Edelweiss Applied Science and Technology
ISSN: 2576-8484
Vol. 8, No. 6, 3150-3160
2024
Publisher: Learning Gate
DOI: 10.55214/25768484.v8i6.2677

Sustainability in sustainability certifications in Thai hotel industry

Antika Sriraksa[1], Prachyakorn Chaiyakot[2*], Montri Luengchavanon[3]
[1,2,3]Ecosystem Innovation Management for Sustainable Tourism, Faculty of Environmental Management, Prince of Songkhla University, Hat Yai, 90110, Thailand; usriraksa@gmail.com (A.S.) Prachyakorn.c@psu.ac.th (P.C.) montri.su@psu.ac.th (M.L.)

Abstract: Thailand is actively working to position itself as a sustainable tourism destination, with sustainability embedded within the nation's tourism industry framework. Assessment and certification play pivotal roles, serving as essential tools that validate the implementation of sustainable management practices within the accommodation sector. This article explores the concept of sustainable tourism through the lens of widely adopted certifications in Thailand's hotel industry. A content analysis was conducted to compare certifications based on the Global Sustainable Tourism Council (GSTC) criteria. Furthermore, the study evaluated the efficacy of certifications in promoting the practical integration of sustainable tourism. To deepen the analysis, a thematic review examined the extent to which these certifications integrate principles of Environmental Management Systems (EMSs). The findings highlight a tendency of certification organizations to prioritize environmental aspects over economic and social dimensions. This suggests a need for better alignment in facilitating the holistic integration of sustainable tourism principles into certification practices.

Keywords: *Environmental management system, Sustainability certification, Sustainable hotel, Sustainable tourism.*

1. Introduction

Tourism has been identified by the United Nations (UN) as one of the key sectors driving the transition towards a Green Economy, contributing significantly to sustainable development across its environmental, social, and economic dimensions [1]. The hotel industry, as a core component of tourism, faces increasing pressure to adopt sustainable practices due to its high resource consumption and waste generation [2, 3] . To respond to this, sustainability certifications have emerged as essential tools that validate a hotel's commitment to sustainable operations [4, 5]. However, certifications have primarily focused on the environmental aspect of sustainability certifications, reflecting a growing economic and social dimension underexplored.

In Thailand, where tourism contributes approximately 12% of the national GDP , the hotel industry is a vital economic component [6] . With rising environmental concerns, voluntary sustainability certifications have been introduced as tools to validate the industry's commitment to sustainability. Thai Hotel Association [7] recognizes the widely adopted sustainability certification standards listed in the Thai Hotel Directory 2022, including the ASEAN Green Hotel Standard , the Green Hotel Standard (GHS), and the Green Leaf Standard (GLS)

This study addresses this gap by conducting a comparative analysis of popular sustainability certifications in Thailand's hotel industry, evaluating their alignment with the Global Sustainable Tourism Council (GSTC) criteria and their use of Environmental Management Systems (EMS) through the Plan-Do-Check-Act (PDCA) framework. This research contributes to the understanding of how sustainability certifications can foster a more comprehensive approach to sustainability, integrating economic, social, and environmental dimensions.

2. Literature Review

2.1. Sustainability in Hotel Industry

* Correspondence: Prachyakorn.c@psu.ac.th

The hotel business generates employment opportunities and promotes various developments in the areas where hotels are established tourist destinations. However, it also leads to significant resource consumption for service provision and convenience for tourists, including energy and water usage [8], as well as generating large amounts of waste [9]. In 2015, the UNWTO integrated tourism into the Sustainable Development Goals (SDGs) to address environmental, economic and social dimensions[10].

The adoption of sustainable practices in the hotel industry has been widely studied [2, 11]. Industry guidelines, including eco-labels and certifications such as ISO14001, Green Globe, and Green Key, provide frameworks for sustainable operations [12, 13]. Research indicates that implementing sustainable practices leads to enhanced environmental performance, cost efficiency, and competitiveness [2, 14-17], as well as greater customer satisfaction through cost savings and value-added services [18].

Sustainability performance in the hotel industry is becoming an important component of business operation. Implementing a reporting system to measure and quantify sustainability operations provides hotels with information needed to identify and enhance their operations [11]. Environmental performance is a key element of overall sustainability performance, which also encompasses economic and social dimensions. Tourism can impact all three with both positive and negative effects [19]. The social aspect of sustainability refers to community well-being, stakeholder relations and visitor satisfaction, while the economic aspect involves cost efficiencies, supply chain management and profitability. The environmental aspect focuses on resource efficiency, pollution reduction, carbon footprint, biodiversity conservation, and waste management [2, 8]. De Burgos-Jiménez, Cano-Guillén [20] emphasize that the environmental performance of hotels varies depending on factors like size, location, and service facilities.

In recent years, tourism sustainability has seen the development of various tools and indicators to measure performance. Sustainability indicators are often linked with tourism certification programs like eco-labels, which provide tangible proof of a hotel's commitment to sustainable practices [12]. These certifications serve as benchmarks for industry standards, using indicators to measure energy efficiency, water conservation, waste management, and community engagement [8].

2.2. Sustainability Hotel Certification

Tourism Certification is a voluntary tool that recognizes a hotel's commitment to environmental [12]. These certifications reflect hotel's dedication to sustainable management rather than one-off environmental actions or cost reduction programs [21, 22]. Certifications come with specific criteria, focusing on policy, strategic planning, implementation, monitoring, and continuous improvement [13]. Abokhamis Mousavi, Hoşkara [18] emphasize that each certification serves a distinctive purpose, and its use varies depending on the country in which the hotels are located. These certifications typically focus on environmental aspects of sustainability. The Global Sustainable Tourism Council (GSTC) criteria provide a benchmark for entire tourism sector, ensuring global standards in sustainability and offering international accreditation for sustainable certification bodies [23].

Thailand has developed several sustainability certification programs aimed at promoting environmentally responsible practices in the hotel industry. The three most widely adopted certifications include the GHS, GLS, and the ASEAN Green Hotel Standard. GHS introduced by The Department of Climate Change and Environment (DCCE) in 2013 to promote resource and energy efficiency, improve environmental management, and prepare hotels for international environmental standards assessments . GLS was established in 1998 by the Board of Environmental Promotion of Tourism Activities (BEPTA). Its standard includes hotel environmental assessments and audits [25]. The ASEAN Green Hotel Standard, an initiative within ASEAN, is committed to advancing sustainable tourism practices across the region [26].

The total number of hotels in Thailand enrolled in these certifications is at 952 hotels. This includes 650 certified hotels by Green Hotel Certification between year 2019 – 2023 [24] , 245 certified hotels between year 2017 – 2022 by Green Leaf Certificate [25] and 57 certified hotel by ASEAN Green hotel Certification between year 2020 – 2022 [27].

Sustainable certification and Environmental Management Systems (EMSs) are closely related, as both aim to improve environmental performance and sustainability. Sustainable certifications, such as

Edelweiss Applied Science and Technology
ISSN: 2576-8484
Vol. 8, No. 6: 3150-3160, 2024
DOI: 10.55214/25768484.v8i6.2677

ISO 14001 or Green Globe, often require an EMSs as part of the certification process. EMSs are a highly effective tools for helping hotels transition towards sustainability by embedding environmental policies into theirs strategic management processes [12, 21]. One of the key strengths of the EMSs is their flexibility. EMSs allow each hotel to tailor the system according to its specific business objectives, resources, and sustainability targets [28]. This customization enables hotels to focus on areas most relevant to their operations-whether that's energy management, water conservation, waste minimization, or reducing carbon footprints-while still adhering to broader sustainability frameworks . Chan and Hawkins [9] highlight that the structure and function of EMSs are similar to the Plan-Do-Check-Act (PDCA) cycle, widely used across various industries, including manufacturing and services, to foster continuous improvement. The PDCA cycle encourages a process-oriented approach to sustainability, where actions are planned based on strategic objectives, implemented with appropriate controls, and regularly checked for effectiveness. The final "Act" phases focused on ensuring ongoing refinement and improvement in environmental performance [29].

3. Methodology

Many researches have been conducted on sustainable indicators for hotel industry, focusing on management and performance, also from the perspective of consumers and business integration. Tourism sustainability, in Thailand, is in an immature stage considering the volume of environmentally certified hotels, it is essential to explore widely adopted certification bodies in the country and determine to what extent these certifications are promoting a sustainable approach and providing instructions for integrating real sustainability performance. The objectives of this paper are:

Q1 - To investigate the degree to which these certifications foster a sustainable approach

Q2 - To assess the guidance provided by these certifications for effectively integrating sustainable practices

This study employs Qualitative Comparative Analysis (QCA) to examine the compliance of popular certifications—such as the ASEAN Green Hotel Standard, GLS, and GHS—with the GSTC criteria. Each certification is analyzed based on its adherence to specific GSTC criteria, which are then coded as either compliant or non-compliant, addressing the first research question (Q1).

To address the second research question (Q2), the PDCA (Plan-Do-Check-Act) framework is utilized to compare and evaluate the effectiveness of the guidance provided by these certifications in fostering sustainability. This qualitative approach allows for an in-depth examination of how sustainability is integrated across different certification bodies.

Qualitative content analysis is used to systematically analyze data, offering opportunities to categorize and interpret explicit and descriptive content [30]. Secondary data are collected from current documentation and reports on sustainability hotel certification in Thailand's hotel industry. The data are compiled, compared, analyzed, and synthesized to draw meaningful conclusions. The analysis identifies which certifications align most closely with international sustainability standards and highlights areas where further improvements are needed.

4. Results and Discussion

4.1. Comparative Analysis of Compliance with GSTC Criteria: Section A –Sustainable Management

The first section (Section A) is related to the demonstration of effective sustainable management comprising 10 main criteria and 4 sub-criteria.

Edelweiss Applied Science and Technology
ISSN: 2576-8484
Vol. 8, No. 6: 3150-3160, 2024
DOI: 10.55214/25768484.v8i6.2677

Table 1.
Section A: Sustainable management compliance.

Code	GSTC-criteria	(1)	(2)	(3)	Percent of compliance
A	Sustainable management				55 %
A.1	Sustainability management system	-	✓	✓	67%
A.2	Legal compliance	-	-	✓	33%
A.3	Reporting and communication	-	-	✓	67%
A.4	Staff engagement	✓	✓	✓	100%
A.5	Customer experience	-	-	✓	33%
A.6	Accurate promotion	-	-	✓	33%
A.7	Building and infrastructure	-	-	✓	33%
A.7.1	Compliance	-	-	✓	33%
A.7.2	Impact and integrity	-	-	✓	33%
A.7.3	Sustainable practices and materials	✓	✓	✓	100%
A.7.4	Access for all	-	-	✓	33%
A.8	Land, water, and property rights	-	-	✓	33%
A.9	Information and interpretation		✓	✓	67%
A.10	Destination engagement	✓	✓	✓	100%
	Percent of compliance	14%	43%	100%	

Note: (-) not compliant , and (✓) compliant. (1)ASEAN Green Hotel standard 2) GHS 3) GLS.

The results in Table 1 indicate that the highest compliance was found in criteria A4 (Staff Engagement), A7.3 (Sustainable Practices and Materials), and A10 (Destination Engagement) across the studied certifications. In contrast, lower compliance was observed in areas such as A2 (Legal Compliance), A5 (Customer Experience), A6 (Impact and Integrity), A7.1 (Access for All), and A7.4 (Land, Water, and Property Rights). The overall compliance rate for the criteria in this section is 55%.

4.2. Comparative Analysis of Compliance with GSTC Criteria: Section B – Socioeconomic Impact

Section B refers to the goal of ensuring that activities or initiatives contribute positively to the local community's well-being and economy while avoiding or reducing any harmful effects. Included in this section are 9 main criteria.

Table 2.
Section B: Socioeconomic impact compliance.

Code	GSTC-criteria for hotels	(1)	(2)	(3)	Percent of compliance
B	Maximize social and economic benefits to the local community and minimize negative impacts				48%
B.1	Community support	✓	✓	✓	100%
B.2	Local employment	✓	✓	✓	100%
B.3	Local purchasing	✓	✓	✓	100%
B.4	Local entrepreneurs	-	-	-	0%
B.5	Exploitation and harassment	-	-	✓	33%
B.6	Equal opportunity	-	-	✓	33%
B.7	Decent work	-	-	✓	33%
B.8	Community services	-	-	✓	33%
B.9	Local livelihoods	-	-	-	0%

Edelweiss Applied Science and Technology
ISSN: 2576-8484
Vol. 8, No. 6: 3150-3160, 2024
DOI: 10.55214/25768484.v8i6.2677

	Percent of compliance	33%	33%	78%	

In Section B, the data revealed that compliance is higher for criteria B1 (Community Support), B2 (Local Employment), and B3 (Local Purchasing) among the studied certifications. However, no compliance was found for criteria B4 (Local Entrepreneurs) and B9 (Local Livelihood). The overall compliance rate for this section is 48%.

4.3. Comparative Analysis of Compliance with GSTC Criteria: Section C – Cultural Impact

Section C refers to the goal of ensuring that activities or initiatives contribute positively to the local community's well-being and economy while avoiding or reducing any harmful effects. Included in this section are 9 main criteria.

Table 3.
Section C: Cultural impact compliance.

Code	GSTC-criteria for hotels	(1)	(2)	(3)	Percent of compliance
C	Maximize benefits to cultural heritage and minimize negative impacts				43%
C.1	Cultural interactions	-	✓	✓	66%
C.2	Protecting cultural heritage	-	-	✓	33%
C.3	Presenting culture and heritage	-	-	✓	33%
C.4	Artefacts	-	-		0%
	Percent of compliance	0%	25%	75%	

In Section C, the data revealed that only C1 (Cultural Interaction) shows higher compliance among the studied certifications. Criteria C2 (Protecting Cultural Heritage) and C3 (Presenting Culture and Heritage) are included only in the Green Leaf Certification, while C4 (Artifacts) shows zero compliance across all certifications. The overall compliance rate for this section is 43%.

4.4. Comparative Analysis of Compliance with GSTC Criteria: Section D – Environmental Impact

The last section in GSTC Criteria is section D, which aim to maximize benefits to the environment and minimize negative impact. Included in this section are 9 main criteria divided into 3 main criteria: D1 (conserving resources), D2 (reducing pollution), and D3 (conserving biodiversity, ecosystem and landscape. Each with 4, 6 and 6 sub-criteria respectively.

Table 4.
Section D : Environmental impact compliance.

Code	GSTC-criteria for hotels	(1)	(2)	(3)	Percent of compliance
D	Maximize benefits to the environment and minimize negative impacts				71%
D.1	Conserving resources				92 %
D.1.1	Environmentally preferable purchasing	✓	✓	✓	100%
D.1.2	Efficient purchasing	-	✓	✓	66%
D.1.3	Energy conservation	✓	✓	✓	100%
D.1.4	Water conservation	✓	✓	✓	100%
D.2	Reducing pollution				83%
D.2.1	Greenhouse gas emissions	-	-	✓	33%
D.2.2	Transport	-	✓	✓	66%
D.2.3	Wastewater	✓	✓	✓	100%

Edelweiss Applied Science and Technology
ISSN: 2576-8484
Vol. 8, No. 6: 3150-3160, 2024
DOI: 10.55214/25768484.v8i6.2677

D.2.4	Solid waste	✓	✓	✓	100%
D.2.5	Harmful substance	✓	✓	✓	100%
D.2.6	Minimize pollution	✓	✓	✓	100%
D.3	Conserving biodiversity, ecosystem and landscape				44%
D.3.1	Biodiversity conservation	-	✓	✓	66%
D.3.2	Invasive species	-	✓	✓	66%
D.3.3	Visits to natural sites	-	✓	✓	66%
D.3.4	Wildlife interactions	-	-	-	0%
D.3.5	Animal welfare	-	-	-	0%
D.3.6	Wildlife harvesting and trade	-	✓	✓	66%
	Percent of compliance	44%	81%	88%	

In Section D, D1 (Conserving Resources) shows the highest compliance at 92%, followed by D2 (Reducing Pollution) at 83%. The lowest compliance was found in D3 (Conserving Biodiversity, Ecosystems, and Landscapes). The overall compliance rate for this section is 71%, the highest among all criteria from A to D.

4.5. Comparative Analysis of Hotel Certifications Based on GSTC Industry Criteria with the Plan-Do-Check-Act (PDCA) Approach

This section examines the integration guidance provided by certifications for implementing effective sustainable practices using the PDCA approach. Based on literature review, the hotel sustainable practices focused on in this study include energy conservation, water conservation, waste management, and sustainable management. Codes for these practices are generated, and sub-codes are defined based on GSTC performance indicators related to these practices.

Table 5.
Comparative analysis: integration of PDCA "Plan" phase guidance.

Code	GSTC performance indicator	(1)	(2)	(3)	% compliance
P1	Planning with goals to reduce				89%
P1E	Energy Conservation	✓	✓	✓	100%
P1W	Water Conservation	✓	-	✓	67%
P1T	Waste Management	✓	✓	✓	100%
P2	Planning with Stakeholder engagement				89 %
P2E	Energy Conservation	✓	✓	✓	100%
P2W	Water Conservation	✓	-	✓	67%
P2T	Waste Management	✓	✓	✓	100%
P3	Planning on sustainability management (SMS)				50%
P3D	The SMS with strategic planning is clearly documented.	✓	-	✓	67%
P3A	The SMS covers all sustainability aspect	-	-	✓	33%
	% compliance	75%	50%	100%	79%

The data presented in Table 5 reveals varying degrees of compliance in the "Plan" phase across different practices. Higher compliance rates are observed in P1 (Planning with goals to reduce) and P2 (Planning with stakeholder engagement), while the planning process for P3 (SMS) shows lower compliance, with the least compliance in the sustainability aspect. Additionally, strategic planning was not mentioned in the GHS. Overall, the standards studied achieve a 79% compliance rate in this phase.

Edelweiss Applied Science and Technology
ISSN: 2576-8484
Vol. 8, No. 6: 3150-3160, 2024
DOI: 10.55214/25768484.v8i6.2677

Table 6.
Comparative analysis: integration of PDCA "Do" phase guidance.

Code	GSTC performance indicator	(1)	(2)	(3)	% compliance
D1	Do: Equipment and practices are used to minimize consumption				100%
D1E	Energy conservation	✓	✓	✓	100%
D1W	Water Conservation	✓	✓	✓	100%
D1T	Waste Management	✓	✓	✓	100%
D2	Risk and opportunities assessment				67%
D2E	Renewable sources are favored and implemented	-	✓	✓	67%
D2W	Water risk and goals has been assessed and determined.	-	-	✓	33%
D2T	Waste management complies with regulations and has no negative impact on livelihoods	✓	✓	✓	100%
D3	Sustainable Management Implementation				67%
D3S	Implementation evidence of the SMS plan	✓	-	✓	67%
	% compliance	71%	71%	100%	81%

The data in Table 6 shows a high compliance rate across certifications, averaging 81%. The highest compliance in the "Do" phase is observed in D1 (Equipment and practices used to minimize consumption), indicating the strong application of sustainability practices. The lowest compliance is seen in D2W (Water risk assessment), with only a 33% compliance rate.

Table 7.
Comparative analysis: Integration of PDCA "Check" phase guidance.

Code	GSTC performance indicator	(1)	(2)	(3)	% compliance
C1	Consumption per tourist/night is monitored and managed				56%
C1E	Energy conservation	-	✓	✓	67%
C1W	Water conservation	-	✓	✓	67%
C1T	Waste management	-	-	✓	33%
C2	Reporting and communication to stakeholder				33%
C2E	Energy conservation	-	-	✓	33%
C2W	Water conservation	-	-	✓	33%
C2T	Waste management	-	-	✓	33%
C2S	Sustainability management system	-	-	✓	33%
	% compliance	0%	29%	100%	43%

Compliance in the "Check" phase varies significantly across standards, with an average rate of 43%. The highest compliance is seen in energy conservation and water conservation, both achieving a 67% compliance rate. However, waste management per tourist per night is only addressed in the GLS. Additionally, only the GLS fully incorporates C2 (Reporting and stakeholder engagement) across all sustainability practices.

Edelweiss Applied Science and Technology
ISSN: 2576-8484
Vol. 8, No. 6: 3150-3160, 2024
DOI: 10.55214/25768484.v8i6.2677

Table 8.
Comparative analysis: integration of PDCA "Act" phase guidance.

Code	GSTC performance indicator	(1)	(2)	(3)	% compliance
A1	Process for monitoring continuous improvement				33%
AE	Energy conservation	-	-	✓	33%
AW	Water conservation	-	-	✓	33%
AT	Waste management	-	-	✓	33%
AS	Sustainability management	-	-	✓	33%
	% compliance	0%	0%	100%	33%

In the analysis of the "Act" phase, compliance is the lowest among all PDCA phases. This phase focuses on continuous improvement through monitoring processes based on the SMS plan. Compliance is found only in the GLS. Overall, the standards under study show the lowest compliance in the "Act" phase, with a rate of 33% for integrating guidance.

5. Discussion

Hotel certifications play a crucial role in assessing sustainability performance, providing hotels with benchmarks to align their practices with international standards like those of the GSTC. These certifications help hotels enhance their sustainability efforts across various areas, such as management practices, socio-economic impacts, cultural preservation, and environmental protection.

GSTC criteria reveal both strengths and areas for improvement in the certifications under study, particularly when evaluated for compliance. Strong performance was observed in operational practices, such as staff engagement and sustainable materials, indicating that hotels are making progress in embedding sustainability into their daily operations. However, gaps in legal compliance and property rights show a need for greater attention to governance and regulatory alignment. In terms of socio-economic impacts, the focus on community support is encouraging, but more work is needed to foster local entrepreneurship and livelihoods. This suggests that while some economic benefits of tourism are being realized, hotels should deepen their engagement with local economies to enhance long-term sustainability. Cultural heritage preservation remains an underdeveloped area, with limited integration of practices that protect cultural sites and artifacts. This is a significant shortcoming, as preserving cultural identity is a core aspect of sustainable tourism. Environmental impacts, particularly resource conservation, show the strongest compliance. However, efforts to protect biodiversity and ecosystems lag behind, indicating that while hotels are making strides in resource efficiency, broader ecological concerns need more focus. Overall, while hotel certifications are making progress in several sustainability areas, they must strengthen efforts in governance, cultural heritage, and biodiversity protection to fully align with GSTC standards and drive holistic sustainability in the tourism sector.

The absence of these aspects in the studied certificates could limit the adoption rate of certified hotels. Economic sustainability indicators, such as cost, profit, and investment indicators for low-carbon innovation, could be incorporated to address this gap.

The analysis on PDCA cycle integration across the certifications under study shows varying strengths and areas for improvement. Each certification demonstrates its unique approach to sustainability practices, but certain patterns and gaps are evident.

For the Green Leaf standard, the strongest integration of PDCA is observed, particularly in areas like water risk management and continuous improvement. The standard incorporates risk management practices, addressing long-term sustainability challenges, such as water conservation in tourism areas where water stress is prevalent. Additionally, Green Leaf is the only certification to effectively implement the "Act" phase, ensuring that monitoring and corrective actions are part of its framework. This positions Green Leaf as the most comprehensive in aligning with the PDCA cycle.

The ASEAN Green Hotel standard and the GHS show moderate integration of PDCA, with a strong focus on operational efficiencies, particularly in the "Do" phase. Both certifications prioritize equipment-related practices that help reduce consumption and improve cost efficiency. However, these

Edelweiss Applied Science and Technology
ISSN: 2576-8484
Vol. 8, No. 6: 3150-3160, 2024
DOI: 10.55214/25768484.v8i6.2677

certifications fall short in addressing more complex, long-term sustainability risks like water management and biodiversity conservation. Neither standard demonstrates sufficient attention to the "Act" phase, which is critical for monitoring and continuous improvement. This limits their ability to adapt and improve over time, leaving key sustainability issues under-addressed.

Overall, while the GLS leads in terms of comprehensive PDCA integration, the ASEAN Green Hotel and GHS are more focus on operational practices and underperform in addressing broader environmental risks and continuous evaluation. For these certifications to fully align with sustainability best practices, they must enhance their focus on long-term risk management, particularly in areas such as water conservation, biodiversity, and ongoing monitoring.

It's worth to highlight high compliance rates in "Plan" phase for areas such as energy conservation (P1) and stakeholder engagement (P2) suggest that these aspects are widely recognized as essential elements of sustainability planning. This could reflect the increased global awareness and pressure on businesses, especially in the hospitality sector, to prioritize energy efficiency and stakeholder collaboration in their sustainability strategies [11, 13]. The absence of strategic planning in the GHS further highlights that certain certifications may not provide sufficient guidance on long-term, holistic sustainability practices. This inconsistency suggests that while basic environmental management (energy, water, and waste) is being well-adopted, more complex sustainability management processes that require multi-faceted planning and documentation are still underdeveloped. These findings suggest an opportunity for certification bodies to reinforce the importance of sustainability management systems, perhaps by offering clearer guidelines or incentives for hotels to improve their planning in these areas.

The "Do" phase of the PDCA cycle shows strengths in equipment-related practices. Hotels are adopting equipment and processes to minimize consumption, focusing on tangible cost savings and operational efficiency. This is The prioritization of short-term cost-saving measures suggests that long-term risks like water management may be overlooked particularly concerning in tourism areas prone to water stress during peak seasons [31, 32].

The "Check" phase reveals that energy and water conservation are better integrated across standards, indicating consistent evaluation. However, waste management per tourist per night, addressed only by the GHS, exposes a notable gap. By benchmarking against industry norms, competitors, or internal records, hotels can identify areas for improvement [33]. Without comprehensive waste tracking, opportunities for reducing tourism's environmental impact are limited. Additionally, only the GLS fully incorporates reporting and stakeholder engagement, both crucial for transparency and accountability. To strengthen the "Check" phase, standards need to ensure that all sustainability factors, especially waste management and engagement, are regularly monitored.

The "Act" phase shows the lowest compliance among all PDCA phases. This phase is critical for ensuring continuous improvement through monitoring and adjustments based on the SMS plan. Compliance is seen only in the GLS, highlighting a lack of commitment to monitoring and corrective actions in other certifications. Without proper monitoring and adjustments, even well-implemented sustainability practices can become stagnant, reducing their long-term effectiveness [33].

This study highlights the importance for hotels to adopt sustainability certificates strategically [4] and drive the hotel industry toward a more sustainable and resilient future [34] by aligning with various elements that guide the organization's management through an integrated process from planning to action, monitoring, and performance improvement. Simultaneously, certifications must evolve to offer a comprehensive perspective that includes economic, social, and environmental aspects in a balanced manner. It's important to note that integrating these practices supports hotels in continuously improving their sustainability performance.

6. Conclusions and Suggestions

The findings of this study provide critical insights into the strengths and weaknesses of sustainability certifications in the Thai hotel industry. While these certifications have been effective in promoting environmental sustainability, there are significant gaps in their treatment of economic and social dimensions. By applying the PDCA framework to evaluate the continuous improvement of

Edelweiss Applied Science and Technology
ISSN: 2576-8484
Vol. 8, No. 6: 3150-3160, 2024
DOI: 10.55214/25768484.v8i6.2677

sustainability practices, this research highlights the need for a more balanced approach to certification standards. Addressing these gaps in social and economic dimensions within hotel certifications could significantly enhance the overall sustainability performance of hotels. The analysis also shows that certification bodies need to enhance the monitoring mechanisms associated with the "Act" phase of the PDCA cycle, which ensures continuous improvement. Without proper monitoring and corrective action, even well-implemented sustainability practices can become stagnant, reducing their long-term effectiveness. Addressing these certification gaps has practical implications. Hotels that align more closely with holistic sustainability criteria may see enhanced brand reputation, increased customer loyalty, and operational efficiencies. Consumers are increasingly seeking sustainable travel options, and hotels with comprehensive certifications are likely to become more competitive in the market. Furthermore, stronger focus on water conservation, biodiversity, and waste management can reduce the negative environmental impacts of tourism, making hotels more aligned with sustainable tourism principles. Certification bodies must develop better strategies to help hotels consistently refine their sustainability practices. In conclusion, for Thailand to strengthen its position as a sustainable tourism destination, certification bodies, hotels, and policymakers must collaborate to address these gaps and enhance sustainability practices.

Copyright:

References

[1] UNWTO, *Sustainable Tourism for Development Guidebook*. 2013.
[2] Abdou, A.H., T.H. Hassan, and M.M. El Dief, *A Description of Green Hotel Practices and Their Role in Achieving Sustainable Development*. Sustainability, 2020. **12**(22): p. 9624.
[3] Koliotasi, A.-S., K. Abeliotis, and P.-G. Tsartas, *Understanding the Impact of Waste Management on a Destination' s Image: A Stakeholders' Perspective*. Tourism and Hospitality, 2023. **4**(1): p. 38-50.
[4] Rodríguez-García, R., I. Ferrero-Ferrero, and M.Á. Fernández-Izquierdo, *Analysis of integration of sustainability in sustainability certifications in the hotel industry*. Frontiers in Sustainability, 2023. **4**: p. 1116359.
[5] Szczepańska-Woszczyna, K., A. Thirakulwanich, and S. Kot, *Modern Green Hotels Initiatives from Guests Perspective*. Journal of Tourism and Services, 2024. **15**(28): p. 285–304-285–304.
[6] Bank of Thailand. *Thailand's Economic Conditions in 2023*. 2024.
[7] Thai Hotel Association. *Thailand Hotel Standard Directory 2022. Certification 2023-2025*. 2023 [cited 2023 December17, 2023]; Available from: https://www.thaihotels.org/16922371/thailand-hotel-standard-directory.
[8] Reem, M., S.M. Rasoolimanesh, and N.R.W. Sara, *Sustainability Indicators in Hotels: A Systematic Literature Review*. Asia-Pacific Journal of Innovation in Hospitality & Tourism, 2022. **11**(1).
[9] Chan, E.S. and R. Hawkins, *Application of EMSs in a hotel context: A case study*. International Journal of Hospitality Management, 2012. **31**(2): p. 405-418.
[10] UNWTO. *Tourism and the SDGs*. 2024 [cited 2024 March 15,2024]; Available from: https://tourism4sdgs.org/tourism-for-sdgs/tourism-and-sdgs/.
[11] Cvelbar, L.K. and L. Dwyer, *An importance–performance analysis of sustainability factors for long-term strategy planning in Slovenian hotels*. Journal of sustainable tourism, 2013. **21**(3): p. 487-504.
[12] Ayuso, S., *Comparing voluntary policy instruments for sustainable tourism: The experience of the Spanish hotel sector*. Journal of Sustainable Tourism, 2007. **15**(2): p. 144-159.
[13] Duric, Z. and J. Potočnik Topler, *The role of performance and environmental sustainability indicators in hotel competitiveness*. Sustainability, 2021. **13**(12): p. 6574.
[14] Putra, R.S., I. Wendri, and I. Sudiarta, *Implementation of Green Practices by Front Office Department Staff in Improving Service Quality at Hilton Bali Resort*. Repositori Politeknik Negeri Bali, 2022.
[15] Chan, W.W., *Environmental measures for hotels' environmental management systems: ISO 14001*. International Journal of Contemporary Hospitality Management, 2009. **21**(5): p. 542-560.
[16] Chung, K.C., *Green marketing orientation: Achieving sustainable development in green hotel management*. Journal of Hospitality Marketing & Management, 2020. **29**(6): p. 722-738.
[17] Astawa, I.K., et al. *The Practice of Green Hospitality at the Operational Level (a Case of 5-Star Hotel in Bali)*. in *International Conference on Social Science 2019 (ICSS 2019)*. 2019. Atlantis Press.
[18] Abokhamis Mousavi, S., E. Hoşkara, and K.M. Woosnam, *Developing a model for sustainable hotels in Northern Cyprus*. Sustainability, 2017. **9**(11): p. 2101.
[19] Kristjánsdóttir, K.R., R. Ólafsdóttir, and K.V. Ragnarsdóttir, *Reviewing integrated sustainability indicators for tourism*. Journal of Sustainable Tourism, 2018. **26**(4): p. 583-599.

[20] De Burgos-Jiménez, J., C.J. Cano-Guillén, and J.J. Céspedes-Lorente, *Planning and control of environmental performance in hotels*. Journal of sustainable tourism, 2002. **10**(3): p. 207-221.
[21] Chan, E.S., *Implementing environmental management systems in small-and medium-sized hotels: Obstacles*. Journal of hospitality & tourism research, 2011. **35**(1): p. 3-23.
[22] 22. Reynolds, P., *Hotel companies and corporate environmentalism*. Tourism & Management Studies, 2013. **9**(1): p. 7-12.
[23] (GSTC), G.S.T.C. *GSTC Industry Criteria with Performance Indicators For Hotels and Accomodations and corresponding SDGs*. 2016.
[24] Department of Climate and Environment (DCCE). 2024 [cited 2024 March 17]; Available from: https://greenhotelthai.com/th/hoteldatabase.
[25] Green Leaf Foundation (GLF). *https://www.greenleafthai.org/en/*. 2024 March 17,2024]; Available from: https://www.greenleafthai.org/hotels/.
[26] The ASEAN Secretariat. *ASEAN Green Hotel Standard*. https://tts.dot.go.th/knowledge/standard/75/detail 2016 [cited 2024 March 17]; Available from: https://tts.dot.go.th/knowledge/standard/75/detail.
[27] Department of Tourism. 2024; Available from: https://datacatalog.dot.go.th/dataset/dataset_11_02/resource/d41f5e83-d7f6-4376-a256-30f4947ccd0c.
[28] Satchapappichit, S., N.A. Hashim, and Z. Hussin, *Factors influencing adoption of green practices by small and medium sized hotels in Thailand*. Journal of Business Management and Accounting, 2013. **3**: p. 61-78.
[29] Isniah, S., H.H. Purba, and F. Debora, *Plan do check action (PDCA) method: literature review and research issues*. Jurnal Sistem dan Manajemen Industri, 2020. **4**(1): p. 72-81.
[30] Lindgren, B.-M., B. Lundman, and U.H. Graneheim, *Abstraction and interpretation during the qualitative content analysis process*. International journal of nursing studies, 2020. **108**: p. 103632.
[31] Styles, D., H. Schoenberger, and J.L. Galvez-Martos, *Water management in the European hospitality sector: Best practice, performance benchmarks and improvement potential*. Tourism Management, 2015. **46**: p. 187-202.
[32] Tortella, B.D. and D. Tirado, *Hotel water consumption at a seasonal mass tourist destination. The case of the island of Mallorca*. Journal of environmental management, 2011. **92**(10): p. 2568-2579.
[33] Bohdanowicz-Godfrey, P. and P. Zientara, *Environmental performance assessment systems in the hotel industry*. International Business and Global Economy, 2014. **33**: p. 743-755.
[34] Chaiyakot, P., et al., *Resilience among Thai Hosts in Andaman Sea Area during Covid-19: Study Community Based Tourism*. Pakistan Journal of Life & Social Sciences, 2022. **20**(2).

Edelweiss Applied Science and Technology
ISSN: 2576-8484
Vol. 8, No. 6: 3150-3160, 2024
DOI: 10.55214/25768484.v8i6.2677