HOW TO PROMOTE BIKE TOURISM GLOBALLY

Chun-An Chen
Hsien-Li Lee

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Abstract
Purpose – The main purpose of this study is to find ways on how to promote bike tourism globally, and use Taiwan as a model to explore this aspect.
Design – The development of the study structure involved brainstorming and the assistance of an expert panel. The study framework is composed of 7 aspects with 8-12 subitems each.
Methodology – The opinions of experts were gathered through a questionnaire survey. Afterwards, the CLPEM (Control Limits Performance Evaluation Method) was adopted to determine the means to promote bike tourism.
Findings – The results show how the government and operators could prioritize service enhancements and improvements such as "bike rental at one station with drop off at another designated location, nanny vans to accommodate bike tourists, bike tourist information center, training for bike tour guides who can provide practical and historical knowledge for tourists, creative bike touring routes depending on the rider's abilities, local friendly hospitality for riders, and comprehensive travel insurance policies".
Originality of the research – This study has constructed a framework to promote bike tourism.
Keywords bike tourism, global promotion, Taiwan, CLPEM

1. INTRODUCTION

Statistics show that the number of tourists traveling to Taiwan in 2014 reached 9,910,000, with foreign exchange revenue from tourism hitting US$14,615,000 which is a 20% growth compared with that of 2013 (Tourism Bureau, 2015a). This implies that tourism has become one of the crucial industries in Taiwan.

Lonely Planet, a globally renowned travel website, listed the world's top 10 travel destinations for 2012, in which Taiwan ranked 9 thanks to its breathtaking and beautiful sceneries, diverse culture, and capacity as a bike tourism destination. According to Lonely Planet, Taiwan has been developing its tourism culture to support two-wheeled vehicles in recent years, focusing strongly on the bicycle market. So far, it has constructed thousands of kilometers of bike paths and can provide a safe, comfortable, beautiful and friendly biking environment for tourists (Lonely Planet, 2012; Tourism Bureau, 2012). All these prove Taiwan's capability to develop its bike tourism market. Although Taiwan is a bicycle manufacturing hub, biking is not as popular unlike in Europe and America.

With the worsening energy crisis, environmental pollution and global warming, people have to reduce their carbon footprint and save energy so as to create an eco-efficient transport model. Manually-driven bicycles have the following advantages: zero pollution, lower power consumption, health and fitness. With the positive benefits of environmental protection, health, tourism and parent-child interaction, biking has been actively promoted by Taiwan government. As a result, biking has become a growing trend in Taiwan and is now quite popular, facilitating progress in environmental sustainability (Lin, 2008).

In recent years, Taiwan has worked hard to promote the construction of software, hardware, and facilities for biking. The bicycle route system and activities often received favorable reactions worldwide. The total length of the country's bike lane was expanded from 900km in 2008 to 4,106km in April of 2014. Moreover, the regular biking population in Taiwan grew to 24.5 million. To improve the bicycle route system in Taiwan, the government invested around US$3.7 million in 2013 and added breakpoints on the country's road network connecting to the bike lane. This would help promote Taiwan as a biking destination, support industrial development, and increase local prosperity and business (Executive Yuan, 2014).

Promoting bike tourism can help improve the tourism industry, reduce carbon footprint and save energy, as well as create more employment opportunities (Executive Yuan, 2014). Since 2010, the Tourism Bureau has organized a series of activities focused on the Taiwan Cycling Festival and encouraged everyone to participate. It was aimed at converting innovative achievements in transportation construction into new tourism resources, to develop Taiwan into an international destination for bike tourism. With a complete road system and geographical advantage, Taiwan offers magnificent sceneries that bike riders would appreciate as they travel along the trail. Biking around Taiwan is a very convenient and enjoyable experience. The bike tour and activities organized by the Tourism Bureau combine tourism and transportation facilities from all counties and cities to showcase Taiwan's cultural diversity. Taiwan is inviting biking enthusiasts at home and abroad to explore its beautiful country and enjoy the different recreational activities that the country has to offer. Biking is not merely a type of physical exercise, but it also offers a rich and meaningful experience that supports physical and mental wellbeing (Tourism Bureau, 2015b).

The number of foreign tourists in Taiwan has remained low even though the country has the capacity to develop bike tours and activities with the government actively taking such initiatives. Taiwan still fails to attract international visitors to come for bike tours (Ceng, 2008). Thus, promoting Taiwan's bike tourism globally has become an important issue. Despite various studies on tourism or biking, research on bike tourism has remained scarce, not to mention research on attracting foreign visitors for bike tours. Since Taiwan actively promotes its tourism industry and biking activities, this study aims to explore how Taiwan's bike tourism can be promoted globally. Initially, it develops an assessment structure, and determines the importance and performance of each item in the structure using the CLPEM method. Its purpose is to find the items that need to be prioritized for improvement, and create improvement strategies that can promote Taiwan's bike tourism globally. The study findings are important in helping

Taiwan promote its bike tourism industry. Moreover, the results can serve as a source of reference for other countries that intend to develop their bike tourism.

2. LITERATURE REVIEW

2.1. Definition of Bike Tourism

Ballantine mentioned in his research that the bicycling trend in England came late but grew very fast, which revolutionized the role of bicycles. The bicycle is not merely a vehicle for commuting but also for touring (Ballantine, 2001). The US and European countries are actively developing their bike tourism for the purpose of promoting rural tourism. For example, the annual tourism revenue contributed by bike tourists in England is quite remarkable (Ritchie, 1998).

Bike tourism is defined as taking a trip using a bicycle or using a bicycle as a primary vehicle for traveling, which can offer bike riders a pleasant travel experience (Ritchie,1998).

2.2. Research on Tourism or Biking

2.2.1. Planning Special Trips

Unlike traveling by car, a bike tour can provide tourists with a different scenic experience (Pesses, 2010). Schiefelbusch, Jain, Schäfer and Müller (2007) proposed the "travel chains" concept, which emphasizes the creation of sustainable tourism products. It is important to design a special itinerary to impress tourists. Tourists appreciate Taiwan's sceneries, festivals, food, folk customs and culture (Ceng, 2008; Chen, 2014; Chen, Lee, Yang and Lee, 2013; Chen, Lee and Yang, 2012), which are quite compatible with bike tourism, making it easy to design the best itinerary. If bike tourists could take part in planning their trip, it could also improve service satisfaction (Matzler, Faullant, Renzl and Leiter, 2005).

2.2.2. Strengthening Promotion

The TV series The Love Boat (1977) made a lot of people dream of going on a cruise. It was believed to make a significant contribution to the popularization of cruise holidays (Cartwright and Baird, 1999; Dickinson and Vladimir, 2007). The Taiwanese film "Island Etude" also started a biking trend among locals around Taiwan (Lin, 2008). Survey statistics show that 59% of tourists have seen the tourism advertisement or promotion for Taiwan. Tourists may be influenced by recommendations from friends who have visited Taiwan or by promotions via the Internet, TV, radio stations, newspapers, magazines and travel agencies, when making a decision to travel to Taiwan (Tourism Bureau, 2015a). Therefore, it is necessary to strengthen promotion activities to boost Taiwan's bike tourism globally.

2.2.3. Providing Comprehensive Facilities

A bicycle is the primary vehicle for bike tourism. It is inconvenient for foreign tourists to travel with their bikes in Taiwan. A bike tour also requires other essential items, such as helmets, gloves, apparel and other individual items including (TaiwanBike, 2015b) head and tail lights, saddle bags, mileage meters, GPS, maps and repair tools. It is quite important to bike tourists if travel agents could provide complete facilities and professional service (Matzler, Faullant, Renzl and Leiter, 2005; Su, 2010).

2.2.4. Training for Professional Tour Guides

Lin and Huang (2010) believed that a tour guide is one of the important factors in promoting bike tourism. A tour guide must possess the following qualities: 1. Detailed knowledge of the trip, 2. Ability to describe scenic spots, 3.Good physical strength, 4. Knowledge of bike-related information, 5. Enthusiasm especially when providing service, 6. First-aid skills, and 7. Capability to handle emergency situations. Taiwan must develop professional tour guides to promote its bike tourism globally.

2.2.5. Providing Complete Support Activities

Dannenberg, Needle, Mullady and Kolodner (1996) conducted a study on long-distance bike tourists and mentioned potential risks such as fall-related injuries, knee-joint pain, numbness in hand or wrist, foot blisters, insect bites, heat exhaustion, etc. Therefore, it is necessary to provide support measures for bike tourists such as pre-travel instruction and training to prevent injury.

2.2.6. Creating a Bike-Friendly Environment and Atmosphere

Many countries propose bicycle-friendly towns. In the 1988 European Charter, the European Parliament passed the pedestrian and bicycle rights (Chang, 2004). According to Mapes (2009), the cities with successful bike promotion include Amsterdam (the Netherlands); Copenhagen (Denmark); Paris (France); Davis, Portland, New York and Chicago (U.S.A.). Creating a bicycle-friendly environment and atmosphere can help boost the bicycle tourism industry.

2.2.7. Providing Tourism Service Information

According to the satisfaction survey conducted by Ceng (2008) among tourists visiting Taiwan, there was a lower satisfaction rate in terms of “easy communication while traveling”, “easy-to-understand signs for roads and public facilities”, “accessible travel information”, etc. The survey showed that the overall travel environment in Taiwan is not at par with international standards. To meet the demands of international bike tourists, Taiwan must make significant improvements in terms of accessibility of travel information. Foreign bike tourists should be able to easily obtain bike tour maps in English or the local language. Aside from a graphic route map, the bike map should also include a contour map, detailed introduction of scenic spots, accommodations, vehicle rental service, etc. The wording of road signs in English should also be checked for consistency. A tourist information center should also be set up.

The study gathers literature and creates a preliminary structure based on the literature review. It then determines the research framework based on the description found in the next section.

3. METHODS

This section illustrates the construction of the theoretical framework and methodology used in this study, as well as the general situation of the respondents. This main purpose of this study is to discuss how to promote bike tourism globally. We establish the preliminary framework by review of literature. Then we form our main framework through expert panel and brainstorming. Last, we use CLPEM to analyze this issue and propose promotion strategies.

3.1. Review of Literature

The method used to construct indicators can be classified as either qualitative or quantitative. The former includes document analysis, expert judgment, brainstorming, the expert team model, nomination team, the focus group method, Delphi Technique, etc. The latter consists of questionnaire survey, regression analysis, factor analysis method (Principal Component Analysis), Analytic Hierarchy Process (AHP), etc. (Lin and Chen, 2006). This study constructs the preliminary structure using the following methods:

1. Data collection: Besides gathering related literature, the researcher checks bicycle-related websites of communities, individuals, forums and travel agencies.
2. Participant observation: With more than ten years of experience in the bike tourism industry, the researcher has participated in various biking activities and has joined different biking communities. Moreover, he has travelled to many biking destinations and had first-hand experience with biking around Taiwan.
   There are 42 items listed in this study that facilitate the global promotion of bike tourism.

3.2. Expert Panel and Brainstorming

Business enterprises must keep on innovating to maintain their competitiveness. Hence, the ability to innovate is a key factor for success (Wang, Lu and Chen, 2008). Brainstorming is the process of developing innovative concepts based on the ideas of a group of people (Wang, 2011). Gerber (2009) believed that communication among participants in a brainstorming session is the key to success. Even though there is no limit to the number of participants, 5-15 is the most ideal number of brainstorming participants (Wang, 2000).

The expert panel involved in the study is composed of 2 university professors from the tourism department, 2 tourism-related government officers, 3 bike tour operators, and 1 tourist with extensive bike touring experience abroad. The brainstorming session came up with more items that facilitate the global promotion of bike tourism. Discussions

were held to review and revise the wording and content of each item. The classification of these items, the selection or revision of items, and the study framework were likewise discussed.

3.3. Study Framework

The study framework is composed of 7 aspects with 8-12 subitems each. A total of 69 items are listed below in Table 1.

3.4. CLPEM

CLPEM (Control Limits Performance Evaluation Method) is derived from IPA (Important Performance Analysis) and PEM (Performance Evaluation Method) (Chen, S. C., Chen, S. K. and Hsia, 2005; Hung, Huang and Chen, 2003). The IPA method proposed by Martilla and James (1977) shows the importance and performance of each item using graphics and draws the items in a four-quadrant chart. It can be used to find the solution for improving service quality. This easy-to-use method still has several limitations, which could lead to inaccurate evaluation results and deviation in decision-making (Mikulić and Prebežac, 2008; Chen, 2016). The PEM method proposed by Lambert and Sharma (1990) divides the entire matrix into 9 blocks, wherein 3 blocks each are evenly distributed as “Target Blocks”, “Poor Resource”, and “Resource Over-supply”. When an item falls under non- “Target Blocks”, it is placed horizontally on the “Target Blocks” (Chi, 2012). However, the PEM method could still make incorrect assessments like the IPA. Therefore, control limits are added in the PEM method to address such deficiency (Hung, Huang and Chen, 2003; Chen, S. C., Chen, S. K. and Hsia, 2005; Lin, Chen, Lin and Wu, 2006; Hsia, T. C., Chen, S. C. and Chen, K. S., 2009). This could help decision-makers determine the target items in need of improvement.

The CLPEM steps are detailed as follows:

Step 1. Confirm the elements to be evaluated.

Step 2. Distribute and collect questionnaires.

Step 3. Calculate the mean value of the importance and performance of each item. Assuming that there are a total of m questionnaires, the mean importance of element j is $\mu Ij=[\Sigma mn=1(Ij)]/m$ and the mean performance is $\mu Pj=[\Sigma mn=1(Pj)]/m$.

Step 4. Convert the mean value of importance and performance into percentage. Percentage of importance $PI=(\mu I-Min)/R$, and percentage of performance $PP=(\mu P-Min)/R$. Min=1 is the minimum value of the scale. R is the distance of the scale. For example, Likert five-point scale is applied in the study, the minimum value is 1, while the maximum value is 5, so Min=1，R=(5-1)=4. We convert the mean value μI and μP of each element into percentage PI and PP. This enables the evaluator to assess the importance and performance of the elements in a clear and easy way. Therefore, PI and PP are both [0,1]. If Likert five-point scale is applied, Min=1，R=5-1=4. When the mean importance of an element μI=4.2, the importance percentage PI = 80%. If the mean service

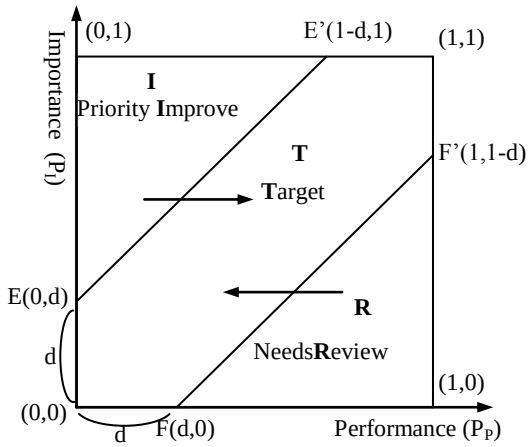
satisfaction μP=3.8, then the service satisfaction percentage PP=70%. According to the two percentage indicators, the importance and satisfaction of the item are more evident. They are also drawn in the matrix based on the values (PP , PI).

Step5. Draw the importance-performance dot plot.
Draw the CLPEM dot plot with the PI and PP of each element as coordinates (PP, PI).

Step 6. Set control limits.
Next, the control limits are set to determine d value, which should be within (0, 1). The coordinates of the following four points are E (0, d), E'(1-d, 1), F(d, 0) and F'(1, 1-d), respectively. In this case, EE' and FF' are the control limits. The dot plot is divided into three sections, I (Priority Improve), (Target Area) and R (Needs Review) (Figure 1).

Step 7. Allocate the invested resources and think about improvement strategies.
If (PI -PP)>d, the element falls under area I "Priority Improve". This indicates that the element is invested with inadequate resources, which should be improved by investing more resources. If -d≤ (PI -PP)≤d, the element falls under area T "Target Area". This indicates that the importance is very close to satisfaction, which should be sustained. If (PP -PI)>d, the element falls under area R "Needs Review". This indicates that the element is over-supplied with resources. If the operator has sufficient resources, then this should be sustained. However, if there is shortage of resources, it is quite necessary to reduce investment of resources in this particular area (Chi, 2012). In other words, there is a need to consider how to allocate resources, making the elements in area I and R move towards area T.

Figure 1: **PEM dot plot control limits**



Source: revised from Chi, 2012

The range of Target Area is determined by the control limits, EE' and FF'. In other words, d value affects the distribution of the three areas. The current literature defines different d values. Hung et al. (2003) and Chen et al. (2005) divided the coordinate value into three equal parts, so d is 1/3. Hsia et al. (2009) divided the overall area of CLPEM plot into three equal parts. In this case, d=1-(√(2/3)), which is about 0.184. In this study, the d value may not be the focus but the resources of the decision-maker instead. If the resources are adequate, d may be set smaller; this screens out more items in need of urgent improvement.

3.5. Respondents and Questionnaire Distribution

This study is about planning strategies. So the questionnaire respondents are experts. Through the web searching for related institutions and experts information, we select which experts to be our respondents. We contact the experts by email or telephone and mail the questionnaire or deliver the questionnaire in person which resulted in 100% respondent rate. In this study, a questionnaire survey was conducted and the respondents included industrial, government and academic experts. There were a total of 148 respondents composed of 31 university professors from tourism-related departments, 42 government officers and bicycle club members and 75 tour operators who were engaged in tourism-related work for more than 5 years. Among these experts, 131 experts have bike tours experiences. So the results of this questionnaire can reflect the bike tourists' opinions. The contact information of relevant institutions was obtained via the Internet and the respondents were contacted via phone or Email before the questionnaires were sent and collected personally or by mail. This improved the rate and credibility of collected questionnaires.

4. RESULTS

4.1. Credibility Test

Credibility refers to the degree of elements included in the questionnaire that can be measured as well as the scope of the study that can be described correctly (Hair, Black, Babin and Anderson, 2010). In terms of importance, the credibility Cronbach's α of the overall questionnaire reached 0.939. The α values for each aspects are A(0.748), B(0.726), C(0.788), D(0.852), E(0.803), F(0.734) and G(0.814). It reached 0.962 in terms of satisfaction. The α values for each aspects are A(0.844), B(0.897), C(0.796), D(0.792), E(0.819), F(0.787) and G(0.880). Generally, a credibility of over 0.6 is considered credible. The α coefficient of the questionnaire is above 0.7, so the results of the questionnaire survey are credible.

4.2. CLPEM Analysis Results

After sorting the questionnaire results, the mean value of importance and performance of each item was calculated and converted into PI and PP. The difference of PI and PP was calculated and the values of (PI-PP) were ranked accordingly. The d value was set as d1=(1/3) and d2=(0.184). This helped determine which area the items would fall

under, i.e., CLPEM plot, Priority Improve, Target Area or Needs Review. The overall analysis results are shown in Table 1.

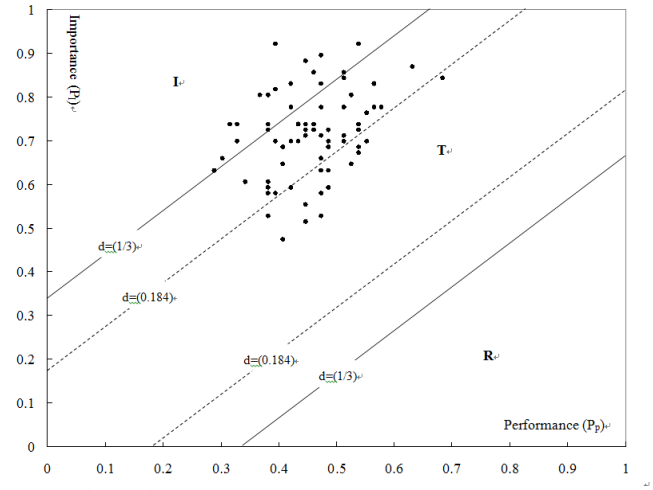
Table 1: **Study Framework and Results of CLPEM**

Item	P_I	P_P	P_I-P_P	Rank	d1	d2
A. Planning special bike tours						
a1. Biking trips that incorporate festivals and events	0.697	0.513	0.184	54	T	I
a2. Comprehensive tours with sightseeing	0.868	0.632	0.237	37	T	I
a3. Tours with sampling of Taiwanese delicacies	0.684	0.539	0.145	58	T	T
a4. Tours that incorporate Taiwanese folk customs and culture	0.855	0.461	0.395	10	I	I
a5. Biking trips and adventures	0.697	0.395	0.303	22	T	I
a6. Customized tours according to tourist preference	0.776	0.474	0.303	21	T	I
a7. Special trips based on biking ability	0.803	0.382	0.421	5	I	I
a8. Accommodation according to preference	0.697	0.421	0.276	27	T	I
a9. Tours including rail trails and bike trails	0.855	0.513	0.342	17	I	I
B. Strengthening global promotion						
b1. Inviting foreigners to participate in biking festivals and events	0.697	0.434	0.263	36	T	I
b2. Organizing various international bicycle racing events	0.776	0.421	0.355	13	I	I
b3. Engaging celebrities as image ambassadors to help in promotions	0.671	0.539	0.132	62	T	T
b4. Producing video clips that help promote bike tourism	0.776	0.579	0.197	46	T	I
b5. Producing dramas and programs that showcase biking activities	0.724	0.539	0.184	51	T	I
b6. Creating a special webpage for bike tourism	0.737	0.434	0.303	22	T	I
b7. Promoting biking as a form of training for foreign athletes	0.592	0.382	0.211	43	T	I
b8. Publishing bike tourism-related books	0.684	0.487	0.197	46	T	I
b9. Inviting foreign athletes to help create awareness of Taiwan as a tourist destination	0.513	0.447	0.066	67	T	T
b10. Setting up a special government agency in charge of promotion	0.605	0.342	0.263	31	T	I
C. Providing complete facilities for bike tourism						
c1. Ensuring availability of many bicycles	0.697	0.553	0.145	61	T	T
c2. Providing rental service for bike facilities	0.829	0.566	0.263	31	T	I
c3. Providing rental or sale of tour guide systems	0.711	0.513	0.197	49	T	I
c4. Providing rental service for bike repair tools	0.632	0.487	0.145	58	T	T
c5. Checking the reliability of bike facilities	0.737	0.434	0.303	22	T	I
c6. Providing special GPS for bikes	0.737	0.382	0.355	14	I	I
c7. Setting up various bike rental stations	0.711	0.474	0.237	39	T	I
c8. Providing service that offers " bike rental at one station with drop off at another designated location"	0.921	0.395	0.526	1	I	I
c9. Reasonable rental rate	0.776	0.566	0.211	42	T	I
D. Training for professional bike tour guides						
d1. Developing a professional certification system for bike tour guides	0.645	0.408	0.237	39	T	I
d2. Training for bike tour guides	0.724	0.487	0.237	37	T	I
d3. Multi-language training for qualified personnel	0.697	0.329	0.368	12	I	I
d4. Training bike tour guides to gain familiarity with different routes	0.829	0.474	0.355	14	I	I
d5. Strong personal and historical knowledge of the itinerary	0.816	0.395	0.421	4	I	I
d6. Working knowledge of bike repair	0.842	0.684	0.158	56	T	T
d7. Ability to handle emergency situations	0.921	0.539	0.382	11	I	I
d8. Ability to predict the weather	0.776	0.513	0.263	31	T	I
d9. Bike training per region	0.579	0.474	0.105	65	T	T
d10. Setting up various bike tour organizations	0.645	0.526	0.118	63	T	T
E. Providing complete support activities						
e1. Providing a nanny van service for bike tours	0.882	0.447	0.434	2	I	I
e2. The nanny vans must be equipped with simple medical-care facilities.	0.842	0.513	0.329	20	T	I
e3. There should be a network of medical-care institutions that offers a complete medical-care system.	0.724	0.461	0.263	31	T	I
e4. Providing comprehensive tourism insurance	0.895	0.474	0.421	7	I	I
e5. Planning and setting up various bike shops	0.579	0.382	0.197	46	T	I
e6. Setting up bike rental stations in major public transportation hubs	0.697	0.487	0.211	43	T	I

Item	P_I	P_P	P_I-P_P	Rank	d1	d2
e7. Bike-transit integration on the light rail	0.737	0.461	0.276	27	T	I
e8. On-road bike-transit integration	0.605	0.382	0.224	41	T	I
e9. Providing travel instructions prior to the trip	0.737	0.539	0.197	49	T	I
e10. Conducting bike training before the trip	0.658	0.474	0.184	51	T	I
e11. Providing video recording service during the trip	0.526	0.474	0.053	69	T	T
e12. Providing support service for supplies	0.632	0.474	0.158	56	T	T
F. Creating a bike-friendly environment and atmosphere						
f1. Promoting the bicycle as a green vehicle to protect the environment	0.763	0.553	0.211	45	T	I
f2. Promoting bike tours as graduation trips for students	0.526	0.382	0.145	58	T	T
f3. Promoting biking in Taiwan as a “coming-of-age” tradition	0.474	0.408	0.066	68	T	T
f4. Designing and promoting a record of completed biking activities	0.553	0.447	0.105	64	T	T
f5. Constructing bike paths along scenic spots	0.737	0.447	0.289	25	T	I
f6. Constructing bike paths around Taiwan	0.724	0.447	0.276	26	T	I
f7. Building hotels throughout Taiwan to accommodate bike tourists	0.592	0.421	0.171	55	T	T
f8. Training citizens to maintain a bike-friendly atmosphere	0.737	0.316	0.421	5	I	I
f9. Promoting Taiwan familiarization bike tours	0.737	0.329	0.408	9	I	I
G. Providing a comprehensive tourist service information						
g1. Setting up a bike tourist information center and service exchange platform for foreign tourists	0.803	0.368	0.434	3	I	I
g2. Providing a complete and standardized travel contract	0.684	0.408	0.276	27	T	I
g3. Providing a foreign-language voice guiding system for tourists	0.632	0.289	0.342	19	I	I
g4. Clear and easy-to-understand road signs and signage in public facilities	0.829	0.421	0.408	8	I	I
g5. Making bike tour information accessible	0.803	0.526	0.276	27	T	I
g6. Providing bike tour maps in various languages	0.724	0.382	0.342	17	I	I
g7. Providing bike tour maps with contour maps	0.658	0.303	0.355	14	I	I
g8. Providing detailed introduction of scenic spots	0.592	0.487	0.105	65	T	T
g9. Providing information on accommodations and vehicle rental service	0.711	0.447	0.263	31	T	I
g10. Developing a mobile APP for bike tours	0.579	0.395	0.184	51	T	I

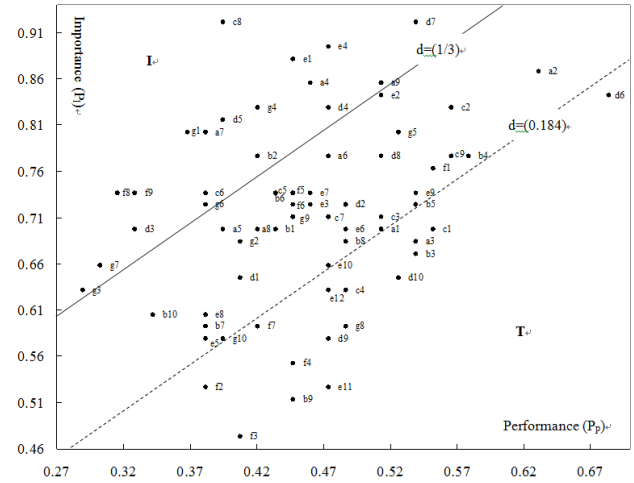
Source: This study

Figure 2: **The CLPEM dot plot**



Source: This study

Figure 3: **Locally magnified CLPEM dot plot**



Source: This study

The CLPEM distribution figure is drawn (Fig. 2) based on the results in Table 1. As shown in the figure, most items are distributed in the middle and upper portions of the figure, and no item is found in area R.

To review the distribution of items more clearly, Figure 2 is locally magnified, as shown in Figure 3. If d value is set as (1/3), then 19 items fall under the Priority Improve area, including c8, e1, g1, d5, a7, f8, e4, g4, f9, a4, d7, d3, b2, c6, d4, g7, a9, g6 and g3.

If d value is set as 0.184, 54 items fall under the Priority Improve area, while only 15 items remain on the Target Area including f7, d6, e12, a3, c4, f2, c1, b3, d10, f4, d9, g8, b9, f3, and e11.

5. DISCUSSION

Through literature analysis, brainstorming and expert discussion, this study has constructed a theoretical framework to facilitate the global promotion of Taiwan's bike tourism, which includes 7 dimensions and 69 items. It used questionnaires and the CLPEM method to analyze the importance and performance of these items. The study is aimed at determining which items should be invested with resources for improvement, so as to achieve the goal of promoting bike tourism globally.

This study has adopted the CLPEM method, and set d value as d=1/3 and d=0.184. When d=0.184, 54 items fall under the Improve Priority area. There are too many items which need real improvement. Thus, d=1/3 is used as the separation line. As shown in Figure 3 and Table 2 of the study results, 14 items; namely, c8 and e1 are the priorities for improvement. In terms of d setting, it is suggested that the decision-maker should

evaluate the resources at hand, and make use of (PI-PP) to determine the number of items that are priorities for improvement.

Taiwan's Public Bicycle System (PBS) currently provides a service that offers "bike rental at one station with drop off at another designated location". However, PSB is still regarded as a short-distance transport vehicle. Currently, there are 5 cycling routes in Taiwan designed by the Tourism Bureau; these are found in Sun Moon Lake, Taroko, Guan Mountain, Dongfeng, Guandu and Taishui, which are intended mainly for leisure and recreation since they are ideal for short-distance biking. Hence, they are not worth promoting to bike tourists from America and Europe (Ceng, 2008). Generally, tourists prefer traveling with bicycles. After traveling for a couple of days and reaching their destination, they could be hundreds of miles away from the departure site. It would be very convenient for bike tourists if there is a service that offers "bike rental at one station with drop off at another designated location".

The highly dense 24-hour convenience stores in Taiwan can easily resolve the bike tourism supply problem. However, many tourists prefer off-road bike trails like the Taiwan Cross-Island Road, Taroko, Wuling, Alishan or Huatung, which are quite challenging and offer beautiful sceneries. Support service is also limited. Therefore, it is necessary to have a nanny van service. There should also be a comprehensive health/medical care service available for both local and foreign tourists. Joining bike tours is a high-risk activity for foreign tourists coming to Taiwan (Dannenberg, Needle, Mullady and Kolodner, 1996), so the government should consider enhancing the country's tourism insurance system.

Generally, the number of bike tour groups is less than typical tour groups. Some tourists include individual hikers, who are accustomed to getting travel information. Thus, it is very important to build a communication platform for foreign tourists to exchange bike tour information. Currently, there are Chinese biking-related websites in Taiwan that cater to users from Taiwan, Mainland China and Hong Kong, and these fail to attract potential customers from Europe and America. To promote bike tour globally, the government should provide bike tour maps in various languages as well as foreign-language voice guiding systems for tourists. Bike tour maps should also include a contour map since Taiwan has a complicated topography and heterogeneous geological conditions. The government could likewise develop a mobile APP that combines the above requirements and has GPS function. It should also develop related software and hardware systems. All these could help assure foreign tourists when they visit Taiwan for bike tours. The road signs in Taiwan are clear and visible, but they are mainly for the convenience of common automobiles. To promote biking in Taiwan, there must be a road sign system set up exclusively for bike riders. These road signs should also be easy-to-understand for foreign tourists.

The tour guides in Taiwan must pass the government qualification test (Chang, 2014) to assess their knowledge and language ability. In terms of bike tourism, there is a need for more related laws and regulations. The government should consider implementing new policies. For example, a biking guide should be familiar with routes and have personal and historical knowledge of such routes. S/he should also have multiple language ability and can handle emergency situations.

Currently, Taiwan's Tourism Bureau has initiated plans to have different routes for tourists depending on their biking abilities (TaiwanBike, 2015a). These routes offer beautiful sceneries and showcase Taiwan's cultural diversity (Lonely Planet, 2012), festivals, food, and folk customs that are truly unique (Chen, 2014). The government could organize contests that offer creative biking routes. Integrating the above requirements can help develop an exciting bike tourism plan that would attract foreign tourists. Taiwan can also develop a complete transport system around the island. Even though TRA's carriage allows passengers to carry their bicycles, the service still has many limitations. Given the effective railway system around the island, the government should also consider how to combine bike tours with fun and flexible rail trips.

To promote Taiwan's bike tourism globally, software and hardware systems should also be developed, as well as marketing knowledge and skills. The government should try to organize various international bike racing events. Through international media and publicity, people from other countries who are interested in joining these biking events could learn more about Taiwan. This would be helpful in promoting Taiwan's bike tourism to the overseas market.

In the past, automobiles in Taiwan didn't yield to pedestrians and bikes. However, thanks to media advocacy and information over the years, automobile drivers have gradually learned to yield to pedestrians. To promote its bike tourism globally, Taiwan has to work hard through public advocacy and instruction. It also has to create a bike-friendly environment. Reading books is not enough, there is a need to travel to different places. Biking is a slow and enjoyable means to travel. Tourists can have a better understanding of Taiwan's history, culture, folk customs and traditions. Having a comprehensive tourism plan can make tourists want to come back to Taiwan.

The abovementioned aspects are the priorities for improvement. However, this doesn't mean that other items are unimportant. As shown in Figure 2, all items fall under the upper portion of the CLPEM figure, and nothing is located at the lower right corner (area R). This implies that there is no over-supply problem maybe because it's been only a few years since Taiwan has invested resources in bike tourism. If there are more resources available for the government and operators, investments could be made to improve other items so as to increase the quality and quantity of Taiwan's bike tourism industry.

6. CONCLUSION

In recent years, bike tourism has been gaining popularity in many countries. With its flourishing tourism industry, Taiwan can capitalize on its rich scenery, history, culture and festivals to organize unique tourism events. Lately, bicycle touring is becoming popular among Taiwanese. The government has been actively building many bike paths in hopes of developing Taiwan's bike tourism.

This study has constructed a framework composed of 7 aspects and 69 items to promote Taiwan's bike tourism globally. The framework can provide the foundation for the government and relevant operators to promote bike tourism worldwide. Using

the CLPEM method, this study has attempted to determine the items that need to be prioritized for improvement and proposed several recommendations which are the key contributions of this research. Although the study only focused on Taiwan, the overall theoretical framework and study methods can provide useful reference for countries that are interested in developing their bike tourism.

Taiwan's bike tourism industry is still in its early stage of development. Due to the related research is not much, the research structure and methodology are not very perfect, which is the limitation of this study. Therefore, this study has taken a general view with regard to the global promotion of Taiwan's bike tourism. Follow-up research is suggested to further explore the items proposed in this study. This could help add more information to the subject of bike tourism.

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Chun-An Chen, PhD, Professor
Chung Hua University
Department of International Business
707, Sec. 2, WuFu Rd., HsinChu, 30012 Taiwan
Phone:+886-3-5186761
E-mail:cachen@chu.edu.tw

Hsien-Li Lee, PhD, Associate Professor
Chung Yuan Christian University
Department of Accounting
200, Chung Pei Rd., Chung Li, 32023Taiwan
Phone:+886-3-2655327
E-mail:lslej0911@yahoo.com.tw

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