Bosch and Sang, 2017)(Dao et al., 2019)(Richardson et al., 2017).	
9	Good shade (e.g., opaque curtains).	0.682
10	Plenty of natural light in the guest rooms.	0.887
11	Split air conditioners in the guest rooms.	0.648
12	Naturally ventilated guest rooms.	0.888
13	Spacious and clean guest rooms.	0.622
14	Good natural landscape outside the windows of guest rooms.	0.819
15	Good privacy in guest rooms.	0.889
	Specialties → DBS → DEV (Van der Werff et al., 2013)(Masuwan and Lertwattanaruk, 2020)(Nguyen et al., 2016).	
16	The design of indoor and outdoor transition spaces is natural/beautiful/healthy (e.g., gallery frames, awnings, balconies).	0.750
17	The design of outdoor space is healthy/natural (e.g., courtyard, terrace, roof garden).	0.823
18	The proportions of public spaces are large and can be changed to meet different tourists' needs.	0.764
19	The layout of the guest rooms is dispersed.	0.814
20	The number of guest rooms of single B&B is small and the rooms are exquisite.	0.619
21	The local culture around the B&B is attractive.	0.671
22	Contingency plans have been developed and are practiced regularly.	0.652
23	Green consumption is encouraged, and environmental protection measures have been implemented.	0.677
	Expectation Fulfillment → WBP (Gim, 2018)(Koo et al., 2020).	
24	I felt the friendliness of the local people near the B&B.	0.833
25	I felt the natural/healthy countryside and environment around the B&B, and I am happy with these.	0.853
	Consumption Emotion → TS (Hong et al., 2020)(Song et al., 2019)(Nguyen et al., 2016).	
26	I was satisfied with the B&B's friendly atmosphere (e.g., leisurely, warm).	0.865
27	I was satisfied with the design of and interaction in the green space.	0.815

QN	Constructs and Scale Items	Factor Loading [1]
	Perceived Value → TL (J. J. Kim et al., 2020)(Meng and Han, 2018).	
28	I plan to choose this B&B when I travel in the future.	0.735
29	I think B&Bs are an important part of travel.	0.864
30	I am loyal to the B&B.	0.774

Note 1: QN = question number, Note: health-related setting (HRS); nature-based solution (NBS); design-based strategy (DBS); green and healthy space (GHS); green and healthy room (GHR); design environmental value (DEV); well-being perception (WBP); tourist satisfaction (TS); tourist loyalty (TL). Note 2: [1] All factor loadings are significant at $p < 0.01$

The establishment of the B&B industry evaluation standard (BIES) shows that China B&Bs will enter a stable development stage following an early stage of unsupervised rapid growth (Jones and Guan, 2011). Moreover, the 2019 China Mainland B&B Industry Development Data Report (CMBBIDDR) reveals the following: (1) The top ten provinces for number of homestays are Guangdong, Shandong, Zhejiang, Liaoning, Hebei, Sichuan, Shaanxi, Hubei, Chongqing, and Jiangsu; (2) The ten provinces with the highest number of homestay reviews are Yunnan, Anhui, Zhejiang, Hunan, Chongqing, Hainan, Liaoning, Guizhou, and Jiangxi; (3) The ten provinces with the highest average user recommendation rate for Ningxia homestays are Fujian, Tibet, Zhejiang, Ningxia, Yunnan, Anhui, Xinjiang, Shanghai, Guangxi, and Jiangsu. All six provinces in East China (Shandong, Shanghai, Jiangxi, Zhejiang, Anhui, and Fujian), representing with an area of 1,014,354 km² ("List of regions of China," n.d.), were in the top ten of at least one of these categories. Thus, this paper selected East China as the research scope.

2002 *8.4.* Measurement Model

2003 IBM SPSS Statistics 23 and AMOS 23 (Armonk, NY, USA) were used as tools for the
2004 data analysis. Confirmatory factor analysis (CFA) was used for the measurement model. Table
2005 30 shows the results of the CFA: average variance extracted (AVE), comparative fit index (CFI),
2006 CR= composite reliability, Tucker–Lewis index (TLI), incremental fit index (IFI), and root
2007 mean square error of approximation (RMSEA). The data fit of the measurement model is
2008 acceptable (Qing et al., 2019). The accepted criteria for factor loading is 0.50 (factor loading of
2009 30 factors ＞0.6) (Qing et al., 2019), this shows that the convergent validity is good. All
2010 constructed AVE values are greater than the recommended value of 0.5, which also indicates
2011 that convergent validity is well established. In addition, since the value of the square root of the
2012 AVE of each structure is higher than the value of the square correlation (R2) between a pair of
2013 structures, strong discriminant validity is confirmed. Finally, the CR values of all constructs are
2014 greater than the threshold of 0.7, which indicates high internal consistency (Hair et al., 1998).

2015 Table 30**.** Results of the confirmatory factor analysis.

Research Variables	GHS	GHR	DEV	DEV	WBP	TS	CR	AVE
GHS	1.000						0.954	0.725
GHR	0.986	1.000					0.917	0.616
DEV	0.863	0.866	1.000				0.898	0.525
DEV	0.769	0.785	0.927	1.000			0.831	0.711
WBP	0.770	0.766	0.937	1.020	1.000		0.828	0.706
TS	0.495	0.531	0.763	0.653	0.697	1.000	0.835	0.628
Mean	4.641	4.603	4.388	4.519	4.510	4.100		
SD	0.763	0.790	0.947	0.865	0.829	1.059		

Research Variables	GHS	GHR	DEV	DEV	WBP	TS	CR	AVE
Goodness-of-fit statistics: χ^2 = 2987.870, df = 390, χ^2/df = 7.661, p < 0.001, NFI = 0.830, IFI = 0.850, CFI = 0.849, TLI = 0.832 and RMSEA = 0.107								

Note 1: AVE = average variance extracted; CFI = comparative fit index; CR= composite reliability; TLI = Tucker–Lewis index; IFI = incremental fit index; RMSEA = root mean square error of approximation. Note 2: Note: health-related setting (HRS); nature-based solution (NBS); design-based strategy (DBS); green and healthy space (GHS); green and healthy room (GHR); design environmental value (DEV); well-being perception (WBP); tourist satisfaction (TS); tourist loyalty (TL).

8.5. Structural Model

Figure 59 and Table 31 display the results of the structural equation modeling (SEM). The proposed structural model is very suitable for the data (χ^2 = 4962.648, df = 399, χ^2/df = 12.438, p < 0.001, NFI = 0.720, IFI = 0.736, CFI = 0.736, TLI = 0.712, and RMSEA = 0.140). The SEM results show that all six hypotheses are statistically supported at the 0.05 level, and the t-value is greater than 1.96 (Jeong and Hyun, 2019).

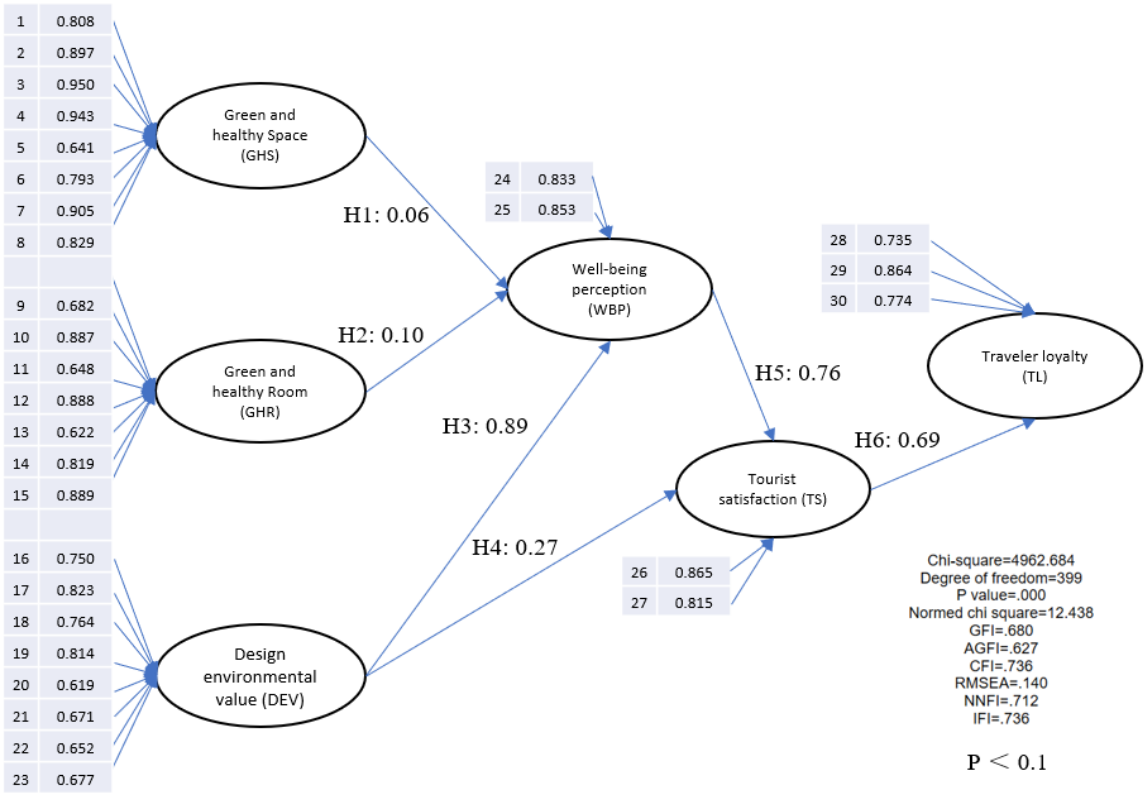


Figure 59. Standardized theoretical path coefficients.

Table 31. Standardized parameter estimates for the structural model.

Independent Variable			Dependent Variable	Standardized Estimate	t-Value	Hypothesis
H1	GHS	→	WBP	0.06	1.990	Supported
H2	GHR	→	WBP	0.10	3.368	Supported
H3	DEV	→	TS	0.89	17.759	Supported
H4	DEV	→	TS	0.27	2.915	Supported
H5	WBP	→	TS	0.76	7.603	Supported
H6	TS	→	TL	0.69	13.825	Supported
Goodness-of-fit statistics: χ^2 = 4962.648, df = 399, χ^2/df = 12.438, p < 0.001, NFI = 0.720, IFI = 0.736, CFI = 0.736, TLI = 0.712 and RMSEA = 0.140						

Note 1: AVE = average variance extracted; CFI = comparative fit index; CR= composite reliability; TLI = Tucker–Lewis index; IFI = incremental fit index; RMSEA = root mean square error of approximation. Note 2: Note: health-related setting (HRS); nature-based solution

2033 (NBS); design-based strategy (DBS); green and healthy space (GHS); green and healthy room
2034 (GHR); design environmental value (DEV); well-being perception (WBP); tourist satisfaction
2035 (TS); tourist loyalty (TL).
2036
2037 *8.6.* Contribution and Implication for B&B in East China
2038 B&Bs are one of the most important types of lodging for the tourism industry in China
2039 and many other countries, especially after the COVID-19 epidemic(Hong et al., 2020). Since
2040 February 20, 2020, East China has gradually resumed operations. However, in 2003, the SARS
2041 crisis opened a window of opportunity for nature-based areas and for businesses in them, such
2042 as green/healthy B&B, and altered the development of the tourism industry (Wang and Wang,
2043 2020). The SARS epidemic provided a new impetus to travel to natural areas (Mouchtouri et
2044 al., 2019). Marketing focused on nature-based B&Bs will exhibit explosive growth after the
2045 epidemic (Sun et al., 2020). However, research on B&Bs in post-COVID-19 context is
2046 insufficient. Therefore, this article focused on B&B promotion strategies designed to support
2047 the industry's recovery in East China following COVID-19. Green/healthy B&B promotion
2048 strategies that focus on a green/healthy physical environment after the health crisis can also be
2049 employed in other countries and regions experiencing the same situation. This is the most
2050 important research contribution of this article.
2051 On the other hand, it is worth that emerging economies have great potential to introduce
2052 major changes in the sustainable development of the B&B tourism industry after the first wave
2053 of COVID-19, particularly in regard to the emerging countries (e.g., the so-called BRIC: Brazil,

2054 Russia, India, and China). These emerging countries will play major roles for sustainable
2055 development (Gunasekaran et al., 2014). Discussions, such as the management of natural
2056 resources (e.g., rural B&B tourism), biodiversity, and climate change will contribute to a more
2057 sustainable society and development. These subjects in emerging countries are parts of the most
2058 relevant challenges to help the pursuit of sustainable development after COVID-19
2059 (Gunasekaran and de Souza Jabbour, 2017).

2060 Implications for theory: Confirmatory factor analysis (CFA) and structural equation
2061 modeling (SEM) were used for testing after the first wave of COVID-19. The relationships
2062 observed among the green/healthy physical environment, well-being perception (WBP), tourist
2063 satisfaction (TS), and tourist loyalty (TL) provide a better understanding of how to support
2064 sustainable tourism recovery. All the hypotheses are supported by the CFA-SEM. We found
2065 that design-based strategies (DBSs) and design environmental value (DEV) are the most
2066 relevant drivers in the promotion of green-based loyalty. Among all the hypotheses, H3 (DEV
2067 to TS) had the highest standardized estimate (0.89). The current paper found that design-based
2068 strategies (DBSs) and design environmental value (DEV) have a direct main impact on well-
2069 being perception (WBP), tourist satisfaction (TS), and tourist loyalty (TL); this represents the
2070 main novel finding of the theoretical implications of the present study.

2071 Implications for practitioners and policy makers: Moreover, these findings in this article
2072 will help to better guide the operators/practitioners in the B&B industry to get market research
2073 support for improvement measures as soon as possible. At the same time, it also has a policy
2074 support role for the government or non-governmental policy-makers in the B&B industry.

Therefore, for health-related B&Bs, the highest priority with regard to promotion strategies designed to elicit tourist loyalty following COVID-19 is design environmental value (DEV). The 8 questionnaire items (QN16-23) related to DEV were as follows: (16) The design of indoor and outdoor transition spaces is natural/beautiful/healthy (e.g., gallery frames, awnings, balconies). (17) The design of outdoor space is healthy/natural (e.g., courtyard, terrace, roof garden). (18) The proportions of public spaces are large and can be changed to meet different tourists' needs. (19) The layout of guest rooms is dispersed. (20) The number of guest rooms in single B&Bs is small, and the rooms are exquisite. (21) The local culture around the B&B is attractive. (22) Contingency plans have been developed and are practiced regularly. (23) Green consumption is encouraged, and environmental protection measures have been implemented. The second tier of priorities with regard to improvement strategies is (1) facility quality: from health-related settings (HRSs) to green and healthy spaces (GHSs) and (2) from nature-based solutions (NBSs) to green and healthy rooms (GHR) (QN1 -15). The correlation scores for the green health measures in this study are not as high as those found for (3) specialties: from design-based strategies (DBSs) to design environmental value (DEV)), but this does not mean that they are not important in the recovery of the homestay industry after the epidemic. Both the healthy indoor and healthy outdoor environments are very important in green B&B construction and services (Wu et al., 2013). Third, the above three factors influenced (4) expectation fulfillment: well-being perception (WBP) and (5) consumption emotion: tourist satisfaction (TS) and had a positive impact on (6) perceived value: tourist loyalty (TL). We believe that by upgrading green B&B strategies based on the above findings, B&B tourism will

attract more tourists, especially during holiday travel. Creating strategies for green/healthy B&B tourism recovery represents a new and important attempt to study post crisis (after the first wave of COVID-19) decision-making.

9. Discussion and Conclusion

Sustainable tourism is to visit locations without harming the local community and nature, and also to have a constructive impact on the environment, society, and economy of the country (Tang, 2011). As per the report of the WTO (World Tourism Organization) in 2018, international tourists spent $1.3 billion per day and a total of $462 billion in the year 2001 alone (Manzoor et al., 2019). The cultural amenities of a destination, such as museum exhibition and art exhibitions, provide some of the main attractions for cultural tourists; moreover, exhibition has positive impacts on sustainable tourism (Cai et al., 2020c). On the other hand, the COVID-19 crisis created a window of opportunity (e.g., green/health physical environment of hospitality industry such as B&Bs and Ryokans) to change the development of the tourism industry (Hong et al., 2020).

9.1. Conclusion -Exhibitions tourism

The rural events and exhibitions (Triennale/Biennale) were mainly aimed at local and regional revitalization, hoping to develop economic, change the shrinkage about population and aging population. Moreover, urban arts events and exhibitions (Triennale/Biennale) were mainly aimed largely at cultural development and revitalization (Takahashi, 2015).

9.1.1. Exhibition of Venice Architecture Biennale

These are the comparisons and facts based on the philosophy of knowledge archaeology. From the comparison of domain-specific knowledge graphs, the questions in the previous sections can be answered to a certain extent; the changes in exhibitions and curating from Venice Architecture Biennale changed our thinking about architecture. In addition to architectural activities, design practice, and research, we can try to "curate the whole world."

On the one hand, from the comparison of "persons," it can be seen that the Venice Architecture Biennale and the Pritzker Architecture Prize are intrinsically linked. The architects who participated in the Biennale (especially in 1996 and 1976) present an important philosophy and thoughts of architecture to the architectural world. Then, they created an architectural time (from modern to postmodern; from maturity to peak). The opportunities given by the Biennale helped these architects obtain the highest honor in the architecture world.

On the other hand, from the thinking of "words", the Venice Architecture Biennale influences the value orientation of the Pritzker Architecture Prize. This confirms the importance and forward-thinking of curators from the Biennale. For example, before a trend of architectural thought changes, the Biennale, being a vanguard, can be presented to the public for the first time.

Finally, we focus on Asia. Based on the Venice Architecture Biennale and Pritzker Architecture Prize statistics, Asian architects are ranked second in the world. In particular, after 2000, Asian architects appeared strongly on the world architecture stage and became an emerging force. This leads us to believe that Asian architects will become more prominent in the future.

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2145 9.1.2. Exhibition of ETAT

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2147 Exhibition-driven tourism will bring new opportunities to the tourism sector. Tourism is
2148 one of the fastest-growing industries and a driving force for many developed and developing
2149 economies (Lyu and Hwang, 2015). In particular, exhibition-driven tourism prefers sustainable
2150 tourism to ensure a green experience during visits. Furthermore, exhibition-driven tourism has
2151 been spotlighted in the tourism context, as more tourists are concerned with art exhibitions.
2152 This equally applies to sustainable economics and the population. Despite the tremendous
2153 opportunities of exhibition-driven tourism (i.e., the growing demands for this type of tourism),
2154 the existing literature on the tourism industry has offered limited research pertaining to
2155 exhibition-driven tourism in association with its positive impacts (for sustainable tourism,
2156 economics, and the population). That is to say, little is known about the intricate relationships
2157 between sustainable tourism, economics, and the population and exhibition-driven tourism. In
2158 addition, no attempt has been made to investigate the moderating effect of the ETAT in the
2159 links among these impacts in a tourism context. The present study successfully fills this void
2160 and considers the roles of exhibition-driven tourism in such relationships. The present findings
2161 thus offer meaningful implications in both academia and industry.

2162 *9.2.* Conclusion -B&Bs tourism

A window of opportunity to modify tourism development was opened by the crisis of COVID–19. Nature-based areas (e.g., B&Bs in the countryside) were likely to be the target destinations (Mouchtouri et al., 2019)(Han et al., 2020b). New motivations to travel to nature-based areas became evident with SARS (Sun et al., 2020). There was a potential marketing emphasis that nature-based tourism types (e.g., B&Bs) could be invigorated and expanded after the COVID–19 crisis (Zeng et al., 2005).

9.2.1. Ryokan in Japan

Crises that have occurred that affect Japan have opened a window of opportunity for the hotel industry. Three findings were obtained from this research: (1) Ryokans are more flexible than hotels, have strong anti-risk capabilities, and have received more and more attention from tourists and support from the Japanese government; (2) improvement strategies for customer satisfaction after COVID-19 were provided from IPA; and (3) an attempt to use dynamic evaluation model of green Ryokans was discussed; it may be employed in other countries and regions experiencing the same situations. The current paper is also one of the first papers attempts to evaluate Ryokans through descriptive statistics obtained from a tourism accommodation survey and customer satisfaction related CASBEE-IPA. This has implications for both theory and practitioners/policy makers.

9.2.2. B&B in Zhejiang, China

The priority suggestions in this paper will be of great help to improve the attraction of B&Bs to tourists after Covid-19. These measures were not paid enough attention before the outbreak. It needs to be focused on after the COVID–19 epidemic. B&Bs are very important for the tourism industry in many countries and tourists have especially welcomed it in recent years in China. To the best of our knowledge, our study was among the first to investigate the immediate impact of the COVID–19 pandemic on tourist satisfaction with B&Bs in China. Many previous studies have reported on COVID–19. Some others studied the correlations between COVID–19 and the quality of life in China. However, few studies have reported the impact of B&B under COVID–19 on tourism in China. The adjusted importance (after COVID–19)–performance (before COVID–19) analysis (IPA) was a new attempt. Moreover, some promotion suggestions were given to the B&B industry recovery after COVID–19 by the IPA.

However, there were some limitations to our study and future research areas. First, the data were collected from tourists in B&Bs in Zhejiang, China. Thus, it was somewhat difficult to apply the suggestions of the impact of COVID–19 to other areas. Future researchers may expand this scope. Second, although we identified the relationships between the determinants of tourist satisfaction and COVID–19, the relative strength of these correlations was unknown. We can test the model and identify the degree of influence of the correlations between these factors to promote the B&B industry in further research. More nuanced research questions should be incorporated. Third, the current paper employed an IPA approach. Even though this method is a widely known method in the tourism industry, it was also a new attempt for B&Bs.

Thus, we suggest that research in other parts of China and on other continents work together to produce similar studies, thereby creating a worldwide body of literature that examines the phenomena related to the effects of crises (e.g., COVID–19) and their impact on B&Bs and tourism.

9.2.3. B&B in East China

The SARS crisis (similar to the COVID-19 crisis) opened a window of opportunity for nature-based tourism destinations (such that B&Bs with green/healthy physical environments will be popular destinations) and altered the development of the tourism industry (Wang and Wang, 2020). COVID-19 "might temporarily immobilize our collective activities, but will not limit us as we validate our research ideas. (Rivera, 2020)" The current paper is an empirical study on green tourist loyalty for green B&Bs during the first national holiday in China (China was the first country to resume travel after the first wave of COVID-19). These sustainable green design strategies can also be promoted in the future in countries and regions with the same climate conditions). The research variables used to measure the correlations among the green/healthy physical environment, well-being perception (WBP), tourist satisfaction (TS), and tourist loyalty (TL) represent a new attempt to promote sustainable tourism recovery. The current paper found that design-based strategies (DBSs) and design environmental value (DEV) have a direct main impact on well-being perception (WBP), tourist satisfaction (TS) and tourist loyalty (TL); this represents the main novel finding of the present study. Promotion strategies

2226 that were discussed in the current paper for green/healthy B&B tourism are necessary/priority
2227 for tourism recovery after the epidemic. The predictions and observations obtained from this
2228 empirical analysis will inform green strategies that can be used as a reference for other countries.
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