

# Driving Sustainability for a Hotel in Phuket



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คณะเศรษฐศาสตร์ จุฬาลงกรณ์มหาวิทยาลัย  
ปีการศึกษา 2565  
ลิขสิทธิ์ของจุฬาลงกรณ์มหาวิทยาลัย

Independent Study Title      Driving Sustainability for a Hotel in Phuket  
By                                      Miss Natharee Somboon  
Field of Study                      Business and Managerial Economics  
Thesis Advisor                      Assistant Professor SAN SAMPATTAVANIJA, Ph.D.

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Accepted by the FACULTY OF ECONOMICS, Chulalongkorn University in  
Partial Fulfillment of the Requirement for the Master of Arts

INDEPENDENT STUDY COMMITTEE

..... Chairman  
(Assistant Professor NIPIT WONGPUNYA, Ph.D.)

..... Advisor  
(Assistant Professor SAN SAMPATTAVANIJA, Ph.D.)

..... Examiner  
(Lecturer KATIKAR TIPAYALAI, Ph.D.)



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ปีการศึกษา	2565	ลายมือชื่อ อ.ที่ปรึกษาหลัก .....

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This research study investigated the factors that impact the environment of the hotel's operations in Phuket, Thailand. The study was made through the analysis of the old research study and the current situation mentioned by the local residents and other stakeholders. According to research, there are three main environmental effects: excessive energy use, ineffective water use, and poor waste management. Suggestions and how to minimize the environmental impacts of Hotel operations were also provided in this research study.



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Natharee Somboon



จุฬาลงกรณ์มหาวิทยาลัย  
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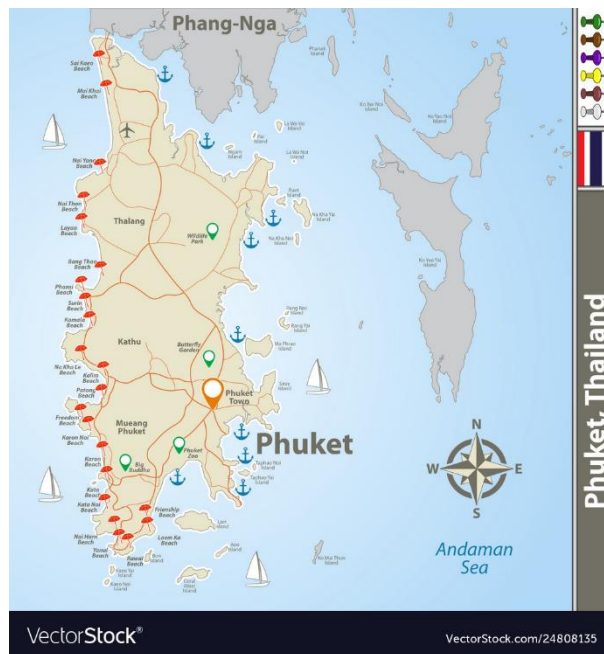


## 1. Introduction

The tourism industry is one of the important tools to stimulate the economy in the Kingdom of Thailand. It was used as a tool to boost the economy by creating jobs and increasing people's income; for example, the industry was able to reduce the migration of workers relocating from the central region or encourage local people to use the national resources in their community to produce the local product and sell it as a memorial gift to tourists while visiting the area (Ministry of Tourism and Sport, 2010). Tourism can serve a high potential to initiate large revenue for a country (Szivas et al., 2003). In 2019, approximately 40 million tourists from abroad visited Thailand, bringing in a revenue of 2 trillion baht, which is equal to 11% of Thailand's gross domestic product. The tourism sector also employed more than 7 million workers, calculated as 20% of total employment (BOT, 2021). However, during the years 2021 and 2022, global tourism was impacted by the COVID-19 pandemic, and Thailand's tourism sector also encountered the same situation. And after two years of competing in this pandemic, Thailand is likely to forecast 3.6% economic growth in 2023, with the majority of the increase being performed by the tourism sector (The Nation Thailand, 2022).

Phuket in southern Thailand is one of the most well-known and popular destinations for travelers. It is an island located in the south and sits on the Andaman Sea (see Figure 1). The total area is estimated at around 570 square kilometers and sits roughly 862 kilometers (536 miles) from Bangkok, the capital of Thailand. Phuket was not only a well-known beach attraction but also had fantastic classical architecture as it had a large Chinese influence plus many other ethnicities bringing different traditions and festivals to the island (Tourism Authority of Thailand, 2022). The Phuket Provincial Administration Organization has issued policies to escalate the tourism sector and also launched a development plan to generate increased revenue for its province. By doing so, they aim to promote a "world-class" center of aquatic tourism, which will generate revenue in the region as well as increase revenue nationally. The provincial administration also focused on developing Phuket's environment and wildlife conservation, as well as supporting the community's sustainability (Sakolnakorn et al., 2013).





**Figure 1: Phuket, Thailand**

Being an attractive destination, Phuket's economy has advantages over that of other provinces in Thailand. The province is currently a typical mass-tourism resort destination and now has a large number of hotel and resort buildings. As the world's top destinations (Kratz, 2005), the natural resources and forests surrounding the areas are being damaged in both legal and illegal ways by the landholders and official holders who want to manufacture or build up the remarkable hotels, resorts, spas, and other businesses that would be attractive to the tourist (Sakolnakorn et al., 2013). It is an undeniable fact that hotels and resorts were playing an important role in the tourism industry; however, they had a range of diverse impacts on the environment in many aspects, for example, the huge energy consumption, large water usage with delicate water consumption, air pollution, or inappropriate waste management (Baxter & Srisaeng, 2021). In accordance with these major environmental impacts, many hotels and resorts are now implementing sustainability policies to ensure that their operations adapt in an environmentally friendly manner. The trends keep growing in pursuit of satisfying the local community and travelers who will visit the province.

The researcher, therefore, applied a qualitative research approach and selected hotels as the case to examine the development and extend sustainable hotels as a new season for the tourism industry in Phuket. Based on this aspiration, the researcher established the main research questions, which are:

- 1). What are the major effects on the environment of hotel operations?**
- 2) How to minimize the environmental impact of hotel operations?**

The three key aspects of sustainable hotels will be examined in this paper. The primary goals of the study are to emphasize the importance of energy efficiency, one of the most important aspects of sustainable hotels because it is able to reduce the amount of energy consumed by the hotel, water conservation, and waste management. The researcher drew up a literature review to present the terms that will be used and conclude this study. The research methodology, results, and conclusion are presented, respectively.

## **2. Literature Review**

### **2.1 Environmental Sustainability**

Normally, people understand and use the word "environmental" in the way of contact between human and natural systems. However, according to Morelli, ecological sustainability is something that is able to fulfill human needs without affecting the health of the ecological community (Morelli, 2011). And to increase human perception in this perspective, the environment should be the subset of the ecological: ecological systems and the interaction of daily human lives.

Understanding and use of the word sustainability were experienced by people over a period of time. From an environmental point of view, the word "sustainable" refers to the property of having little or no environmental impact and so being able to last for a long time (Cambridge, N.D.). There is much different consciousness on this concept. Nowadays, the term "sustainability" is usually used to define the processes and actions that humans will avoid that will destroy natural resources in order to keep the balance of the ecological system and their modern lifestyle (You Matter, 2021).

Therefore, the term "environmental sustainability" in this paper will concern the perception of human activity as well as the ecological concept. In other words, how can human activity be controlled within the boundaries of sustainability to respond to the innocuousness of the ecosystem? And to be more specific, environmental sustainability is the accountability to sustain the environment and protect the global natural resources that still accomplish human needs, health, and well-being (Sphera's Editorial Team, 2020). It needs to meet today's needs without any reflection on the needs of future generations (EPA, 2022).

## 2.2 Definition of Green Hotel

To achieve an ever-increasing level of living, we must prioritize environmental protection. According to Amandeep, the phrase "green hotels" was to characterize a hotel that operated to be more environmentally friendly by making efficient use of energy and water consumption, plus the use of natural resources, while keeping the same standard of quality services (Amandeep, 2017). The Tourism Council of Australia also states that the concept of green hotels is to provide rooms and facilities that include green services, green products, and a healthy environment (Chen & Chen, 2012). For instance, try to employ a variety of recycled or reused materials while constructing a hotel, including wood, steel, stone, brick, masonry, etc., and try not to irritate the environment while at the same time maintaining safety standards. The brightness of the building design, solar radiation impact, and waste material disposal management must be considered during the design stage before construction as well. This is to assure energy savings for the operations. In consequence, the environment should be protected during the rapidly increasing trends of the tourism industry. Lastly, a green hotel is an interpretation of environmental protection by using hotel software and hardware to reduce energy consumption, improve water management, and diminish solid waste. (*Definition: Software* in the hotel industry indicates the employee or staff who contribute to the services and operate the hotel business. On the other hand, *hardware* was implied for the main construction and facilities (Chen & Chen, 2012))

The basic needs of a green hotel include (A) recycling materials, (B) recyclable materials, (C) low pollution, and (D) energy savings. To reduce the excessive amount of energy consumption, it is necessary to raise awareness of the desire to safeguard the environment through an efficient recycling system and the rising usage of solar energy and wind energy (Ahmed, 2016). Based on the earlier assumption, all stakeholders should be responsible for reduction and sustainability to achieve the same objective,

### **2.3 Challenges in developing the Hotels operation in sustainable ways**

The hospitality industry was one of the sectors that most people took an interest in. Per Withiam, guests at hotels have emphasized that they want the industry to operate sustainably; however, most of them did not behave in that way. Sustainability involved many perspectives, such as improving the operation while maintaining and renovating the existing properties and adding new facility designs. There is a question: Is sustainability a charity? The answer is no; it was a part of the hotels running the business (Withiam, 2011). Energy saving, waste management, and water circulation need to engage the employees, plus research and development; these are all part of the business operation, and yet, it is expensive. Therefore, developing a 'green' hotel was not easy. It does not require only an understanding of the environmental issues; it also needs to consider the economic and sociocultural components (Melissen et al., 2016). Furthermore, aiming for sustainable development needs to account for both systemic and ethical aspects. In terms of systemic, hotels' operations should start with organizations, companies, and people, respectively, by ranking from the most powerful to the local operation to process the development (Melissen, 2013). The change that was driven by the hotel industry will have a positive impact not only on their sector but also on communities. However, it was not easy to address sustainability as most of the operation stages were driven by cost-saving, while sustainable operations required a lot of investment (Garay & Font, 2012).

It appears that using a strong model of sustainability is still just a beginning point and goal for people in the industry. Most of them acknowledge the benefit of appearing sustainable but find it hard to move beyond it because this might mean that they have to invest in a new product or process (Baumgartner & Ebner, 2010). Even though the journey is quite long and it is hard to contribute to making it happen, the impacts of the changes will minimize the negative effect that occurred on the environment.

## **2.4 Hotel Management**

### **2.4.1 Energy Management**

Hotel operations have consumed a large amount of energy, especially in guest rooms. Consumers will consume more energy when they are on vacation rather than staying home. This behavior is something that needs to change from the consumer's viewpoint. They should not overuse the energy in their accommodation facilities but should conserve it as they did in their own residence (Filimonau & Magklaropoulou, 2020). However, the hotel facilities that also consume a lot of energy would be restaurants, fitness centers, pools, etc. (Baxter & Srisaeng, 2021). The higher the number of tourists, the more energy consumption would be required. This is the positive relationship that is a result of the increase in the hotel's carbon dioxide emissions. The weather and season are also other important factors that affect the amount of energy in the guest rooms. All parties associated with hotels can gain advantages from having a better plan for energy management. This is not only good for the hotel's sustainability goals and cost reduction but also has a positive effect on the environment (Baxter & Srisaeng, 2021).

### **2.4.2 Water Management**

Globally, almost every place around the world is facing some form of water crisis. Water is becoming an exclusive resource that requires good management due to the increasing population and high consumption. Therefore, water must be provided for beneficial use with precisely the standard of sustainability (The World Bank, 2022). Nonetheless, for the hotel business, the water that is used by hotel guest bathrooms and for sanitary purposes has consumed gigantic amounts of water. The average use of water is approximately 60,000–220,00 liters per year for a single room, which

represents around 54% of total consumption (S.p.a, 2022). A hotel's food and beverage departments and laundry departments also require substantial amounts of water for operation and cleaning purposes. Besides a high consumption rate in the hotel's business, the sports resort has consumed much more water. Water consumption is either for the field of play or the sport itself. For example, football might not require water from the activity, but water might be used on turf fields to maintain and support the equipment. Other sports, such as swimming, require water for their well-performed functional, clubhouse, maintenance, and cleaning purposes. From an economic point of view, the high consumption of water not only means having a high cost for daily operation but also the energy cost that was spent in parallel. Consequently, the management of water is essential in order to achieve sustainable water management in the hospitality sector. The hotels need to control water usage and source alternative ways to avoid the water crisis.

### 2.4.3 Waste Management

Food waste has attracted global attention, especially from developed countries. The issue seems to be a serious but not uncontrollable environmental problem. The increase in food waste around the world was caused by the overproduction of food and the decrease in the total cost of food as consumer goods. Thus, many consumers and retailers choose to throw away leftover foods rather than handle them properly, as it is the easiest way with the lowest cost (Srijuntrapun et al., 2022). As a result, discarded food has many different impacts in different areas, but one of the most important is that it has an effect on the environment. Food waste has released carbon dioxide and methane, which are substances of greenhouse gases that subsequently contribute to the global warming effect (FAO, 2014).

The hotel sector generates a substantial amount of food waste every year. Its operations have a negative impact on the environment. The food and beverage department accounted for the largest volume of waste compared to the others. The wastes can be categorized as biodegradable (organic waste) and non-biodegradable waste, which has 3 different meanings. (1) Pre-consumer: pre-consumer is defined as a product or raw material produced in the kitchen before the finished menu is handed

to the customer. (2) Post-consumer is the leftover that was not consumed by the customer's meal. (3) Packaging waste is determined as anything that is used in the kitchen, such as plastic covering the food before leaving the kitchen (Baxter & Srisaeng, 2021). To turn the dark side into the bright side, the hotel industry can establish a recycling or reuse program for the leftovers. This not only improved waste management in the industry but also promoted the social image and improved the reputation of the public.

### **3. Methodology**

#### **3.1 Research design**

The researcher chose a qualitative approach to examine the development and extension of sustainable hotels as a new season for the tourism industry in Phuket since the goal of qualitative research is to understand the social reality of how different stakeholders are participants in their problems (Mcleod, 2023). The researcher seeks to explain 'why' and 'how' a particular phenomenon needs to be used to fit the research question.

##### **3.1.2 Phenomenological research**

A phenomenological approach is one that seeks to understand and describe a wide-ranging form of study. The researcher will gather different sources of information that explain how individuals experience and feel about it. The outcomes will be shown from different points of view as people have experienced things differently (Hoover, 2021). In simpler terms, phenomenological research will be used to explain the phenomenon's universal nature by examining people's thoughts throughout their experience (Ho & Limpaecher, 2022). In order to do so, the researcher will use document analysis to gather useful data, either from the printed document or electronic record, to carefully analyze and draw the conclusion from the related documents. However, the data analysis that is formulated by the researcher will not be influenced by one particular stakeholder. The main result of this study will be fairly analyzed based on the given information.

### 3.2 The Conceptual Framework

Used to support the analysis and planning of sustainable development in this study was the SEAN (Strategic Environmental Analysis) model. The purpose of this model was to examine the interactions between ecosystems and human society, with the intent of gaining insight into the relationships between environmental key issues and other factors of sustainable development, such as social and economic issues, in order to achieve the strategic overall objectives for each sector. SEAN can be defined as a participatory process that is structured by an analytical framework in order to:

- (1) Analyze the environmental problems and opportunities for human development
- (2) Identify the main actors
- (3) Define strategic goals at the early stages of decision-making or planning

SEAN is a specific process of generating, gaining knowledge, and making strategic decisions. The process is structured into five phases, which are preparation, scoping, detailed studies, synthesis and planning, and follow-up and monitoring (see figure 2). However, to complete the whole process, the four clusters, which hold ten analytical tasks, will be used as a framework to ensure that all necessary information that is relevant to environmental issues is not overlooked and included in the analysis (see figure 3). Thus, the process phases and analytical tasks are paramount characteristics of this model (Kessler, 2000).

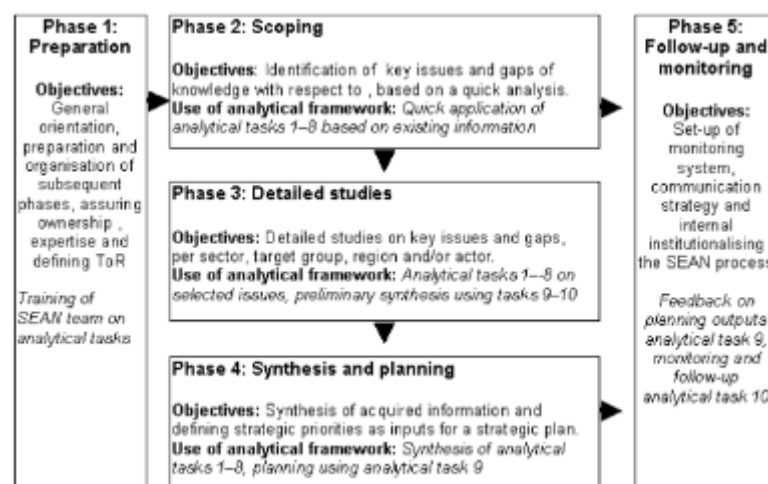
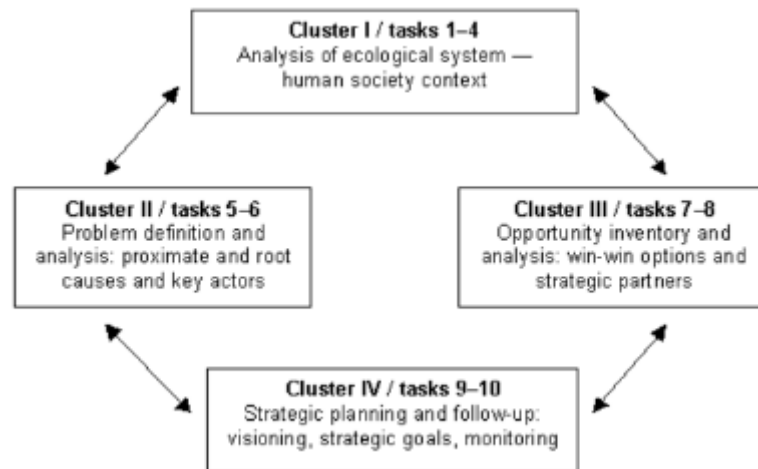


Figure 2: 5 Phrases of the SEAN process





**Figure 3: 10 Analytical tasks with 4 different clusters in the SEAN framework**

To briefly explain this model for better understanding, each phase will be described in words before presenting a research result accordingly.

1. *Preparation*: A critical phase that included defining the objective, participant, and relevant experience. This would be a key element to finding the objective of this paper.
2. *Scoping*: To capture the existing knowledge or research study by going through the SEAN analytical tasks
3. *Detailed studies*: Involved old case studies from different researchers to capture their viewpoint toward certain aspects
4. *Synthesis and planning*: Define a common vision and strategic goals for sustainable development in hotel operations
5. *Follow-up and monitoring*: Supporting and strengthening the strategy indicated in the previous phase, working out the action plans to ensure feedback on the result

As mentioned earlier, the ten analytical tasks which are categorized into four groups need to be included in the model to ensure that all relevant information is not left between the paths. The summation of all tasks will provide a final objective in phase 4, synthesis and planning, before going to the follow-up and monitoring process in the last phase of the SEAN model (Kessler, 2000).

*Outcomes of Batch 1 analytical of the environment*

- *Task 1: Identification of relevant stakeholders and environmental functions.* The main stakeholders that were impacted by the environmental functions in both direct and indirect effects.
- *Task 2: Assessment of trends and cause-effect chains.* The changes that will influence the environmental trends in terms of opportunities and threats. The benefit of having sustainable development.
- *Task 3: Impacts of environmental trends.* Stated the environmental trend and the impact that damages the environment by focusing on the present and absent stakeholders.
- *Task 4: Assessment of Norms.* Norms, Standards, and thresholds are difficult to assess and sometimes are not available for identification. For the bottom line, it is hard or unacceptable to change for certain stakeholders. The changes or implementations will affect the current trend of the environment. However, in a real situation, every aspect must be included concerning the impact on the environment. If it is not easy to accept the change, it needs to be adopted bit by bit in order to sustain the environment for all stakeholders as well as future generations. Therefore, there is no real meaning of practice for the Norms of the current trend of environment functions but depends on a current impact in one particular area

*Outcomes of Batch 2 analytical of the environmental problem*

- *Task 5: Definition of environmental problems.* After completing tasks 1-4, identify the environmental problems that have occurred. Also, explain the meaning of a problem that was emphasized.

- *Task 6: A problem analysis.* For each environmental problem, the main causing activities and the factors that motivated the difficulties will be illustrated and summarized to see the relationship. Some of the factors that are approached to cause harm to the environment are pointed out in order to understand the same issue.

*Outcomes of Batch 3, finding an opportunity for environmentally friendly*

- *Task 7: Identification of opportunities.* The main environmental opportunities were defined in order to construct the strategic choice for developing and improving sustainable development.
- *Task 8: Analysis of opportunities.* The opportunities were analyzed to find out whether the strategic choice will be possible for sustainable development or not. The win-win options are selected to conclude the strategic options.

*Outcomes of Batch 4, strategic planning and monitoring process*

- *Task 9: Synthesis and strategic planning.* After analyzing the win-win options in task 8, the strategic goals for development will be set. The action plans were worked out for the strategic choices to highlight that the strategy will be suitable to develop sustainability.
- *Task 10: Design an environmental monitoring plan.* Issue and implement a follow-up strategy and also establish an environmental monitoring system to ensure the management process.

## **4. Research analysis and finding**

### **4.1 Objective and Research Studies**

Businesses like hotels and resorts use natural resources in their development and operations, which has an impact on how long the environment can be sustained. They used a lot of water, energy, and unneeded waste. The pollution has affected many stakeholders, such as the local people and natural resources in the operating areas. As a result, the researcher will focus on a specific Thai province, Phuket, to evaluate the use of sustainable management in the development and running practices of hotels and resorts. The researcher attempts to describe information that is able to help the

hotels and resorts implement an effective environmental management program that fits with their businesses. The program will create a balance between economic, social, and environmental dimensions that bring the greatest benefits to all stakeholders. For the most part, the researcher will imply the case studies that determine the operating practices for energy conservation, freshwater consumption, and sustainable solid waste management. Case studies are used to determine the operational procedures that successfully lead to operational cost reduction and sustainability. Another possibility is the effective use of natural resources, which can be used sufficiently to manage trash, provide energy and water, or serve as a foundation for marketing the hotel and resort as socially and environmentally responsible.

#### **4.2 Perspective of Hotel operations toward the Environment (Environmental impacts)**

The environmental impacts have diverse effects on the ecosystems and are caused by human activity. Construction and deconstruction were the results of actions that brought about an environmental impact, which also led to an impact on public health and life quality (Abdallah, 2017). Under these circumstances, the operations of the hotel business have an impact on the environment because of the ways they have used the resources to run their business. The main stakeholders that were impacted by the environmental functions in both direct and indirect ways were identified as the hotel owner, staff, employees, hotel guests, local residents, and natural resources. Based on the list of functional groups, all of them are part of the environmental functions. Some stakeholders are directly using and managing natural resources. While the others are not aware of their actions that might harm the environment. Therefore, to make efficient use of natural resources, some behavioral and operational functions must be developed. And once the changes have been implemented, we cannot deny that they will bring great value to the environment. However, there are always pros and cons to everything. Figure 4 will illustrate the opportunities and threats to the changes that influence environmental trends.

OPPORTUNITIES	THREATS
Community Development: a fair solution to all stakeholders	A gap between rich and poor: overlooked poverty by focusing only on sustainable environment
Increase stakeholder trust and customers satisfaction	Decrease in sales due to a decrease in operations
Reducing carbon emissions which lead to the reduction of global warming	Higher purchasing price from the changes of raw materials that need to be environmentally friendly
Water conservation, Healthy environment, Better waste management	Disruption to the environment
Cut cost by saving energy, waste reduction, and recycling	-

**Figure 4: Opportunities and threats to the implementation of environmental**

To put it more simply, on the opportunity side, it will improve the quality of community life as well as increase customer satisfaction as people are now more environmentally conscious. The efficient utilization of natural resources results from sustainable operations. On the other hand, the threats were causing the gap between the rich and the poor to widen as the issues of poverty might be disregarded in favor of sustainability; poverty has a significant impact on society. Moreover, it might affect the hotel owner in the way of higher purchasing prices due to the changes in raw materials that need to be more environmentally friendly.

The damages to the environment have impacts on both present and absent stakeholders. According to Figure 5, the present stakeholders in the detrimental environment were people's incomes, their efficiency to generate income for daily life activities, and their health. And the absent (indirect) stakeholders were people outside communities, future generations, and ecosystems. All of these stakeholders were taken into consideration in order to cover all the details that were impacted by a harmful environment.

Key issues of Environmental	Present Stakeholders			Absent stakeholders		
	Incomes	Efficiency	Health	Outside communities	Future generations	Biodiversity
Natural resource inadequacy	-/+	?	-	-	-	-
Water availability	-	-	-!	-	-	-
Waste and Hazards	-	?	-!	0	!	!

*Description:* 0 = no impact ; - = negative impact ; + = positive impact ; ! = high risk ;  
? = unknown impact

**Figure 5: Impact of environmental trends for different stakeholders, a sign indicated was from the research studies and researcher's logical opinion**

- **Present Stakeholders**

1. Natural resource inadequacy: There is a negative and positive impact on the income because different stakeholders have received different monthly or yearly incomes; therefore, we cannot predict under this scope. The result is an unknown impact on efficiency to generate income in human activities because people have spent differently based on their income and interests. Lastly, it has a negative impact on people's health due to the scarcity of natural resources.
2. Water availability: negative impact on incomes, efficiency, and health. As water is the main resource for human survival, the lack of water conservation will have a direct impact on both humans and the environment. A decrease in freshwater resources will pose a high risk to human health and lifestyles.
3. Waste and hazards: generate a negative impact on income and health but pose a high risk to people's well-being. This is because people need to spend a lot of money to invest in technology to solve problems. However, the impact on efficiency to generate income is unpredictable due to the fact that low-income people might not be able to absorb the investment cost, while people with high incomes may consider the innovation for their own well-being.

- **Absent Stakeholders**

1. Natural resource inadequacy: negative impact for all three indirect stakeholders. The shortage of resources should affect the living quality of future generations and other communities, as well as the development of the ecosystem surrounding the area (Sakolnakorn et al., 2013).
2. Water availability: negative impact for all three indirect stakeholders. Fresh water is needed for a better quality of life.
3. Waste and Hazards: The pollution could have zero impact on the other communities due to the effect that occurred in one particular area. However, there was a high risk of impact on future generations and biodiversity due to the problem that had accumulated for a long time (Owyoung, 2021). In other words, the actions of the current period might be a consequence for the new generation to figure out the solution, but sometimes it is too late to handle and bring back the natural resources that we have lost.

#### **4.3 Environmental impacts on the Hotels operation**

The main causes of environmental problems and the factors that motivated them are the increasing numbers of travelers (see Figure 6). With an increasing number of visitors, the business owner would like to capture the economic value by building and developing their own business to attract the customers' interest. And sometimes, they do not realize that they have damaged the environment or natural resources in one way or another. Hence, the business's owner should be the first responder to act and at least find a way to solve the environmental problem from their side. They must understand the ongoing issue that has been caused and try to communicate the concern that they have found to their employees. After that, add awareness and cascade it down to the customers in order for them to be a part of the conservation and try to minimize the environmental impacts. However, a sustainable environment or conservation could not be achieved within one sector; the Provincial Administration Organization should be supported and promoted in order for everyone to hit the same goals. The government needs to issue the policy and create a campaign to support the business owners, such as by providing a green certificate to certify a product or service that approaches implementation for green procurement (Gatlabayan &

Prathumratana, 2020). This will bring value to the business owners as consumers are now more concerned about purchasing environmentally friendly products and services. Another example would be requesting support from financial institutions to incorporate sustainability business and operating models into the consideration of credit or budget allocation for the business's owner, who would like to adopt the green concept in their business.

	Energy consumption	Water consumption	Unwanted waste
Causing activities	Hospitality Industry, the number of tourists is increasing continuously	Hospitality Industry, the number of tourists is increasing continuously	Hospitality Industry, the number of tourists is increasing continuously
Primary actors	Hotels' owner	Hotels' owner	Hotels' owner
Secondary actors	Provincial Administration Organization	Provincial Administration Organization	Provincial Administration Organization

**Figure 6: Relationship between the actors that motivated the environmental problems**

The environmental problems that got influenced by the hospitality industry were defined as high energy consumption, inefficient water usage, and incapable waste management. Each environmental problem will be described in detail to make sure that all understandings align and state the causes of issues.

#### 4.3.1 Energy Consumption

The hotels' and resorts' energy consumption are dependent upon the size (small to large), components, performance, and activity of each property that they operate. The main components of energy consumption are mobile and stationary fuel and the purchase of electricity. The demand for energy has rapidly expanded as a result of the government's declaration that it is committed to developing Phuket as a hub for tourism, maritime, and land transportation. As a consequence, the use of energy was prioritized and deserves attention in order to support the economic growth and recovery of the tourism industry. In accordance with the Provincial Electricity Authority, Phuket's electricity consumption demand has the second-highest rank in the south of Thailand, and the electricity consumption growth is 7–10 percent per year (EGAT, 2022)



#### 4.3.2 Water Usage

The hospitality industry uses a large amount of water and can have a massive impact on water conservation. A hotel building serves different types of facilities and functions that operate 24 hours per day and run throughout the whole year. According to Pure Blue, water usage averages between 100 and 400 gallons per day per room (Pure Blue, 2023). Every operation, for example, laundry, kitchen, and restaurant, in the hotel management industry, has a significant effect on total water use each day. The showers and toilets in guest rooms account for much more water wasted than the swimming pools or laundry. Some guests were not aware of the simple use of water for showering and thought that they already spent money to use the hotel's service, so it was not necessary for them to conserve water during their stay in the hotel. The type of hotel, services, and amenities that are provided are also important factors that vary the usage of water. A large property often has a large number of guests, which leads to a larger consumed amount of water compared with a smaller hotel.

In accordance with Phuket Municipality, the estimated water consumption for the tourism industry is expected to be 33.60 million m<sup>3</sup> (cubic meters) and the local consumption is approximately 55.93 million m<sup>3</sup> in 2027. The forecasted water source is about 62.20 million m<sup>3</sup>, which is below the water demand (Phuket Municipality, N.D.). The main issue with the water shortages is an inadequate supply of water for consumption by both the local population of Phuket and the rising number of tourists. As a consequence, in order to prevent a shortage of natural resources, awareness of water usage needs to be increased as a priority for the hotel sector.

#### 4.3.3 Waste Management

The number of travelers visiting Phuket has increased rapidly. The increase in number has made waste management a majority problem in the province. In 2018, the province alone produced 700 to 1,000 metric tons of garbage daily. The majority of the waste was burned or dumped in landfills. But there aren't enough spaces in landfills for all of the rubbish that is generated each day, and burning trash isn't the best practice to get rid of it because it harms the environment (Owyoung, 2021). The waste pollution has led to other major effects such as global warming, which conducts

climate change and directly impacts water and natural resources (Mohan et al., 2017). The impact also caused health issues for local residents. The local government should handle the waste effectively to avoid bad odors and pollution and protect the province's image. Making change needs to start from a small point; thus, it is better to concentrate on the hotels' operations and look at how they operate and investigate waste reduction strategies.

#### **4.4 Strategic goal for Sustainable development**

As stated by Hunter, people, and nature are living together. People cannot live without natural resources; therefore, the conservation and utilization of resources must be stated for sustainable tourism to allocate proper management of the interconnections between humans and nature (Sakolnakorn et al., 2013). And based on past experience, well-managed energy, water, and solid waste will be beneficial to the environment. The following details were explained briefly on how to drive sustainability for the hotels in Phuket:

##### **4.4.1 Energy Consumption**

The design and construction were two of the most important things to be considered when constructing or renovating the hotel's building. The design that blends in with the environment also generates economic value for the business owners in the ways of purifying air in the guest rooms from the smart design windows, a proficient building and operation management system, efficient energy consumption in equipment, and LED lighting throughout the whole building, as well as ozone protection for building wrapping. The use of building materials is the key to achieving sustainability. The constructor may use recycled and renewable materials, wood, or local natural resources that are not harmful to the environment to develop or build new properties. They might involve technology such as automatically turning off the air conditioning when the door (or balcony) room is opened or installing a water-tube boiler to make steam for the hotel laundry operation. The results of applying those technologies will lead to lower energy consumption in the hotel's management operation. Additionally, investing in solar energy was another option for the hotel to have lower electricity consumption. The use of solar panels enables the conversion of energy from the sun

into electrical energy, which is able to absorb the hot water or electrical charges in guest rooms and common areas.

To illustrate solar panels, it has eloquent benefits for the hotels' operations as well as benefits to the environment. The installation of solar energy will reduce utility costs and reduce overall expenses. The decision to switch to solar power is a great way to drive environmentally friendly business practices while also preserving natural resources. Looking at the bright side of solar energy, it will build the brand reputation of the hotels as customers are now becoming environmentally conscious and want to decrease the impact of their activities while traveling. Therefore, a hotel with solar power will attract customers' attention, reduce pollution, have a less significant impact on the ecosystem, and provide a high energy source for the hotel's operations. The installation can be placed on the hotel's rooftop, the installation period is really short, and there is no need to shut down the hotel's operations during the installation period. Moreover, the payback and return can be earned very fast, within 5 years after the installation, and sometimes the source of solar energy can be accounted for as revenues in some circumstances (Naveco Power, 2021). There are two types of solar energy systems: on-grid and off-grid. For the off-grid, the building was constructed with both cities' electric networks and solar panels on the rooftop. Solar energy will be used in sunny weather or during the summer season, while the electric system will be used on rainy days or cloudy days. However, the off-grid system was disconnected from the electrical source and used only solar power to generate energy. The minimum size of the installation for installing the solar system has cost around 90,000 baht for a volume of 1.6 kW. This volume of energy was sufficient for television or air conditioning. The approximate cost of installation was 169,000 baht, depending on the size and space of the installation's area. After the return periods, solar energy was able to save an average of 37,811 baht per year (Thailand Real Estate, 2022). Without looking at the prices of the product and installation, it is obvious to say that solar panels have helped to reduce electricity bills, save money in the long term, and also help to decrease a negative effect on the environment.

#### 4.4.2 Water Conservation

The awareness of water conservation must be raised among both the hotel's guests and staff. The conservation of water cannot be effective within one sector. Based on the case study of Far Eastern Plaza's hotel in Taiwan, the implementation of water saving was rewarded by the Water Resources Agency for the water saving group competition (Chen & Chen, 2012). The action taken by the hotel has driven sustainability through efficient water consumption. For example, installing the water limiter on the faucets to achieve water savings by having smaller water consumption per flush, as well as installing the ultra-red sensor in the hotel guest toilet, and implementing low-flow showerheads and low-flow water taps in the bathrooms in order to cut down on excess water use, but still, satisfy the customers. The low flow is able to increase the conservation of water by an average of 11 liters per minute (IHG, 2022). Furthermore, she guides the customers by placing notes in the guest restroom reminding them not to change the towels when not necessary.

Water that leaves the hotel's property must be of a safe standard; thus, the treatment of wastewater is necessary for a sustainable environment. Well-managed wastewater is able to reduce the spread of disease, whether biological, chemical, or physical unit processes, to the local community and prevent water or air pollution that threatens public health and the environment. The treatment helps to ensure that the water is safe, clear, and odorless. The form of the water treatment process can heighten and control the adulterated objective in the environment. After the treatment, the health and ecological conditions surrounding the area will improve. The system should be designated to prevent pathogenic organisms from entering human life and reduce the impact on the aquatic environment when it receives waste. The method of treatment processing can include a high degree of a pathogen (pathogens include bacteria, viruses, parasitic protozoans, and helminths) destruction or use the removal of organics (Bio Oxygen) to prevent pollution (Sadi & Adebitan, 2014). Once the water has been treated to be safe, the recycled wastewater can be used to irrigate plants in the hotel's garden, which is beneficial to their operations.

The other advantage of water treatment would be the production of renewable energy. As stated by Severn Trent, they are able to rotate the sewage and create 208 million kWh, which equals powering the energy sources for more than 50,000 houses annually (Severn Trent, 2023). The drain sludge is loaded into airtight tanks, which are known as anaerobic digesters. The temperature is kept at 35 degrees Celsius and mixed with the bacteria until it breaks down. And once the bacteria have digested the sewage, methane is produced along with fertilizer. After that, the large engines are fed with methane to generate heat, power, and even biofuels. The heat is maintained at the ideal level and can be used for hotel operations. Once the hotels are able to turn sewage into energy, they will be able to lower their operating costs in terms of electricity bills. Furthermore, converting wasted water to energy also provides an important benefit to the environment as it reduces direct disposal into land and water environments. On the contrary, the cost of investing in anaerobic digesters is quite expensive. The cost of a treatment system starts at the lowest around 8 million baht and also needs to involve other factors to calculate the pricing in the management (SAMCO, 2019). Even though they are capable of producing a source of power for an entire hotel's operations, reducing an electricity bill may not be able to cover all the costs of the digester (McKenzie, 2019). Without funding support from the government or the low-interest rate offered by funding agencies, it might not be financially feasible for the hotel owner to invest in this kind of technology.

#### 4.4.3 Waste Management

Hotel industries need a well-performed waste reduction system. They need to apply real practices and policies to cut waste disposal costs and protect and preserve natural resources. A pragmatic way for waste management to be implemented is to implement a campaign to refuse, reduce, reuse, recycle, and dispose of waste. The campaign must motivate the use of environmentally friendly materials that will not harm or cause any impact on natural pollution. In hotels, the purchase of natural materials from the local community is able to help the local people in terms of generating income for their households as well as reducing the use of plastic that may affect the environment. Natural materials like banana leaves can serve and decorate food or dessert dishes. The banana leaves are able to replace the plastic plates, which

are difficult to decompose. Furthermore, the plastic items in the kitchen can be eliminated. The single-use plastic of a squeeze bottle can be substituted with paper piping bags. Other ingredients, such as oils and herbs, should be stored in jars or glass bottles that have safe and high-grade food-grade containers, and raw materials or fresh products can be kept in metal containers in order to eliminate the use of cling film. This best practice should ask for collaboration from the hotel's supplier and other partners to remove the plastic. The drinking water bottles provided to the customers, either in the guestroom or common area, should be made of glass instead of plastic bottles. Once the customers had consumed the product, the empty glass bottles were returned to the supplier for recycling. The hotel should also get rid of the plastic amenities and substitute everything that is made from plastic with natural materials that are reusable and refillable to minimize the environmental impact. Moreover, produce bio-extract from the leftover food and the residual raw materials used in the kitchen. In order to do so, the hotels should invest in Mobile Aerated Floor (MAF) composting technology. The system will push air through the compost material until the bacteria are broken down into nutrient-rich material (Owyoung, 2021). The bio-extract made from organic waste is able to be used for cleaning drains or to nourish the gardener with high-quality nutrition. It may also be distributed to the local communities near the hotels, which may lead to corporate social responsibility accountability on the part of the hotel's management. In contrast, the price of composting machinery varies depending on its size. The food waste decomposer that will be utilized in hotels can cost more than a million baht (Garbage to Green, 2023).

The benefits of plastic and waste reduction are cost savings, reduced energy consumption, and decreased environmental pollution. The waste reduction in the hotel industry also conserves natural resources and increases the hotel's reputation for conserving the environment, which leads to an increase in the number of loyal guests who are environmentally friendly. Nevertheless, the government agency needs to issue the policy and promote the protocol to raise tourist awareness. Doing a practical by the hotels themselves will not be very effective; the collaboration from the tourists and other stakeholders is important to take part in conservation. Government agencies

need to provide knowledge and education about the value of refuse, reduction, reuse, and recycling for people to be more environmentally protective.

## 5. Conclusion

According to the research study, the researcher has discovered that the hotel industry has numerous consequences that have an immediate impact on the environment. The majority of hotel owners are aware of the primary problem, but they continue to struggle to put an appropriate plan into action to address its impacts. The hotel's owner believes that while establishing a green policy is not extremely challenging, government support in the form of advice, incentives, and engagement is significantly more important for propagating the concept of environmental conservation. The researcher also learned that it might be hard to persuade hotel owners to adopt sustainable policies when they are struggling financially or in a slow market, as environmental protection measures could be expensive. They might think that enacting such a plan will raise operating costs for the hotel or possibly have a negative financial impact because they are not aware of the possible advantages associated with using green policies. Thus, it is advocated for the government to allocate funding or waive taxes to encourage the establishment of hotels.

In conclusion, the major problems also have an impact on the environment and have a direct effect on the stakeholders, which also include the hotels themselves. Sustainability can't be driven by one sector alone; it needs collaboration from every angle. The government should support it, as some of the strategic planning might have a high cost. However, if the hotel tries to implement the green concept, it can save operational costs, increase its reputation, and gain attention from the customer, as nowadays a green concept is a major factor in a customer's purchasing decision.

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จุฬาลงกรณ์มหาวิทยาลัย  
**CHULALONGKORN UNIVERSITY**

## **VITA**

**NAME** Natharee Somboon  
**DATE OF BIRTH** 05 December 1995  
**PLACE OF BIRTH** Bangkok, Thailand



จุฬาลงกรณ์มหาวิทยาลัย  
**CHULALONGKORN UNIVERSITY**