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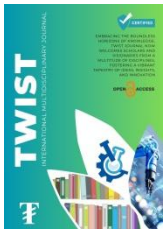

The Sustainable Development of Hotel Business: A Prediction Based on Sustainable Entrepreneurship and Energy Management

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Abstract
On the grounds that sustainable development and entrepreneurship are effective approaches to ensuring the future development of the whole community, several research streams spanning the nexus of sustainable entrepreneurship and sustainable development focus explicitly on environmental sustainability and energy efficiency. This study aims to confirm that small and medium hotel entrepreneurs in Bangkok, Thailand, play critical roles in sustainable entrepreneurship and energy-efficient management, highlighting the benefits of embracing sustainable development. The author utilized exploratory factor analysis and multiple regression analysis to scrutinize significant aspects of sustainable contributions, perspectives on energy management, and the extensive advantages of sustainable development for hotels, while also establishing a correlation between these variables. The results showed a positive relationship between these variables, which contributes to developing a model of sustainable development prediction based on sustainable entrepreneurship and energy management. Ultimately, the model would motivate hotel entrepreneurs to move ahead with putting sustainable management policies and operations into effect, particularly those relating to energy efficiency, as it allows the hotels to save on costs and demonstrates a public commitment to environmental stewardship.

Keywords
Sustainable development, Sustainable business, Hotel entrepreneur, Energy management

INTRODUCTION

Sustainable development has recently emerged as a leading business and policy concept. It involves improving the overall standard of living, including environmental, cultural, economic, and social dimensions. Other benefits include a vibrant and inclusive economy, a stable environment that promotes public health and mental wellbeing, community vitality, effective management, effective voluntary participation of individuals and groups, less waste generation, and ecosystem enforcement (Power, 2004).

In light of this, businesses are more aware of their sustainability and environmental consequences. John Elkington introduced a “triple bottom line” strategy for sustainability in the mid-1990s. Since then, most large companies have public sustainability strategies and utilize this technique to assess economic, environmental, and social performance (Elkington, 1998). However, small and medium enterprises (SMEs) are apparently falling behind in this regard. Some have become sustainable entrepreneurial companies by aligning their sustainable development goals with environmental and social issues (Jansson et al., 2015). SMEs need sustainable entrepreneurship to develop a sustainable future, which is essential to universal sustainability. The Office of SME Promotion reports that many Thai hotels are service sector SMEs (OSMEP, 2019). Their energy expenditures are high because they are one of the biggest consumers. Thai hotel entrepreneurs are trying to follow Thailand's sustainable policies, such as the "20-Year Energy Efficiency Development Plan (2011–2030)," which encourages SMEs to use energy-efficient practices. Other policies, such as "Thailand Energy 4.0," prioritize energy-efficient growth in the future. It stimulates Thai enterprises to develop new energy-related inventions, resulting in global revitalization (Sutabutr, 2016).

Recognizing how essential maintaining sustainability is, hotel entrepreneurs, realizing the importance of maintaining sustainable operations, particularly through energy conservation, will undoubtedly implement energy management (EM) in their businesses to enhance energy efficiency. Advocates have long emphasized this as a crucial approach to boosting societal productivity and sustainability (Campbell et al., 2012). The implementation of EM strategies can improve the competitiveness, innovation, and resourcefulness of SMEs by reallocating resources to more productive activities and reducing costs (Wachter, 2022). Thus, exploring sustainability-driven entrepreneurship and contributing to sustainable efforts should be sustainable entrepreneur's primary goals, and building a successful, viable enterprise is a means to that end.

Given the prior stated concern, this study seeks to investigate small and medium-sized hotels in Bangkok, the capital city of Thailand, which is home to a majority of Thai SMEs (OSMEP, 2019). The objective is to confirm the crucial contribution of small and medium hotel entrepreneurs in Bangkok to sustainable entrepreneurship and energy management, while emphasizing their role in predicting sustainable development in the hotel business. Additionally, this study offers incentives for hotel business to embrace sustainable features, as it not only yields long-term cost savings but also highlights energy efficiency, which can ultimately bolster their public perception.

LITERATURE REVIEW

Sustainable Development (SD) and SMEs

Environmental sustainability is a topic of growing interest among both researchers and environmental management practitioners (Aroonsrimorakot et al., 2022). Increasing biodiversity, climate change, pollution, and drought are global environmental challenges (Fontanella et al., 2019). Therefore, SD has become a prominent topic in environmental discourse because it indicates that society can progress while sustaining social, environmental, and economic objectives (the "triple bottom line"), utilizing resources to enhance abundance for current generations without sacrificing future opportunities (WCED, 1987). Consequently, SMEs are required to align their goals with SD, especially environmental and social challenges (Jansson et al., 2015). The best ways encompass policies, investments, and new ideas (Fischer et al., 2018).

This study then thoroughly examines the three aspects of the SD to see how they relate to small and medium sustainable entrepreneurship, which seeks to reduce costs for hotels while also demonstrating a public commitment to sustainability.

Sustainable Entrepreneurship (SE)

Many entrepreneurs value sustainability in their businesses (Jansson et al., 2015). Cohen and Winn (2007) defined SE as receiving products and services while considering economic, psychological, social, and environmental impacts. Schaltegger and Wagner (2011) proposed a sustainable entrepreneurial paradigm. This paradigm expects sustainable entrepreneurs to significantly contribute to the three sustainability pillars. This framework promotes economic growth, sustainable farming, social solidarity, the abolition of prejudices, climate change technology, environmentally friendly practices, and sustainable consumption (UN General Assembly, 2015). Small and medium entrepreneurs are crucial to SD because they create a sustainable future. Through sustainable practices, enterprises can achieve public reputation and stakeholder trust. This helps them improve corporate performance and create sustainable business plans. This study seeks to examine the relationship between SE and SD based on the available evidence. Therefore, the subsequent hypothesis is formulated:

Hypothesis 1 (H_1): SE is a significant predictor of the SD of small and medium hotels in Bangkok.

Energy management (EM)

As sustainable enterprises, it is crucial for SD drivers to stay ahead of the curve. Campbell et al. (2012) support the idea that enhancing EM leads to higher social productivity and sustainability, primarily through reducing energy use. Based on Wachter (2022), energy efficiency helps SMEs cut expenses and reallocate resources, improving resourcefulness, innovation, and competitiveness. Therefore, SMEs have embraced EM practices, saved energy, and prioritized renewable energy. Energy efficiency boosts economic growth, infrastructure, energy security, institutions, environmental sustainability, social inclusion, and poverty reduction, according to the 2015 UN General Assembly. It also increases lucrative revenue and public environmental awareness (Kamal et al., 2019). The hotel sector uses lots of electricity. Managers recognize that the hotel industry's rapid growth harms the environment globally. Thus, they currently help SD by promoting energy efficiency and environmental awareness (Popsa, 2023). Studies have found energy-efficient hotel practices in management policies (MP), operations (OP), maintenance (MT), guest rooms (GR), and facilities (FC) (WTO, 2010; Wang et al., 2018; Kapiki, 2010). As a result, this study assesses sustainable entrepreneurs' EM practices to determine their contribution to hotel enterprises' global SD goals. Consequently, we form the following hypotheses:

Hypothesis 2 (H_2): MP is a significant predictor of the SD of small and medium hotels in Bangkok.
Hypothesis 3 (H_3): OP is a significant predictor of the SD of small and medium hotels in Bangkok.
Hypothesis 4 (H_4): MT is a significant predictor of the SD of small and medium hotels in Bangkok.
Hypothesis 5 (H_5): GR is a significant predictor of the SD of small and medium hotels in Bangkok.
Hypothesis 6 (H_6): FC is a significant predictor of the SD of small and medium hotels in Bangkok.

METHODOLOGY

Sample Determination

The respondents to this survey were entrepreneurs or managers of small and medium hotels in Bangkok, Thailand. According to the OSMEP report of December 10, 2022, there were a total of 1,260 small and medium hotels in Bangkok (OSMEP, 2022). The researchers used a typical probability sampling method with 95% confidence and +5% precision (Yamane, 1973). The researchers obtained a minimum sample size of 304 entrepreneurs and managers. The Geographic Information Division (2024) classified Bangkok's 50 districts into six authority-based groups. We rounded each group's sample demand to 51. We added 2% to each group, totaling 312 samples, to improve study accuracy and importance. Multistage area sampling combined two or more probability sampling methods to acquire data (Zikmund et al. 2013). We randomly selected one district from each category in the initial sample stage. We randomly selected Paya Thai, Sathron, Ladprao, Bang Kapi, Klongsan, and Phasricharoen. We distributed a self-administered questionnaire to a representative sample of entrepreneurs and managers from small and medium hotels in each group's designated areas in the second stage. Table 1 shows details.

Table 1 Number of Sample Determinations

Bangkok Authority-Based Groups	No. of Districts	Randomly Selected District	No. of Samples
1. Central	9	Paya Thai	52
2. South	10	Sathorn	52
3. North	7	Ladprao	52
4. East	9	Bang Kapi	52
5. North Krungthon	8	Klongsan	52
6. South Krungthon	7	Phasricharoen	52
Total	50		312

Research Instrument

A self-administered questionnaire consisted of three parts: Section 1 asked respondents about their gender, age, and hotel experience. Sections 2-4 covered the theories from the literature review. In Section 2 on SE, respondents assessed their sustainable contribution participation. The UN General Assembly's resolution on entrepreneurship for SD inspired this segment's questions (UN General Assembly, 2015). Three issues addressed hotel businesses' economic, environmental, and social triple bottom lines. In Section 3, respondents rated their energy-efficient methods in five hotel areas: management policies (MP), operations (OP), maintenance (MT), guest rooms (GR), and facilities (FT). These questions were based on the World Tourism Organisation's energy efficiency guidebook (WTO, 2010), an evaluation index of energy-saving and environmental protection methods (Wang et al., 2018), and hotel energy solutions (Kapiki, 2010). It included twenty five items. In Section 4, respondents assessed SD and the benefits of contributing. The International Energy Agency (IEA) provided the questions in this category to measure the benefits of energy efficiency for sustainable development (Kamal et al., 2019). Nine items again pertain to economic, environmental, and social sustainability. In Sections 2-4, respondents rated the questionnaire on a five-point Likert scale: strongly disagree, disagree, neither agree nor disagree, agree, and highly agree. The Index of Item-Objective Congruence (IOC) verified the questionnaire content's validity. Two hotel executives and one researcher rated IOC -1 to +1. We accepted items with scores over 0.5 (Rovinelli & Hambleton, 1977). All 37 questions in sections 2-4 scored more than 0.5, suggesting they met research objectives (Turner & Carlson, 2003). Therefore, we kept them in the questionnaire.

Data Collection

We first investigated the pre-test during data collection to evaluate the internal consistency and reliability of the questionnaire using Cronbach's alpha. We made this decision to guarantee the reliability and consistency of the instrument's responses. There is no formula for determining the number of members required. The decision is entirely subjective. Perneger et al. (2015) believes that 30 members are sufficient. Thus, in this study, 30 entrepreneurs and managers of small and medium hotels in Bangkok, who were members of the study population but not part of the sample group, pre-tested the questionnaire. Cronbach's alpha for items in Section 2 on SE was 0.768, 0.825 for items in Section 3 on EM, and 0.844 for items in Section 4 on SD. These Alpha values indicate that the questionnaire was reliable as they fell between 0.7 and 0.8 (George & Mallery, 2010). Additionally, the pre-test results also addressed the instrument's strengths and weaknesses in question content, wording, format, and order. Therefore, we completed a pre-test and revision before the final distribution of the questionnaire and then started data collection. Table 1 displays the random selection of samples from the designed districts. We then gave them the questionnaire to complete.

Data Analysis

We first analyzed the collected data using descriptive statistics to make sure the statistical techniques used in this study did not violate any assumptions. The study required a normality test to confirm the normal distribution of variable scores (Pallant, 2016). Then, we used exploratory factor analysis (EFA) to calculate variable correlations and identify the number of factors that influence them (Haig, 2010; Yong & Pearce, 2013). We also used Pearson correlation analysis to describe the strength and direction of the linear relationship between two variables (Pallant, 2016). Additionally, we

applied multiple regression analysis, which is based on correlation and allows a more sophisticated exploration of the interrelationship among a set of variables (Tabachnick & Fidell, 2019). It helped to explore how well SE and EM were able to predict the SD of small and medium hotels. Finally, for hypotheses with multiple independent variables, we measured a formal detection-tolerance or variance inflation factor (VIF) for multicollinearity to indicate a multicollinearity problem.

RESULTS

Descriptive Analysis

The primary check was the normality test, as indicated by descriptive analysis. In this paper, an examination of the normal probability plot revealed that all variables appeared to be reasonably normally distributed. The descriptive analysis results shown that a greater proportion of the 312 respondents were male (66.67 percent). The most common age was 50 or older (46.15 percent), and hotel experience was most frequently between 20 and 29 years (52.88 percent).

Exploratory Factor Analysis

In order to explore factoring analysis, the thirty-seven predetermined questions pertaining to SE in Section 2, EM in Section 3, and SD in Section 4 of the questionnaire were examined. All of these data sets were qualified for factor analysis since 60 percent of the correlation coefficients in the correlation matrix were larger than 0.30, suggesting that the outcomes were highly interrelated (Noursis, 1994).

Table 2 Kaiser-Meyer-Olkin (KMO) and Bartlett's Test

Variables	KMO	Bartlett's Test	Sig.	Int.[b]	Ave. Com.[a]
SE	.638	297.686	.000	Significant	.688
EM	.927	6752.314	.000	Significant	.747
SD	.796	503.942	.000	Significant	.573

a. Average communalities
b. Interpretation

Table 2 displays additional results, including the Kaiser-Meyer-Olkin (KMO) and Bartlett's tests. The KMO measuring sampling adequacy were 0.638, 0.927, and 0.796, respectively. This was above the required 0.6, indicating creditable and interrelated data (Kaiser, 1974). The Bartlett's Test of Sphericity Value was 297.686, 6752.314, and 503.942, respectively, with a sig. value of 0.000. The sig. value, which was equal to or less than 0.05, implied a significant and adequate correlation to factor analysis (Pallant, 2016). Additionally, the communalities' average values ranged between 0.573 and 0.747, satisfying the Kaiser Criterion's requirement for a value greater than 0.40 (Yong & Pearce, 2013). This indicated that the common factors moderately described the data's variance.

For additional details regarding factor extraction, refer to Table 3, which indicates the outcomes of Section 2, SE. We included all three suggested criteria for SE contribution because their factor loadings exceeded the 0.40 threshold, as determined by pragmatic reasoning (Yong & Pearce, 2013). The principal component analysis identified only one dimension: SE. This dimension accounted for 68.76 percent of the total variation and was considered significant because it consisted of at least three variables and had an eigenvalue of 2.06, which was above the acceptable threshold of 1.0 (Tabachnick & Fidell, 2019).

Table 3 Exploratory Factor Analysis for Sustainable Entrepreneurship

Sustainable entrepreneurship	Mean	St. dev.[a]	Loading
Factor 1: Sustainable Entrepreneurship (SE)			
1. Encourage technological adaptation to promote environmentally sustainable practices and consumption patterns.	3.55	.847	.775
2. Boost economic growth by creating jobs, promoting innovation, and encouraging economic value.	3.57	.807	.781
3. Promote social cohesion, reduce inequality, and develop opportunities for all, including women, young people, disabled people, and vulnerable people.	3.48	.726	.507
Number of Items	*3*		
Eigenvalue	*2.06*		
Percentage of variance (%)	*68.76*		
Cronbach's alpha (α)	*0.77*		

a. Standard Deviation

Table 4 Exploratory Factor Analysis for Energy Management

Energy Management	Mean	St. dev.[a]	Loading
Factor 1: Management Policies (MP)			
1. Install a ventilation movement sensor in bathrooms and toilets that only works when triggered.	3.51	.911	.799
2. Manage guests into blocks where possible, i.e., rooms next to each other, to cool one part of the building and achieve one temperature level in a concentrated part of the building.	3.47	.903	.788
3. Train and motivate employees to keep energy consumption low.	3.49	.871	.781
4. Install photocells and motion detectors in places like public restrooms where it's unrealistic to expect users to turn on and off the lights.	3.58	.838	.780
5. Replace conventional showerheads with water-efficient showerheads.	3.53	.829	.761
6. Use key card-controlled lighting, HVAC systems, televisions, and motorized draperies.	3.46	.877	.754
7. Communicate to all staff the key objectives of the energy efficiency program.	3.57	.850	.682
8. Use natural ventilation, which can maintain a comfortable indoor temperature without requiring energy.	3.63	.827	.673
9. Commit to reducing energy consumption by using energy more efficiently while maintaining standards of guest comfort.	3.71	.774	.661
10. Ensure that room temperatures match recommended temperature standards as closely as possible.	3.55	.913	.599
11. Set the thermostats to the appropriate temperature on all water heaters.	3.51	.829	.596
12. Use eco-labeled or Thailand Energy-labeled electronic products.	3.52	.900	.574
Number of Items	*12*		
Eigenvalue	*12.11*		
Percentage of variance (%)	*48.44*		
Cronbach's alpha (α)	*.95*		
Factor 2: Maintenance (MT)			
1. Set thermostats in unused areas, such as unoccupied offices, guest function, or storerooms.	3.66	.814	.808
2. Check the time and temperature settings on all electric panels and storage heaters.	3.62	.874	.783
3. Check doors and windows are sealed to ensure airtightness.	3.71	.716	.778
4. Monitor the energy consumption of diesel, gas, water, and electricity.	3.59	.863	.774
5. Ensure proper use of ventilation; clean aggregates, grids, and condensers.	3.56	.862	.727
Number of Items	*5*		
Eigenvalue	*2.21*		
Percentage of variance (%)	*8.84*		
Cronbach's alpha (α)	*.91*		
Energy Management	**Mean**	**St. dev.**	**Loading**
Factor 3: Operations (OP)			
1. Use wireless EM to support multiple controls for a building's main energy-using equipment.	3.57	.795	.850
2. Use an energy benchmarking tool to evaluate carbon emissions and mitigating techniques to control energy efficiency.	3.59	.805	.826
3. Nominate staff members to oversee key action points that improve the workplace's efficiency.	3.64	.797	.562
4. Use renewable energy for water heating and electricity, e.g., solar thermal, solar cells, solar cooling, biomass, wind power, etc.	3.54	.781	.509
Number of Items	*4*		
Eigenvalue	*1.76*		
Percentage of variance (%)	*7.03*		
Cronbach's alpha (α)	*.89*		

a. Standard Deviation

Table 4 presents the results of Section 3, which examined twenty five suggested items for EM practices. Since all the items had factor loadings exceeding 0.4, they were all deemed acceptable (Yong & Pearce, 2013). Principal component analysis yielded five dimensions. We eliminated two dimensions, each consisting of two items, because they failed to

satisfy the minimum factor criteria of three items or variables (Tabachnick & Fidell, 2019). There remained just three dimensions with a total of twenty one items in the results. Therefore, these three dimensions with 12, 5, and 4 items and eigenvalues greater than 1.0 were preserved. (Kaiser, 1960). The identification of the three dimensions as factors was accurate. We specifically designated them as management policies (MP), maintenance (MT), and operations (OP). The variance percentages for the three dimensions were 48.44%, 8.84%, and 7.03%, respectively. These percentages collectively account for 64.31% of the overall variation across all three dimensions. Table 5 presents a list of the three factors under consideration.

Table 5 Exploratory Factor Analysis for Sustainable Development

Sustainable Development	Mean	St. dev.[a]	Loading
***Factor 1: Sustainable Development* (SD)**			
1. The total costs of energy supply, water, heating, and air-conditioning are reduced.	3.55	.854	.595
2. The capital investment for new energy projects is saved due to the greater efficiency of the new equipment.	3.56	.839	.562
3. The release of greenhouse gases, especially carbon dioxide (CO2), is reduced.	3.66	.782	.565
4. The hotel has a greater positive image as a green public business.	3.63	.775	.441
5. The changes in the hotel staff's energy efficiency behavior will affect overall energy consumption and result in individual and societal welfare benefits.	3.64	.797	.704
Number of Items	*5*		
Eigenvalue	*2.87*		
Percentage of variance (%)	*57.33*		
Cronbach's alpha (α)	*.81*		

a. Standard Deviation

Table 5 displays the findings from Section 4, which examined each of the nine suggested sustainable development items. We eliminated four items with low communalities from the scale to preserve the reliability-based line of having the mean extracted communalities at or above 0.4 (Yong & Pearce, 2013). Factor loadings greater than 0.4 were only present in five acceptable items. The primary components formed only one dimension, sustainable development (SD), which explained 57.33 percent of the variance.

For the examination of reliability, Cronbach's alpha coefficient (α) was employed to determine internal consistency among the many items in each factor (Cronbach, 1951). Cronbach's alpha coefficients ranged from 0.77 to 0.95 for all dimensions in Tables 4 to 6. These values exceeded 0.70, indicating that they were valid and reliable for further statistical analysis (Peterson, 1994).

Pearson Correlation

We investigated the relationship among variables using the Pearson product moment correlation coefficient, as shown in Table 6.

Table 6 Correlation of the Variables

		SD	SE	MP	MT	OP
SD	Sustainable development	-				
SE	Sustainable entrepreneurship	0.816*	-			
MP	Management policies	0.833*	0.729*	-		
MT	Maintenance	0.586*	0.552*	0.711*	-	
OP	Operations	0.857*	0.784*	0.636*	0.441*	-

** The correlation is significant at the 0.05 level (2-tailed)*

Table 6 presents the Pearson correlation coefficient (r). Cohen (1988) proposes that r values between 0.5 and 1.00 indicate a substantial impact size. There was a significant and strong positive correlation (r = 0.816*) between the SD and SE. This relationship was confirmed by a p-value of 0.000 (p<0.05). As the SE level increased, the SD also improved.

There was a significant positive correlation (r = 0.833*) between the SD and MP for EM. The p-value was 0.000 (p<0.05), showing a significant relationship. As the level of MP increased, SD would improve. The relationship between SD and MT in EM was moderately positive, with a correlation coefficient (r) of 0.586*. The p-value was 0.000 (p<0.05), suggesting statistical significance. As the MT level increased, the SD rose slightly. Furthermore, the SD and OP in EM had a significant and substantial relationship (r = 0.857*). The p-value of 0.000 (p<0.05) indicated that this correlation was statistically significant. As the level of operations increased, the SD also improved. Overall, these findings

demonstrated an unambiguous relationship between the EM, MP, MT, and OP strategies used by small and medium hotel entrepreneurs and the SD of small and medium hotels.

Multiple regression

The next stage was to perform multiple regressions based on the above-stated correlation. Table 7 displays the results.

Table 7 Coefficients of Hypothesis Testing

Coefficients[a]								
	Unstandardized Coefficients		Standardized Coefficients				Collinearity Statistics	
Model	**ß**	**Std. Error**	**Beta**	**t**	**Sig.**	**Int.[b]**	**TOL**	**VIF**
Constant	.315	.077		4.119	.000	Significant		
SE	.102	.034	.110	2.97212	.003	Significant	.293	3.418
MP	.392	.031	.447	.687	.000	Significant	.322	3.101
MT	-.008	.025	-.009	-.310	.757	Not Significant	.489	2.043
OP	.439	.029	.491	15.022	.000	Significant	.374	2.676

a. Dependent Variable: Sustainable Development (SD)

b. Interpretation

c. R= 0.737, R^2 =.543

To ascertain the impact of each independent variable on the prediction of the dependent variable, it is imperative to assess each independent variable individually. The study found an important positive relationship between all independent factors and the SD of small and medium hotels in Bangkok. The correlation coefficient (r) was 0.737, indicating a strong relationship because a correlation was greater than 0.7 (Moore et al., 2013). The R-squared (R^2) value of 0.543 indicates that the independent variables collectively explained 54.3% of the variance in the SD. We used standardized coefficients as a unified scale of measurement to facilitate the comparison of various variables.

The analysis of the independent variables in Table 8 revealed that only three variables had a significant impact on SD. These variables included SE (ß =.110, t = 2.972, $p < 0.05$), MP (ß =.447, t =.687, $p < 0.05$), and OP (ß =.491, t = 15.022, $p < 0.05$). To some extent, SE's beta value was 0.110, with a p-value of 0.003, indicating that H_1 was accepted at a statistically significant level of 5%. This implies that SE is a significant predictor of the SD of small and medium hotels in Bangkok. If SE expands by one standard deviation unit, it is likely that the SD will also rise by 0.110 standard deviation units. The MP exhibited a beta value of 0.447 and a p-value of 0.000, suggesting a statistically significant acceptance of H_2 at the 5% level. MP has the ability to predict the SD of small and medium hotels in Bangkok. A one-standard deviation increase in MP will result in an expected increase of 0.447 standard deviation units in the SD. Finally, we accepted the OP's H_3 at a 5% significance level, with a beta coefficient of.491 and a p-value of 0.000. This suggests that the OP is a significant predictor of the SD of small and medium hotels in Bangkok. We anticipate an increase in the SD of approximately 0.491 standard deviation units if we increase the OP by one standard deviation unit. Therefore, the research model can include these three variables because they provide support for the hypotheses. However, the coefficient of MT (ß) was -0.009, and the p-value was greater than 0.05. This indicates that MT does not make a statistically significant contribution to the SD prediction. Therefore, H_4 is deemed invalid. Consequently, the model would no longer incorporate MT.

When considering the variance explained by all different variables in the model, the higher ß values for MP (ß =.447) and OP (ß =.491) indicate that these variables have the greatest individual impact on explaining the SD. The lower ß coefficient for SE (ß = 0.110) indicates that this variable had a smaller impact or contribution. Furthermore, the tolerances (TOL) of the important independent variables were 0.293, 0.322, and 0.374, all beyond the threshold of 0.2. This suggested the absence of multicollinearity, as stated by O'Brien (2007). The variance inflation factors (VIF) were 3.415, 3.101, and 2.676%, respectively. The values were below 5, indicating that there were no interrelationships among the independent variables. Thus, the presence of multicollinearity remained unaffected (Anderson, 2021).

The research results above indicate that SE and two areas of EM, namely MP and OP, have a positive relationship with the SD and are significant predictors of the SD. Figure 1 below illustrates the formation of the final model.

DISCUSSION

The survey and analysis results bolstered the research project's objectives, demonstrating a favorable correlation between SE, EM, and the SD of small and medium hotels in Bangkok. To a certain extent, the more entrepreneurs engage in SD, the more benefits they derive from it. These results align with the investigation of Dhahri and Omri (2018), who confirmed a positive entrepreneurship contribution on two dimensions within sustainable, economic, and social aspects. Jansson et al. (2015) also confirmed that many managers of SMEs hold positive attitudes toward the environment. They pointed out that even though SMEs have less sustainable practices in place than larger companies, they still intend to pursue and achieve SD in the long term. Therefore, we can confidently state that sustainable entrepreneurs who strive to achieve a balance of economic wealth, environmental preservation, and social equity are important drivers of SD (Filser et al., 2019). In addition, the more entrepreneurs engaged in EM, especially concentrating on MP and OP, the more they benefited from SD. The WTO (2010) stated that hotels' organizational structures incorporate EM. Significantly, energy

efficiency allowed hotel entrepreneurs to save on costs, which benefits them the most. SD enhances capital equipment services, improves guest comfort, and demonstrates a commitment to fighting climate change (Energy Star, 2020). However, Tela et al. (2020) discovered that energy savings as a result of energy efficiency have a significant impact on employees perceived moral behavior. Therefore, integrating EM into a hotel's daily operations fosters an ecosystem that continuously enhances energy efficiency (WTO, 2010). This, in turn, reduces the hotel's energy costs and amplifies benefits, consequently encouraging SD (Kapiki, 2010).

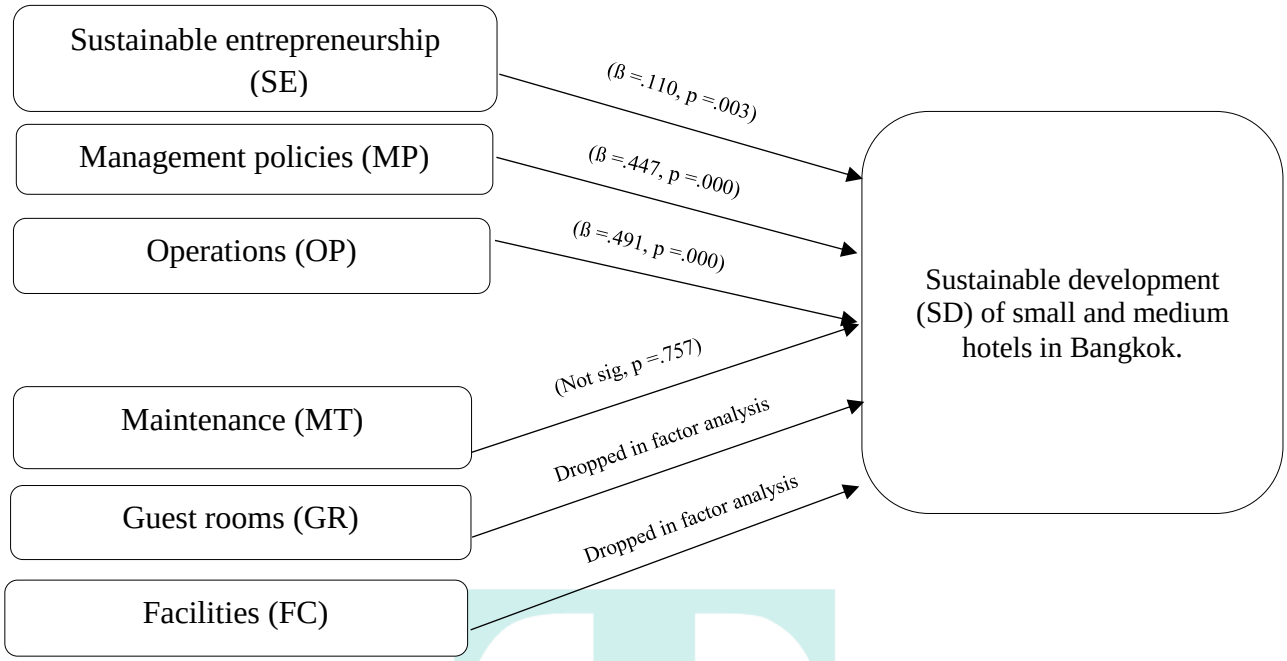

Fig. 1 The Research Model for the Sustainable Development of Small and Medium Hotels in Bangkok

CONCLUSION AND RECOMMENDATIONS

In conclusion, this article unequivocally confirms that SE and EM are crucial factors in predicting the SD of small and medium-sized hotels in Bangkok. Hotel entrepreneurs play a vital role in promoting sustainable business practices and benefiting the community as a whole. To achieve sustainable objectives, they should focus on SE and maintain appropriate energy efficiency measures. EM should primarily focus on service methods, encompassing MP and OP rather than MT. The hotel management should make a strong commitment to decrease energy usage by optimizing energy efficiency without compromising guest comfort standards (WTO, 2010). All employees should effectively receive the fundamental objectives of the energy efficiency program, followed by comprehensive training and ongoing motivation to minimize their energy consumption. Hotels must conduct regular energy consumption analyses to monitor their progress and adapt to any changes that could further decrease greenhouse gas emissions. Additional cost-effective methods suggested for supporting hotel entrepreneurs may include the implementation of eco-labeling and energy benchmarking, the adoption of wireless EM systems, and the use of renewable energy sources. Implementing the recommended principles will enhance hotel entrepreneurs' capabilities, allowing them to advantage from the positive impacts of establishing sustainable practices in their hotels. These benefits primarily include increased consumer preference and improved energy efficiency, leading to reduced energy expenditures.

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DECLARATION OF CONFLICT

The author affirms that they are free of any identifiable conflicting financial interests or personal relationships that could have potentially influenced the findings presented in this paper.

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