

doi: 10.52370/TISC26126MM

ENVIRONMENTAL COSTS, INITIATIVES, AND PERFORMANCE OF HOTEL ENTERPRISES IN SERBIA

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Abstract

The aim of this paper is to review environmental cost tracking, environmental initiatives, and the environmental and financial performance of hotel enterprises. The research is based on a survey questionnaire covering various categories of environmental costs, the level of implementation of environmental initiatives, managerial incentives, and perceptions of environmental and financial performance. The empirical study was conducted on a sample of 50 employees in hotel enterprises in Serbia. The results indicate that systematic monitoring of environmental costs and the implementation of environmental initiatives have a positive impact on improving both environmental performance and the financial performance of hotel enterprises.

Key Words: environmental initiatives, environmental costs, performance, hotel enterprises.

JEL classification: M41, M49

Introduction

The hotel industry, together with tourism, is one of the largest and most dynamically expanding sectors, employing a large number of people and

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significantly contributing to the economic prosperity of society. Nevertheless, its activities also have a considerable negative impact on the environment. This impact manifests through increased energy and water consumption, contamination of air, water and soil, generation of diverse waste streams, noise emissions and related environmental disturbances. It is estimated that hotel guests produce up to 2.5 kilograms of various waste per night (Pham Phu et al., 2018). According to data from ComplyCarbon (2025), hotels emit from 5 to over 50 kilograms of carbon dioxide per guest per night. It should be noted that the environmental impacts described above can arise both from the operational activities of the hotel itself and from the actions of its guests.

These environmental concerns have prompted hotels to implement a wide range of ecological initiatives/practices/activities aimed at mitigating pollution and reducing the consumption of energy, water and other resources. The application of environmentally sustainable practices in modern business contexts has been identified as a critical determinant of hotel performance and long-term success (Olimovich et al., 2026). Nevertheless, despite their recognised importance, numerous hotels fail to implement such measures consistently. Both the implementation and non-implementation of these activities result in the incurrence of certain costs. These are environmental costs. These costs are the subject of environmental cost accounting, which primarily serves company management for informed business decision-making. As such, it can also be considered an important managerial tool for decision-making from the perspective of environmental protection. Although information derived from environmental cost accounting is significant in managerial decision-making regarding the adoption of environmental initiatives (Mitrović et al., 2024), many hotels have yet to implement such practices.

The subject of the paper is environmental initiatives and environmental cost accounting in hotel enterprises operating within the Republic of Serbia. The aim of this paper is to consider the perceptions of hotel employees in the Republic of Serbia regarding the implementation of environmental initiatives and environmental cost accounting, and to assess how these factors influence both the environmental and financial performance of hotels. Following the introduction, the paper provides an overview of previous research. The third section outlines the research methodology as well as the sample data. The research results are presented in the fourth section, while the final considerations, research limitations and future research directions are presented in the fifth section.

Literature review

The relevance of environmental initiatives to the business operations of hotel companies has been increasingly acknowledged within the scientific community. This assertion is substantiated by studies that have investigated the implementation of environmental initiatives in hotel enterprises, the determinants shaping their adoption, and the resulting impacts on both environmental and financial performance. Researchers have employed diverse methodological approaches in their studies, leading to varying findings and conclusions.

The results of research conducted by Wan et al. (2017) among hotels in Macau show that the majority of respondents actively implement environmental initiatives, which simultaneously contribute to the reduction of operating costs. The most frequently adopted measures include the use of energy-efficient lighting, the implementation of functional systems for leak detection and repair, and the installation of water-saving devices. In contrast, initiatives such as using solar lighting for outdoor areas, recycling food leftovers, and reusing wastewater are significantly less common. The crucial obstacles to the implementation of environmentally sustainable practices have been identified, including the absence of adequate regulatory frameworks for environmental management, financial limitations, a shortage of trained personnel, and the perception that such initiatives may adversely affect the guest experience. It has further been established that lower-rated hotels face more limited resource availability, which additionally complicates the adoption of environmentally sustainable practices. According to Kusa et al. (2023), greening represents a particular challenge for the hospitality industry. In the hotel sector, environmentally sustainable practices may be manifested through waste management, reducing the purchase of materials that cannot be recycled, reducing energy and water consumption, investing in alternative energy equipment (solar or wind energy), and adopting an environmentally friendly approach in the enterprises' strategy. It has also been confirmed that the adoption of green practices has a positive influence on hotel performance.

The positive influence of ecological practices on hotel performance has been empirically confirmed in the research of Molina-Azorín et al. (2009) and Perramon et al. (2022). Huyen et al. (2025) confirmed the role of green practices, particularly green activities related to open innovations, in customers' intentions to revisit, which is reflected in hotels' revenue levels. Research conducted by Han et al. (2018) in Vietnam indicates that hotel

practices focused on water conservation and waste reduction management significantly contribute to an increase in perceived value, as well as to the pro-environmental intentions of respondents. Furthermore, it has been established that the hedonic and utilitarian values of staying in “green” hotels play a mediating role in this relationship. In addition, environmental concern was identified as a significant moderator of the above effects. Research conducted by Osei et al. (2026) in Ghana points out that green innovation has a significant mediating role in the relationship between stakeholder pressure and environmental performance. Specifically, the findings suggest that hotels that adequately respond to customer demands and regulatory pressures can achieve better environmental outcomes if they integrate green innovations into their operating practices.

However, some studies have found an adverse impact of implementing environmental initiatives on hotel performance. Kim and Kim (2018) established the existence of a statistically negative relationship between environmental protection expenditures and ROA, indicating that higher ecological investments reduce hotel profitability. In addition, Lin et al. (2023) indicate that investments in green energy equipment in hotels certified by the European Union have a negative effect on operational efficiency. Such findings suggest that the return on investment in this type of equipment is not achieved in the short term and often requires significant initial investments. This can be explained by the fact that hotel guests often do not recognise the implementation of such initiatives and therefore do not perceive them, which can influence the decision to choose a hotel where environmental activities are more noticeable. Consequently, a downturn in sales revenue is expected, which will adversely affect profit levels.

Research methodology and sample data

The research presented in this paper was conducted through a survey of categorised hotel enterprises in the Republic of Serbia between January and March 2026. The questionnaire was distributed via email and was designed on the basis of questionnaires used in studies conducted by Mensah (2006), Henri et al. (2014) and Henri et al. (2016). The questionnaire consists of two parts. The first part relates to basic information about the respondents and the hotels in which they are employed. The second part consists of five questions and aims to collect data on respondents’ attitudes towards the implementation of ecological initiatives in hotels and the factors influencing them, the monitoring of

ecological costs, the effects of ecological initiatives, and the impact of ecological initiatives and the monitoring of ecological costs on the ecological and financial performance of hotels. Respondents' attitudes were evaluated using a Likert scale from 1 to 5. Statistical data processing was performed using IBM SPSS Statistics, version 23. Descriptive analysis was used in the study.

The questionnaire was completed by 50 respondents. Thirty-two of them are employed in three-star hotels, fifteen in four-star hotels and three in two-star hotels. Within the dataset, 35 hotels operate independently, whereas 11 are part of a domestic chain and 4 of an international chain. Twenty-two hotels have been operating for more than 11 years, 15 for 6 to 10 years, and 12 for less than 6 years. The largest number of respondents, 21, are employed as accountants or financial managers. Twenty respondents are employed in other positions, while 6 are employed as general managers and 3 as sales managers. According to the level of education, employees who have completed master's studies predominate (30% of them).

Research Results and Discussion

As shown in Table 1, the respondents expressed the highest level of agreement with the statement that the hotels in which they are employed carry out environmental initiatives by encouraging guests to behave in an environmentally responsible manner and by supporting environmental initiatives in the local community. These two statements were most frequently rated 5. By contrast, the respondents expressed the lowest level of agreement with the statement that the hotel uses energy from renewable sources.

Table 1: *Environmental initiatives in hotels*

	Min.	Max.	M.	SD.	Med.	Mod.
We encourage guests to engage in environmentally responsible behaviour	1	5	4.04	1.07	4	5
We support environmental initiatives in the local community	1	5	3.96	1.07	4	5
The hotel makes use of energy-efficient devices as well as sustainable lighting systems	2	5	3.84	0.98	4	4
The hotel has installed systems and devices enabling the rational use of water	2	5	3.84	1.06	4	4
Environmentally friendly cleaning products are used	2	5	3.80	0.88	4	4

	Min.	Max.	M.	SD.	Med.	Mod.
The staff is trained to act in accordance with the principles of environmental protection	2	5	3.66	1.00	4	4
Products in larger quantities are procured in order to reduce packaging	1	5	3.4	1.09	3	4
The recycling of solid waste is actively undertaken as part of our operations	1	5	3.26	1.21	3	4
Food waste is processed through composting practices	1	5	3.18	1.16	3	4
Energy from renewable sources (solar energy, biomass, wind energy, etc.) is used	1	5	3.14	1.05	3	3

Source: Authors. Notes: Cronbach's Alpha = 0.928, Min-minimum, Max-maximum, M-mean, SD-standard deviation, Med.-median, Mod.- modus.

According to the respondents, the main motivation for implementing ecological initiatives in hotels is the reduction of operating costs (Table 2), which confirms the results obtained by Wan et al. (2017). This is followed by reducing the negative impact of operations on the environment and the occurrence of pollution, as well as improving regulatory compliance. The most common rating for these items is 5. On the other hand, slightly lower ratings as motives for implementing environmental initiatives in hotels are given to employee mobilisation.

Table 2: *Reasons for implementing environmental initiatives in hotels*

	Min.	Max.	M.	SD.	Med.	Mod.
Minimization of operational expenditures	2	5	4.36	0.85	5	5
Reducing the negative impact on the environment and decreasing pollution	2	5	4.28	0.83	4	5
Regulatory compliance improvement	2	5	4.28	0.90	5	5
Social Responsibility and Ethical Issues of Senior Managers	2	5	4.24	0.75	4	4
Marketing/advertising opportunity	1	5	4.22	0.89	4	5
Customer Requirements	1	5	4.12	0.94	4	5
Public promotion of environmental protection	2	5	4.10	0.81	4	4
Increasing value for shareholders	2	5	3.98	0.96	4	4
Enhanced access to investment capital	2	5	3.94	0.84	4	4
Employee mobilization	2	5	3.90	0.93	4	4

Source: Authors. Notes: Cronbach's Alpha = 0.950.

The results of the descriptive statistical analysis of responses regarding the implementation of environmental cost accounting in hotels are presented in Table 3. The responses indicate that hotels generally calculate environmental costs, as reflected in the average score exceeding 3. The largest proportion of respondents stated that they regularly record the listed categories of environmental costs, but that the resulting data are analysed and used only sporadically in decision-making and process improvement (i.e. the most frequently selected response was a rating of 4). This pattern shows that hotels have not yet fully acknowledged the strategic importance of environmental cost information for business decision-making. The existence of this problem in hotels in the Republic of Serbia is also highlighted by Milašinović et al. (2026). The highest mean values are observed for the calculation of regulatory costs and for the calculation of waste recycling and disposal costs. These responses are expected, given that hotels are under constant pressure to comply with legal regulations, making the calculation of regulatory costs crucial for avoiding penalties and maintaining reputation. Additionally, due to the large amounts of waste generated in hotels, the costs of recycling and waste disposal are an essential and closely monitored aspect of operations.

Table 3: *Environmental cost accounting in hotels*

	Min.	Max.	M.	SD.	Med.	Mod.
Regulatory costs (permits, fines, consultancy fees, legal expenses)	2	5	3.80	0.97	4	4
Recycling and waste disposal costs	1	5	3.76	1.04	4	4
Environmental management and control system costs	1	5	3.62	1.01	4	4
Efficiency control costs	1	5	3.56	1.09	4	4
Costs of plants, equipment, and facilities	1	5	3.54	1.01	4	4
Research and development costs	1	5	3.50	1.05	4	4
Remediation costs	1	5	3.43	1.09	4	4
Material costs of production results (materials converted into products, by-products, and packaging)	1	5	3.42	0.97	4	4
Less tangible costs (potential future liabilities, company image, and stakeholder relations)	1	5	3.34	1.00	4	4

Source: Authors. Notes: Cronbach's Alpha = 0.969

The respondents regard the most important effect of implementing environmental initiatives and environmental cost accounting as the sole positive impact of hotel operations on the environment itself (Table 4). Additionally, a significant effect is observed on the efficient management

of environmental risk and overall environmental performance. The respondents expressed the lowest level of agreement with the statement that implementing environmental initiatives and environmental cost accounting contributes to the reduction of greenhouse gas emissions.

Table 4: *The impact of environmental initiatives and environmental cost accounting on the environmental performance of hotels*

	Min.	Max.	M.	SD.	Med.	Mod.
Positive environmental impact	3	5	4.16	0.79	4	5
Effective environmental risk management	2	5	4.02	0.84	4	4
Overall environmental impact	2	5	4.02	0.94	4	5
Greater regulatory compliance	3	5	4.00	0.86	4	5
Reducing water pollution	2	5	3.92	0.83	4	4
Efficient use of raw materials	2	5	3.88	0.82	4	4
Reducing the level of atmospheric pollutants	2	5	3.80	0.81	4	4
Minimization of solid waste generation	2	5	3.76	0.77	4	4
Reduction of greenhouse gas emissions	2	5	3.64	0.90	4	3

Source: Authors. Notes: Cronbach's Alpha = 0.960

According to the respondents, the implementation of environmental initiatives and environmental cost accounting primarily contributes to the growth of sales revenue (Table 5). Such results are also to be expected, since guests in modern business conditions regard concern for environmental protection as an integral part of hotel services, and hotels' own efforts to preserve the environment positively affect the level of service satisfaction, which leads to guests returning to the hotel (and consequently to increased sales revenue). Furthermore, such guests are willing to pay a higher price for services provided in this way compared with standard services. On the other hand, according to the respondents, the implementation of environmental initiatives and environmental cost accounting contributes least to the growth of return on investment.

Table 5: *The impact of environmental initiatives and environmental cost accounting on the financial performance of hotels*

	Min.	Max.	M.	SD.	Med.	Mod.
Revenue growth from sales	3	5	3.82	0.77	4	5
Profit	2	5	3.80	0.78	4	4
Profit margin	2	5	3.68	0.87	4	4
Return on investment	2	5	3.66	0.85	4	3

Source: Authors. Notes: Cronbach's Alpha = 0.937

Conclusion

The implementation of environmental initiatives is becoming increasingly significant for the operations of hotel enterprises. The (non)-implementation of such initiatives is accompanied by the emergence of environmental costs, which are observed in environmental cost accounting. As a result of implementing environmental initiatives and applying environmental cost accounting, an improvement in the environmental and financial performance of hotel enterprises is expected.

Research has shown that hotels in the Republic of Serbia most often encourage guests to engage in environmentally responsible behaviour and support environmental initiatives in the local community. Environmental initiatives are implemented mainly to reduce operating costs, decrease the negative impact on the environment and the occurrence of pollution, and align business operations with regulations. According to respondents, most hotels carry out environmental cost accounting, but the results and information from these cost calculations are analysed and used only sporadically. Following the implementation of environmental initiatives and environmental cost accounting, a positive impact of hotel operations on the environment is expected, together with efficient management of environmental risk and improved overall ecological performance. The implementation of environmental initiatives and environmental cost accounting has been accompanied primarily by an increase in sales revenue. The contribution of this paper lies in supplementing existing research that addresses environmental initiatives and environmental cost accounting in hotel enterprises.

The paper presents several limitations, thus providing guidance for future research. Firstly, the subjectivity of respondents is noted as a limitation. Therefore, future research should be conducted through interviews. Since the research included only employees in hotels in the Republic of Serbia, future studies should also include employees in hotels in the neighbouring countries. Additionally, future research should consider the impact of hotel characteristics (such as number of stars, size, affiliation with hotel chains, etc.) and management characteristics (such as education, years of experience, etc.) on the implementation of environmental initiatives and environmental cost accounting.

Acknowledgment

This research is supported by the Ministry of Science, Technological Development and Innovation of the Republic of Serbia by the Decision on the scientific research funding for teaching staff at the accredited higher education institutions in 2026 (No. 451-03-34/2026-03/200375 of February 5, 2026).

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