Seaplane Aviation Business Trends and Tourists' Expectations for Seaplane Tourism in Thailand

Kanitvipa Wattanasan[1]*
Faculty of Business Administration, St Teresa International University, Thailand
Email: kanitvipa@trsu.ac.th
*Corresponding Author

Thanoo Saowaros[2]
Faculty of Business Administration, St Teresa International University, Thailand
Email: thanoo.sao@trsu.ac.th

Harrywong Kubtavanich[3]
Faculty of Business Administration, St Teresa International University, Thailand
Email: harrywong.kub@trsu.ac.th

Surath Sridech[4]
Faculty of Business Administration, St Teresa International University, Thailand
Email: surath@trsu.ac.th

Sourabh Singha Roy[5]
Faculty of Management Studies, Global Narayan Singh University, India
Email: singharoy2224@gmail.com

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Abstract

This research aims to study the feasibility and trends of the seaplane aviation business and to study tourists' expectations towards seaplane tourism in Thailand. This research is a mixed method research consisting of two stages. The first stage was qualitative to study the feasibility and trends of the seaplane aviation business. The second stage was quantitative to study tourists' expectations of seaplane tourism in Thailand. The research instrument used was a questionnaire. Statistics used in the research consist of Mean, S.D., and t-test. The findings are as follows: 1) Seaplane aviation business in Thailand is feasible in all aspects. In the aspect of legal feasibility, the responsible authorities can develop regulations to align with ICAO standards. In the investor's aspect and tourist destinations aspect, several tourist destinations in Thailand can accommodate seaplane tourism along the Eastern region, the southern region along the Andaman Sea, and the Gulf of Thailand 2) Seaplane business

trends in Thailand tend to operate in 4 formats: Flight services for passenger between tourist destinations, connection flight services from major airports to marine tourist destinations, co-service providers of domestic travel packages, and co-service providers of international travel packages 3) The expectations of tourists towards seaplane tourism in Thailand was high in all aspects, which consist of natural attractions, accessibility to tourist destinations, and amenities at tourist destinations 4) The comparison indicated no differences between the expectations of tourists towards seaplane tourism between tourists from Western countries and tourists from Eastern countries.

Keywords: Seaplane, Feasibility of the Seaplane Aviation Business, Aviation Business Trends, Tourists' Expectations

1. Introduction

A Seaplane or a Hydroplane is a fixed-wing aircraft that takes off and lands on water. There are two types of seaplanes. The first type is a floatplane, equipped with 2 elongated buoys underneath for floatation while the fuselage stays well above water. The second type is a flying boat because the fuselage can float on water and has a Force of Buoyancy like a floating boat hull. There may be small buoys attached to each side of the wings for balance. Seaplanes are different from Amphibious aircrafts which can take-off and land on either an airfield or on water surfaces (De Remer and Baj, 2003; Chinvorarat et al., 2019, Aroonsaengmanee et at., 2019).

The first person to successfully fly a seaplane was Henri Fabre, a Frenchman, who flew a Trimaran Floatplane in 1910. In 1911, Glen Curtis, an American, was the first to successfully build a floatplane. Later, he developed amphibious aircrafts with retractable landing gears for take-off and landing on ship decks and on water surfaces. Thereafter, several countries further developed seaplanes for marine operations like surveillance and reconnaissance, as well as for Navy operations such as naval gunfire spotting (De Remer and Baj, 2003; Buranadilok, 2021).

After World War I, seaplanes have greatly improved both for transporting goods and for carrying passengers in terms of size, tonnage, payload capacity, airspeed, endurance, and capabilities to fly in adverse weather conditions. This led to the widespread use of seaplanes for connecting flights between cities worldwide and for flying to cities with limited landing airport facilities (De Remer and Baj, 2023; Buranadilok, 2021; Majka, 2012).

After World War II, however, airport runways in major cities around the world became longer. This coupled with the evolution of new aviation technologies to improve aircraft capabilities such as aircraft design, engine thrust, navigation systems, and communication. Aircrafts increased in size, with capabilities to carry greater payloads, fly longer distances, and capable to operate in every weather condition (Bonnett, 2011; Klamsaengsai, 2014). Thus, the demands for seaplanes to transport goods and passengers gradually decreased until their use is limited only to sea reconnaissance, search and rescue at sea, and extinguishing forest fires (EUROCONTROL, 2011; Buranadilok, 2021).

In Thailand, the use of seaplanes began in 1910 (at that time, Don Mueang Airport was a small airport used only by the military). A section of the Chao Praya River between the Khlong Toei Port and Chong Nonsi, Bangkok was used for seaplane take-off and landing, called Sanambin Nam Khlong Toei (Khlong Toei Water Airport) (Ministry of Culture, 2020). In 1939, demands for seaplane services increased until they were used more earnestly. The Sanambin Nam Klong Toei was moved to a very wide and straight section of the Chao Phraya River suitable for seaplane take-off and landing in Pak Kret district, Nonthaburi province, and was renamed Sanambin Nam (Water Airport). In the same year, an Imperial Airways Shorts S-23 type seaplane (its specific name was Cordelia) flew its maiden voyage from England to Australia. It was a 10-day journey with 9 overnight stopovers along the route including Bangkok, where this seaplane landed at Sanambin Nam. Since then, this water airport was recurrently used by foreigners. However, after the end of WW2, the uses of seaplanes gradually declined, until they are no longer used commercially. Thus, Sanambin Nam is no longer in service, the area was instead considered as residential quarters for the Department of Military Affairs personnel in Muang district, Nonthaburi province (TNews, 2020).

Nevertheless, in many European cities, seaplanes are still used for short trips with a small number of passengers, both for traveling between cities and for tourism (Majka, 2012). With the growing trend for sustainable tourism, seaplanes became an excellent choice for traveling to coastal or beautiful marine tourism destinations like the Maldives, thus seaplane aviation business began to grow again in several world-class tourism cities (Hafizah et al., 2023).

Thailand has a multitude of marine tourism resources along its world-renowned coasts and beaches that are uniquely different from any other marine tourist destinations. These Thai destinations are, for example, the city of Pattaya and the Rayong province in the Eastern region; in the southern region, the Surat Thani and Prachaub Kiri Kan provinces along the Gulf of Thailand, and Phuket and Krabi provinces along the Andaman Sea (Watcharayothinkul, 2017; Poltanee & Boonphetkaew, 2017; Srimuang, 2018).

Moreover, Thailand hosts many types of aviation businesses with a substantial number of people involved in the aviation business that can extend their operations to support tourism (Saowaros and Puncreobutr, 2016). Although seaplanes are not being used for tourism in Thailand today, there are many research findings on sustainable marine ecotourism destinations, for example, Koh Talu Island in the Prachuab Kiri Kan province, in which locals of the island were interested in promoting seaplane tourism, and thus recommended for Thailand to start the seaplane aviation business (Poltanee & Boonphetkaew, 2017).

Since the seaplane aviation business might be feasible, it is deemed appropriate to research the feasibilities and trends of the seaplane aviation business and tourists' expectations of seaplane tourism in Thailand. This research will both directly and indirectly benefit the aviation industry policymakers, aviation business entrepreneurs, higher education institutions producing aviation business graduates, as well as the people involved in marine tourism, aviation business development, and marine tourism product development. The findings of this research can be used to plan supporting operations for the rapid stimulation of the country's economy and to build tourist confidence.

2. Research Objectives

2.1 To study the feasibility and the trends for seaplane aviation business in Thailand.

2.2 To study tourists' expectations of seaplane tourism in Thailand.

3. Research Methodology

This research is a mixed method, consisting of 2 stages.

Stage 1 - The study on the trends for seaplane aviation business in Thailand

The first stage of this research is qualitative.

This qualitative stage aims to study the trends for seaplane aviation business in Thailand. The sample group consisted of people involved in aviation business or the aviation industry, including air transport and tourism regulators, administrators of the Civil Aviation Authority of Thailand (CAAT), administrators of the Aeronautical Radio of Thailand Ltd., airline operators, seaplane tourist agencies, as well as aviation business experts and academics, particularly those in higher education institutions.

Data was collected via in-depth interviews with a total of 20 people involved in aviation business or the aviation industry, and experts and academics of aviation business. The snowball sampling method was used to obtain the sample. The data collected was triangulated and used to further analyze the trends in the Seaplane aviation business in Thailand.

Stage 2 - The study on tourists' expectations of seaplane tourism in Thailand

The second stage of this research is quantitative.

The sample population for this stage consisted of 1,000 foreign tourists visiting Thai destinations with trends for seaplane aviation business and these tourists have at least once experienced seaplane tourism in other countries. The sample group consisted of foreign tourists who are visiting the southern region of Thailand along the Andaman Sea, specifically the Phuket and Krabi provinces, the southern region of Thailand along the Gulf of Thailand, specifically the Surat Thani and Prachaub Kiri Khan provinces, and the Eastern region of Thailand, specifically the city of Pattaya and the Rayong province. All of which, have experienced seaplane tourism, totaling up to 278 people sampled. The sample group size was determined using the Krejcie & Morgan table. Stratified sampling was performed using tourist type as the criterion for stratification.

Variables

1) The independent variable is the type of tourists, categorized into two types: tourists from Western countries and tourists from Eastern countries.

2) The dependent variables are tourists' expectations of seaplane tourism in Thailand, i.e., attractions, amenities, and accessibility which was adopted from the 3A's Components of Tourism Theory by Collier & Harraway, and the findings from research conducted by Watcharayothinkul (2017), Poltanee & Boonphetkaew (2017), and Srimuang (2018).

The research instrument used was a questionnaire created by the researcher, with a discriminant index between .309-.821, and a reliability index of .83. The statistics used in the research are Mean, S.D., and t-test.

This research was conducted between October 2023 – December 2023.

4. Research Findings

4.1 The feasibility and trends for seaplane aviation business in Thailand

4.1.1 The feasibilities for seaplane aviation business in Thailand

Legal Feasibility

The findings from in-depth interviews with senior administrators of the Ministry of Tourism and Sports, senior administrators of the Ministry of Transport, and academics, revealed that seaplane aviation services, which Thailand already had in the past, should urgently begin again to give tourists another transportation option to alleviate congestions at major airports. In addition, the seaplane regulations framework previously established should be modernized to coincide with the International Civil Aviation Organization (ICAO) guidelines.

The findings from in-depth interviews with administrators of the Civil Aviation Authority of Thailand (CAAT), the national aviation regulator, revealed that they can issue regulations, notices, and requirements regarding Water Aerodrome standards or temporary water runways to support seaplane services in Thailand. However, before proceeding, it is essential to prioritize tasks such as flight route planning, infrastructure inspections, and safety and risk analysis. These processes should adhere to the recommendations set forth by the International Civil Aviation Organization and align with regulations from government agencies. This includes coordination with entities like the Marine Department of the Ministry of Transport, the Department of National Parks, Wildlife and Plant Conservation of the Ministry of Natural Resources and Environment, and various environmental agencies. Approval from these bodies is necessary for establishing seaplane take-off and landing areas, as well as deploying associated equipment, at designated sustainable tourist destinations.

Regarding the readiness to provide services for seaplane aviation business, the administrators of the Aeronautical Radio of Thailand Ltd. expressed that Thailand is equipped to provide Visual Flight Rule (VFR) air traffic control services for seaplanes flying in all marine sectors of Thailand. The VFR service will cover the air space from seaplanes' take-off to their descent for landing on water. However, the efficiencies of air navigational aid systems, i.e., communication systems, radio and visual navigation aid systems, and aircraft tracking systems, need to be improved in some remote areas at sea.

Investment Feasibility

The findings from in-depth interviews with private sector operators in the seaplane aviation business revealed that Thailand is equipped to immediately start seaplane aviation business. As of now, 2 companies, Thai Seaplane and Siam Seaplane have applied for accreditation with the Civil Aviation Authority of Thailand. These two companies indicated their readiness in terms of aircrafts, skilled pilots, and business plans, to start their seaplane aviation business as soon as they are accredited by the Civil Aviation Authority of Thailand and other responsible authorities. These two companies are ready to provide services in all areas at sea including marine tourist destinations with large bodies of water such as dam reservoirs in the north, west, and northeast of Thailand. Moreover, at least 4 other private

aviation companies are planning to submit applications for accreditation to the Civil Aviation Authority of Thailand very soon.

The findings from in-depth interviews with seaplane tourism operators and aviation experts/academics revealed that seaplane aviation business could enhance Thailand's tourism by fully exploiting its potential and resources. New tourist groups will be targeted, and novel tourism products and services will be developed. This approach fosters sustainable ecotourism, enabling access to environmentally sensitive destinations without causing harm to its natural state. Moreover, the seaplane aviation business will significantly add value to the Thai economy.

Tourist Destinations Feasibility

The results from in-depth interviews with seaplane tourism operators and experts highlighted a consensus: Thailand possesses numerous intriguing and world-class marine and freshwater locations that remain untapped as tourist destinations. Several intriguing locations remain inaccessible due to the substantial costs associated with road improvements, potential environmental impacts, and concerns regarding Thailand's world heritage sites and the ongoing registration of other sites by various organizations. The utilization of seaplanes is therefore an apt solution for controlling the number of tourists during specific periods, and it is expected to be well-received by distinct tourist groups.

4.1.2 Trends for seaplane aviation business

The study with private sector operators in the seaplane aviation business, seaplane tourism operators, and experts/academics of aviation business, revealed a consensus on the trends for 4 operational models for seaplane aviation business as follows:

1) Private seaplane aviation operators provide passenger pick-up/drop-off flight services or provide full flight services between destinations, intended to connect domestic tourism destinations.

2) Private seaplane aviation operators cooperate with domestic and international airline partners to offer shared flights or provide connecting flights between major airports and marine tourist destinations. The objective is to facilitate connections between international airports and a variety of marine tourist destinations.

3) Private seaplane aviation operators cooperate with accommodations providers, tour operators, and other partners to develop domestic tour packages. The objective is to establish a comprehensive one-stop service that caters to all aspects of domestic tourism. Alternatively, they could be co-service providers for domestic tour packages.

4) Private seaplane aviation operators cooperate with domestic and international airline partners, accommodations providers, tour operators, and other partners to develop international tour packages. The objective is to establish a comprehensive one-stop service that caters to all aspects of international tourism. Alternatively, they could be co-service providers for international tour packages.

Which model is to be implemented depends on the regulations set forth by Thai authorities, which are expected to be promulgated by mid-2024. Seaplane aviation operators anticipate that they will be able to begin their services in 2024.

4.2 Tourists' expectations towards seaplane tourism in Thailand

The findings of the study on tourists who previously traveled by seaplane for tourism journeys abroad, with specific focus on their expectations towards seaplane tourism in Thailand are as follows:

4.2.1 The level of tourists' expectations for seaplane tourism in Thailand

The findings on the expectations of seaplane tourism of foreign tourists visiting Thai cities in the Eastern region, the southern region along the Gulf of Thailand, and the southern region along the Andaman Sea is displayed in Table 1.

Table 1 Tourists' expectations for seaplane tourism in Thailand (N=278)

Aspects	Mean	S.D.	Level of Expectation
Natural attractions	4.31	.556	High
Amenities at tourist destinations	4.18	.517	High
Accessibility of tourist destinations	4.20	.512	High
Overall expectations of tourists	**4.23**	**.459**	**High**

From Table 1, the overall tourists' expectation for seaplane tourism in Thailand was high (4.23). The level of expectation was also high for the individual aspects in this descending order: attractions (4.31), accessibility (4.20), and amenities (4.18).

Upon careful examination of each aspect, the following intriguing findings were uncovered:

Natural attractions: Tourists had high level of expectations for natural attractions in the following order 1) enjoyable scenic beauty and atmosphere by the sea and water activities on the beach 2) opportunities for coral diving 3) the availability of rowing and sailing 4) places for sunbathing and fresh seafood dining and 5) chances to explore the lifestyles of fishermen and indigenous sea tribe communities.

Accessibility to tourist destinations: Tourists had high level of expectations for accessibility to tourist destinations in the following order 1) captivating seaplane routes to the destinations 2) convenience of traveling by seaplane 3) safety of traveling by seaplane 4) appropriate travel expenses and 5) convenience and speed in accessing seaplane destination information.

Amenities at tourist destinations: Tourist had high level of expectations for amenities in the following order 1) completeness of sufficient and suitable basic tourist services including accommodation, restaurants, souvenir shops 2) utilization of modern technology, including various applications, to enhance service delivery 3) the availability of tour operators or concierge services 4) the availability of ancillary services, including currency exchange, access to banks, hospitals, and police services.

4.2.2 The comparison of the level of tourists' expectations for seaplane tourism in Thailand

The findings from the comparison of the level of tourists' expectations for seaplane tourism in Thailand among tourists from Western countries and tourists from Eastern countries are displayed in Table 2.

Table 2 The comparison of the level of tourists' expectations for seaplane tourism in Thailand, classified by tourist type (N=278)

Aspects	Western (106)		Eastern (172)		t	p
	Mean	S.D.	Mean	S.D.		
Natural attractions	4.24	.561	4.36	.551	-1.704	.089
Amenities at tourist destinations	4.17	.493	4.20	.533	-.394	.694
Accessibility of tourist destinations	4.20	.513	4.19	.513	.096	.923
Overall expectations	**4.21**	**.455**	**4.25**	**.462**	**.798**	**.425**

*p<.05, **p<.01

According to Table 2, the comparison of the level of tourists' expectations for seaplane tourism in Thailand, the data indicated that tourists from Eastern countries had overall higher expectations compared to tourists from Western countries, with no statistical significance.

Upon consideration of each individual aspect, the following findings were revealed:

Natural attractions: Tourists from Eastern countries had higher expectations for natural attractions compared to tourists from Western countries. The difference for this aspect was not statistically significant.

Amenities at tourist destinations: Tourists from Eastern countries had higher expectations for amenities at tourist destinations than tourists from Western countries. The difference for this aspect was not statistically significant.

Accessibility of tourist destinations: Tourists from Western countries had higher expectations for accessibility to tourist destinations than tourists from Eastern countries. The difference for this aspect was not statistically significant.

5. Conclusion

The results of the study can be summarized as follows.

5.1 The study on the feasibility and the trends of seaplane business in Thailand

1) The study on the feasibilities of seaplane aviation business in Thailand revealed that it is feasible across all 3 aspects: legal aspect, investment aspect, and the tourist destinations aspect. In terms of legal feasibility, the responsible regulating authorities can develop regulations in alignment with the International Civil Aviation Organization (ICAO). In terms of investment feasibility, numerous parties have expressed willingness to invest in the seaplane aviation business. Currently, 2 investors have submitted accreditation applications, and at least 4 additional investors are in the process of preparing their applications. In terms of tourist destinations feasibility, Thailand has several marine tourist destinations in the Eastern region, the southern region along the Gulf of Thailand, and the southern region along the Andaman Sea that are conducive to supporting seaplane tourism.

2) The study on the trends of seaplane aviation business in Thailand revealed at least 4 operational models for seaplane aviation business 1) seaplane passenger flight services between destinations 2) cooperating with domestic and international airline partners to offer connecting flight services from major airports to marine tourist destinations 3) cooperating in partnership with accommodation providers, tour operators, and other partners to develop and operate domestic tour packages 4) cooperating in partnership with domestic and international airlines, accommodations providers, tour operators, and other partners to develop and operate international tour packages.

5.2 The study on tourists' expectations for seaplane tourism in Thailand

The finding of the study on tourists' expectations for seaplane tourism with foreign tourists visiting Thai cities with prospects for seaplane aviation is as follows:

1) The overall level of tourists' expectations for seaplane tourism in Thailand was high. When considering individual aspects, it was found that the expectation level was high across all 3 aspects; the level of expectation for natural attractions was the highest, and the level of expectation for amenities at tourist destinations was the lowest.

In terms of the level of tourists' expectations for natural attractions, the level of tourists' expectations for enjoyable scenic beauty and atmosphere by the sea was the highest, followed by the expectations for coral diving - the second highest.

In terms of the level of tourist's expectations for accessibility to tourist destinations, the level of tourists' expectations for captivating seaplane routes to the destination was the highest, followed by the expectations for convenience of traveling by seaplane - the second highest.

In terms of the level of tourist's expectations for amenities at tourist destinations, the level of tourists' expectations for the availability of basic tourist services including accommodation, restaurants, souvenir shops were the highest, while the expectations for the utilization of modern technology, including various applications, to enhance service delivery was the second highest.

2) The findings of the comparison of the level of the tourists' expectations for seaplane tourism in Thailand indicated no significant differences in the overall expectations among tourists from Eastern countries and tourists from Western countries. There were also no significant differences in the individual aspects of tourists' expectations for seaplane tourism in Thailand among tourists from Eastern countries and tourists from Western countries.

In addition, tourists from Western countries had slightly higher level of expectations than tourists from Eastern countries regarding the accessibility of tourist destinations. The difference was not statistically significant. On the other hand, tourists from Eastern countries had slightly higher level of expectations than tourists from Western countries overall and in the individual aspects of natural attractions and amenities at tourist destinations. The differences found in this respect were also not statistically significant.

6. Discussion of Results

The findings on tourists' expectations for seaplane tourism in Thailand indicated high overall expectations across all 3 individual aspects. Upon the examination of individual aspects, the findings showed that, concerning natural attractions, the two highest levels of expectations were for enjoyable scenic beauty and atmosphere by the sea and coral diving. In terms of accessibility to tourist destinations, the study found the level of expectations for captivating seaplane routes to destinations and the convenience of traveling by seaplane were the two highest. Additionally, regarding amenities at tourist destinations, the two highest level of expectations were for the availability of basic tourist services including accommodation, restaurants, and souvenir shops, and the utilization of modern technology, including various applications, to enhance service delivery. Notably, these findings are consistent with prior research conducted by Watcharayothinkul (2017), Poltanee & Boonphetkaew (2017), and Srimuang (2018), which uncovered that Thailand possesses natural beauty that extends across every region of the country. Additionally, situated on the Indochina Peninsula with the Andaman Sea to the west and the Gulf of Thailand to the east, Thailand showcases diverse and unique characteristics in its marine resources. This, coupled with Thailand's potential in tourism management, both in terms of accessibility to tourist destinations and amenities at these destinations, has left a positive impression on tourists. This favourable perception extends to tourists from Western countries such as European nations and the United States, as well as those from Eastern countries like China, Japan, Korea, and Malaysia.

7. Recommendations

7.1 Recommendations for applying the research results:

According to the findings, seaplane aviation business in Thailand is feasible across all three aspects: legal, investment, and supporting tourist destinations. Therefore, policymaker associated with the aviation industry should develop regulations that align with the International Civil Aviation Organization (ICAO) standards and establish guidelines for expeditiously issuing licenses to seaplane aviation business operators. Additionally, educational institutions producing graduates in the aviation business should enhance their curriculum to cover the management of seaplane aviation business and ensure sustainability in marine tourism.

From the findings, the trends for seaplane aviation business in Thailand suggest at least 4 operational models. Therefore, policymaker, and agencies related to marine tourist destinations that can support seaplane aviation, aviation business operators, and other tourism-related operators should collaboratively establish plans and operational strategies for each model. This is to ensure safe access to marine tourism destinations and sustainable conservation of natural resources, fostering confidence among tourists and rapidly stimulating the local and national economy.

According to the findings, tourists' expectations towards seaplane tourism in Thailand, both overall and across all three aspects, namely natural attractions, accessibility to tourist destinations, and amenities at tourist destinations, are high. Moreover, there are no significant differences in the expectations of tourists from Eastern and Western countries. Therefore, policymaker, agencies related to seaplane-supported tourist destinations, aviation business

operators, and tourism-related operators, should collaborate in developing marine tourism products. This is essential for both stimulating the national economy and fostering continued confidence among tourists.

7.2 Recommendations for further research:

This study has found that the trends for seaplane aviation business in Thailand suggest at least 4 operational models. However, it is important to note that this study is qualitative and may not cover all possible scenarios comprehensively. Therefore, further research adopting other methods should be conducted to validate the findings of this study thoroughly.

This study has revealed that the differences in the expectations of tourists, both overall and in individual aspects, among tourists from Eastern countries and tourists from Western countries were not statistically significant. This may be due to the focus on tourists in specific areas and the study being conducted within a limited timeframe, not during peak tourism seasons. Therefore, to ensure complete confidence in the findings of this study, it is recommended to conduct further research on the expectations of tourists for seaplane tourism in Thailand, which covers a broader range of target areas and throughout various additional research periods.

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