Application of Environmental Management Measures in Accommodation Facilities: Evidence From Czechia

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Abstract

Trends in accommodation services in recent years include an approach to ecology and the principles of sustainable development. These trends manifest mainly in large hotel companies, but independent hotels and guesthouses with a smaller bed capacity are also trying to go green. The goal of this article is to analyze the application of environmental measures in selected accommodation facilities in Czechia (administrative district Žďár and Sázavou). The questionnaire was evaluated as the most suitable data collection method to answer the research questions. Accommodation facilities (n = 47) were contacted from November 2022 to March 2023, and the selection set consisted of 33 accommodation facilities. The method of correspondence analysis was used for the evaluation, and the STATISTICA 12 software was used for graphical representation. The results indicate minimal differences in the number of environmental measures implemented between collective accommodation facilities, i.e., hotels and guesthouses. The categories of apartments, and cottages & chalets achieved reasonable results. However, they did not apply more than half of the environmental measures concerning employees and guests. On the other hand, the star rating of accommodation facilities is not a key parameter in the environmental impact assessment. The research results are helpful for the practice of national professional associations that promote resource conservation and thus influence the entire hospitality industry. Furthermore, they can be used by other accommodation facilities to gain information on sustainability issues or examples of best environmental practices.

Keywords: *hospitality, accommodation facilities, environmental management, Czechia*

Introduction

Sustainability and corporate social responsibility are becoming a more significant strategic issue in the business environment [1–3]. The values associated with sustainable business are included in the foundations of strategies for the further development of businesses [4–6], and this is unchanged in the case of accommodation facilities as well [7,8]. Thriftiness in the local and global environment is very important, as the demand for sustainable products, services, and consumption increases with the dwindling supply of natural resources [9].Urbancová and Vrabcová add that sustainable business is about managing the triple profit, which [10] defines as economic, social, and ecological. The triple bottom line approach [11,12], which arose out of frustration with traditional, financially focused measures of business performance, suggests that decision-making criteria should also include social and environmental factors instead of a business focusing solely on profit maximization [13] as the concept supports the evaluation of overall business performance based on three critical areas: profit, people and planet [14]. Businesses know that success is not only reflected in their profit and loss statements. Instead, to gain an accurate and holistic

view of its operations and relationships with the environment, community, and economy, a business must thoroughly consider all the costs of doing business beyond compliance [12]. The International Union for Conservation of Nature (IUCN), in the document Many Voices, One Earth, states that some businesses favor the economic pillar of sustainable development over the social, especially the environmental one [15]. Even though this document is almost twenty years old, companies still prioritize the economic side over others. However, in our opinion, the situation is improving, as businesses that do not consider the social and environmental pillars will not survive in the tourism market in the long term. It is, therefore, more than desirable that the dimensions of the environmental and social pillars are comparable to the economic ones (Figure 1).

Figure 1: The three pillars of sustainability
Source: IUCN, 2004.

The circular economy, whose principle consists of the alternative reuse, recycling, and recovery of materials [16], is an integral part of sustainable development [17–19] and represents one of the possible ways to ensure a sustainable hospitality business [20,21] where production and consumption generate net zero (or near zero) waste. The 3R principle, i.e., Reduce – Reuse – Recycle, has already been adopted by many businesses in the tourism industry [22]. However, Vargas-Sánchez[23] describes the circular economy in terms of the 6Rs, i.e., Reuse – Recycle – Redesign – Remanufacture – Reduce – Recover.

The effort to minimize any negative environmental impact is manifested in the hotel industry through environmental management (also known as green or green management). Environmental management refers to an organization's philosophy, technology, and methodology aimed at optimizing the impact of its operations on the environment. It is becoming a fundamental aspect of the operation of tourism businesses worldwide [22]. Environmental management in hotels is usually focused on waste management, saving energy and water, improving indoor air quality, and educating employees and hotel guests to protect the environment. It is the hotel industry that causes a less negative impact on the environment than the manufacturing industry [24]. However, due to the luxurious nature of its functions, operations, and services provided, hotels consume a large amount of non-durable products, water, and energy, creating a much more significant negative impact on the environment than can be expected [25]. Montabon et al.[26] defined environmental management practices as techniques, principles, and procedures used by a hotel specifically aimed at monitoring and controlling the impacts of its operation on the natural environment.

Running an accommodation facility that satisfies every need of the most demanding guest, creates an unforgettable image on the market, and its competitiveness reflects all its competitors is challenging. In addition, with ongoing efforts to sustain the development of an environment in which tourism and the hotel industry play a significant role, the chances of success often disappear. However, it can mean something other than an apparent failure. Information and communication technologies in the tourism industry contain many utilities, practices, and elements that help managers run just such successful accommodation facilities and enjoy the joy not only of satisfied guests but also of the quality of the environment to which the accommodation facility contributes [27]. The pressure to reduce costs, especially during the COVID-19 pandemic, is noticeable. In their study, [28] verified that, in the long term, accommodation applying environmentally friendly principles reduces costs with higher societal added value and increases the rate of return on investment. In addition, Omune et al.[29] note that the

government should provide accommodation facilities with financial support to implement costly environmental measures. As a result, hotels have been challenged by stakeholders such as governments, customers, investors, and government agencies to implement measures to enable them to protect and preserve the natural environment. Following the growing interest in environmental management in the hotel sector, hotels have adopted various environmental management practices that allow them to reduce the negative impacts of their operations. An environmental management plan represents the techniques, policies, and procedures adopted by organizations specifically aimed at monitoring and controlling the negative impacts of their activities on the natural environment[26].

Table 1: Examples of environmental management elements in accommodation facilities

Economic and social activities	- purchasing commodities and products within the region, - supporting local infrastructure, - utilizing public transport and bikes, - employing residents, etc.
Communication and raising employees' and guests' awareness	- a steady plan for staff training in working with new technologies, - setting work procedures and checking their implementation, - promoting a public environmental program, - gently promoting the observance of green principles even by guests, etc.
Management	- implementing EMAS, EN ISO 14 001 standards, - purchasing in bulk, - giving priority to "eco-friendly" products, - purchasing quality and truly needed products, - purchasing products from regional suppliers, - measuring customer satisfaction, etc.
Waste management	- sorting waste at the accommodation facility, - recycling bins for plastic, paper, etc., in hotel rooms, - multiple reuses of recyclable materials, - composting organic waste, etc.
Energy conservation	- geothermal energy and waste heat utilization, - heating and air-conditioning control, - compact fluorescent lamps and LED light bulbs, - at a minimum Class A energy-efficient appliance, - energy-saving technologies, - thermal insulation of buildings, etc.
Water conservation	- installing single lever taps and faucet aerators - installing water-saving shower heads, - dual-flush toilets, - utilizing greywater, - rainwater catchment, etc.

Source: Own elaboration, 2024.

Several measures (Table 1) in environmental protection are primarily aimed at reducing energy consumption [30–44] and water [45–55]. It also involves the reduction of chemical agents, office material, increasing the proportion of natural materials[57], limiting the generation of waste [56–68], aestheticizing the environment, reducing noise and emissions, etc. [69–75,75,76].

Accommodation facilities take different approaches to selecting cost-saving measures. Some facilities decide based on what is most urgent, while others focus on measures that will bring the most significant savings at the lowest cost. There are many ways to go green. Environmental responsibility takes many forms, including energy management or recycling practices, turning off lights, monitoring air conditioner use, or recycling waste [77].

This article aims to analyze the application of environmental measures in selected accommodation facilities in Czechia.

Data and Methods

The goal of this article is to analyze the application of environmental measures in selected accommodation facilities in Czechia (administrative district Žďár and Sázavou, see Figure 2). It is located in the north-east of the Vysočina Region. The neighboring municipalities with extended competence are Havlíčkův Brod, Chotěboř, Jihlava, Velké Meziříčí, Nové Město na Moravě. The administrative area includes 48 municipalities, the average of the Vysočina Region. The territory is covered with dense forests, and half of the area is agricultural land (CZSO, 2013).

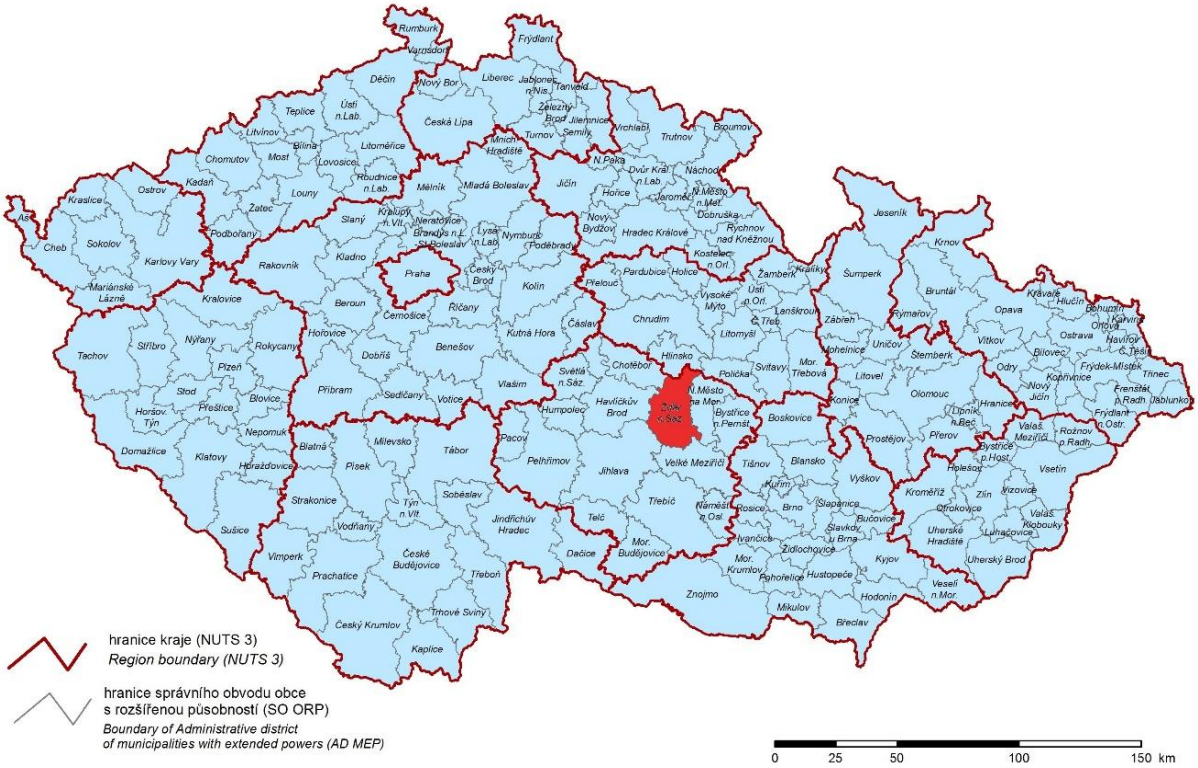

Figure 2: The map of the administrative district Žďár and Sázavou
Source: Czech Statistical Office, 2023.

The administrative district of Žďár nad Sázavou (Figure 3) is an area with good environmental quality. Implementing transport and technical infrastructure and other processes reduces environmental risks and the negative impacts of human activity on this district's environment and public health. These include improving air quality, reducing the volume of liquid waste, protecting water resources, reducing the volume of unsorted municipal solid waste, improving old ecological burdens, eliminating the mutual adverse effects of activities in the area, and anti-flood measures. In this mentioned district, there is no facility (industrial, agricultural, mining) with significant adverse effects on the environment (CZSO, 2013).

Figure 3: The detailed map of the administrative district Žďár and Sázavou
Source: CZSO, 2023.

The following research question was posed concerning the research goal: What environmental management measures are most often applied in selected accommodation facilities? The questionnaire was evaluated as the most suitable data collection method to answer the research questions. Accommodation facilities were continuously contacted using e-mail addresses for five months, from November 2022 to March 2023, at three-week intervals. Respondents were sent a link to the online questionnaire. In the case of non-functioning or full e-mail boxes of the accommodation facility, the operators, owners, or receptionists were contacted by phone, and after the agreement, a questionnaire was sent to them via social networks. The highest return of completed questionnaires was recorded at the end of November and the beginning of December 2022. The questionnaire targeted hotels, guesthouses, apartments, and cottages and chalets. It consisted of twelve questions: the first five were general and identified the respondents, i.e., the accommodation facilities into appropriate categories. In contrast, others focused on the usage of environmental management. Another section dealt with individual environmental management measures and elements. The questions were formulated so that respondents could choose from several options. All the participants remained informed concerning the research and the privacy of the questionnaire, and all of them were willing to participate. The method of correspondence analysis was used for the evaluation, and the STATISTICA 12 software was used for graphical representation. The number of mass accommodation facilities is 47 in this district, of which 2,100 beds. The most significant number of accommodation facilities can be found directly in the town of Žďár nad Sázavou, with a total of twelve accommodation facilities with a structure of six hotels, two guesthouses, and four other accommodation facilities (apartments + cottages and chalets). The village of Škrdlovice occupies the second place with eight accommodation facilities. It is dominated by guesthouses with five and other accommodation facilities (apartments + cottages and chalets). The municipality of Svratka and the municipality of Polnička have more than three accommodation facilities. The remaining municipalities in the municipality of Žďár nad Sázavou have either one or two accommodation facilities. There are ten hotels, twenty guesthouses, and seventeen other accommodation facilities (apartments + cottages and chalets; Czech Statistical Office, 2023). All the accommodation facilities were contacted (n = 47), and the selection set consisted of 33 accommodation facilities. The return rate was 70% (Table 2).

Table 2: Selection set

Category	Basic set	Selection set	Return rate in %
Hotel	10	9	90
Guesthouse	20	10	50
Apartment	9	7	78
Cottage and chalet	8	7	88
Total	47	33	70

Source: Own elaboration, 2024.

Results

Thirty-three accommodation facilities participated in the research, of which 31% were guesthouses, and 27% were hotels. Categories “apartments” and “cottage and chalet” comprised 21%. More than half of the accommodation facilities (55%) stated they had no stars. Tourist class included only 3% of accommodation facilities, Economy class (12%) and Standard class (30%). The First Class and Luxury classes had no representation in the basic set. Accommodation facilities with different capacities were used in the research. The basic set contains accommodation facilities with a smaller accommodation capacity, which was also confirmed in the selection set. The most represented was the capacity of 5 to 20 rooms, where all guesthouses were included, and overall, 52% of accommodation facilities applied for this capacity. The second most represented capacity was 1 to 4 rooms (all apartments), more than one-third of accommodation facilities (36%). The capacity of 21 to 40 rooms was represented by 9% of accommodation facilities (hotels only), and the capacity of 41 to 60 rooms was represented by 3% of accommodation facilities (hotels only; Figure 4).

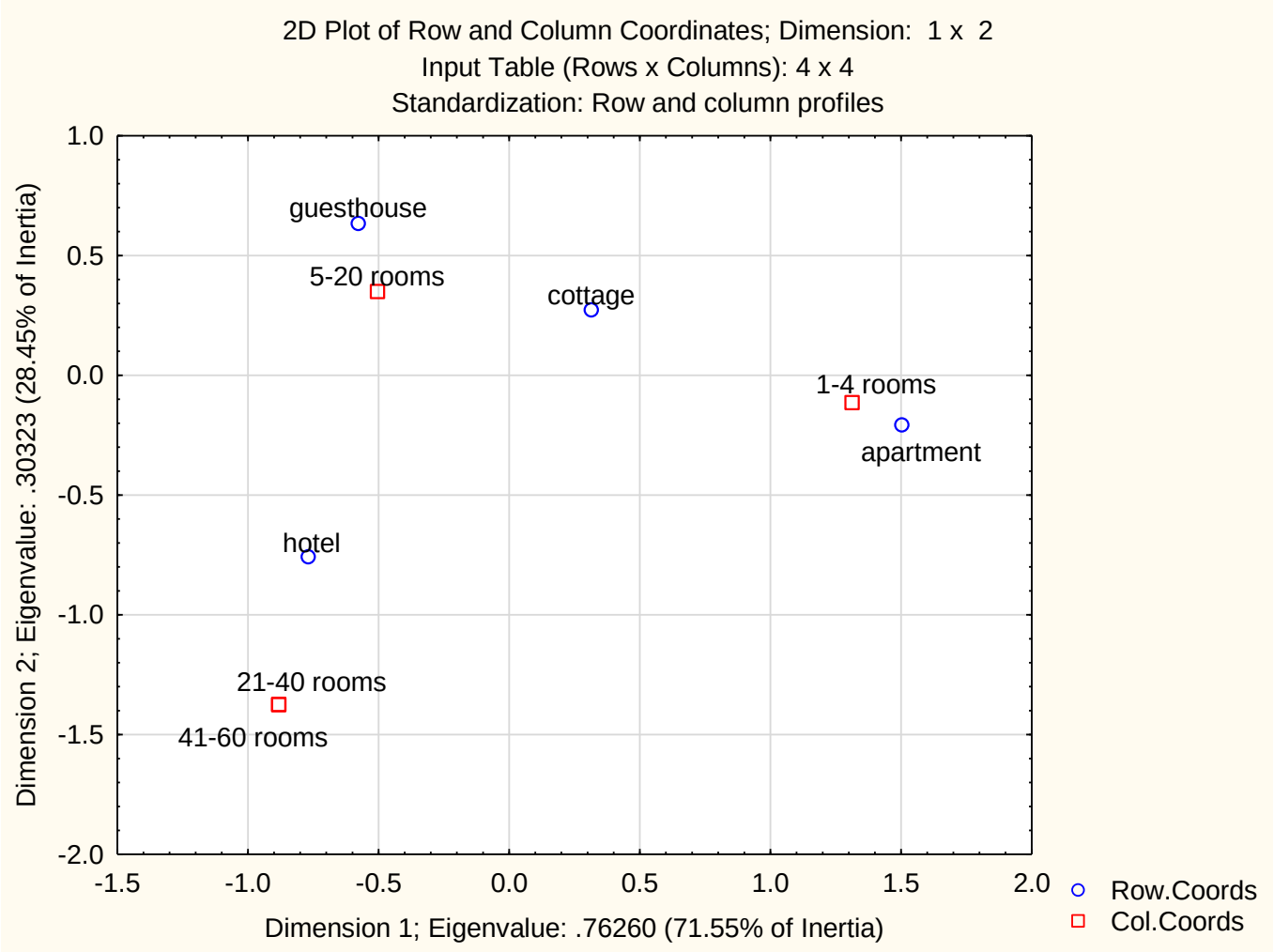

Figure 4: The capacity of surveyed accommodation facilities
Source: Own elaboration, 2024.

The application of environmental measures varied in the accommodation category. Thermal insulation of the building was the most applied measure in the hotel category (78%). The least applied measure was in the cottage and chalet category (29%). In contrast, thermal insulation of windows was the most applied measure in the cottage and chalet category (57%), and the least applied measure was in the apartment category (29%). Heating control in individual rooms was the most applied measure in the apartment category (86%) and the least in the cottage and chalet category (71%). However, this measure was more than 70% in all categories. The solar energy measure was at most 30% for the accommodation categories. The apartment category and cottage and chalet category had the highest uptake (29%). The cottage and chalet category had the highest value of energy-saving appliances (86%), followed by the hotel (78%) and guesthouse (70%) categories, and the apartment category was the lowest (14 %). More than half of the hotels (67%) unplugged unused appliances. Guesthouses were worse off by more than half, with only 30% reporting that they take this measure, the worst of all categories. The use of low-consumption light bulbs was the most applied energy measure by all categories: hotels (100%), guesthouses (100%), apartments (86%), and cottages and chalets (86%). Automatic motion sensor lights in rooms were installed by hotels (11%) and guesthouses (10%). The guesthouses (70%) and hotels (44%) mainly applied automatic lights for motion sensors in corridors. The other categories did not apply these measures because of their uselessness (Table 3).

Table 3: Environmental measures – energy (%)

Measure	Hotels	Guesthouses	Apartments	Cottages and chalets
Thermal insulation of the building	78	50	57	29
Thermal insulation of windows	44	50	29	57
Heating control in individual rooms	78	80	86	71
Solar energy	11	10	29	29
Energy saving appliances	78	70	14	86
Unplugging appliances not in use	67	30	43	43
Energy-saving light bulbs with low consumption	100	100	86	86
Automatic motion sensor lights in rooms	11	10	0	0
Automatic motion sensor lights in corridors	44	70	0	0
Lights in rooms via hotel card	0	0	0	0

Source: Own elaboration, 2024.

Water flow reduction devices, such as aerators, were used most by hotels (89%), followed by apartments (71%), and cottages and chalets (57%). None of the respondents in the guesthouse category reported using water flow reduction devices. Water-saving shower heads were also used most by hotels (78%), followed by apartments (71%) and guesthouses (50%). Two-stage flushing toilets were used most by the hotel category (100%), followed by apartment, and cottage and chalet categories (86%) and guesthouses (80%). The possibility of collecting rainwater for later use is one of the lesser-known water-saving measures. This measure was mainly applied by guesthouses (20%), followed by cottages and chalets (14%), and hotels (11%). The change of bed linen was applied only upon guest request by 90% of guesthouses (Table 4).

Table 4: Environmental measures – water (%)

Measure	Hotels	Guesthouses	Apartments	Cottages and chalets
Water flow reduction devices (aerators)	89	0	71	57
Energy-saving shower heads	78	50	71	43
Two-stage toilet flush	100	80	86	86
Rainwater collection for later use	11	20	0	14
Change of linen and towels only on guest request	33	90	14	14

Source: Own elaboration, 2024.

All surveyed hotels (100%), guesthouses (90%), and cottages and chalets (86%) had sorting containers in their properties. Apartments were the least likely to have this measure (71%). The apartments (43%) and cottages and chalets (43%) had the most sorting bins in each room. The results are above average, but every accommodation facility should sort the waste. We note that such an obligation exists and is enshrined in the Waste Act (No. 541/2020 Coll.), specifically in § 62. The law does not regulate in what specific way and to what extent; it only specifies that it is necessary to enable sorting into containers for paper, plastics, glass, metals, and biological waste. The methodological instruction of the Ministry of the Environment states that collection containers must be placed at a reasonable distance and in sufficient numbers so that customers can dispose of waste. In our opinion,

it is not a requirement to have containers for sorted waste in every room. At the same time, we do not believe it is necessary, for example, for the maid to take over and further sort the waste. However, the law requires placing sufficient containers at a reasonable distance. This is up to individual judgment, but we can imagine one such place on the floor, e.g., strategically located near the elevator, the staircase (where most customers pass, so they have collection containers "on the way"), then, for example at the exit of the hotel or in another place, or more considerable waste should be sent to collection containers for sorting in the hotel's facilities, for example (ramp, etc.). The guesthouse category was the best in sorting bio-waste (90%). Apartments (57%), hotels (56%), and guesthouses (50%) were the most likely to minimize single-use products. Apartments (14%), hotels (11%) and guesthouses (10%) were the most likely to reuse recycled materials. Eco-friendly cleaning products were used by 50% of guesthouses and 14% of cottages and chalets. No hotel or apartment applied this measure (Table 5).

Table 5: Environmental measures – chemicals and waste (%)

Measure	Hotels	Guesthouses	Apartments	Cottages and chalets
Sorting containers	100	90	71	86
Sorting bins in individual rooms	22	20	43	43
Sorting of biological waste	22	90	43	43
Minimizing single-use products	56	50	57	29
Reuse of recycled materials	11	10	14	0
Eco-friendly interior paints, varnishes	0	30	0	0
Eco-friendly cleaning products	0	50	0	14

Source: Own elaboration, 2024.

Staff training regarding the environment was applied most by guesthouses (20%), followed by cottages and chalets (14%). Hotels and apartments still need to train their staff about the environment. Staff training regarding the correct dosing of cleaning agents was also carried out primarily by guesthouses (40%), followed by apartments (14%), and hotels (11%). Apartments trained their staff the most about efficient management of waste, water, energy, and natural resources (43%), followed by hotels (33%), guesthouses (20%), cottages and chalets (14%). This measure was the only one represented in each category of accommodation facility. Only guesthouses reported rewarding their employees for suggestions in ecology (10%). Guesthouses (10%) and hotels (11%) applied to support employees in using public transport. Only 11% of hotels reported informing guests about environmental efforts in their information brochures. Less than 1/5 of cottages and chalets (14%) reported informing guests about environmental efforts on booking portals. Half of the guesthouses (50%) did not apply any environmental measures; for hotels, it was even a value of 56%, apartments 57%, and cottages and chalets 71%. Thus, cottages and chalets applied the most minor environmental measures regarding staff and guests. This may be because of the nature of the cottages and cottages, as this accommodation facility has few employees (Table 6).

Table 6: Environmental measures – staff and guests (%)

Measure	Hotels	Guesthouses	Apartments	Cottages and chalets
Educating employees about environmental management	0	20	0	14
Educating employees about the correct dosage of cleaning agents	11	40	14	0
Educating employees about waste, water, energy and natural resources management	33	20	43	14
Rewarding employees for suggestions for environmental improvements	0	10	0	0
Encouraging employees to use public transport (e.g. travel allowance)	11	10	0	0
Promotion of the environmental program to the public	0	0	0	0
Informing guests about environmental efforts on the website	0	0	0	0
Informing guests about environmental efforts in information forms around the reception area	11	0	0	0
Informing guests about environmental efforts in the information brochure	0	0	0	0
Informing guests about environmental efforts on booking portals	0	0	0	14
None of the above	56	50	57	71

Source: Own elaboration, 2024.

Discussion and conclusion

The findings of this study indicate a low level of implementation of environmental measures in accommodation facilities, which is in line with studies [78,79]. The inadequate implementation of environmental measures in accommodation facilities is a significant issue influenced by various factors. One crucial factor is the need for clear government regulations concerning water and energy conservation in tourism accommodation units [78]. This trend contrasts with the growing global interest in construction and interior design sustainability, where using recycled materials and eco-friendly products is becoming the standard [80]. As mentioned in the article, the implementation of green measures can have a synergistic effect not only on the accommodation facilities themselves but also on their guests, who can be motivated to adopt these principles in their daily lives [81,82]. Hotels typically have larger operating budgets, allowing them to invest in technologies that reduce energy and water consumption. At the same time, often family-run guesthouses can focus more on lower-cost initiatives such as waste segregation and staff training. These conclusions were also reached by [83]. Another interesting finding is that most accommodation facilities need to use rainwater harvesting. This practice, although relatively simple to implement, can significantly reduce potable water consumption, which is particularly crucial during periods of drought. Moreover, if combined with other measures such as the use of greywater, this initiative could significantly contribute to the sustainability of water resources in the region. It is appropriate to consider raising awareness of these measures among accommodation operators or offering financial or technical support for their implementation.

Considering the current situation, accommodation facilities should invest more funds in green initiatives and behave more responsibly towards the environment. Although individual accommodation facilities affect only a tiny part of the global environment, they can contribute to a certain extent to the solution of the main ecological global problems. The use of these environmental measures can also create a synergistic effect. There is an assumption that if the guest becomes familiar with the given philosophy of the accommodation facility and adopts the environmental principles, he will also follow them daily.

The goal of this article was to analyze the application of environmental measures in selected accommodation facilities in the administrative district of Žďár and Sázavou. After an overall evaluation of all responses from the investigated accommodation facilities, it can be concluded that environmental management is not yet a big topic for accommodation facilities in the administrative district of Žďár nad Sázavou. Regarding energy saving, using energy-saving light bulbs with low consumption (97%) was the most widely used in accommodation facilities—the fewest accommodation facilities reported using automatic motion sensor lights in rooms (6%). In the water area, the measure of two-stage toilet flushing was the most used (88%), and the measure of collecting rainwater for later use was the most minor used (12%). In the field of waste and chemicals, the most used measure was sorting containers, which was applied by 88% of surveyed accommodation facilities. On the contrary, ecological interior paints, varnishes, and repeated use of recycled materials were used the most minor (9%). As part of staff training, 58% of accommodation facilities did not apply any measures, followed by staff training on efficient management of waste, water, energy, and natural resources (27%). The difference in the application of environmental measures between collective accommodation facilities, i.e., hotels and guesthouses, differed according to the area on which the accommodation facility could concentrate. Hotels have applied more energy and water-saving measures. Guesthouses focused more on waste, chemicals, and staff and guest training.

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Uplatňování opatření environmentálního managementu v ubytovacích zařízeních: Důkaz z Česka

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Souhrn

K trendům v ubytovacích službách v posledních letech patří přístup k ekologii a zásadám udržitelného rozvoje. Tyto trendy se projevují především u velkých hotelových společností, ale o ekologizaci se snaží i nezávislé hotely a penziony s menší lůžkovou kapacitou. Cílem tohoto článku je analyzovat uplatňování environmentálních opatření ve vybraných ubytovacích zařízeních v České republice (ORP Žďár nad Sázavou). Jako nejvhodnější metoda sběru dat pro zodpovězení výzkumných otázek byl vyhodnocen dotazník. Ubytovací zařízení (n = 47) byla oslovena od listopadu 2022 do března 2023 a výběrový soubor tvořilo 33 ubytovacích zařízení. Pro vyhodnocení byla použita metoda korespondenční analýzy, pro grafické znázornění byl použit software STATISTICA 12.

Výsledky ukazují minimální rozdíly v počtu zavedených environmentálních opatření mezi hromadnými ubytovacími zařízeními, tj. hotely a penziony. Přiměřených výsledků dosáhly kategorie apartmánů a kategorie chat a chalup. Neuplatnily však více než polovinu ekologických opatření týkajících se zaměstnanců a hostů. Na druhou stranu hvězdičkové hodnocení ubytovacích zařízení není klíčovým parametrem při posuzování vlivu na životní prostředí.

Výsledky výzkumu jsou užitečné pro praxi národních profesních asociací, které podporují ochranu zdrojů, a tím ovlivňují celé odvětví hospitality. Dále je mohou využít další ubytovací zařízení k získání informací o problematice udržitelnosti nebo příkladů osvědčených environmentálních postupů.

Klíčová slova: *hospitality, ubytovací zařízení, environmentální management, Česko.*