Polish tourist facilities' engagement in the communication of the low-emission activities and sustainable development

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Abstract

In 2021, Booking.com, one of the largest web portals for tourist facilities online reservations, started the Sustainable Travel Program. The main purpose behind it was to promote environmental consciousness among tourists as well as engage the tourist facilities owners to implement sustainable practices in their companies, and, as a consequence of such practices, reward them with a Sustainable Travel Badge. The objective of this research is to examine the engagement of Polish tourist facilities in low-emission and sustainable development activities. To meet the defined purpose, the research was conducted on the data about the facilities in Poland, included in the Booking.com Sustainable Travel Program. The study examines what types of facilities possess the sustainable badge more than others; in which voivodeships (provinces) of Poland there are more objects with the badge, and which Sustainable Travel Practices (out of 30) are realized more frequently. Such information may be useful when choosing a tourist destination, especially for tourists sensitive to environmental issues. The sustainable development practices introduced by Booking.com are mostly possible to be realized by large hotel enterprises. However, it is sometimes difficult to verify whether a certain practice is indeed implemented by a facility, or what exactly its implementation looks like in reality. The number of tourist objects engaged in the Booking.com Sustainable Travel Program has a low correlation with the level of wealth of the voivodeship where an object is located. It is justified by the fact that the wealthiest voivodeships in Poland are not necessarily the most attractive for tourists. The collected data can be a recommendation for both owners of tourist facilities and tourists regarding Polish regions and holiday destinations that meet the criteria of being sustainable, in accordance with the Booking.com guidelines.

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1 Introduction

The plan to build a sustainable economy (climate-neutral economy) using low-emission energy sources (Mulugetta & Urban, 2010) and to use natural resources more efficiently (Meadows et al., 1995) is one of the priority problems of today's world (Azam et al., 2021; Hák et al., 2016). The United Nations in Sustainable Development Goals (ONZ, 2015) repeatedly point to the need to introduce sustainable and modern energy sources, reduce emissions in production and service activities, reduce high-emission transport, care for the natural environment and air quality, as well as care for the preservation of natural resources, including water, fuel and other resources for future generations (Azam et al., 2021; Rauschmayer et al., 2020).

The problem of building a sustainable economy rests primarily on international organizations (Kent, 2021) and regional and national policies (Zhang, 2021), including through investments (Sheng, 2020; Singhal & Poonia, 2021) and subsidies for entrepreneurs (Vasilenko & Arbačiauskas, 2012), which help to implement new and more environmentally beneficial technologies. Although such activity is statutory and prescriptive, it is also necessary to involve entrepreneurs and consumers in global change. Integrating the concept of sustainable development into the strategy of enterprises is of great importance in the global economy. It is necessary to limit environmental and social damage. Moreover, its importance is increasing because market participants pay more and more attention to the environmental, social, and financial policies of companies (Przychodzeń, 2013).

Countermeasures against climate change by saving energy and reducing emissions are a challenge (Mensah, 2019; X. Yang et al., 2021) that must be tackled by businesses and consumers to ensure the viability of future generations. The concept of sustainable development, which underlies a low-carbon economy, is extensive, popular, and ubiquitous (Mensah, 2019). Due to the specificity of each branch of the economy, researchers are moving away from researching the general issue to focusing on specific areas.

The objective of this paper is to find out how tourist facilities in Poland are involved in the low-emission activities and sustainable development. To achieve the objective, the authors have set three research questions:

RQ1 How many tourist facilities in Poland are involved in sustainable development communication?

RQ2 Which tourist facilities in Poland are involved in programs related to the communication of activities related to sustainable development?

RQ3 What are the most common sustainable activities implemented by Polish tourist facilities?

The paper examines the subject of communication of sustainable development by tourism enterprises through online booking platforms, which is rarely discussed in the literature. Due to the numerous concerns of the tourism industry, which may result from both the fear that customers will think that the standard of the facility will be lowered by the sustainable activities, and the accusations of greenwashing, enterprises in this industry rarely communicate about sustainable development. Most of them are also not large enough to be subject to the reporting obligation. As a consequence, there is no clear picture of the level of involvement of tourism enterprises in sustainable development.

In addition, according to the research (Arzoumanidis et al., 2022), online booking platforms do not sufficiently support hotels in communication of sustainable development. In the years 2017—2019, only two platforms contained filters that allowed the search for sustainable tourism facilities and Sustainability Labels (Arzoumanidis et al., 2022). In 2020, due to the emergence of the COVID-19 pandemic, platforms shifted the priority to communicating about health and safety. After the introduction of a new green label program by Booking in 2021, there was an opportunity to study the declared commitment of accommodation facilities on a large scale.

There have been numerous studies dedicated to the broad topic of sustainable development in the hotel industry, but it remains insufficiently explored due to its multidimensionality and challenges in accessing information (Jiao & Bai, 2020; Salem et al., 2022). Many studies focus on consumer opinions and analyze whether consumers mention green practices of accommodation establishments in their reviews (Brazytė et al., 2017; D'Acunto et al., 2020; Ettinger et al., 2018; Foris et al., 2020; Mariani & Borghi, 2022), some of which were conducted through discourse analysis on large datasets from online booking platforms (Foris et al., 2020; Mariani & Borghi, 2022). There is less research on the communication of sustainable development by accommodation providers, and there is no dominant research method for studying this topic, as in the case of consumer opinions. Jiao et al. (Jiao & Bai, 2020) analyzed the presence of Airbnb properties, which are considered more sustainable due to their shared economy principles, in various cities in the United States. Tiago et al. focused on the use of eco-labels by accommodation establishments on their own websites (Tiago et al., 2021) and M. C. Santos et al. (Santos et al., 2019) sought messages about sustainable actions on hotel websites in Portugal. Bogren and Sörensson analyzed the content of GRI reports (Bogren & Sörensson, 2021) to determine the sustainable development actions undertaken by hotels. However, all these approaches are very time-consuming and territorially limited.

The only similar study we were able to identify is (Y. Yang et al., 2023). However, this study used mixed information, including both the customer's perspective (reviews) and facility data (such as prices or hotel class). In addition, this study is based on the TripAdvisor review platform program and not on an online booking platform. Therefore, it is impossible to say whether the reviews posted there are reliable (while Booking only collects reviews from guests who have made a reservation through the platform).

The program launched by Booking allows for the analysis of large datasets on sustainable development practices in the hospitality industry. Our approach focuses on the perspective of hotels, examining the initiatives they engage in and identifying areas that need further development. Booking, as described later in the article, verifies the truthfulness of the declarations of facilities thanks to feedback from real guests.

This study can indicate the scale of the implemented activities. In addition, indicate the areas where these activities are carried out and the areas where activities are rare. This is not only an answer to the question bothering researchers about the level of involvement of tourism in sustainable development, but also this study will give the opportunity for further work on what can be done to make more sustainable tourism, which is its main contribution. This is the first study in the literature aimed at identifying specific sustainability activities in which hotels declare their commitment on online booking platforms.

The structure of the paper is presented as follows: in Sect. 2 related works on sustainable development are discussed; Sect. 3 contains description of the materials and methods used in the research on tourist facilities; in Sect. 4 results of the research are presented, with detailed statistics; Sect. 5 is a discussion on the conducted research and its results; the

paper is concluded with Sect. 6, which covers contributions and limitations of the research as well as the avenues for future research.

2 Literature review

2.1 Sustainable tourism

Tourism, as one of the largest industries in the world (D'Arco et al., 2021), currently accounts for around 10% of the global gross domestic product (D'Arco et al., 2021). In economic terms, it has many positive effects: it is a significant contributor to global economic growth (Balsalobre-Lorente et al., 2020; Cao et al., 2021); creates job places (Balsalobre-Lorente et al., 2020; Fawaz et al., 2014; WTTC, 2020); influences the development of other branches of the local economy (Yang et al., 2021); increases the income of the local community. At the same time, it brings problems related to the environmental impact of this sector, both locally and globally (Alonso-Muñoz et al., 2023; Moscardo & Murphy, 2014), including water use and pollution, destruction of animal habitats, and land use (Heslinga et al., 2017). Tourism development also affects the local communities (Buckley, 2012; Pratama, 2020; Romeo Asa et al., 2022; Simão & Partidário, 2012) and may threaten their heritage and cultural identity (Grilli et al., 2021; Pratama, 2020) and also economic growth and development (Romeo Asa et al., 2022). Another problem is high energy consumption and high CO_2 emission (Balsalobre-Lorente et al., 2020; Cao et al., 2021; D'Arco et al., 2021; Lenzen et al., 2018; Zhu et al., 2020) including carbon dioxide emission from transport to tourist destinations (Hamaguchi, 2021; Zhu et al., 2020) or the one emerging as a result of the activities of other enterprises in the tourism supply chain (X. Yang et al., 2021). Current research shows that tourism can account for up to 8% of global greenhouse gas emissions (Lenzen et al., 2018). The growth in tourism demand outweighs the development of technologies designed to decarbonize tourism-related processes.

The tourism sector's observation and diagnosis of problems contributed to intensifying research on tourism in sustainable development (Aall, 2014; Alonso-Muñoz et al., 2023; Jamal et al., 2013; Mihalic, 2016). It also brought the emergence of global and regional initiatives and policies to implement sustainable development in the tourism sector (GTSC, 2020; UNWTO, 2004). However, some researchers point out that the goals of sustainable tourism development are defined in a general way and do not provide clear guidelines (Camilleri, 2014; Nunkoo et al., 2023; Schwan, 2019) on how tourism enterprises should implement them.

Moreover, due to its heterogeneity, the indicator-based strategy is extremely complex to implement in tourism. Enterprises operating in this industry are accommodation facilities, leisure organizers, travel agencies, tour leaders, and many others. In addition to the work carried out by the United Nations World Tourism Organization (UNWTO), the European Union, and other institutions, many researchers and experts have analyzed the indicators. As a result, many different indicators were created, combined with each other to capture the widest possible context, including internal and external dimensions of the tourism system (Jovicic, 2014; Weaver, 2006). European Union undertook many initiatives to create and develop indicators system, e.g., the EU's Eco-Management and Audit Scheme (EMAS), a tourism reporting mechanism and Environment (TOUERM), European Tourism Indicator System (ETIS), Ecolabel or Indicators of Sustainable Development for Tourism Destinations (UNWTO, 2004). UNWTO proposed actions that entities in the tourism industry

should take to achieve the objectives (UNWTO, 2004). The GSTC (Global Sustainable Tourism Council) proposed in 2008 the global standards for sustainable development in tourism (GTSC, 2020) (as amended, now the third version of the GSTC Criteria). Many local and global certification programs have also been established to popularize the implementation of sustainable development in tourism, standardize activities, and communicate about the activities carried out (Alonso-Muñoz et al., 2023). However, some researchers think that the involvement of tourist entities in certification is small and insufficient (Bernard & Nicolau, 2022; Moyle et al., 2018).

2.2 Communication about sustainable development in tourism companies

According to some authors, promotional, communication, and marketing activities are contrary to the concept of sustainable development. The rationale behind this perception is an alleged conflict of interest in the objectives of the activities (Emery, 2012). The goal of marketing activities is to sell products and services. The goal of sustainable development is to limit consumption and, consequently, to limit the sale of products and services. Ph. Kotler noted that many people doubt the legitimacy of marketing when the environment is being degraded, natural resource shortages are beginning to be felt, and the world is struggling with the problems of hunger, poverty, and insufficient social welfare (Kotler, 2005). However, reducing tourism consumption would reduce the income of tourism enterprises and, consequently, lead to a decline in GDP (Hall et al., 2020). It can also lead to a reduction in employment or deterioration in employment conditions, a decline in the incomes of tourism supply chain companies, and even the liquidation of enterprises. Therefore, such activities are in contradiction with the possibility of meeting other (non-environmental) goals of sustainable development, such as no poverty, zero hunger, economic growth, full and productive employment, and decent work (ONZ, 2015). That is why a radical solution by limiting tourism consumption seems to be burdened with a high risk. It is, therefore, necessary to carry out many other activities in parallel. From introducing technological solutions to social campaigns, corporate promotional activities, and education. Such activities would make tourism more sustainable.

For many years, some environmental declarations in the communication of companies were not covered by facts (Aall, 2014; Chamorro & Bañegil, 2006; Sharpley, 2009). Those practices led to skepticism about pro-ecological declarations and messages from companies (Carlos & Lewis, 2018). However, it is observed that the trend of communicating about sustainable activities of enterprises is increasing (Kapoor et al., 2021; Tiago et al., 2021). Companies try to be honest and transparent in their activities. According to Tiago et al., small tourism enterprises, in particular, are concerned about sustainability communication (Tiago et al., 2021) when they cannot prove the facts, e.g., through certification. However, due to the high participation costs in international certification programs, those companies rarely decide to participate in such programs.

2.3 Consumers' attitude towards the sustainable development of tourism

There is no consensus on whether consumers are willing to pay more for a stay in a sustainable hotel. There are studies and reports that indicate that there is a large group of tourists, including the so-called "green people", who are able to pay more for the opportunity to relax in facilities whose owners show care for the environment (Clark et al., 2021; Demerdash, 2019; Fernández Robin et al., 2016; Moise et al., 2021; Vasilenko

& Arbačiauskas, 2012; Verma & Chandra, 2018). On the other hand, it is argued that tourism is largely focused on meeting selfish and hedonistic entertainment needs (Font & McCabe, 2017; Higgins-Desbiolles, 2018; Tiago et al., 2021). Concern for the environment is therefore not crucial when making decisions about rest, and tourists will be guided by other attributes of the facility, such as comfort, location, or price (Cembruch-Nowakowski, 2019; Juvan & Dolnicar, 2014; Mihalic, 2016; Moyle et al., 2018); and sustainable practices may be perceived as undermining the quality of services (Peng & Chen, 2019; Santos et al., 2019).

The problem of consumer awareness of sustainable development and responsible practices in tourism is also still being discussed (Bordian & Gil-Saura, 2021; Park & Millar, 2016; Tiago et al., 2021; Tölkes, 2018). According to the latest reports, consumers are becoming more and more environmentally aware. The research conducted in 2018 shows that even 83% of loyal brand consumers are willing to change the product if it is established that the company from which the goods are purchased is not socially responsible (Melovic et al., 2018). A report by a packaging company indicates that 67% of consumers participating in the survey identify themselves as environmentally conscious (Trivium Packaging, 2021). According to the commercial research conducted by Booking Holdings, as many as 82% of surveyed tourists believe that sustainable travel is important, and 72% of travelers say they are more likely to book at a facility that adheres to sustainable practices (Booking Holdings, 2020). The same report contains information that in 2020 there was a 58% increase in the number of tourists who want to choose sustainable forms of travel compared to the previous year. Especially younger people between 18 and 44 years of age declare that they can pay more for environmentally friendly products (Trivium Packaging, 2021). In the reports mentioned, one can also read opinions showing that travel experiences and observation of the impact of tourism on the environment during the holidays has impacted tourists by shaping more ecological attitudes in their everyday lives. These data confirm the need for enterprises, including tourism, to engage in sustainable development activities to allow consumers to choose the more sustainable form of travel, which they expect.

Researchers and practitioners have great hopes for sustainable tourism development to save the natural environment and fight global social problems.

One of such global problems was the COVID-19 pandemic, which in a way forced a temporary reduction of consumption in the tourism sector, and has caused a number of effects of such reduction. Difficulties related to mobility during the pandemic have prompted tourists to travel locally (Hall et al., 2020; Nagy et al., 2022), reducing mobility, which contributes significantly to CO2 emissions in the tourism sector (Aall, 2014). Reducing mobility by introducing remote work and education, regional lockdowns, border restrictions (Hall et al., 2020) and temporary closure of certain industries, has given people the opportunity to see the clean air and beauty of their own regions (Edelheim, 2020). According to some researchers, this crisis became the moment of re-evaluation of society values on many levels, including tourism (Lew et al., 2020; Palazzo et al., 2022; Tolkach, 2021). It can be the starting point for transformation (Ioannides & Gyimóthy, 2020), since in the face of the pandemic people have turned their attention to such forgotten values as education (Edelheim, 2020), security and the common good. For entrepreneurs, it can be a turning point in the evolution of their firms towards being more crisis-resistant, and looking for new strategies and business models (Ioannides & Gyimóthy, 2020). Researchers suggest that it will be possible to turn the tourism sector into a new, sustainable form. The aim of our study was to check whether the hospitality industry's commitment to sustainable development is visible at the end of the COVID pandemic.

3 Materials and methods

To answer the research questions and fill the identified research gap, the authors analyzed publicly available data of tourist facilities in Poland that participate in the Sustainable Travel program of the Booking.com booking service. This program was created in February 2021 in response to the needs and expectations of the tourism sector and consumers diagnosed in the report (Booking Holdings, 2020) concerning sustainable development, including the problem of excessive CO2 emissions and social equality. As the website representatives declare, this is one of the initiatives undertaken by Booking.com in sustainable development (de Andres, 2021). The website enabled tourist facilities to receive a special "Sustainable Travel" label to mark the obtained certificates such as Green Tourism, EU Ecolabel, or others recognized by the GSTC (GTSC, 2020). The property host may indicate any number of sustainable practices selected by Booking.com (Booking.com, 2021), which will be displayed in the property's presentation on the website. Identifying the conducted practices is not equivalent to receiving a Travel Sustainable badge. The Booking.com team qualifies facilities that receive this badge based on: the property's location and reported practices. Then the program's eligibility criteria model will calculate an overall impact score (Booking.com, 2021). These practices are divided into five categories in the administration panel for the facilities' owners: Reduce waste, Reduce energy and greenhouse gases, Use less water, Support your local community and Protect nature (Booking.com, 2021). The presented process is consistent with the Booking practices conducted in 2022—at the time this particular study was conducted. The sustainable practices are divided into five categories in the administration panel for the facilities' owners: Reduce waste, Reduce energy and greenhouse gasses, Use less water, Support your local community and Protect nature. Marking the practices carried out is to help consumers who book accommodation through the website to understand the company's contribution to sustainable development. There is a difference between how the questions on the Extranet Booking system (administration panel for owners of accommodation facilities) are formulated and how messages are presented on the Booking.com website. Table 1 presents sustainable development practices that accommodation owners can select. The authors of this article decided to adopt the wording used on the Booking.com website (displayed to clients). The authors maintain, however, the division into groups implemented in the administration panel (Practices to reduce waste, Practices to save energy or reduce greenhouse gasses, etc.). The numbering given to the practices is proprietary. It results from the order of displaying practices in the Extranet and has been introduced to maintain the legibility of the data.

A general description of the program and a screenshot of a fragment of the list of activities at https://partner.booking.com/en-gb/solutions/advice/sustainability-solutions.

In order to determine the total number of facilities participating in the Travel Sustainable Program, a search of facilities was performed on the Booking.com website, with the following criteria: no specific availability date, Poland as destination, 2 adult guests, 1 room. The date of the study was February 23, 2022. In the search, two types of results were obtained.

The sum of the objects by type indicated in the filters was 50,325, while the number of the "properties found" displayed above the search results was 47,526. Further, with the filter module, the objects that received the Travel Sustainable Badge on Booking.com were highlighted. Again, the number of objects according to the type (1224 results) was higher than the number of properties shown in the upper line of search results (1060 results). Such a difference may be caused by the fact that some objects were assigned to more than one

Table 1 Sustainable development practices on Booking.com

Practices to reduce waste	
Practice 1	Water cooler/dispenser
Practice 2	Recycling bins available to guests and waste is recycled
Practice 3	The property makes efforts to reduce their food wastage
Practices to save energy or reduce greenhouse gasses	
Practice 4	Key card or motion-controlled electricity
Practice 5	Bicycle rental
Practice 6	Bicycle parking
Practice 7	Most food provided at the property is locally sourced
Practice 8	Most lighting throughout property uses energy-efficient LED bulbs
Practice 9	All windows are double-glazed
Practice 10	Offsets a portion of their carbon footprint
Practice 11	100% renewable electricity used throughout
Practice 12	Electric car charging station
Practices to reduce water use	
Practice 13	Option to reuse towels
Practice 14	Option to opt-out of daily room cleaning
Practice 15	Water-efficient toilets
Practice 16	Water-efficient showers
Practices to reduce the impact on the environment	
Practice 17	Wild (non-domesticated) animals are not displayed/interacted with while captive on the property or harvested, consumed, or sold.
Practice 18	Green spaces such as gardens/rooftop gardens on the property
Practice 19	Most food provided is organic
Practices to support the surrounding area or community	
Practice 20	Invests a percentage of revenue back into community projects or sustainability projects
Practice 21	Tours and activities organized by local guides and businesses offered
Practice 22	Local artists are offered a platform to display their talents
Practice 23	Provides guests with information regarding local ecosystems, heritage, and culture, as well as visitor etiquette
Removing single-use plastics from your property	
Practice 24	Single-use plastic miniature shampoo, conditioner, and body wash bottles not used
Practice 25	Single-use plastic straws not used
Practice 26	Single-use plastic cups not used
Practice 27	Single-use plastic water bottles not used
Practice 28	Single-use plastic beverage bottles not used
Practice 29	Single-use plastic cutlery/plates not used
Practice 30	Single-use plastic stirrers not used

type of tourist facility on the website. One more complication that the authors faced here was caused by the Booking.com search procedure: it is possible to see only the first 1000 results for any search, even if 1060 (or 1224) are actually found by the system.

This part of the study resulted in obtaining the information on sustainable practices possible to be marked by the tourism facilities that want to take part in Booking's Travel Sustainable Program. Also, by conducting a facility search, a total number of tourism objects rewarded with the Travel Sustainable Badge was obtained. The search also revealed discrepancies in facilities number if filtered by object type.

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4 Results

Obtaining information on how many objects in the system have marked the implementation of sustainable development activities is impossible. It is only possible to filter objects marked with the Travel Sustainable badge. Booking.com gives the objects awarded with the Travel Sustainable Badge a higher position in the search results. The objects that implement sustainable practices, but do not have the Travel Sustainable Badge, are hardly visible. Information about sustainable practices is at the bottom of the presentation. It is a section that pops up when a "Read more" link is clicked.

Objects that are most often distinguished with the Travel Sustainable Badge on Booking.com, are shown in Table 2. The data were obtained from the website filtration module, as discussed above. This result enables us to provide an answer for research question number one. We identified 1,224 tourist facilities in Poland listed on Booking.com, that are actively engaged in sustainable development communication and have been awarded the "Travel Sustainable Badge.".

The largest number of properties in Poland are Apartments, which constitute over 55% of all types of properties in the country on the Booking.com website. Apartments qualified for the Travel Sustainable program constitute 46.12% of all facilities distinguished by the Badge. Hotels take 13.08% of all facilities in the program, and 8.09% are Homestays. The least involved in the program are the following facilities: Motels—only 0.79% of all Motels on the site, Country houses—0.91%, Lodges (holiday homes)—1.33%, Campsites—1.39%, and Holiday homes—1.94%. Boats (5.00%), Bed and breakfasts (4.16%), Guest houses (4.04%), Villas (3.97%), and Hotels (3.90%) are involved in most of their types. However, the overall number of Campsites, Motels, Country Houses and Boats on the website is very low and amounts to less than 150 facilities of a given type (less than 0.5% of all facilities in Poland). This result allows us to provide an answer for research question number two. We discovered that in Poland, relatively, "Bed and breakfast" is the top facility, followed by "Guest houses" and "Villas," among facilities with a count higher than 100 across the country. These facilities are actively involved in programs related to communicating activities associated with sustainable development.

Table 3 presents the number of all tourist facilities (Total) in the province (voivodeship), the number of facilities in the program (Badge) and the involvement of facilities in the program in each province (Badge in voivod.). In addition, to check whether

Table 2 Booking.com Travel Sustainable Badge in Poland: statistics by property type (*Number of prop* number of properties of each type; *PL* total value for Poland, *% of number PL* share of a property type in total number for Poland, *Badge* number of properties with the Badge, *% of Badge PL* share of a property type with the Badge in total number of properties with the Badge in Poland, *% of Badge in number PL* share of a property type with the Badge in total number of properties in Poland

Property type	Number of prop	% of number PL	Badge	% of Badge PL	% of Badge in number PL
Apartments	27,826	55.30%	564	46.12%	2.03%
Hotels	4098	8.14%	160	13.08%	3.90%
Holiday homes	3914	7.78%	76	6.21%	1.94%
Homestays	3699	7.35%	99	8.09%	2.68%
Bed and breakfasts	1995	3.96%	83	6.79%	4.16%
Cabins	1917	3.81%	41	3.35%	2.14%
Guest houses	1064	2.11%	43	3.52%	4.04%
Farm stays	1025	2.04%	31	2.53%	3.02%
Lodges	980	1.95%	13	1.06%	1.33%
Chalets	957	1.90%	30	2.45%	3.13%
Villas	731	1.45%	29	2.37%	3.97%
Resorts	643	1.28%	19	1.55%	2.95%
Hostels	629	1.25%	20	1.64%	3.18%
Holiday parks	376	0.75%	8	0.65%	2.13%
Campsites	144	0.29%	2	0.16%	1.39%
Motels	126	0.25%	1	0.08%	0.79%
Country houses	110	0.22%	1	0.08%	0.91%
Luxury tents	45	0.09%	2	0.16%	2.22%
Boats	40	0.08%	2	0.16%	5.00%
PL (column sum)	50,319	–	1224	–	–

a given voivodeship is rich, data on tax revenues for 2020 per capita (income) were provided as of June 30, 2021 (Ministry of Finance, 2022). The data has been sorted by income level in order of the richest voivodeships.

Table 4 presents descriptive statistics for the following variables: the number of tourist facilities in the province (total), the number of facilities in the program (Badge) and the level of voivodeship wealth (income). Results of the Shapiro–Wilk test are also given in the table (last two rows).

The tests have shown that the data do not have normal distribution, that is why the next step was to study correlation between the variables using the non-parametric Spearman's Rho Test. The results of this test are given in Table 5.

The largest number of objects taking part in the Travel Sustainable program is located in the Lesser Poland (24.29%), Pomerania (14.75%), Lower Silesia (12.54%) and West Pomerania (11.84%) voivodeships. Most of these objects are located in wealthy voivodeships of Poland (Pomerania, Lower Silesia, Lesser Poland), which, however, are not the wealthiest in the country. Spearman's Rho Test results show a moderate correlation between a voivodeship's income and the total number of facilities located in this voivodeship; and a low correlation between a voivodeship's income and the number of facilities participating in the Travel Sustainable program. However, there is a very high

Table 3 Booking.com Travel Sustainable Badge in Poland: statistics by voivodeships *ICP* income per capita, *PL* total value for Poland, *Number of prop.* number of properties in each voivodeship, *Badge* number of properties with the Badge, *% of Badge in voivod.* share of properties with the Badge in a voivodeship, *% of Badge PL* share of Badge properties in a voivodeship in total number of Badge properties in Poland, *% of Badge in number PL* share of Badge properties in a voivodeship in total number of properties in Poland

Voivodeship	ICP	Number of prop	Badges	% of Badge in voivod	% of Badge PL	% of Badge in number PL
Lodz	245.65	689	27	3.92%	2.39%	0.06%
Lubuskie	195.78	492	17	3.46%	1.50%	0.04%
Lesser Poland	264.02	8861	275	3.10%	24.29%	0.58%
Lower Silesia	319.65	5013	142	2.83%	12.54%	0.30%
Podkarpackie	169.89	1572	43	2.74%	3.80%	0.09%
Podlaskie	143.41	1037	28	2.70%	2.47%	0.06%
Silesia	274.50	2721	72	2.65%	6.36%	0.15%
Swietokrzyskie	158.31	639	16	2.50%	1.41%	0.03%
Lubelskie	145.29	106	26	2.45%	2.30%	0.05%
Masovia	665.19	3454	83	2.40%	7.33%	0.18%
Opolskie	189.45	279	6	2.15%	0.53%	0.01%
Kuyavian-Pomeranian	221.02	1075	22	2.05%	1.94%	0.05%
Pomerania	310.63	8864	167	1.88%	14.75%	0.35%
Warmia-Masuria	142.31	2586	48	1.86%	4.24%	0.10%
Greater Poland	325.57	1449	26	1.79%	2.30%	0.05%
West Pomerania	183.34	7616	134	1.76%	11.84%	0.28%
PL (column sum)	50,319	–	1224	–	–	–

Table 4 Descriptive statistics for the variables "Income", "Total" and "Badge", with the Shapiro–Wilk Test results, for 16 voivodeships

	Total	Badge	Income
Mean	2,962.94	70.75	247.13
Median	1,510.50	35.50	208.40
Standard deviation	2,998.99	73.80	128.57
Minimum	279.00	6.00	142.31
Maximum	8,864.00	275.00	665.19
Gap	8,585.00	269.00	522.88
Quarter range	3,847.25	98.25	140.39
Skewness	1.227	1.696	2.478
Kurtosis	0.113	2.754	7.635
W	0.786	0.785	0.728
Significance	0.002	0.002	<0.001

correlation between the number of facilities in the voivodeship and the number of facilities engaged in the Travel Sustainable program.

For further research, a list of the first 1000 results was used with the following criteria: 2 adult guests in one room, without specific availability date, specified destination—Poland. Table 6 presents the most frequently implemented sustainable development practices (by the facilities).

Table 5 Results of the Spearman's Rho Test

		Income	Total	Badge
Income	Correlation coefficient		0.435*	0.377
	Relevance (one-sided)		0.046	0.075
Total	Correlation coefficient	0.435*		0.942**
	Relevance (one-sided)	0.046		<0.001
Badge	Correlation coefficient	0.377	0.942**	
	Relevance (one-sided)	0.075	<0.001	

*Correlation significant at the level of 0.05 (one-sided)

**Correlation significant at the level of 0.01 (one-sided)

Table 6 Sustainable development practices application on Booking.com: total number of facilities and descriptive statistics for voivodeships, sorted by the popularity of practice implementation

Practice No	For voivodeship $n = 16$				Total	
	Min	Max	Av	SD	All	%
2	5	237	58.06	62.69	966	97%
15	5	238	58.50	62.89	964	96%
24	4	206	50.50	55.18	952	95%
3	5	189	45.31	48.76	950	95%
14	5	240	57.69	62.65	942	94%
25	5	243	59.25	64.26	941	94%
13	5	241	58.75	62.85	937	94%
1	3	84	21.50	21.43	934	93%
30	5	242	59.44	64.21	933	93%
16	5	233	58.25	63.11	931	93%
27	4	225	52.44	58.57	925	93%
12	0	21	5.81	6.15	896	90%
28	5	231	55.94	61.14	841	84%
26	5	236	58.25	62.53	824	82%
29	5	240	58.75	63.39	809	81%
6	4	172	45.00	45.72	791	79%
8	4	246	60.13	64.90	780	78%
7	2	165	36.00	40.52	726	73%
9	5	247	60.25	65.45	722	72%
11	2	90	23.88	23.28	694	69%
4	1	109	24.00	28.15	578	58%
20	3	107	31.06	30.35	496	50%
10	2	81	20.50	22.01	425	43%
17	3	205	49.38	54.75	383	38%
21	3	217	50.69	56.05	344	34%
18	3	204	48.63	53.52	340	34%
22	1	75	20.81	20.11	339	34%
23	2	177	43.25	45.34	334	33%
5	3	80	24.75	22.89	328	33%
19	2	114	26.44	28.57	93	9%

The most frequently indicated practices from the list are 2 and 15—"Recycling bins available to guests" and "Waste is recycled". They are carried out by 97% of the objects awarded with the Travel Sustainable Badge. From the group of the most popular practices (more than 90%), most are relatively easy to be implemented by a facility, e.g., the options to opt-out of daily room cleaning or reuse towels (practices 14 and 13). "Removing single-use plastics from your property" group (practices 24–30) is also very popular—each of these activities is carried out in at least 80% of objects.

The number of accommodation facilities offering Electric car charging stations (as much as 90% of participating facilities) may be surprising. The number of Bicycle rentals is also surprisingly low (only 33% of facilities offer Bicycle rental).

Practices from the group "Practices to save energy or reduce greenhouse gasses", which are directly related to energy and carbon footprint, are highlighted in gray in the table. These practices are moderately popular. The lowest number of facilities declare that they have bicycle rental (33%) and offset a portion of their carbon footprint (43%). Most facilities claim that lighting throughout the property uses energy-efficient LED bulbs (78%) and electric car charging stations (90%).

Table 7 presents the average percentage involvement of objects in implementing activities within groups of activities. The most significant involvement is visible in the framework of activities from the "Practices to reduce waste" group, and the lowest involvement is in "Practices to reduce the impact on the environment". Commitment to activities related to the low-carbon market defined in the "Practices to save energy or reduce greenhouse gasses" group is carried out on an average level. These results allow us to answer research question number three, which reveals that the most common sustainable activities implemented by Polish tourist facilities are "Recycling bins available to guests" and "Waste is recycled."

The authors decided to verify the popularity of activities statistically depending on the type of accommodation. Groups with a small (> 10) number of facilities (19 facilities in total) were excluded from these analyzes: Boats—two facilities, Campsites—two facilities, Country houses—one facility, Holiday parks—six facilities, Inns—five facilities, Luxury tents—two facilities and Motels—one facility. As a result of the rejection of those facilities, a set of 981 facilities was subjected to further analysis.

In the next step, statistical tests on the collected data were performed. First, the normality of the distribution was checked using the Shapiro–Wilk Test. For voivodeships, the Shapiro–Wilk tests has showed significance departure from the normality, $W(480) = 0.725$, $p < 0.001$. For the types of objects, the Shapiro–Wilk tests has showed significance departure from the normality, $W(403) = 0.515$, $p < 0.001$.

Table 7 Sustainable development practices on Booking.com: by practices groups

Practices group name	Percent
Practices to reduce waste	95%
Practices to save energy or reduce greenhouse gasses	66%
Practices to reduce water use	94%
Practices to reduce the impact on the environment	27%
Practices to support the surrounding area or community	38%
Removing single-use plastics from your property	89%

The Shapiro–Wilk Test has showed that neither for voivodeships nor for object types the data have a normal distribution (Table 8). The hypothesis H0 of normality of distribution is not met, then we use the Spearman's rho test.

Rho-Spearman's correlation matrices between property types has the lowest values of correlation for Lodges and Hotels (0.546; p-value < 0.01), and it is a moderately significant correlation on Guilford's scale. Moderate significant correlation are also between Lodges and Hostels (0.593; p-value < 0.01), Lodges and Resorts (0.619; p-value < 0.01), Hostels and Chalets (0.637; p-value < 0.01), and Hostels and Farm-stays (0.613; p-value < 0.01). All other correlations are above 0.7 which is considered as strongly related coefficient. The highest correlation is between Homestays and Apartments (0.942; p-value < 0.01), Homestays and Bed-and-breakfasts (0.937; p-value < 0.01), and Homestays and Aparthotels (0.935; p-value < 0.01). It is visible, that Homestays, Apartments, Bed-and-breakfasts, and Aparthotels are the properties which have the most number of sustainable practices applied (Tables 9, 10).

For the voivodeships correlation matrix, the lowest correlation values are for Świetokrzyskie voivodeship. But still, the lowest value is (0.628; p-value < 0.01) with Podkarpackie, which is considered a moderate relationship. The highest correlation values are for Lesser-Poland, where ten relationships are considered very strongly correlated, above 0.9 (p-value < 0.01). A similar good score is for Lower-Silesia, where ten relationships are also very strongly correlated.

Table 11 presents the percentage of commitment to the implementation of specific sustainable development practices by various types of accommodation facilities. The cells, in which more than 95% of facilities of a certain type carry out a particular activity, are marked in light grey. The high commitment is visible on the implementation of Practice 2 "Recycling bins available to guests and waste is recycled" (nine facilities types above 95%) and Practice 3 "The property makes efforts to reduce their food wastage" (eight facilities types above 95%), which are included in the "Practices to reduce waste group". Also, the high commitment is visible on the implementation of Practice 15 (nine facility types above 95%) and Practice 14 (seven facility types above 95%), which belong to the "Practices to reduce water use" group. The lowest level of implementation is for Practice 19 (Most food provided is organic): in any type of facility, the level of implementation of this Practice did not exceed 30%. The engagement below 30% occurs in seven facility types for Practice 5 (Bicycle rental in the "Practices to save energy or reduce greenhouse gasses") and five facility types below 30% for Practice 21, Practice 22 and Practice 23 of the "Practices to support the surrounding area or community" group.

5 Discussion

The study presented in the paper temporarily overlaps with the period when some restrictions related to the COVID-19 pandemic were still in force, but it does not directly concern changes in the behavior of customers in the tourism sector resulting from the pandemic, although such changes could obviously be observed. The changes introduced by online booking platforms were primarily related to safety issues, not directly to sustainable development. However, some of the safety-related measures introduced by tourism industry entities during the pandemic gave a starting point for the implementation of further ones, moving towards sustainability.

Table 8 Results of Shapiro–Wilk test for or voivodeships and object types

Parameter	Voivodeship	Properties types
p-value	0	0
W	0.7251	0.5154
Sample size (*n*)	480	403
Average (x̄)	44.1063	53.7717
Median	23	25
Sample Standard Deviation (S)	51.5444	86.1546
Sum of Squares	1,272,617.581	2,983,888.998
b	960.6132	1,240.0609
Skewness	2.1032	3.3673
Excess kurtosis	4.4371	11.0281
Outliers	237, 136, 238, 135, 206, 189, 240, 130, 243, 139, 241, 130, 242, 121, 139, 233, 142, 225, 122, 231, 132, 236, 135, 240, 135, 172, 246, 121, 138, 165, 247, 141, 205, 217, 204, 177	444, 408, 417, 372, 307, 427, 163, 427, 395, 423, 424, 425, 422, 417, 410, 240, 433, 438, 165, 152, 354, 135, 312, 255, 366, 288, 293, 132, 198

Table 9 rho- Spearman correlation between object types

Spearman	Apart-hotels	Apartments	B&B	Chalets	Farm stays	Guest houses	Holiday homes	Home-stays	Hostels	Hotels	Lodges	Resorts	Villas
Aparthotels	1	0.892	0.895	0.779	0.815	0.86	0.832	0.935	0.782	0.859	0.728	0.843	0.897
Apartments	0.892	1	0.901	0.873	0.882	0.892	0.918	0.942	0.768	0.783	0.864	0.827	0.921
Bed-and-breakfasts	0.895	0.901	1	0.826	0.895	0.876	0.901	0.937	0.753	0.853	0.734	0.899	0.897
Chalets	0.779	0.873	0.826	1	0.852	0.898	0.872	0.835	0.637	0.719	0.84	0.756	0.876
Farm-stays	0.815	0.882	0.895	0.852	1	0.879	0.938	0.903	0.613	0.708	0.845	0.834	0.894
Guest-houses	0.86	0.892	0.876	0.898	0.879	1	0.887	0.882	0.735	0.768	0.84	0.81	0.911
Holiday-homes	0.832	0.918	0.901	0.872	0.938	0.887	1	0.925	0.702	0.729	0.868	0.79	0.906
Homestays	0.935	0.942	0.937	0.835	0.903	0.882	0.925	1	0.75	0.825	0.805	0.882	0.927
Hostels	0.782	0.768	0.753	0.637	0.613	0.735	0.702	0.75	1	0.852	0.593	0.735	0.688
Hotels	0.859	0.783	0.853	0.719	0.708	0.768	0.729	0.825	0.852	1	0.546	0.894	0.744
Lodges	0.728	0.864	0.734	0.84	0.845	0.84	0.868	0.805	0.593	0.546	1	0.619	0.817
Resorts	0.843	0.827	0.899	0.756	0.834	0.81	0.79	0.882	0.735	0.894	0.619	1	0.812
Villas	0.897	0.921	0.897	0.876	0.894	0.911	0.906	0.927	0.688	0.744	0.817	0.812	1

Table 10 rho- Spearman correlation between voivodeships

Spearman	Lodz	Greater-Poland	Kuyavian-Pomeranian	Lesser-Poland	Lower-Silesia	Lubelskie	Lubuskie	Masovia	Opolskie	Podkarpackie	Podlaskie	Pomerania	Silesia	Swietokrzyskie	Warmia-Masuria	West-Pomerania
Lodz	1	0.817	0.81	0.84	0.823	0.75	0.897	0.909	0.803	0.654	0.783	0.827	0.863	0.74	0.686	0.84
Greater-Poland	0.817	1	0.896	0.915	0.934	0.842	0.893	0.882	0.84	0.818	0.86	0.937	0.908	0.793	0.812	0.958
Kuyavian-Pomeranian	0.81	0.896	1	0.911	0.939	0.875	0.86	0.901	0.795	0.837	0.869	0.893	0.895	0.741	0.76	0.872
Lesser-Poland	0.84	0.915	0.911	1	0.961	0.923	0.915	0.946	0.823	0.864	0.912	0.936	0.939	0.731	0.85	0.927
Lower-Silesia	0.823	0.934	0.939	0.961	1	0.918	0.896	0.908	0.815	0.909	0.911	0.949	0.913	0.742	0.822	0.938
Lubelskie	0.75	0.842	0.875	0.923	0.918	1	0.851	0.889	0.728	0.838	0.856	0.841	0.855	0.676	0.719	0.826
Lubuskie	0.897	0.893	0.86	0.915	0.896	0.851	1	0.928	0.831	0.75	0.89	0.879	0.877	0.808	0.79	0.894
Masovia	0.909	0.882	0.901	0.946	0.908	0.889	0.928	1	0.86	0.764	0.861	0.879	0.941	0.747	0.75	0.869
Opolskie	0.803	0.84	0.795	0.823	0.815	0.728	0.831	0.86	1	0.739	0.832	0.861	0.873	0.658	0.745	0.847
Podkarpackie	0.654	0.818	0.837	0.864	0.909	0.838	0.75	0.764	0.739	1	0.886	0.866	0.807	0.628	0.866	0.839
Podlaskie	0.783	0.86	0.869	0.912	0.911	0.856	0.89	0.861	0.832	0.886	1	0.885	0.856	0.69	0.83	0.867
Pomerania	0.827	0.937	0.893	0.936	0.949	0.841	0.879	0.879	0.861	0.866	0.885	1	0.907	0.769	0.842	0.977
Silesia	0.863	0.908	0.895	0.939	0.913	0.855	0.877	0.941	0.873	0.807	0.856	0.907	1	0.785	0.835	0.914
Swietokrzyskie	0.74	0.793	0.741	0.731	0.742	0.676	0.808	0.747	0.658	0.628	0.69	0.769	0.785	1	0.67	0.805
Warmia-Masuria	0.686	0.812	0.76	0.85	0.822	0.719	0.79	0.75	0.745	0.866	0.83	0.842	0.835	0.67	1	0.855
West-Pomerania	0.84	0.958	0.872	0.927	0.938	0.826	0.894	0.869	0.847	0.839	0.867	0.977	0.914	0.805	0.855	1

Table 11 Summary of sustainable development practices carried out in various types of facilities (italics—the lowest results, bold—the highest results)

Practice no	Apart-hotels	Apartments	B&B	Chalets	Farm stays	Guest houses	Holiday homes	Home-stays	Hostels	Hotels	Lodges	Resorts	Villas
1	91%	95%	89%	96%	94%	95%	95%	93%	94%	85%	100%	89%	96%
2	**95%**	**99%**	**97%**	**100%**	**97%**	90%	**97%**	**98%**	89%	89%	92%	**100%**	**100%**
3	**95%**	**96%**	89%	**100%**	94%	**97%**	92%	**96%**	94%	90%	**100%**	**100%**	**100%**
4	72%	54%	78%	35%	84%	72%	33%	47%	78%	63%	33%	78%	60%
5	23%	37%	29%	26%	29%	31%	30%	30%	50%	23%	42%	39%	32%
6	81%	82%	74%	52%	74%	82%	72%	74%	**100%**	80%	83%	72%	80%
7	79%	69%	79%	61%	77%	77%	63%	67%	**100%**	87%	67%	72%	64%
8	74%	70%	92%	91%	**97%**	95%	94%	89%	50%	60%	92%	89%	**96%**
9	72%	66%	72%	87%	84%	74%	81%	72%	78%	81%	58%	78%	80%
10	56%	45%	49%	35%	58%	56%	27%	39%	50%	26%	8%	61%	36%
11	70%	65%	74%	78%	81%	77%	69%	68%	94%	66%	75%	83%	80%
12	**98%**	**95%**	85%	87%	90%	92%	92%	94%	83%	60%	**100%**	72%	**96%**
13	**95%**	**95%**	88%	**96%**	94%	**97%**	94%	94%	**100%**	91%	83%	94%	**96%**
14	**98%**	92%	**97%**	78%	94%	90%	94%	**97%**	**100%**	**100%**	83%	**100%**	**96%**
15	**95%**	**98%**	**97%**	91%	**97%**	90%	**100%**	**97%**	**100%**	91%	92%	**100%**	**96%**
16	**95%**	94%	90%	**100%**	**97%**	95%	**98%**	95%	94%	83%	**100%**	72%	**100%**
17	40%	34%	29%	52%	68%	38%	56%	45%	33%	32%	75%	22%	24%
18	44%	27%	33%	26%	55%	51%	33%	34%	39%	46%	17%	50%	32%
19	*14%*	*10%*	*6%*	*4%*	*3%*	*8%*	*6%*	*1%*	*6%*	23%	*0%*	28%	*4%*
20	40%	57%	44%	30%	42%	56%	31%	45%	56%	52%	33%	44%	28%
21	44%	37%	35%	*9%*	23%	31%	27%	*16%*	39%	55%	*0%*	33%	48%
22	51%	30%	32%	30%	19%	31%	*8%*	28%	44%	71%	25%	61%	24%
23	44%	30%	38%	35%	52%	41%	22%	29%	28%	43%	17%	61%	32%
24	**95%**	**96%**	94%	**96%**	**100%**	95%	94%	95%	94%	90%	**100%**	94%	**100%**
25	93%	**96%**	92%	**96%**	**100%**	95%	94%	95%	89%	87%	**100%**	89%	**96%**

Table 11 (continued)

Practice no	Apart-hotels	Apartments	B&B	Chalets	Farm stays	Guest houses	Holiday homes	Home-stays	Hostels	Hotels	Lodges	Resorts	Villas
26	93%	80%	85%	96%	87%	87%	77%	78%	78%	88%	67%	89%	88%
27	**98%**	92%	92%	78%	90%	92%	83%	**97%**	94%	**99%**	67%	**100%**	**96%**
28	86%	89%	83%	91%	81%	87%	86%	89%	78%	56%	92%	61%	**96%**
29	77%	84%	78%	87%	94%	79%	89%	86%	67%	57%	**100%**	83%	76%
30	93%	94%	94%	**100%**	84%	95%	92%	91%	**100%**	93%	92%	89%	92%
Average	73%	70%	70%	68%	75%	73%	68%	69%	73%	69%	66%	74%	71%

Due to the inability to filter objects that implement sustainable practices, but do not have the Travel Sustainable Badge on Boking.com, one may get an impression that the tourism industry is not involved in activities related to sustainable development. That may falsely confirm the hypotheses regarding the low involvement of enterprises (Bernard & Nicolau, 2022; Moyle et al., 2018). When analyzing the sustainable practices indicated by Booking. com, it can be assumed that they were developed mainly for large hotel enterprises. Most of them are closely related to environmental protection, while the smaller part concerns social issues. As part of the section informing about activities implemented in the field of sustainable development, the facilities do not have an opportunity to inform their guests about activities (if any) in the field of pro-health prevention (although there is a separate section on safety), educational activities, adaptation of the object for people with disabilities (although there is a separate section of filters to find facilities and equipment for disabled people), employment, compliance with legal acts, and more. The algorithm responsible for qualifying objects for the Travel Sustainable Badge is not publicly available, so it is not possible to verify the correctness of this classification, or to state, for instance, whether facilities for disabled people are considered when an object is qualified for the program.

Data, collected from Booking.com, show that the types of facilities most actively involved in the Travel Sustainable Badge program are "Bed & breakfast" objects, followed by "Guest houses" and "Villas". The observations from this study are not consistent with (Yang et al., 2023) conclusion that higher-end properties are more committed to sustainability. While we can say that Villas are high-class facilities, the involvement of Hotels, Resorts and Apartments is low.

Analyzing this engagement in the scale of all tourist facilities available on Booking. com, we can see that it is still only around 2% of the total number. It can be concluded that the involvement of facilities in sustainable development is still low, which is in line with (Bernard & Nicolau, 2022; Moyle et al., 2018), at least in Poland. Still, it is necessary to remember (as it was already discussed above) that not all facilities which are actively engaged in sustainable development possess the Badge; at the same time, some of the sustainable development practices are difficult to be verified, so some of the practices declared by a tourist object may not be realized in fact.

Further analysis of Booking.com statistics has allowed to state that there is low correlation between the wealth of a certain voivodeship (its income per capita) and the number of facilities possessing the Travel Sustainable Badge. In other word—wealthy voivodeships do not necessarily have more facilities with the Badge than some less wealthy regions. The reason lies in the fact that not all voivodeships with high income are very attractive for tourists. For instance, Masovia voivodeship, which includes Warsaw, has the highest ICP (665.19), yet only 83 facilities with the Badge are located there; Pomeranian voivodeship, in turn, with the ICP of only 310.63, is a tourist place because of the Baltic Sea, and the Badge is possessed by 167 objects on Booking.com. With an even lower ICP of 264.02, Lesser Poland voivodeship has the highest number of Badge objects and a lot of tourist facilities in general—probably, because of Kraków (one of the popular historical cities), the Trail of the Eagle's Nests (a chain of 25 medieval castles) and many others.

One more important observation made by the authors concerns the distribution of sustainable development practices realization by facilities on Booking.com. The most frequently applied practice is "Recycling bins available to guests and waste is recycled". It can be claimed that this practice is also one of the easiest to be implemented—there is no difficulty in purchasing recycling bins for an object. On the other hand, the least frequently implemented practice is "Most food provided is organic". Here it should be noted that organic food is quite expensive if purchased, and only

a very small number of facilities are able to grow organic food in their own gardens and greenhouses. One more example—the practice "Most lighting throughout property uses energy-efficient LED bulbs", which has a rather high frequency of implementation by Booking.com facilities. By using LED bulbs, the objects save energy, which results in lower bills for energy they have to pay. Therefore, such bulbs become not only necessary for sustainable development, but also simply allow saving funds of a facility. Summing up, it can be stated that realization of sustainable development practice in many situations might be hindered not by the unwillingness of an object, but by its financial situation.

6 Conclusions

The paper presents the research conducted on the data taken from Booking.com service. The objective of this paper was to find out how tourist facilities in Poland are engaged in various sustainable development activities promoted by the country and the European Union. The objective was achieved with analysis of the facilities on Booking.com, which, according to the website, are engaged in the Travel Sustainable Badge program.

The authors found out how many tourist objects in Poland actually realize sustainable development practices, and on this basis, they maintain the conclusions of previous research that the involvement of tourist facilities in sustainable development is small. In the period in which the study was conducted, out of 50,319 tourist facilities in Poland, available on Booking.com, 1,224 (about 2%) were awarded the Sustainable Travel Badge, which means that they implement activities in the field of sustainable development defined by Booking.com as necessary to receive the award. This allows to provide the answer for RQ1.

The authors also found out, the objects of which types are more active in sustainable development. The objects that are most often (according to the total number, not relative) awarded are apartments, which in the case of Poland accounts for 46.12% of all awarded objects in a total of 19 categories of objects. Boats are the least frequently awarded objects (0.16% of Sustainable Travel Badges were awarded to these objects), which may be related to the overall low number of these objects in Poland (only 40 objects for rent belong to this group). It allows to provide the answer for RQ2.

What also has been examined is the type of sustainable practices realized by Polish tourist facilities. According to the gathered data, the practices that the facilities implement most often (out of the practices defined by Booking in the Sustainable Travel Program catalog) are: availability of garbage recycling bins, water-efficient toilets, not using single-use plastic miniature shampoo, conditioner, and body wash bottles, and reducing food waste. The practices that facilities implement the least often are: providing guests with information regarding local ecosystems, bicycle rental and providing organic food. It allows to provide the answer for RQ3.

Information gathered and presented above can be treated by the tourist facilities owners as guidelines or recommendations on which sustainable activities should be implemented in their facilities in order to become not only sustainable but also to enter the Booking's Sustainable Travel Program and receive the Sustainable Travel Badge.

6.1 Limitations of the research

The authors see the limitation of the presented research in the fact that, due to the rules of Booking.com, not all the facilities showed after filtration could be actually seen (only the first 1000). The other limitation is usage of Booking.com. Although the website is one of the largest online services for tourists' accommodation, there are still many objects in Poland that do not offer their service on Booking.com at all, or, perhaps, are not very active on the website. These objects sell accommodation for tourists via their own websites. Therefore, these facilities were not considered in this research, although many of them may have high level of sustainable development practices realization.

6.2 Contributions of the research

The authors distinguish the cognitive contribution of this research, which consists of a few elements. First, it is the literature review performed to collect and arrange related works on sustainable development of tourist facilities. Second, it is the data collected from Booking.com, that shows which sustainable practices are realized most or least frequently, in which voivodeships in Poland, and by what types of tourist objects. Third, it is the statistical analysis that shows correlation (high or low) between the geographical location of facilities and the number of practices they realize within the Travel Sustainable Badge program.

6.3 Avenues for future research

Presently, the conducted research is limited to Poland only. That is why the priority direction of future research for the authors is the expansion of geographical space by studying tourist facilities in all European Union countries. Such research would contribute to the understanding of sustainability development by providing information about distribution of implemented sustainable practices within the countries united by particular EU laws. This is all the more important as the conclusions of our study are inconsistent with those of other authors.

The other avenue of future research in this field would be to engage tourists to the study. As discussed before, on Booking.com one can find information about the Travel Sustainable Badge, yet it is not possible to verify whether all the sustainable practices are indeed implemented. In order to compare Booking.com information with the actual situation, opinions of tourists could be also taken into consideration. That would contribute by showing whether the realization of sustainable development practices by facilities is properly controlled and verified by the Booking.com service.

Finally, since the beginning of 2023 Booking has been presenting the verification process, in order to reward a facility with a badge. According to the information from the webpage (accessed in June 2023), the verification process has two stages. The first considers third-party auditor involvement, whose task is to check that the information given by the facility owner is true and accurate. In case any discrepancies are found, the indicated practice from a property page is removed until the evidence of its implementation is provided. The second stage refers to the guests' survey. After a guest stays in a facility, they are asked to complete a survey about the accuracy of the information on a property page about the facility, services and sustainability practices. The change
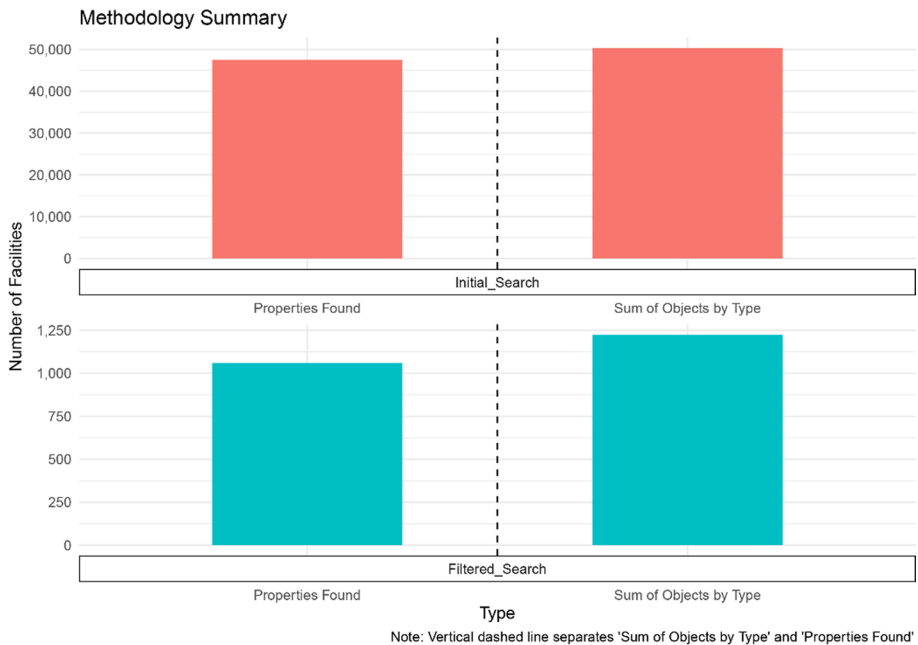
Fig. 1 Graphical representation of the methodology

introduced by Booking opens a possibility to conduct similar studies in order to compare the number of facilities rewarded with the Travel Sustainable Badge now, when the rewarding process is more transparent (Fig. 1).

Declarations

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