

FRAMEWORK FOR MANAGING THE CLIMATE CHANGE IMPACT IN MALAYSIAN HOTEL INDUSTRY

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Abstract: Climate change has gradually impacted many sectors including the hotel industry. For the hotel industry, climate change has meant changing demands of tourists to stay in hotels. These have affected hotel revenue and development. Although increasing research of climate change has occurred, the few studies carried out focus on issues related to hotel efficiency and its impact on climate change. Researchers believe that efficiency is an important factor that influences decision making of a hotel organization in a changing industry environment. The purpose of this paper is to propose a conceptual framework for highly efficient hotel operations to address the impacts of climate change. The proposed framework is not only meant to find adaptive solutions, but, more importantly, to provide insights to hotel managements to be prepared before actual climate changes occur. Inputs and outputs in data envelopment analysis (DEA) will determine the efficiency of hotel operations in determining the hotel benchmark.

Keywords: Data envelopment analysis, benchmark, climate change, management control, hotel industry

Introduction

The adverse impacts of climate change have been observed to occur in many aspects of human life, suggesting complexity for proper resolution of the issue and for mitigating its adverse effects on the community (Bujosa *et al.*, 2015). In the business context, climate change has impacted the climate-affected sectors such as tourism and agriculture (Nikolau *et al.*, 2014). For instance, the hotel management is facing major challenges due to increasing uncertainties caused by unpredictable climates that influence the perceptions of tourists for travelling to and staying at hotels. Although climate change is often treated as an independent issue, it has consequences for the hotel industry. The impact of climate change can be seen on hotels revenues related to security, safety, and weather issues. Importantly, researchers have suggested that the issue should be given due attention by the management of an organization because challenges it brings in terms of financial risks. This is followed by its effects on business operations thus, making organizations incapable of getting raw materials, creating the need to relocate businesses and adversely impacting transportation and safety (Nikolaou *et al.*, 2014). These factors critically influence the ability of a hotel organization to remain competitive in the market. As such, the competitiveness of the hotels will depend largely on the usage of its resources that could

assist in achieving the hotel's goals when faced with climate change.

Efficiency and the Hotel Management

The tourism industry contributes to various sectors including the economy, society and the environment (Bhuiyan *et al.*, 2013). This industry includes several business areas including hotels, tour operators, travel agencies, restaurants, transportations and event management. Of these, the hotel industry has experienced tremendous growth and contributed extensively to tourism development. Thus, researchers have urged more dramatic actions to be taken in preparing hotel businesses to adapt to the impacts of climate change (Getz & Page, 2016). Towards that end, key elements to be considered in the adaptation effort have been identified as infrastructural, organizational and social factors (Klein, 2011). These elements could complement technological development to increase an organization's capability in facing the impacts of climate change (Sovacool *et al.*, 2017).

As part of the adaptation strategy through organizational effort, an efficiency measurement is viewed as an important management control for hoteliers in adapting to climate change. The efficiency of the hotel's operation is measured by comparing the capability of the hotel inputs to achieve the desired outputs (Barros & Mascarenhas, 2005). Researchers

believe that efficiency measurement has a critical place in developing an adaptation strategy for climate change mitigation (Shukla, 1999). The efficiency of operations is a relevant source for making decisions especially with regard to a changing business environment such as climate change (Yen & Othman, 2011). For hoteliers, the outcomes of the efficiency effort lead to better planning for their services, increased guest satisfaction and comfort, and show the commitment of the hotel management towards environmental issues (Said *et al.*, 2017).

In management control practices, many indicators can measure the efficiency level. Yen and Othman reviewed efficiency measurement metrics and found that researchers have widely used performance indicators to measure the efficiency level of an organizations (i.e., Fay *et al.*, 1971; Jaedicke & Robichek, 1975; Coltman, 1978; Van Doren & Gustke, 1982). These indicators are a good reference for organizational planning and for further development of organizational strategies due to their capabilities to compare the performance of one organization with another organization (Yen & Othman, 2011). These performance indicators have included cost-volume-profit analysis, sales revenue and asset revenue. Other researchers have optimised the use of a lodging index indicator to assess the efficiency level of hotel operations (Wassenaar & Stafford, 1991). However, because this index considers the average number for rooms occupied and room rates, some critics have said that lodging indicator failed to assess the efficiency of the operational costs (Yen & Othman, 2011). However, this index is particularly relevant when examining the efficiency of local tour operators who are incapable of providing their average occupancy and room rates. Revenue is also used to assess the efficiency level of the hotel operations by measuring total revenue, gross profit and net profit (Baker & Riley, 1994).

Several researchers have highlighted that hotel performance evaluation in the past was less comprehensive and restricted to performance indicators (Anderson *et al.*, 2000; Barros & Dieke, 2008; Barros *et al.*, 2009). With the advancement of methods such as the stochastic frontier approach (SFA) and data envelopment analysis (DEA), the inclusion of multiple inputs and outputs in the analysis have provided more accurate and understandable performance metrics (Oliveira *et al.*, 2013). Efficiency and its determinants are among the most highly researched areas in hospitality industry research (Oliveira *et al.*, 2013). Among the determinants are size, location, quality of facilities, entrepreneurship and promotion strategies. However, very few studies have been conducted on hotel efficiency (Barros & Mascarenhas, 2005). This paper adds to the dearth of literature on hotel efficiency, particularly in relationship to the impact of climate change.

Climate Change

Climate change is considered as an emerging and dominant phenomenon in the society as it brings one of

the greatest risks to the survival of all life on earth (Solomon *et al.*, 2011). The risks and opportunities of the climate change events could influence many contextual elements either internally or externally. This includes political, economic, technological factors, systems, physical and relational view (Loosemore *et al.*, 2011). Given these contributory factors to the climate change, researchers have suggested for transformational adaptations to be of high consideration by many parties due to the adverse impact of climate change that potentially affects the society (Kates *et al.*, 2012). A study carried out by Kates *et al.*'s (2012) found that although many transformative adaptations are technological, these approaches can also be behavioural which affect how individuals and society make decisions and allocate resources to cope with climate change. To date, however, the research to explore innovative and cost-effective ways in addressing the problem related to climate change is still lacking, even though the potential risks of the event is almost clear (Kithiaa, 2011).

Due to the risk that is posed by climate change, many studies have been conducted to examine the severity of climate change events. For instance, heavy rainfall will likely to increase the level of the sea and cause floods in a certain area. The economy sector will be one of the sectors affected by this situation. Economic losses due to floods have greatly increased, mainly due to the increased exposure of the companies' assets during the event (Kundzewicz *et al.*, 2014). Some of these evidences can be seen in several regions including the great deserts and high mountains of western North America, southern South America, northern Africa, Australia and also Central Asia. Moreover, losses from flood are reported to be higher in developed countries, thus suggesting more adverse impacts to the society in many parts of the world (Kundzewicz *et al.*, 2014). As a result of several extreme weather events, the development of climate change policy is increasingly being considered. The policy development is a crucial action in adapting to the unexpected impacts of the climate change (Hunt & Watkiss, 2011).

The trade-offs between opportunities that need to be exploited and risks to be avoided pose a serious challenge to public policy makers and also managers of the company (Muir *et al.*, 2014). Even if climate change brings a higher risk to the organization, institutional investors are increasingly focusing on opportunities to adapt to potential climate change impacts. This can be seen through programmes on energy efficiency, clean technology and renewable energy as part of the organizational strategies (Solomon *et al.*, 2011). Researchers also relate these approaches to an advantage of the adaptation action plans that contributes to the economic opportunities in a particular place (Lachmann *et al.*, 2018). Indirectly, the organizational resources could be utilised in line with the development of the adaptation strategies in managing the climate change impacts to gain benefits rather than its drawbacks.

Resource-Based View and the Hotel Management

The resource-based view (RBV) is one of the well-established theories in the field of strategic management (Lazarova *et al.*, 2017). RBV assumes that the competitive advantage of an organization could be achieved by utilising its internal and external strengths and opportunities in dealing with its weaknesses and the threats faced in the business environment. Through the proper utilisation of existence resources, it is expected that the organization could achieve more efficient and effective operations. Researchers believe that the utilisation of internal resources in the RBV includes a focus on the potential of employees, so that this potential could be harnessed to add value to an organization especially in challenging times (Becker & Huselid, 2006). Harnessing such potential is applicable to the hotel industry, which is faced with a complexity of issues impacting hotel operations due to the impacts of climate change. RBV can be integrated into the implementation of human resource management (HRM) to assist an organization in accomplishing its goals when facing uncertain conditions like climate change. For instance, the HRM framework could be formulated so that the talents of employees could be optimised and fully utilised to earn a competitive advantage (Barney & Wright, 1998). Time and space are other resources to be considered while formulating an adaptation strategy through the RBV (Barros & Mascarenhas, 2005).

In discussing hotel management, several metrics have been traditionally suggested as references for assessing the efficiency of hotel operations. One traditional approach of measuring hotel efficiency utilises accounting-based performance indicators (Barros & Mascarenhas, 2005). According to the RBV, the adoption of accounting-based performance indicators in the hotel industry is made with the assumption that hotels are imperfect in their operations and that each hotel is different in its characteristics (Rumelt, 1991; Barney, 1986). These differences are explained through a hotel's resources and capabilities in achieving its goals. If a hotel is capable of properly utilising its resources and capabilities, the most efficient hotel could earn a competitive advantage from its operations.

Importantly, two factors that distinguish the performance between organizations are the uniqueness of the organization's resources and capabilities (Guthrie *et al.*, 2004). These factors are found to be more significant than the characteristics of the industry, suggesting the importance of examining the potential of organizational resources in achieving a competitive advantage. The determinants of unique resources have been described as those resources that are valuable, rare, inimitable and have no substitutes (Barney, 1991). A resource is valuable if it can be integrated into organizational strategy any time that it is needed. The utilisation of the skill and knowledge of employees only offers an advantage if a particular skill of an employee is rare and not easily imitated. When an organization has employees of high quality who contribute to

organizational goals such that the quality is not obsolete and cannot be substituted for by any technologies, this organisation has a competitive advantage (Lytras & Ordonez de Pablos, 2008).

To choose the correct resources to be used in a particular situation, the determination of the value of each resource is critical (Espino-Rodrigues & Padron-Robaina, 2004). This determination needs to be done thoroughly to identify the correct resources that could significantly contribute to the competitive advantage of the hotel. In the hotel industry, the resources appropriate to deal with the impact of climate change could be several. Based on the review of the study in the hotel industry as shown, some similarities on the use of input (organizational resources) and output (organizational goal/outcome) can be observed. This is true as most studies from 2010 onwards have focused on rooms and employees as input while the revenue is the main consideration to represent the output.

Research Context: Malaysia

The tourism industry in Malaysia is recognized as one of the most important sectors contributing to the national income. This industry has contributed not only to economic enhancement, but also to social and environmental development (Bhuiyan *et al.*, 2013). The tourism industry includes several areas of business including hotels, tour operators, travel agencies, restaurants, transportations and event management. As the largest contributor to the development of the tourism industry, the Malaysian hotel industry has experienced tremendous growth and has attracted tourists to visit the country. The Ministry of Tourism Malaysia has reported an increase in the number of tourist arrivals to Malaysia from 2011 to 2014. The Malaysian Ministry of Finance reported that the service sector including tourism contributed 56.2% to the national Gross Domestic Product (GDP) in 2014, more than any other sector including agriculture (7.1%) and industry (36.8%). This demonstrates the importance of the service sector as a main contributor to the national income.

As of December 2017, there are 3126 hotels recorded throughout the country and the number of hotels room grew to 246564 units in December 2017 (CEIC, 2018). Occupancy rate of hotels in Malaysia improved by 2.2% to 65.3% during the first quarter of 2017, with an increase in revenue per available room of 7.2% (STR, 2017). To ensure all hoteliers are more competitive and marketable, the Ministry of Tourism and Culture Malaysia (MOTAC) endorses five types of hotel classification ranging from one star to five stars. These classifications are based on the hotel's service, bedrooms, safety and standard hygiene, services as well as qualitative and aesthetic requirements. The MOTAC introduced a newly improved criteria in May 2017 to include other types of accommodation such as innovative hotels and boutique hotels (Syed Mestaddin, 2017). Property Stock Report for 2017 reported that the highest number of hotels is unrated hotels with 1555 hotels,

followed by 3 and 2-star hotels, with 325 and 261 hotels respectively (Valuation and Property Services Department, 2017). Further, only 100 hotels were classified as 5-star hotels and in terms of numbers are the lowest among all-star rated hotels. This signals an effect of good tourism industry development that bursts the demand of local and international tourists to visit many places in Malaysia and find a suitable accommodations based on their needs and affordability.

In terms of geographical distribution, Johor has the highest number of hotels with 433 hotels and followed by Sabah and Sarawak with 366 and 354 respectively (Valuation and Property Services Department, 2017). In the east coast of Peninsular Malaysia, Pahang has 294 hotels, Terengganu has 163 hotels, and Kelantan has 90 hotels. Four categories of hotels are classified under hotel's location: city/town, beach, hill and others (Valuation and Property Services Department, 2017) and hotels located in city/town have the highest number with 2387 hotels, followed by beach hotels totalling 465 hotels. In Malaysia, it is reported that the lowest number of hotels are located in the hills and this is possibly due to the purpose of visiting the city-town among tourists which are varied from business purposes, leisure or work.

Despite its potential, the Malaysian hotel industry is also vulnerable to the constant pressure from global business issues (Said *et al.*, 2015). Heightened uncertainties due to tough economic situations and climate change are among the forces that have affected the development of the hotel industry in Malaysia. The impact of climate change is adversely effecting coastal communities including hoteliers as increased sea levels, heavy rainfall and cyclones could bring the damage to their property and hotel infrastructure (Senapati & Gupta, 2017). Nonetheless, climate change and its impacts are often treated as a distant problem. This is true as research on environmental impacts have suggested slow development in dealing with the impacts of climate change as compared to more immediate economic factors (Getz & Page, 2016). However, the problems related to climate change require continuous attention to minimize future impacts on the hotel industry. Measuring efficiency is crucial as part of the management control process as it provides information for improvements and in the decision-making process. In addition, an adaptation strategy in managing the impacts of climate change is crucial to minimize its impacts to service sector development.

Based on the Malaysian hotel industry's data and the issue of the climate change impact, the main focus of this study will be on unrated and 3-star hotels that are located on islands/beaches and these two types of hotels are chosen as they represent the highest number of hotel types. The study of these hotels therefore could potentially impact the development of the hotel industry as well as the tourism sector in Malaysia. While the climate change impact is unexpected and will bring many uncertainties to the business operator, the other focus will be on the hotels located on the islands/beaches as they

are more vulnerable to the risks of unexpected events caused by climate change.

Proposed Framework

The proposed framework is developed based on the situations in the Malaysian tourism industry due to climate change and unexpected climate-related events. A quantitative research method focuses on the optimization of organizational resources (inputs) to achieve the expected organizational outcomes (outputs) to produce the findings of the study. Researchers have suggested that the exploration of climate change requires a more robust approach as the solution for the issue seems to be uncertain and requires contextual-based understanding (Bigano *et al.*, 2006). De Freitas (2001) notes that relatively little is known about the effects of climate on tourism. He believes that, thus far, much of the research has been superficial because relationships between climate and tourism have been assumed rather than observed and have seldom been objectively tested. Thus, observation and the development of frameworks embracing theory, paradigms, processes and interactions are critical. This is to ensure that individual feedback could be linked into a specific climate change event and enable more actual experience to be integrated in the theory development while assisting the effort for practical implementation.

Therefore, this current study proposes the application of quantitative and qualitative methodology in gathering the necessary data to understand the interactions between climate change and hotel management. In the first stage, quantitative methodology using data envelopment analysis (DEA) will be employed as a nonparametric method that will allow the use of multiple outputs and inputs to measure the level of efficiency. The efficiency in the framework of DEA means the optimal allocation of resources used in a particular business operation. The advantage of using DEA to measure efficiency is that it enables the researcher to include the appropriate benchmarks that are crucial to the research context, hotel industry (Barros & Mascarenhas, 2005). While DEA considers multiple inputs and outputs simultaneously, this approach is considered more robust and effective as compared to other financial techniques. This allows the performance evaluation of decision making units (DMU) to be made by considering resources that are important for its operation in one analysis. The questionnaire for the quantitative method will therefore be developed according to the input and output chosen for the study. Based on the DEA results, the following stage involves qualitative methodology through in-depth interviews with managers/owners of the most and the least efficient hotels to explore the contextual elements that contribute to their hotels' efficiency score. Drawing on the RBV theory, interview questions will be tailored to understand the way in which each hotel utilises its resources to achieve its goals. Thematic analysis will be employed to

analyse the interview data and answer the research question.

The proposed framework suggests four inputs that influence the efficiency of the hotel operations as shown in Figure 1. The identification of these inputs is made based on the review of literature of on the efficiency studies in the hotel industry. The information is then tailored with the preliminary interviews carried out with

some experts in the hotel industry. In the Malaysian context, the pre-interview sessions with the hotel managers, who are the industrial experts, show that they believe that the two sources contributing to hotel revenues are rooms and food and beverages. Although occupancy rates are seasonal, the experts note that services from the food and beverages unit could ensure hotel revenue on a normal day.

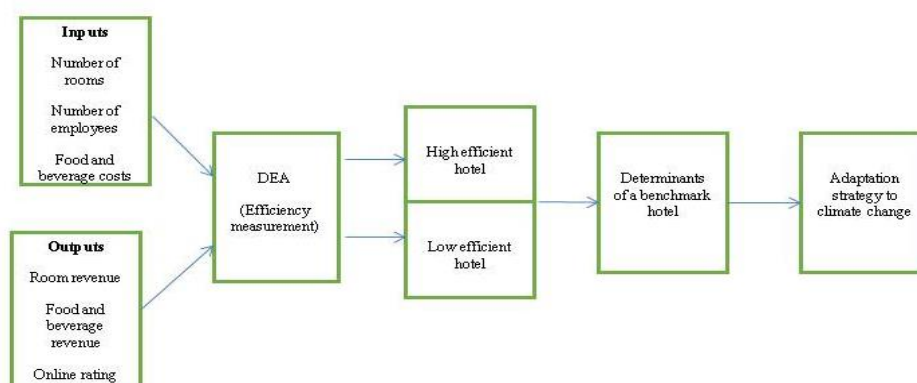


Figure 1: Research model for the hotel management in adaptation to climate change

(Source: Derived from preliminary interviews)

In line with the use of inputs discussed earlier, the output of the hotel operations is gained from room, food and beverage revenues. Because of the influence of technologies and online reservation systems, this current research proposes online rating as another output to be considered. That is because customers who have an experience with a particular hotel service may put their reviews online, which could influence the decision making of others. While a climate change-related event may be unpredictable, a review from an online reservation website could provide updated information quickly. This suggests the need for the inclusion of online ratings as an output for the hotels operation.

After the identification of the most efficient hotel by the DEA results, the investigation of the hotel's operations towards climate change is followed by a qualitative approach of the specific hotel. This would ensure that an in-depth understanding could be gathered to explain the most influential determinants of the most efficient hotel, especially regarding adaptation strategy to deal with the impact of climate change. RBV will be used as an underlying theory to guide the qualitative data analysis. From the comprehensive information derived from questionnaires and interviews, the hotel identified as the most efficient will act as a benchmark for other hotels in dealing with the challenges of climate change. This is especially significant in guiding inefficient hotels to improve their performance and stay competent in the market. The proposed framework (Figure 1) to assess the efficiency level of hotels with

the impact of climate change is mainly based on the DEA framework.

Based on the framework, the identification of inputs that have affected a hotel's efficiency will be the main determinant for the adaptation programme. As resources such as rooms, food and beverages and salary are the outcomes of employee performance, the adaptation programme for the hotel industry should focus on the human capital. This is particularly true in the hospitality industry because employee job satisfaction will strongly influence customer satisfaction (Aminuddin, 2013). Horwath Hotel Tourism and Leisure (HTL) surveyed Malaysian hotel operations and reported that hotels in Kuala Lumpur had produced an increase in revenue per available room while hotels in other cities reported declines of between 11 and 15% in 2010 (Horwath HTL, 2011). One possible explanation for the growth of hotels in Kuala Lumpur is the presence of international chain hotels includes Hilton, Shangri-La, Hyatt and others. Researchers believe that these international organizations bring modern management techniques to their branches in Malaysia (Andi Kele, Mohsin, & Lengler, 2017). In particular, the empowerment approach which is used to improve hotel performance and customer satisfaction. This can be done through job design and work environment, where minimum supervision is used to manage employees and decentralization that allows for flexible communication between managers and subordinates. The flexibility in the empowerment approach is relevant to the hospitality sector because employees deal directly with customers.

The opportunity for them to make improvements while performing their jobs has the potential to influence the hotels' performance. In fact, previous research has found that empowered employees contribute greatly to the effectiveness of a company through the increase of customer satisfaction (Ro & Chen, 2011). Thus, any strategies concerning climate change should include employee participation.

The focus on employee capabilities is also relevant to the Malaysian context due to the tight cost controls implemented by the hotels beginning in 2010 (Horwath, HTL, 2011). The implication has been on limited capabilities of a hotel to make improvements on physical resources like rooms and public hotel spaces if large financial costs are involved. The improvement of these resources remains possible but requires long lead times and thorough analysis before improvements can be made. With impact of climate change, these options may be unavailable in the event of a sudden and unexpected climate-related event. This leads to the need for better utilization of employees to improve the efficiency of hotel operations in the short term. However, further investigations of empowerment practices are necessary to ensure the successful implementation of the approach by the hotel management with the assistance of employees. Therefore, instead of focusing on infrastructure expansion and improvement, the hotel industry should utilize the skills and capabilities of employees, regardless of the changing situation during climate change. This will help to sustain the hotel operations and revenues.

Conclusion

This paper proposes a research model for hotel management to adapt to the impacts of climate change. Whilst the issue of sustainability is taken more seriously than ever by the hospitality industry, the framework focusing on the adaptation strategy for climate change impact could potentially drive a more responsible agenda and provide useful content to implement the agenda. Efficiency can be used as an essential element to develop an adaptation strategy for hotels to manage the impacts of climate change. This can go hand in hand with the increased necessity to explore the dynamic capability of organizations to gain a competitive advantage for organizational development. By understanding its own capabilities and resources, an organization could develop more managerial innovations to assist hotel management in operating and contributing to the economic development of the country. Although the proposed framework is based on a particular research context, this framework would be useful in understanding the interactions between climate change and the tourism sector elsewhere. It is undeniable that extreme weather changes could significantly influence the development of the tourism sector across the world. This understanding could be tailored to achieve highly efficient hotel practices, particularly in increasing environmental awareness among accommodation providers and bridge

the gap in the literature in the field of sustainable tourism. Importantly, an understanding of climate change may improve the quality of tourism in Malaysia by attracting more concern and awareness about the possible risks of climate change event and to be prepared with the best adaptation strategy that could benefit businesses and other tourism community as a whole.

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