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The Thai Hospitality Industry is taking Steps to Address Potential Future Water Crises

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Water is one of the most important resources for the hospitality industry. Given the ongoing severe global warming situation, efficient resource use is essential for all activities. Addressing sustainability issues in the tourism sector requires effective utilization of resources, particularly water. This study is a preliminary study of water resource management practices in hotels across Thailand, focusing on both the quantity and quality of water resources. It examines the measures hotels have implemented to manage these resources efficiently. This includes setting goals and adjusting equipment and technologies to optimize water use. The findings categorize the hotels' responses to water management into three groups: Group A, which demonstrates an intensive implementation of guest participation, with over 80 percent of respondents indicating that guest involvement is a central focus. Group B: Hotels in this group have implemented most water efficiency and conservation measures, with rankings ranging from 61 percent to 80 percent among respondents. Group C: This group includes hotels that face challenges related to water availability and access to water sources, such as rainwater collection, with rankings below 60percent. The conclusions of this study provide a foundation for further in-depth research. Efficient water uses in hotels, particularly in Thailand, which is in a tropical zone and is experiencing water shortages exacerbated by climate change, will have a positive impact on resource management and service delivery in the Thai tourism sector, especially within the hotel industry.

Keywords: *sustainability indicators, water efficiency, water in hotels, green leaf certification, sustainability tourism*

Introduction

People and countries worldwide are facing increased droughts, higher temperatures, and growing water shortages. Even in Thailand, the land of water, a sufficient water supply cannot be taken for granted everywhere. The hope now is to secure that supply with water conservation and reuse. Thailand is a country where the search for clean water is becoming a growing challenge. Some regions have had acutely dry weather in the last few years, and groundwater levels have plummeted. The causes are not just more drought periods but also soil sealing and higher pollutant levels in the water, which have also become a problem. Thailand requires

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more water for agriculture and growing crops during the dry season. It is not just climate change causing problems with water, but also mass tourism is a major contributor that requires large amounts of water and generates pollution.

The consequences are evident in the wake of climate change: extreme drought and water shortages are putting a strain on the country, where resources are already scarce. Tourism accounts for over a quarter of total water consumption. The problem is that mining harms the environment and the people. The hospitality industry and tourism, in general, present a number of challenges for the management of water supplies (Chen et al. 2010).

The empirical data from the study shows a significant effect for those accommodations concerning the water issue. However, since Thailand is a tropical country. Water scarcity issues are a national priority that must be addressed. Thailand is an agricultural country with agriculture consuming a large amount of water. Sustainable water management for the agricultural sector is urgently needed (Kaewmai et al. 2021).

This paper focuses on how the implemented program for water conservation and water pollution reduction aims to ensure the longer availability of water in Thailand. Because tourism is highly dependent on the availability of fresh water resources (e.g. Orams 1998, Garrod and Wilson 2003).

Recreational activities such as swimming, sailing, kayaking, canoeing, diving, and fishing are often associated with lakes and rivers, which are important components of landscapes that attract tourists. Freshwater is also essential for the operation of tourist infrastructure, including swimming pools, irrigated gardens, bathrooms, and laundry services (Gössling 2001, Gössling 2006). The concept of sustainable tourism has become increasingly prominent in industry today. When applied to the hospitality sector, sustainable tourism can be defined as promoting sustainable consumption and production across all supply chains involved in tourism activities.

Jones mentioned in his review paper that, on the other hand, it is impossible to ignore the demands that all tourism, including nature-positive tourism, makes on the environment and natural resources, as well as the industry's focus on what its critics see as unsustainable consumption (Jones 2024). The paper also mentioned that "Towards Nature Positive Tourism" has a variety of terms, including sustainable tourism, green tourism, and eco-tourism, which have been employed to define such harmonious relationships. In some ways, sustainable tourism is an umbrella term for other terms, some of whose meanings seem to have changed over time (Jones 2024).

Literature Review

Water is one of the essential components of all life on Earth and is crucial for sustaining it. However, the amount of fresh water on Earth is limited, and its quality is under constant threat, particularly in heavily populated and industrialized areas. Clean water is, therefore, one of the most precious resources.

Sustainable Development Goal (SDG) 6, which aims for water and sanitation for all, is alarmingly off track. About two billion people lack access to safe drinking

water, while roughly half of the world's population experiences severe water scarcity for at least part of the year. Human rights to water, sanitation, and a clean and healthy environment are not being fulfilled. Climate change and population growth are expected to worsen the situation. Data indicates that the health and livelihoods of 4.8 billion people could be at risk by 2030 if water quality and monitoring are not improved (UNEP 2024). Tourism-related water consumption is still little investigated, and there are few detailed studies of water use in different geographical settings, for different forms of tourism, or the many forms of accommodation establishments (Gössling 2006).

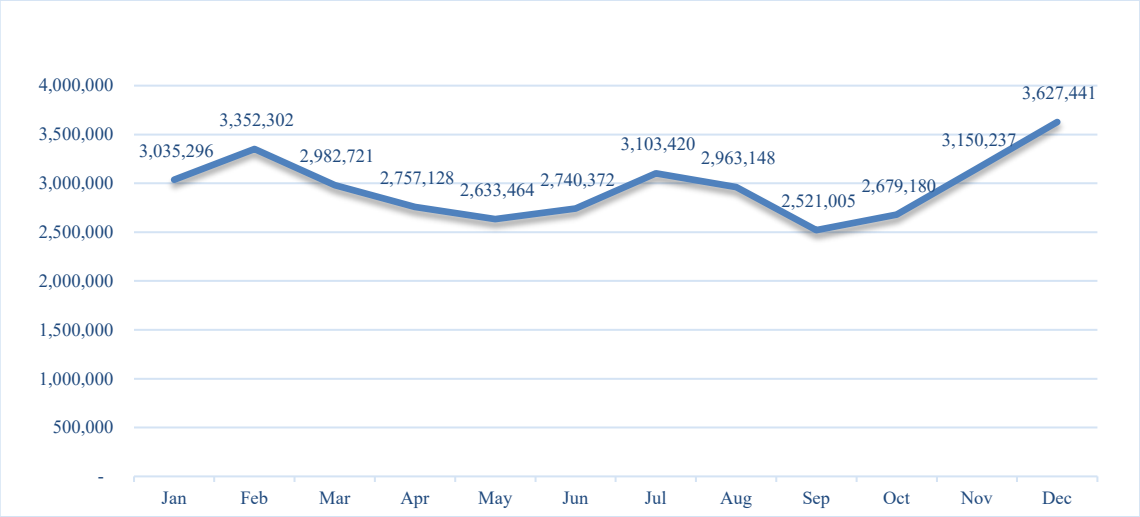
The Green Leaf Foundation, a sustainability promotion initiative organization in Thailand, has implemented programs for decades to promote the sustainable hospitality industry in Thailand. The foundation set the sustainability standard for the hospitality industry, particularly for hotels. The Green Leaf Sustainability Standard for Hotels is also designed to help lower operational costs and pass those cost savings on to customers. Indeed, the program also encouraged customers to participate in saving energy and natural resources through various participatory activities (GLF 2025).

Sustainable water management is one of the key areas that relies on water efficiency, water quality, both freshwater supplies, and treated water quality. The sustainable water management of the Green Leaf Foundation also involves engaging all stakeholders, including staff, guests, suppliers, and local communities, in which the hotel is located. Sustainable water management in hotels is also linked to the long-term sustainability of tourism in Thailand. Initially, water efficiency for hotels should be the focal point at the first stage of hospitality and tourism management in Thailand. Since the Thai tourism profile focuses on tourism activities, the government aims to transform the country into a regional hub for tourism and sports, as illustrated in Figure 1. The Sustainable Hospitality Alliance (2021) suggests that as an industry, hospitality also relies heavily on the natural world around us; for materials to build our properties, food and beverages to serve to our guests, and a local environment to entice people to visit. More specifically, natural capital is considered by some authors to comprise a range of natural assets. For example, the World Forum on Natural Capital (2017) defines natural capital as the world stocks of natural assets which include geology, soil, air, water and all living things and argues that natural assets provide a wide range of services, often referred to as ecosystem services, which ultimately underpin human life and economic activity (Wynn and Jones 2023). The paper mentioned in the discussion section highlights more fundamental and complex issues regarding natural capital and its relationship to sustainability and economic growth. While a focus on natural capital is generally seen to be compatible with a transition to a more sustainable economy and society, in the hospitality industry, protection of natural capital is often seen as a way of justifying continuing growth (Wynn and Jones 2023). This also means that water is one of the crucial natural resources for running tourism smoothly.

The problems related to water in tourism have been rising as a crucial issue to be addressed from a sustainable tourism perspective. Water pollution is the changes caused by groundwater, riverbeds, and air pollution in the marine environment that limit the effectiveness of beaches, seawater, coastal appearance, and tourism use on

the Syrian Coast (Tachir and Alalı 2022). This problem also occurs in various coastal tourist destinations in Thailand.

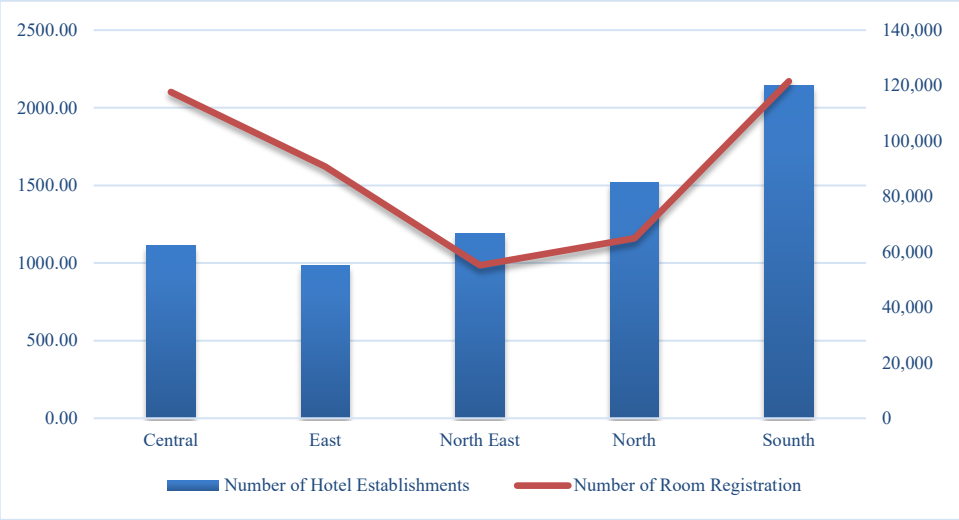
Figure 1. *Monthly No. of International Tourists Arrival in Thailand in 2024*



Source: TAT Intelligence 2025.

In 2024, around 35 million international tourists visited Thailand. Figure 1 illustrates the monthly trend of tourist arrivals, demonstrating a seasonal pattern. This suggests that many travelers choose to visit during the winter and summer months to relax and escape the cold weather in their home countries. Thailand experiences its summer season from March to May and the monsoon season from August to September, periods that typically attract fewer tourists compared to other times of the year.

Figure 2. *Number of Hotel Establishments and Number of Room Registration in 2024*



Source: TAT Intelligence 2025.

According to statistics from TAT Intelligence, the accommodation landscape in Thailand can be summarized by the number of hotels and rooms across different regions. The Central region has 1,115 hotels with a total of 117,718 rooms. The Eastern region has 982 hotels, offering a total of 90,744 rooms. In the Northeast region, there are 1,187 hotels with a total of 55,185 rooms. The Northern region boasts 1,516 hotels and 64,961 rooms. Finally, the Southern region has the highest number, with 2,145 hotels and 121,550 rooms. This information is illustrated in Figure 2: key water users in the tourism sector include hotels, restaurants, and recreational activities. Besides that, water is also indirectly used in the supply chain of goods and services for tourists (e.g., the water used to produce food). Water measurements and implementation of water-saving measures in the tourism sector are important aspects for effective water management. Water footprint and tourism: 3.5 percent - 5.8 percent, representing global water consumption by tourism, according to the World Travel and Tourism Organization (Tervoort and Langergrabe 2024).

Direct water consumption involves water directly consumed by tourists and tourism facilities. Figure 4 shows that globally, approximately only 19 percent of water consumption by tourists is direct (2021 data). In most studies, the direct water consumption consists of water consumed at the accommodation and water used for recreational activities (Gössling et al. 2012). These two aspects are relatively easy to quantify, as they are directly attributable to the tourism sector (Tervoort and Langergrabe 2024).

Most research on water consumption in the tourism sector has been focused on accommodations, in particular hotels (e.g., Gössling 2015, Charara et al. 2011, Tortella and Tirado 2011). It is important to recognize that water consumption varies across different types of accommodations. For instance, hotels and resorts typically offer a wide range of water-intensive facilities, such as swimming pools and spas. In contrast, camping sites may have more limited facilities, and private rental properties may align more closely with local water usage patterns. An additional facet of this discussion involves water use by ships, particularly cruise ships, in harbors, which represents a unique category in the tourism sector. The most straightforward way tourists consume water at accommodations is through the facilities in the hotel rooms itself. Water usage within hotel rooms encompasses essential activities, such as tap water for drinking and washing hands, toilet flushing, showering, and bathing (Tervoort and Langergrabe 2024).

Measuring carbon dioxide emissions from international travel requires cooperation among several parties, including airlines and the governments of both the origin and destination countries. Promoting environmentally friendly tourism can be achieved through various suggestions and analyses. Additionally, it is important not only to manage emissions by measuring carbon levels but also to implement domestic initiatives through national policies.

The precipitation pattern observed in Thailand indicates a declining trend in rainfall over the past century. Consequently, the amount of freshwater available for consumption is expected to decrease because of these precipitation patterns. Meanwhile, data shows that Thailand's population is growing exponentially.

Availability of and Access to Water

Domestic Water Consumption in Thailand

The country reports that the percentage of households with access to clean drinking water increased from 97 percent in 2012 to 99.5 percent in 2019. Government efforts to provide clean water to villages lacking plumbing systems have been successful, reducing the number of such villages from 7,321 to 169.

The quality of available drinking water remains a significant challenge. According to the Ministry of Public Health's Report on Drinking Water Quality from 2009 to 2019, only 40.8 percent of the water supplied to households was suitable for consumption. The report indicated that 43.7 percent of household water required further treatment before it could be safely consumed. In comparison, an additional 15.5 percent was contaminated with chemicals at levels exceeding the recommended limits. Further studies have revealed that 59.2 percent of the water used in households did not meet the necessary quality standards.

According to 2019 data, 89 percent of households in Thailand had access to designated handwashing facilities, while 97.1 percent had access to private toilets. However, the combination of population growth and an increasing number of tourists, along with inadequate drainage systems, has resulted in a decline in the quality of surface water sources. In 2018, only 9 percent of water from these sources met the required quality standards, which dropped to a concerning 82 percent by 2019. Additionally, the percentage of poor-quality water sources doubled from 9 percent in 2018 to 18 percent in 2019. Thailand has also faced droughts three times in the past five years: in 2015, 2019, and 2020.

The country's continued economic and social growth, coupled with the transition towards industrial agriculture, has increased Thailand's water needs. As such, the Thai Government has pursued integrated implementation of SDG6 in four main ways: (1) the Development of the Masterplan on Water Resources Management (2018-2037) as the country's roadmap on this issue; (2) the establishment of the Office of National Water Resources (ONWR) as the focal point for all relevant agencies; (3) the passing of the Water Resources Act (2018) as the main piece of legislation encompassing work in this area; and (4) the promotion of technology, knowledge, and innovation in water resources management in the (VNR 2021).

However, the Water security status of Thailand in each dimension compared with the world (Koontanakulvong 2019). A comparison of water in several issues shows that Thailand has only 1.3 weighting for water sufficiency when compared to the global, Asia, and ASEAN scales, which are 2.7, 2.3, and 2.3 weightings, respectively.

The report also mentions the ranking of the World National Water Security Index by Economy (2003-2007), in which Thailand was ranked at level 23 globally. These rankings were gathered and grouped by country.

One of the largest water consumers not only among the different tourist lodging options, as stated by Hamele and Eckardt (2006), but also within the entire tourism industry (Gossling et al. 2012), is the hotel sector. Despite the different determinants related to the size, star rating, or specific water services, some studies estimate that,

on average, water consumption in hotels ranges from 216 litres per guest night to 920, with an average of 686 litres per guest night, according to a study compiling data from 30 published articles from different geographical contexts (Alhudaithi et al. 2022, Gabarda-Mallorqui et al. 2024).

Water conservation is crucial for hotels, particularly as climate change increases the risk of water scarcity. Although 82.0 percent of hotels actively track their water consumption, only half have action plans to reduce water use. There remains a significant opportunity for the hotel industry to reduce water consumption by making simple changes, such as installing low-flow toilets and high-efficiency showerheads. For example, one in two hotels has yet to adopt high-efficiency showerheads (GreenView 2024).

Water usage in Hotels in Thailand

Water and the Hotel and Tourism Industry

The fundamental issues concerning our use of water. It provides guidance on how to use less water, how to keep it free from contamination during use, and how to ensure responsible treatment of hotel wastewater (Kirk, 2010).Water consumption in the hospitality industry is a crucial aspect that must be carefully managed across all activities and services. There are two primary categories of water usage: hot services and cold services. Figure 3 displays a water steam flow chart that illustrates the water use system in the building for hospitality services.

Figure 3. *Building Water Systems and uses Diagram (Chen et al. 2010)*

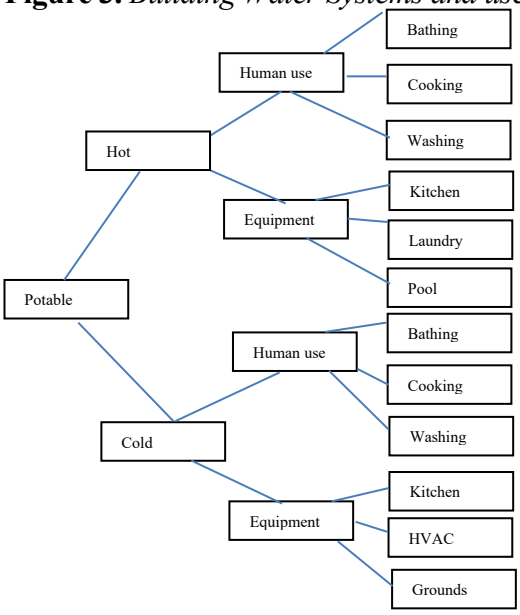


Figure 3 illustrates the water consumption systems in the hotel building, along with their respective activities. There are two primary lines of hotel water consumption: hot water usage and cold-water usage. The estimation of water use of tourism and share

of municipal use by country reported by Becken in 2014 found that tourism use per person per guest night was 716 litres, which could estimate about Tourism's share of municipal water withdrawal 2 percent (Becken 2014).

The statistics on water consumption from the laundry system indicate that the laundry supplier may be able to provide information on the amount of water used. If the total water usage is not available from the supplier, it can be estimated. A common assumption is that 20,000 liters of water are used to wash 1 ton of laundry. If the total tonnage of laundry is unknown, it can be approximated based on the assumption of 0.00512 tons (or 0.0056 imperial tons) of laundry per occupied room (LaundryToday 2024).

Domestic water use in accommodation buildings is a complex issue that varies depending on the type and size of the operation. One area that requires particular attention is laundry services, which can lead to water contamination from cleaning chemicals and the direct discharge of wastewater from laundry outlets. The management of retention ponds or collection systems is also crucial for the proper disposal of laundry water.

Additionally, swimming pools have become a standard facility in hotel services. There is a shift in water treatment methods for swimming pools, moving away from synthetic chlorine towards more environmentally friendly alternatives, such as salt chlorination systems.

The kitchen is a major consumer of high-quality water, but it also generates significant water contamination that needs treatment, particularly from fats, oils, and grease (FOG).

In hotels, another key source of both water consumption and contamination comes from heating and cooling systems. Water cooling systems are particularly common in Thai hotel operations. A significant concern with these systems is the risk of Legionella contamination, especially given that Thailand is in a tropical zone.

Additionally, as shown in Figure 3, water usage for landscaping purposes is another important factor for hotels. Efficient landscape management involves selecting plants that maximize water efficiency. Another consideration in landscape design is the use of chemicals, such as fertilizers and herbicides, which help maintain a clean and vibrant appearance throughout the year.

In Thailand, most domestic water consumption is supplied by waterworks. In the capital and suburban areas, the Metropolitan Water Works provides water, while the Provincial Water Works serves those living outside Bangkok and in surrounding areas. The Thai hospitality industry considers water in its sustainability program. Water management program. Water footprint assessment of the hotels type 1 in Bangkok (volume of the water use of one guest per night) indicated that more than half of water use of hotels was poor according to the benchmark for fresh water use in guest room base on guest is less than 300 litres, Fair is equal 300-350 litres , Poor is greater than 350 litres per guest-night (Sanamthong 2019).

Water Efficiency: Reduce Water Consumption by installing Water-saving Fixtures and Appliances

Thailand's increased water usage indicates regional growth, driven by population and economic expansion. However, the extensive developments in urban areas and the constantly increasing demand for water can lead to water scarcity and pollution problems. As economic development is significantly important for Thailand, the nation may face water scarcity in the near future (Rosa et al., 2020). Our main results regarding determinants of water consumption show that higher water prices cause a drop in water demand. However, the increase in a country's economic growth means a surge in water consumption. Furthermore, when it comes to climate variables, we find that water consumption rises due to higher temperatures, sunshine, and wind speed. In contrast, it falls due to higher precipitation. Finally, analyses of both short-term and long-term effects confirm the results, with all regions except Bangkok showing consistent findings (Tangworachai, Wong, & Lo, 2023).

Track water consumption: Monitor and analyze water use to identify areas for improvement.

The water used by a hotel is extracted from the local water cycle. Water from these external sources can, in principle, be metered or estimated as it enters the hotel's water system. All respondents measured total water withdrawal and use per occupied room with varying methodologies. Other intensity metrics included: water use by: total square footage; number of rooms; built hotel and turnover (Ricaurte & Jagarajan, 2021).

Wastewater Management and reuse: Investing in watershed management strategies for the Central Thailand region could be both beneficial and feasible if funding can be generated through increased water prices. Like the Central region, the East, Southeast, and Southwest regions are also experiencing a rising water demand each year.

Methodology

The Thai hospitality industry considers water management a crucial component of its sustainability program. This study adopted a quantitative research approach, utilizing structured questionnaires distributed to accommodation establishments across five major tourism destinations in Thailand. The research team employed the Voluntary Response Sampling method by sending the online questionnaire to the Thai Hotel Association members in the selected areas. The chosen destinations for distributing the questionnaires included Bangkok, the Central region, the Eastern region, the Northeastern region, the Northern region, and the Southern region, as illustrated in Figure 6.

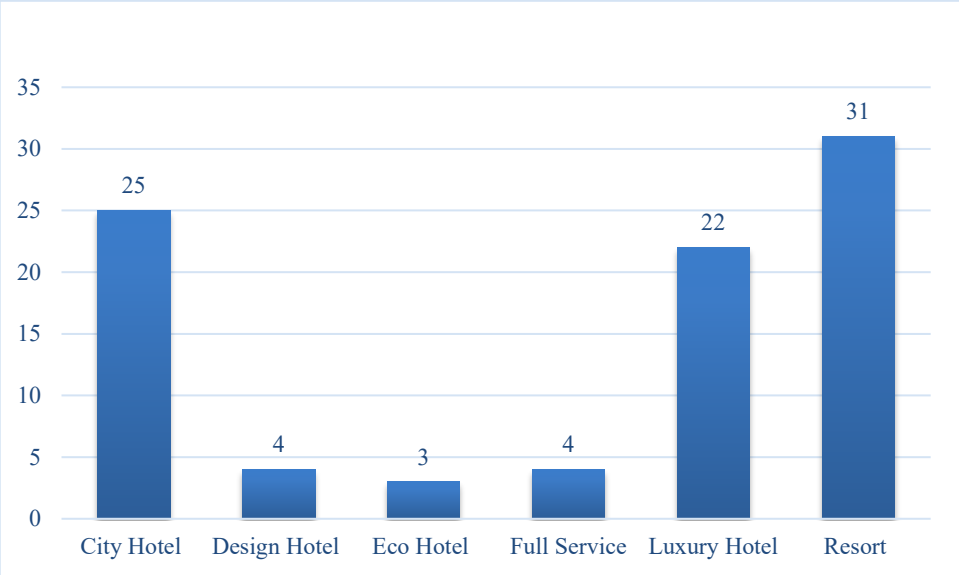
The survey specifically targeted hotel managers, top management, and individuals responsible for sustainability within hotels. The results showed that the highest percentage of respondents, 43.66 percent, identified as General Managers or Representatives. Participants from Human Resources followed this at 16.90 percent, the Engineering Department at 14.08 percent, and those directly responsible for

sustainability at 5.63 percent. Additionally, other roles, including personnel from Housekeeping, Purchasing, Marketing, and Public Relations, accounted for 19.72 percent of the total respondents.

The target group included various accommodation sizes and types. A total of 95 responses were collected from March to May 2025. The data were analyzed using descriptive statistics and thematic categorization of 89 responses.

The data on water usage practices was collected through sustainability initiatives in Thailand, explicitly using the Green Leaf Sustainability Standard. This standard has been recognized both locally and internationally for over two decades. Additionally, to develop a comprehensive water efficiency plan, this study incorporates water management activities from international reports, such as Green View 2024. These comparisons will help assess the study's impact on water management in hotels, ensuring effective operations in the future.

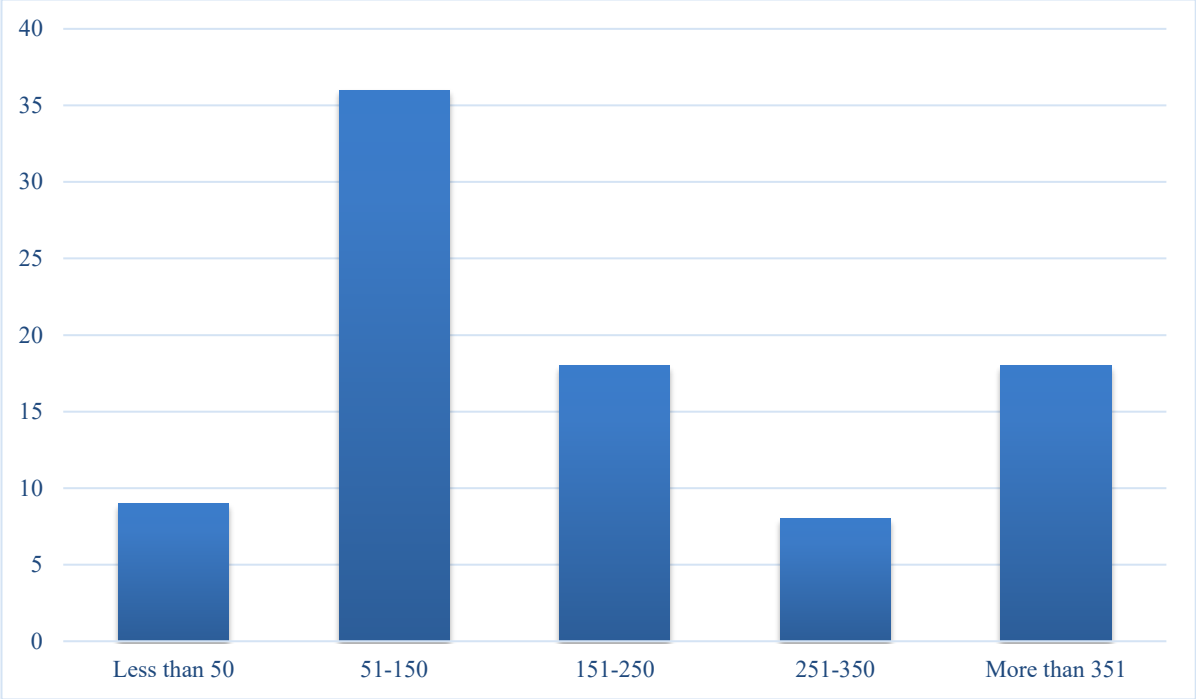
Figure 4. *Number of Accommodation by Type*



Source: Research survey, 2025

Figure 5 illustrates the size of the establishments based on the number of rooms. The data indicates that medium-sized businesses, which represent the largest group of respondents in the survey, typically operate between 51 and 150 rooms. These correspondents are predominantly associated with medium-sized city hotels and resorts, which are likely to have properties within this range. Additionally, there are luxury establishments that also fall into the medium-scale category in Thailand. It is essential to note that properties with more than 300 rooms exhibit significantly higher water consumption, rendering water intensity a crucial factor in their operations.

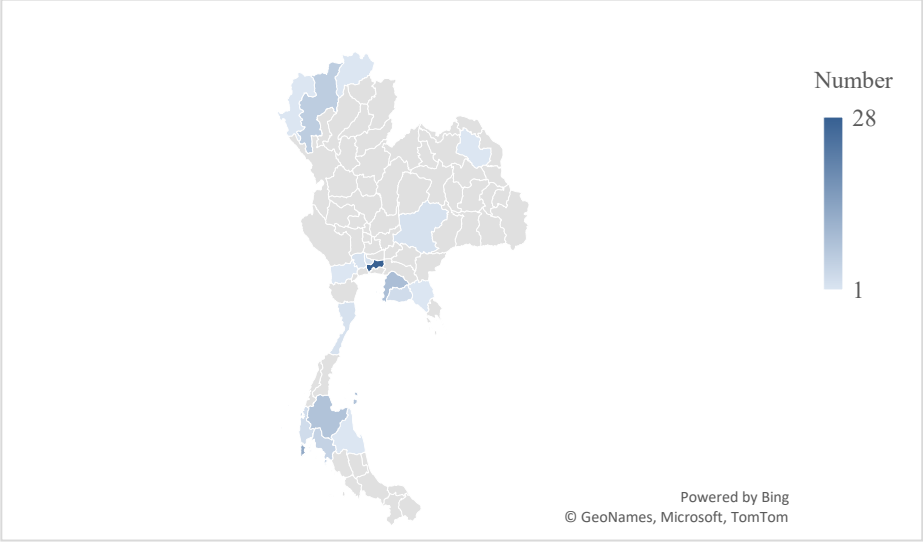
Figure 5. *Size of Esthablisment by Number of Room*



Source: Research survey, 2025

Figure 6 shows the distribution of research across the country. The survey was conducted in five leading tourism destinations, and the most respondents are in four tourist provinces in Thailand: Bangkok, Phuket, Surat Thani, and Chonburi. Analyzing the accommodation locations reveals that all establishments in Bangkok and Chonburi are situated on the mainland. In contrast, most accommodations in Phuket and Surat Thani are located on the islands and operate as resorts or luxury hotels.

Figure 6. *Research Distribution*



Source: Research survey, 2025

Thailand generally experiences three main seasons: summer, rainy, and winter. During the wet season (known as *reudu fon*), the weather is dominated by the southwest monsoon, which brings warm, humid air to the country from the Indian Ocean, resulting in abundant rain throughout these months. Rain tends to fall on most days but comes in short bursts of an hour or two in the afternoon or overnight, with the heaviest rain falling in September and October. While it is not the hottest time of the year, the high humidity caused by the South-West monsoon can make the wet season an uncomfortable time to visit Thailand. It's worth noting that the monsoon also brings consistent onshore winds, which create reliable breaks if you're planning on surfing the Thai coast (Metoffice.gov.uk 2025). However, climate change has led to unusual variations in the monsoon seasons, causing significant challenges. Recently, these changes have led to flash floods and droughts across the country. The most pressing water concern is the quality of water in the pipelines. The issue of water quality is critical as the number of industries increases. Additionally, tourism contributes to water contamination in this country.

The survey results include questions that evaluate the impact of water issues on the hotel's operations. A hotel in Thailand implemented 15 management indicators to enhance water efficiency and conservation based on these results. The findings can be categorized into three main groups.

1. More than 80 percent of implementations will be classified as Group A.

The properties implemented management indicators for water efficiency and conservation by encouraging guest participation in reusing towels, achieving an impressive reuse rate of 98.88 percent. Guests were also asked to reuse their bed linens during stays of more than one night, resulting in a reuse rate of 91.01 percent. Additionally, hotel-organized programs aimed at reducing water contamination, such as the installation of grease traps in washing areas, achieved a compliance rate of 91.01 percent.

The hotel has established a regular water consumption tracking program, which shows a compliance rate of 89.89 percent. Meanwhile, its water management policy operates with an 85.39 percent compliance rate. This demonstrates a solid commitment to water conservation.

2. Between 61percent and 80percent of implementations will be categorized as Group B.

Group B can improve its implementation strategies for the future. The results indicate that the hotel has installed 79.78 percent of the toilets, enabling 76.40 percent of respondents to reduce water consumption by reusing treated water. Additionally, Group B focuses on water conservation by installing water-efficient showerheads, faucets, and toilets.

3. Fewer than 60 percent of implementations will be categorized as group C.

Hotel organizers currently have water-efficient laundry systems implemented in 61-80 percent of their operations, categorizing them in the B group. According to survey results, there is room for improvement, with 42.70 percent of respondents indicating potential areas for enhancement. Although the number of hotels utilizing rainwater collection has increased, this practice has led to a 33.71 percent reduction in water consumption during the dry season.

Table 1. *Presents the Water Management Indicators implemented at the Hotel*

Water Management Indicators	No. of establishments implemented	percent	Group
1. The hotel encourages guests to participate in its towel reuse program.	88	98.88	A
2. The hotel encourages guests to participate in reusing linens, such as bed sheets.	81	91.01	A
3. The hotel organized a program to reduce water contamination, including the installation of grease traps in the washing areas.	81	91.01	A
4. The hotel has a regular program for tracking water consumption.	80	89.89	A
5.The hotel has implemented a water management policy.	76	85.39	A
6.The hotel has installed water-saving toilets and equipment in the guest rooms.	71	79.78	B
7. The hotel has a program for reusing treated water.	68	76.40	B
8.The hotel has implemented a plan to reduce water usage.	67	75.28	B
9. The hotel regularly implemented water efficiency measures for outdoor consumption to reduce leaks and conserve water for all activities.	64	71.91	B
10. Hotel will cultivate local plants in garden areas to minimize water and chemical use.	63	70.79	B
11. The hotel has installed flush tanks that consume less than 6 liters of water per flush.	61	68.54	B
12.The hotel has installed water-saving showers and taps in the guest rooms.	60	67.42	B
13.The hotel invites guests to opt for no room cleaning if staying for more than one night.	55	61.80	B
14. The hotel operates an efficient laundry system that promotes water conservation.	38	42.70	C
15. The hotel has a rainwater collection system that is used during the dry season to reduce water consumption from other sources.	30	33.71	C

Source: Research survey, 2025

Discussion

The survey results indicate that perceptions of water management in hotels in Thailand could be enhanced by categorizing the sustainability activities implemented in these hotels into four categories: 1. Standard Practices, 2. Established Practices,

3. Emerging Practices, and 4. Innovative Practices, as mentioned in Green View 2024 (GreenView 2024). The findings of this survey apply this classification concept to three groups, as illustrated in Table 2.

Table 2. *Shows the Type of Practices for the Water Management Indicators implemented at the Hotel*

Water Management Indicators	Type of practice
1. The hotel encourages guests to participate in its towel reuse program.	Common Practice
2. The hotel encourages guests to participate in reusing linens, such as bed sheets.	Common Practice
3. The hotel organized a program to reduce water contamination, such as installing grease traps in the washing areas.	Common Practice
4. The hotel has implemented a water management policy.	Common Practice
5.The hotel has implemented a water management policy.	Common Practice
6.The hotel has installed water-saving toilets and equipment in the guest rooms.	Established Practice
7. The hotel has a program for reusing treated water.	Common Practice
8. The hotel has implemented a plan to reduce its water usage.	Common Practice
9. The hotel regularly implemented water efficiency measures for outdoor consumption to reduce leaks and conserve water for all activities.	Established Practice
10. The hotel will cultivate local plants in garden areas to minimize water and chemical use.	Established Practice
11. The hotel has installed flush tanks that consume less than 6 liters of water per flush.	Established Practice
12. The hotel has installed water-saving showerheads and faucets in the guest rooms.	Established Practice
13.The hotel invites guests to opt for no room cleaning if staying for more than one night.	Common Practice
14. The hotel operates an efficient laundry system that promotes water conservation.	Innovation Practice
15. The hotel has a rainwater collection system that is used during the dry season to reduce water consumption from other sources	Innovation Practice

Source: Research survey, 2025

Additionally, standard practices in Group B indicate that Thai hotel operations need to improve in several areas related to water issues. These include implementing composting, regularly reusing treated water, and officially establishing a water reduction plan. Another important issue that should be addressed is encouraging guests to participate in the "no-room make-up" option for stays longer than one night, with clear communication of this initiative in all operations.

Based on the analysis of the collected data, the water practices in Thai hotels

have introduced a longitudinal perspective to this study. All activities are focused on understanding how the environmental knowledge base of these firms evolves and the impact this knowledge has on their business performance, as well as global trends.

Thailand is a tropical country rich in water resources and offers various means of access. One potential approach to innovating water resource management is to explore methods for reintroducing rainwater into everyday operations. Hotels are now required to establish integrated circular economy frameworks that guide their business models from the outset and throughout the water life cycle, making the best use of treated water. This is crucial not only for enhancing water efficiency but also for addressing the urgent need to improve water quality nationwide.

Conclusions

The findings presented in this study have some limitations that could inform future research in this area. This research specifically focuses on the Thai hospitality sector, targeting individuals who voluntarily wish to participate in the study. To enhance the generalizability of our results to other service-related industries, similar analyses should be conducted across the entire tourism supply chain, as well as in other sectors with environmental impacts, in different geographical and socio-economic contexts. This approach would provide a more thorough understanding of this critical topic and offer valuable guidance for managing water-related issues in Thailand's tourism sector, ultimately leading to better management indices and performance.

The challenge of further study lies in the lack of basic information, and researchers must contend with the availability of data that sometimes compromises the confidentiality of business operations.

Acknowledgement

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