



Willingness to Use and Pro-Environmental Attitudes for Airlines' Environment Friendly Services: The Perspective of Thai Passengers

Maytinee Vongtharawat*

Kasetsart University,
Bangkok, Thailand

Katawoot Jeambua

Rajamagala University of Technology
Thanyaburi, Khlong Hok, Thailand

Santidhorn Pooripakdee

Silpakorn University,
Bangkok, Thailand

Abstract: This research has three main objectives. Firstly, there is an intention to understand passengers perception towards airlines environmentally friendly services related to pre-travel, pre-flight and in-flight service. Secondly, there is the investigation of passengers pro-environmental attitudes and perceptions towards airlines environmentally friendly services. Thirdly, there is the analysis of passengers willingness to use the airlines toward pro-environmental attitudes. To confirm theories, relevant literature has been drawn from both paper versions and reliable sources, which is our methodology. Utterly, the results showed that there are significant differences in perceptions towards airlines environmentally friendly services and passengers pro-environmental attitudes. Additionally, passengers pro-environmental attitudes have a positive effect on the willingness to use the airlines. The conclusion is substantial to the improvement and sustainability of airlines environmental protection efforts and airlines business performance.

Keywords: *Willingness to use, pro-environmental attitudes, environmentally friendly services, passenger perception*

Received: 13 May 2019; **Accepted:** 12 July 2019; **Published:** 26 August 2019

INTRODUCTION

Airports in Thailand have the capacity to accommodate a huge number of passengers. Suvarnabhumi International Airport sees an average of nearly 70 flights flowing in and out per hour. Several other airports across the country accommodate more than 10 flights per hour. To support the increased capacity demands that are primarily resultant from the gradual growth of international visitors, airports across Thailand are investing significant financial and human resources into improving their operations ([Thailand Board of Investment, 2019](#)).

Thailand, moreover, relies on imported aviation equipment and is a net-importer of products, including aircraft parts, maintenance services, and airport/ground support equipment. U.S. aviation equipment and technology are well-received by Thai buyers ([International Air Transport Association, n.d.](#)). Additionally, Thailand is expected to receive over 40 million tourists in 2019, a 5.5% increase from 2018, according to the Tourism Council of Thailand. Under a Thai government policy to develop the domestic aerospace industry, Maintenance, Repair and Overhaul (MRO) services will take center stage. Thailand is a major player in regional aircraft maintenance and manufacturing industries. Infrastructure facilities are in place for aircraft repair and engine overhaul services. The major leading airlines in the country, Thai Airways, Bangkok Airways, and Thai Lion Air, have established Maintenance MRO facilities, aiming to serve their own aircraft and those of other airlines that service Thailand.

*Correspondence concerning this article should be addressed to Maytinee Vongtharawat, Kasetsart University, Bangkok, Thailand E-mail: meemay05@gmail.com

Airlines' environmentally friendly services are mentioned in terms of environmental management in 2018. Moreover, Airports of Thailand Public Company Limited (AOT) has continuously been committed to enhancing airport service quality, safety as well as the well-being of communities surrounding airports so as to achieve its vision to operate the world's smartest airports while increasing competitive excellence according to the Strategic plan's goals to be reached by 2021 as well as respond to the Sustainable Development Goals of the United Nations ([Airports of Thailand Public Company Limited, 2018](#)). In terms of sustainable development aspect, AOT has included the issues on the country's development and the social well-being and benefits as part of its strategies and day-to-day operations by defining activities or providing support to improve the environment, society, and economic system.

Rarely, willingness to use Airline business has been found. In his study, [Martín, Román, and Espino \(2008\)](#) mentions willingness to pay for airline service quality in terms of the monetary valuations, pay, or air travel regarding level-of-service attributes. The quantitative method, logit regression, has been studied from the work of [Garrow, Jones, and Parker \(2007\)](#); the willingness to pay to travel by air and willingness to pay for air service improvements are developed. Additionally, [Kuo and Jou \(2017\)](#) refer to the supply side of strategic pricing planning for the civil aviation industry rather than the demand side. Therefore, the willingness to use the airline business is still in the dark. This research would like to shine it.

In terms of pro-environmental attitudes, [Félonneau and Becker \(2008\)](#) studied about a social dominant norm, which is a self-reported environmental concern not necessarily accompanied by a change in attitudes, values, and beliefs. Furthermore, the self-presentation paradigm examined student's adherence to and knowledge of this pro-ecological norm explored by [Félonneau and Becker \(2008\)](#) and discussed the gender differences. A survey to study the Psychology and Educational Sciences study programmes from [Pavalache-Ilie and Unianu \(2012\)](#) revealed the fact that it is necessary to train internally in order to develop a more positive attitude towards the environment. This can be realized within an educational programme aimed to promote the acquisition of internality in the causal explanation of behaviours, adapting the internality training techniques to the city population, teachers, employees and children. What's more, pro-environmental attitudes rise and fall with current events and vary with age, gender, socioeconomic status, nation, urban-rural residence, religion, politics, values, personality, experience, education, and environmental knowledge ([Chalfoun, 2018](#); [Gifford & Sussman, 2012](#); [Nabilla, 2019](#)). However, the airline aspect of the attitude in the pro-environmental attitude should be clear.

Finally, this research has three main aims, which are: To study Thai passengers' perceptions of airline' environmentally friendly services related to pre-travel, pre-flight, and in-flight services; To understand passengers' pro-environmental attitudes and perceptions towards airlines' environmentally friendly services; To understand passengers' willingness to use the airlines towards pro-environmental attitudes. The literature review includes the three groups of variable items, as shown in the topics of this article. Lastly, the two hypotheses were tested and the results will be shown as well as discussed in the last part.

LITERATURE REVIEW

Airlines' Environmentally Friendly Services

The commercial aviation industry is a critical contributor to Global Greenhouse Gas (GHG) emissions of some pollutants and makes a negative impact on the environment that causes global warming alternately ([Forsyth, 2011](#)). Additionally, there are some endeavors that airline companies demonstrate their modest policies and technological advance to express their concern for global environmental protection. These efforts include reducing carbon footprint, testing of alternative bio-fuels efficiency of newer aircraft, using renewable energy, and recycling fuels during aircraft maintenance. This related method will be able to mitigate the growth of Carbon dioxide (CO₂) emission generally produced by the airline industry ([Mair, 2011](#)).

The International Air Transport Association (IATA) has addressed the environmental benefits of climate impact management as part of the airline leader industry to achieve a zero carbon-emission future flight by the year 2050. This objective is required as all IATA airline members responsibility in order to strongly operate practices together followed in the aviation industry's four-pillar climate protection strategy. This strategy absolutely consists of technological progress improvements, aircraft operational efficiency, and ground processes measure, airport-based infrastructure improvements and a global market-based measure system to complement the other three pillars ([International Air Transport Association, n.d.](#)). Attributes of airlines environmentally friendly services have been proposed from reputed airlines' websites and international airlines annual sustainability reports. The items are most truthfully associated

with air passenger services. In this study, these services can be divided into the following three stages of procedures: pre-travel, pre-flight, and in-flight services.

In the pre-travel stage, online services are provided during the airline ticket reservation process, such as seat selection, special meal order, and selection. Passenger also receives flight information, for instance, time table, flight status, schedule management, additional services, membership services, promotions, and travel distribution channels. In addition, airlines decide to use lightweight materials for all cabin service equipment or eco-friendly products to reduce aircraft fuel consumption and greenhouse gas emissions. Moreover, airlines convince passengers to pre-order in-flight meals and duty-free products through an online electronic system before departure flight to decrease aircrafts' total weight (China Airlines, 2018a).

As for the pre-flight stage, most airlines have introduced automatic ticketing and self-check-in kiosks; passengers can completely check-in via mobile application or official airlines' website, print out e-boarding pass, and e-luggage tag before selected departure flight. E-boarding pass includes passenger seat assignment and flight details. This online service certainly saves passenger time from waiting in line at the airport and promotes paper-saving activities. Then passengers can present boarding pass at bag drop counter and proceed to the boarding gate (China Airlines, 2018a). Subsequently, Airlines establish the accuracy of flight plans during the period of take-off until landing for appropriate engine-aircraft performance in relation to the optimal function of aircraft and fuel efficiency. At the same time, airlines capably prepare passenger information, weight and balance detail in order to adjust aircraft configuration and passenger seat allocation for minimizing fuel consumption. In this way, airlines invest continually in newer and ultra-modern long haul aircraft, especially innovation in fuel-efficient aircraft and engine technologies (Japan Airlines, 2019).

During the in-flight service process, most airlines encourage passengers to participate in 3 R rules, i.e., Reduce, Reuse, Recycle, to measure other environmentally friendly activities for establishing even more sustainability on board. For example, cabin attendants request passengers to close cabin window shade in high summer before they deplane from the aircraft to decline cabin temperature, alleviate the heavy usage of the aircraft ventilation system and reduce the costs of the Auxiliary Power Unit (APU). Meanwhile, airlines propose passengers to assist flight attendants to separate cabin waste on board, such as used cups, beverage cans, bottles and lids for recycling items. These activities give passengers the opportunity to decrease environmental impact at the moment of their en-route journey. Airlines also recommend passengers to reuse in-flight supplies, such as paper cups, chopsticks, headsets, and upcycling amenity kits to reduce resource consumption. Besides, airlines promote electronic and information services by offering E-journal instead of classic newspapers and magazines. Airlines implement the exclusive use of eco products on a long-haul flight in all service classes and the avoidance of plastic outer packing for amenity kits, slipper bags, reusable boxes and blanket cover bags. Moreover, airlines incorporated the concept of environmental protection into the design of the in-flight meal. They offer mostly healthy, balanced and high quality ordinary raw material and put a ban on the use of overfished or endangered species. Another point is that the in-flight meal menu is printed by soy ink on recycled paper and marked with a carbon footprint to foster passengers environmental awareness (China Airlines, 2018b; Lufthansa group, 2019). Based on the above discussion, the following hypothesis is developed:

H1: *Perception towards airlines' environment friendly services positively affects passengers' pro-environmental attitudes.*

Pro-Environmental Attitudes and Willingness to Use

Environmental attitudes are considered essential as an antecedent of environmental behaviors, often measured in tourism research as the key indicator of internal tourist influence to predict individuals' environmental behaviors (Kim, 2012). The term *attitude* is defined as an outcome of the unobservable psychological process. They also determine as predisposition which causes learning to respond to the positive or negative effects of a specific action. Attitudes are closely significant in relation to belief, trust, and intention that are direct factors of concrete product and service decision-making process (Maslikhan, 2019; Meng & Choi, 2015).

In recent years, it appears to be the case that the attention is on the pro-environmental attitudes which emerge when individual greener tourists apperceive and concern about the consequences of climate change toward the environmentally friendly issues. It is generally accepted now that tourism and hospitality companies should be emphasized and take responsibility for their Corporate Social Responsibility (CSR) and environmentally friendly activities (Dewi, Mataram, & Siwantara, 2017; Whitmarsh & O'Neill, 2010).

Based on the Theory of Reasoned Action (TRA), an individual's behavioral intention is determined by the variation

of his/her attitude to engage in that positive or negative behavior of each personal final decision (Ajzen & Fishbein, 1980; Fabrigar, Petty, Smith, & Crites, 2006). Many current studies of the literature have shown a positive and significant association between pro-environmental attitudes and diverse pro-environmental tourist behaviors. Mayer, Ryley, and Gillingwater (2012) examined that 612 air passengers' general attitudes regarding a green image of different airlines both full-service network carriers and low-cost carriers operating at Liverpool John Lennon Airport of England. The result indicated that air passengers could differentiate between airlines based on their environmental friendliness and green image of the airlines. Air travelers also differentiate between the perceived effectiveness of the measure that airlines can adopt to decline their environmental impact. Using new aircraft is determined as the most productive method to confirm airlines' environmental commitment. According to Chen, Chang, and Lin (2012), they described that while generating a green image positively affects consumer purchasing behavior, the effect of CSR initiatives on customer loyalty in the airlines' industry is generally considered by the majority of Taiwanese customers. The research findings have shown that when airlines recognize the essence of environmental protection, they have responded by incorporating environmentally friendly practices, such as reducing air pollution, complying with international and national environmental regulations, using renewable energy and reducing energy consumption on the ground. As a result, an increasing number of Taiwanese customers have positive attitudinal loyalty regarding airline social responsibility initiatives and become lifetime customers as a member of frequent flyer passengers of the airlines. Haggmann, Semeijn, and Vellenga (2015) conceded that most passengers hold a different green image of the airlines. These images are specific to passengers' general attitudes regarding the green image of various airlines. Passengers' general attitude and perceived environmental friendliness influence airline choice during the reservation process. It is also illustrated that passengers are willing to pay extra for a greener flight and eco-friendly service options.

According to these research results, it could be said that passengers are willing to use airlines when they have more particular attitudes to do things that are environmentally friendly. Thus, the following hypothesis is proposed:

H2: *Passengers' pro-environmental attitudes have a positive effect on willingness to use these airlines.*

The proposed theoretical research framework includes a total of 2 constructs and 2 research hypotheses. The relationship between each construct is illustrated in Figure 1.

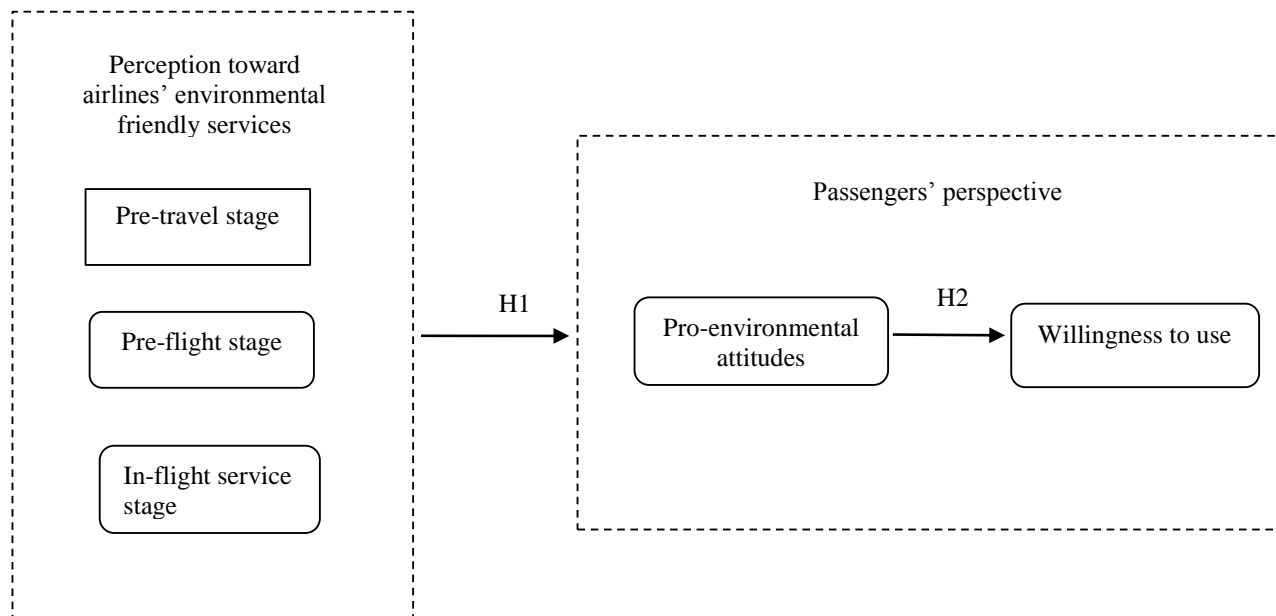


Figure 1 Research Framework

METHODOLOGY

Population, Sample Size, and Sampling Techniques

A population was derived from Thai passengers who had air travel experience with at least one flight on both full-service network carrier and low-cost carrier flights that arrived to and departed from Suvarnabhumi International

Airport (BKK) within the past three years. Available data of the population number from the last year was 8,446,070 (Ministry of Tourism and Sports, 2018). The sample size for regression analysis was based on Hair, Black, Babin, and Anderson (2007) which indicated that the desired level is between 15 and 20 observations for each predictor variable. Also, the minimum sample size should be 100. In this research, the predictor variables are 3, which require a minimum sample size of 100. Convenience sampling was applied as a nonprobability sampling technique in this study to select Thai passengers who had experienced with the airlines.

Research Tools

The questionnaire was considered to be the major tool of quantitative research which was divided into four main parts. In the first part, the socio-demographic profile of respondents was obtained regarding their gender, age, highest education level, occupation and personal income. Travel behaviors also were stated in this part which include the purpose for air travel, number of air travels per year, frequently used carrier, accompanying persons and travel arrangement. The second part consisted of variables that were adapted from previously validated studies, the websites, and sustainability reports of internationally famous airlines to determine the group of variables mentioned in Table 1. Respondents were asked to indicate the overall level of perception toward airlines' environmentally friendly services. The participants also state their pro-environmental attitudes based on Davison, Littleford, and Ryley (2014) and Alcock et al. (2017) in the third section of the survey. In the final part of the questionnaire, willingness to use such airlines based on Oreg and Katz-Gerro (2006) and Hagemann et al. (2015) was also rated by the respondents. Item-Objective Congruence Index (IOC) was applied to a content validity test evaluated by three experts. These experts include two supervisors of flight operations and one academic lecturer from the logistical transportation and aviation business of a renowned university. The congruence index of the questionnaire is much higher than the minimum score at 0.5. This means the overall content of various items of the designed questionnaire is completed to be used in the pilot test process (Pasunon, 2010). Thirty pilot questionnaires of 30 airline passengers or equivalent were distributed via an online channel. After that, we calculate some significant statistics to test the assumption, following the process of questionnaire improvement. The reliability test of this research demonstrated Cronbach's Alpha Coefficient at 0.720 for levels of perception toward airlines environmentally friendly services, at 0.734 for levels of pro-environmental attitudes and at 0.809 for levels of willingness to use airlines. These questionnaires implied a good internal consistency which could be used as reliable tools for the research (Mallery & George, 2000).

Data Collection

There are three main stages of the data collecting process, which consist of preparation stage, gathering and collecting data stage, and the data filling out and purify stage. We can describe in details the following:

The preparation stage: The data was collected by a questionnaire that consists of four parts, as mentioned in the research tools details.

The gathering and collecting data stage: Data gathered from the designed questionnaire were randomly selected passengers of Thai airline passengers for international as well as domestic flights and questionnaires were collected through an online survey via participating family and friend e-mails. The invitation was also published on online community website, such as Facebook. At the end of this stage, a number of 145 valid responses was received. Respectively, 134 self-completed questionnaires were fully retrieved.

The data filling out and purify stage: To make sure that the data are clean and ready to analyze, the quantitative results are shown in terms of descriptive statistics in Table 2, which is the socio-demographic information of Thai passengers. Thai passenger travel behaviors were indicated in Table 3, respectively. The average and the correlation between the main variables were illustrated in Table 4. Finally, the tests of two main hypotheses to describe the stated research objectives were in Table 5, the regression analysis result.

Table 1 *The Attributes of Airlines' Environment Friendly Services*

Attributes	Statement
Pre-travel stage	<ul style="list-style-type: none"> - Provide online service during the airline ticket reservation process to decrease paper usage - Convince passengers to pre-order in-flight meals through an online electronic system before departure flight to prevent food waste - Suggest passengers to pre-order duty-free items through e-shopping system before departure flight to reduce aircraft loading - Use lightweight materials for all cabin service equipment to reduce the aircraft fuel consumption
Pre-flight stage	<ul style="list-style-type: none"> - Provided e-check in service via mobile application or official airlines website and automatic ticketing and self-check-in kiosks at the airport - Encourage passenger to print out e-boarding pass and e-luggage tag before departure flight to replace paper usage - Conduct the accuracy of flight plans for engine-aircraft performance in relation to aircraft optimal function and lower fuel consumption - Adjust aircraft configuration and passenger seat allocation to save fuel consumption - Invest in newer and ultra-modern long-haul aircraft for fuel efficiency and engine technologies
In-flight service stage	<ul style="list-style-type: none"> - In summer, request passenger to close cabin window shade before disembarkation to decline cabin temperature and heavy usage of aircraft ventilation - Propose passengers to assist cabin attendants to separate cabin waste on board, e.g., used cups, beverage cans, bottles, and lids for recycling items. - Recommend passengers to reuse in-flight supplies, e.g., paper cups, chopsticks, headsets, and upcycling amenity kits to reduce resource consumption - Promote in-flight entertainment system to display e-journal instead of classic newspapers and magazines to reduce paper consumption - Use eco products on board in all service classes and avoid using plastic packing for amenity kits, slipper bags, reusable boxes, and blanket cover bags - Use ordinary ingredients produced for the in-flight meals and put a ban on the use of overfished or endangered species - Use soy ink on recycled paper for in-flight meal menu and marked with a carbon footprint to foster passengers environmental awareness

RESULTS AND DISCUSSION

From Thai passengers as a sample of 134 respondents, most of them were 85 female respondents (63.4%). The majority of participants were 31-40 years, representing 45.5%. The largest group of 63 (47.0%) respondents gained bachelor's degree education, and only 4 (3.0%) respondents achieved below bachelor's degree. Of the 134 respondents, 47 (35.1%) were private business employees, 42 (31.3%) were government/civil servants, and 25 (18.6%) were business owners. Only 10%, 6%, and 3%, respectively, were temporary workers, other relevant occupations, and students. The majority of respondents of 49 (36.6%) had average incomes between 20,001 and 40,000 Baht per month. The following table summarizes the socio-demographic information of Thai passengers.

Table 2 *Socio-Demographic Information of Thai Passengers*

Variables	Frequency	Percentage
Gender		
Male	49	36.6
Female	85	63.4
Age 12-20 years	4	3.0
21-30 years	17	12.7
31-40 years	61	45.5
41-50 years	33	24.6
Above 51 years	19	14.2
Education level		
Under Bachelor degree	4	3.0
Bachelor degree	63	47.0
Master degree	59	44.0
Doctoral degree	8	6.0
Occupation Student	4	3
Government/Civil Servant	42	31.3
Private business employee	47	35.1
Business owner	25	18.6
Temporary worker/Freelance	10	7.5
Others	6	4.5
Personal income per month		
Less than 20,000 THB	25	18.7
20,001-40,000 THB	49	36.6
40,001-60,000 THB	18	13.4
60,001-80,000 THB	9	6.7
80,001-100,000 THB	12	8.9
More than 100,000 THB	21	15.7

Table 3 *Thai Passenger Travel Behaviors*

Variables	Frequency	Percentage
Purpose of travel		
Leisure/Holiday	50	37.3
Business	31	23.1
Education	14	10.5
Visit friend/relatives	15	11.2
Medical purpose	8	6.0
Meeting/Seminar	16	11.9
Number of air travel per year		
1-2 times	27	20.1
3-4 times	54	40.3
5-6 times	41	30.6
More than 6 times	12	9.0

Table 3 *Continued...*

Frequently used carrier		
Low-Cost Carrier (LCC)	53	39.6
Full-Service Network Carrier (FSNC)	81	60.4
Accompanying persons		
Alone	34	25.4
Friends/Colleague	42	31.3
Spouse	31	23.1
Family	27	20.2
Travel arrangements Own arrangement	95	70.9
Package	39	29.1

Based on the Thai passengers travel behavior results were presented in Table 3, 37.3% or 50 passengers traveled for leisure purpose whereas 23.1%, 11.9%, 11.2% had other purposes on business, meeting/seminar and visiting friends and relatives. The rested travel for education purpose and medical purpose. That is, 54 (40.3%) of respondents had experienced by air travel mode at 3-4 times per year. Most of respondents, 81 persons (60.4%) are frequently fly with full-service network carrier. According to the number of accompanying persons, majority respondents of 42 (31.3%) passengers traveled with friends or colleagues. In addition, 95 respondents (70.9%) arranged trip by themselves whereas 39 passengers or 29.1% decided to choose travel agency to arrange their trip package including accommodation, air ticket and travel itinerary.

Table 4 *The Average and the Correlation between the Main Variables*

Variables	Perceptions towards Airlines Environment Friendly Services			Passengers' Perspective	
	Pre-travel Stage	Pre-flight Stage	In-flight Ser- vice Stage	Pro- environmental Attitudes	Willingness to Use
Mean	4.31	4.34	4.06	4.27	4.19
Standard Deviation	.552	.415	.734	.412	.624
Pre-travel stage	-				
Pre-flight stage	.500**	-			
In-flight service stage	.319**	.376**	-		
Pro-environmental attitudes	.340**	.464**	.481**	-	
Willingness to use	.620**	.619**	.540**	.574**	-

As the result showed in Table 4, the Pearson's correlation between the set of variables is in between .319 and .620. Moreover, the relationship between the group of variables is significant at 0.05. Therefore, the simple regression analysis is developed to test for the two main hypotheses. However, to determine the effect of perception on airlines' environmentally friendly services, we need to calculate the grand mean of pre-travel, pre-flight, and in-flight service stages which are 4.31, 4.34, and 4.06.

An initial assumption was completed to verify the use of the data for regression analysis. Durbin-Watson values of 1.737 and 1.855 were calculated. With this value between 1.50 and 2.50, it can be realized that the data meet the assumption of independence of residuals. Leverage value was 0.007 determined to be less than 0.5, thus indicating that no case had excessive leverage in the model. Additionally, all Cook's distances were 0.12 and 0.11 which were below a value of 0.2, indicating that there were no influential points.

Table 5 *The Regression Analysis Result*

Variables	Hypothesis	
	Pro-environmental Attitudes H1	Willingness to Use H2
Perception toward airlines environmental friendly services	.523***(.068)	
Pro-environmental attitudes		.870***(.108)
Adjusted R ²	.310	.330

*** p<0.05; The value in this table showed the regression coefficients and standard deviation

The regression analysis result from Table 5 aims to test the effect of perception on airlines environmentally friendly services and willingness to use through pro-environmental attitudes. The enter method was employed in this stage even though several other methods are available to build models, controlling how variables are included in a model; also note that several methods can be combined. Therefore, the main goal of this method is to determine the best subset of variables explaining a dependent variable. The result showed that perception toward airlines' environmentally friendly services has a positive impact on pro-environmental attitudes ($= 0.523, p < 0.05$) at the 0.05 significance level. So, we do not reject the null hypothesis of the first assumption, H1. Not surprisingly, pro-environmental attitudes have a positive effect on willingness to use ($= 0.870, p < 0.05$) at the 0.05 significance level. So, we do not reject the null hypothesis of the second assumption, H2, as we expected.

CONCLUSION

The result of this research reveals the understanding of passengers perception towards airlines environmentally friendly services related to pre-travel, pre-flight, and in-flight services has been focused on in detail. In addition, the study considers the analysis of passengers pro-environmental attitudes and perceptions towards airlines environmentally friendly services as well as passengers willingness to use the airlines toward pro-environmental attitudes were analyzed to confirm the theoretical model as we found in the literature review.

H1, Perception toward airlines' environment friendly services have positive effects on pro-environmental attitudes from the Pearson's correlation and simple regression analysis with R² of .310. These results illustrated the influence that Thai passengers perceived as the significant environmental friendliness issues of the airlines based on their environmentally friendly services which can be associated with a pro-environmental attitude. Apart from that, Mayer et al. (2012) study confirmed that passengers perceived the effectiveness of environmental friendliness measures among 12 airlines. These measures include: using new aircraft, offering carbon off-setting, testing biofuels (can be subjected to environmentally friendly service related to pre-flight stage); reducing the waste onboard and serving fair trade and organic products (can be subjected to environmentally friendly service related to the in-flight stage). The finding reported that air travelers attitudes towards different airlines are diverse depending on their perception regarding the effectiveness of environmental measures. From the passengers viewpoint of this issue, an effective approach is evaluated as more environmentally friendly activities. Hwang and Lyu (2019) seem to agree that when air passengers acknowledge an attempt of an environmentally friendly airline to well-established environmental concerns and conduct prosperously environmental protection, such as saving fuel, reducing waste, and recycling. It is fair to say that air passengers are more likely to show higher levels of desirable attitude toward various airlines.

H2, Pro-environmental attitudes have a positive impact on willingness to use is confirmed by the Pearson's correlation and simple regression coefficient as well as R² at the level of .330, respectively. In this exploration, the results demonstrated the high correlation coefficient which can be inferred that Thai passengers pro-environmental attitudes and willingness to use are positively associated. Likewise, van Birgelen, Semeijn, and Behrens (2011) concluded that air passengers who have positive attitudes toward carbon offsetting and understand well the negative impact of CO₂ emissions from air travel on the environment, they are willing to choose the airline that participates in the carbon offset program at the time of purchasing tickets. An investigation by Lu and Wang (2018) also illustrated that carbon offsetting air travel has a positive impact on the natural environment; that is why passengers attitudes toward voluntary carbon offset scheme program are related to the willingness to use the airlines that implement this

program. Additionally, airline passengers are also willing to change their travel behaviors when traveling by air. For example, passengers intend to decrease baggage weight to mitigate carbon emissions. Besides, passengers are willing to compensate for extra charges for low-carbon flights. Another study by Hwang and Lyu (2019) pointed out that there is a significant positive relationship between airlines' green image and desire to take environmentally friendly airlines. If passengers respond to the strong environmental reputation of the airlines, there will be a positive effect on their decision to choose with those airlines.

RESEARCH CONTRIBUTION

There are three main groups of people and institution would get the benefit from our research results which are as the following:

1. Airline business to improve business performance through their effort in environmentally friendly services on behalf of marketing strategies well-appointed as environmental protection policy in each airline's annual sustainability report. Furthermore, the airline should continually provide air passengers with environmental education information on particular environmentally friendly services to enhance passengers perceptions of these services, which could develop their positive pro-environmental attitudes and be more willing to use airlines select routes. Airlines can demonstrate fuel-saving consumption, carbon emission and mitigation via several media channels, such as in-flight entertainment, magazines, printed card or airline website. In addition, airlines can promote frequent flyer passengers to join reduce, reuse, recycle or other environmentally friendly services on environmental-themed flights (e-flights).
2. The Civil Aviation Authority of Thailand (CAAT), on behalf of an aviation regulator as a part of policymaker, to develop environmental policy measures that encourage airlines to meet sustainable development goals. These include the processes to reduce carbon emission, air pollution, energy consumption and the involvement in an environmental protection program. Apart from that, CAAT should remind authorized airlines to follow the international standard of Environmental Management System (EMS) to obtain ISO 14001 certification for their environmental management accreditation and environmental commitment affirmation.
3. The linkage of the airline industry and hospitality service sectors to expand and extend the environmentally friendly services. Airlines can provide travel arrangement services via their website. For example, promoting green connection by public transport to reach the airport, offering eco-friendly accommodation as per airline marketing package and proposing eco-friendly or organic products with recycled packaging.

SUGGESTIONS FOR FUTURE RESEARCH

To improve the quality of the research and the new paradigm of perception toward airlines' environmentally friendly services in the airline business as well as to extend the concept of pro-environmental attitudes have positive effects on willingness to use environmentally friendly services. We recommend expanding the work on this topic in three main perspectives.

1. To study in terms of the comparative study which is used to determine and quantify relationships between two and more variables by observing different groups either by choice or circumstances are exposed to different treatments. For example, Thai and foreign passengers, an organizational culture of each airline or national culture of different airline passengers.
2. To employ path analysis to be our theoretical testing. Because this method allows us to specify relationships among the set of the independent variables. The result can show us the causal relationship through which independent variables produce both direct and indirect effects on the dependent variable.
3. To follow up on the Thai passenger about the persistence in behavior. In this case, the database might need to create a cohort study, and the time-series data analysis needs to be concerned. However, we might gather personal contact via the e-mail to let them give us personal behavior. So, the electronic questionnaire that might help us to collect the data in terms of panel study will be priceless and placeless.

REFERENCES

Airports of Thailand Public Company Limited. (2018). *Sustainable development report 2018*. Retrieved from <https://bit.ly/39wpm4G>

- Ajzen, I., & Fishbein, M. (1980). *Understanding attitudes and predicting social behavior*. Upper Saddle River, NJ: Prentice Hall.
- Alcock, I., White, M. P., Taylor, T., Coldwell, D. F., Gribble, M. O., Evans, K. L., ... Fleming, L. E. (2017). Green on the ground but not in the air: Pro-environmental attitudes are related to household behaviours but not discretionary air travel. *Global Environmental Change*, *42*, 136–147. doi:<https://doi.org/10.1016/j.gloenvcha.2016.11.005>
- Chalfoun, F. (2018). Is environmental sustainability a case of failure of policy implementation? *Journal of Advanced Research in Social Sciences and Humanities*, *3*(6), 229-235. doi:<https://doi.org/10.26500/jarssh-03-2018-0604>
- Chen, F.-Y., Chang, Y.-H., & Lin, Y.-H. (2012). Customer perceptions of airline social responsibility and its effect on loyalty. *Journal of Air Transport Management*, *20*, 49–51. doi:<https://doi.org/10.1016/j.jairtraman.2011.11.007>
- China Airlines. (2018a). *China airlines corporate sustainability report*. Retrieved from <https://bit.ly/3bDZpOH>
- China Airlines. (2018b). *Eco services*. Retrieved from <https://bit.ly/38snl5y>
- Davison, L., Littleford, C., & Ryley, T. (2014). Air travel attitudes and behaviours: The development of environment-based segments. *Journal of Air Transport Management*, *36*, 13–22. doi:<https://doi.org/10.1016/j.jairtraman.2013.12.007>
- Dewi, N. I. K., Mataram, I. G. A. B., & Siwantara, I. W. (2017). Validating a framework of the integration of corporate social responsibility and culture: The case of hotel industry. *International Journal of Business and Economic Affairs*, *2*(1), 31–44. doi:<https://doi.org/10.24088/ijbea-2017-21005>
- Fabrigar, L. R., Petty, R. E., Smith, S. M., & Crites, S. L. (2006). Understanding knowledge effects on attitude-behavior consistency: The role of relevance, complexity, and amount of knowledge. *Journal of Personality and Social Psychology*, *90*(4), 556–577. doi:<https://doi.org/10.1037/0022-3514.90.4.556>
- Félonneau, M., & Becker, M. (2008). Pro-environmental attitudes and behavior: Revealing perceived social desirability. *International Review of Social Psychology*, *21*(4), 25–53.
- Forsyth, P. (2011). Environmental and financial sustainability of air transport: Are they incompatible? *Journal of Air Transport Management*, *17*(1), 27–32. doi:<https://doi.org/10.1016/j.jairtraman.2010.10.006>
- Garrow, L. A., Jones, S. P., & Parker, R. A. (2007). How much airline customers are willing to pay: An analysis of price sensitivity in online distribution channels. *Journal of Revenue and Pricing Management*, *5*(4), 271–290. doi:<https://doi.org/10.1057/palgrave.rpm.5160052>
- Gifford, R., & Sussman, R. (2012). *Environmental attitudes*. Oxford, UK: Oxford University Press.
- Hagmann, C., Semeijn, J., & Vellenga, D. B. (2015). Exploring the green image of airlines: Passenger perceptions and airline choice. *Journal of Air Transport Management*, *43*, 37–45. doi:<https://doi.org/10.1016/j.jairtraman.2015.01.003>
- Hair, J., Black, W., Babin, B., & Anderson, R. (2007). *Multivariate data analysis*. Harlow, England: Pearson Education.
- Hwang, J., & Lyu, S. O. (2019). Relationships among green image, consumer attitudes, desire, and customer citizenship behavior in the airline industry. *International Journal of Sustainable Transportation*, *1*, 1–11. doi:<https://doi.org/10.1080/15568318.2019.1573280>
- International Air Transport Association. (n.d.). *Climate change*. Retrieved from <https://bit.ly/2OUf3f2>
- Japan Airlines. (2019). *Fly into tomorrow* (JAL report 2019). Tokyo, Japan: JAL Group.
- Kim, A. K. (2012). Determinants of tourist behaviour in coastal environmental protection. *Tourism Geographies*, *14*(1), 26–49. doi:<https://doi.org/10.1080/14616688.2011.597774>
- Kuo, C.-W., & Jou, R.-C. (2017). Willingness to pay for airlines' premium economy class: The perspective of passengers. *Journal of Air Transport Management*, *59*, 134–142. doi:<https://doi.org/10.1016/j.jairtraman.2016.12.005>
- Lu, J.-L., & Wang, C.-Y. (2018). Investigating the impacts of air travellers' environmental knowledge on attitudes toward carbon offsetting and willingness to mitigate the environmental impacts of aviation. *Transportation Research Part D: Transport and Environment*, *59*, 96–107. doi:<https://doi.org/10.1016/j.trd.2017.12.024>
- Lufthansa group. (2019). *Balance* (Sustainability report 2019). Cologne, Germany: Lufthansa Group.
- Mair, J. (2011). Exploring air travellers' voluntary carbon-offsetting behaviour. *Journal of Sustainable Tourism*, *19*(2), 215–230. doi:<https://doi.org/10.1080/09669582.2010.517317>
- Mallery, P., & George, D. (2000). *SPSS for windows step by step*. Boston, MA: Allyn & Bacon, Inc.
- Martín, J. C., Román, C., & Espino, R. (2008). Willingness to pay for airline service quality. *Transport Reviews*, *28*(2), 199–217. doi:<https://doi.org/10.1080/01441640701577007>

- Maslikhan, M. I. (2019). The effect of negative publicity on brand equity (image attitude, and purchase intention) in Indonesia: Case of Dolce & Gabbana racism scandal. *International Journal of Business and Administrative Studies*, 5(3), 144-154. doi:<https://dx.doi.org/10.20469/ijbas.5.10004-3>
- Mayer, R., Ryley, T., & Gillingwater, D. (2012). Passenger perceptions of the green image associated with airlines. *Journal of Transport Geography*, 22, 179–186. doi:<https://doi.org/10.1016/j.jtrangeo.2012.01.007>
- Meng, B., & Choi, K. (2015). Extending the theory of planned behaviour: Testing the effects of authentic perception and environmental concerns on the slow-tourist decision-making process. *Current Issues in Tourism*, 19(6), 528–544. doi:<https://doi.org/10.1080/13683500.2015.1020773>
- Ministry of Tourism and Sports. (2018). *Traveler statistics: 5 airports*. Retrieved from <https://bit.ly/2wjlIJf>
- Nabilla, F. (2019). Advertising attitude, green purchase intention and environmental concern: Promoting functional versus emotional appeals. *International Journal of Business and Administrative Studies*, 5(2), 199–223. doi: <https://dx.doi.org/10.20469/ijbas.5.10003-4>
- Oreg, S., & Katz-Gerro, T. (2006). Predicting proenvironmental behavior cross-nationally. *Environment and Behavior*, 38(4), 462–483. doi:<https://doi.org/10.1177/0013916505286012>
- Pasunon, P. (2010). *Business research textbook 1*. Nakhon Pathom, Thailand: Phetkasem Printing.
- Pavalache-Ilie, M., & Unianu, E. M. (2012). Locus of control and the pro-environmental attitudes. *Procedia - Social and Behavioral Sciences*, 33, 198–202. doi:<https://doi.org/10.1016/j.sbspro.2012.01.111>
- Thailand Board of Investment. (2019). *Aerospace industry-Taking off to new heights*. Retrieved from <https://bit.ly/37u0Pbh>
- van Birgelen, M., Semeijn, J., & Behrens, P. (2011). Explaining pro-environment consumer behavior in air travel. *Journal of Air Transport Management*, 17(2), 125–128. doi:<https://doi.org/10.1016/j.jairtraman.2010.12.013>
- Whitmarsh, L., & O'Neill, S. (2010). Green identity, green living? The role of pro-environmental self-identity in determining consistency across diverse pro-environmental behaviours. *Journal of Environmental Psychology*, 30(3), 305–314. doi:<https://doi.org/10.1016/j.jenvp.2010.01.003>