

A Study of Sport Tourism's Environmental Impact

A Case Study of Kenting Traveling Destination in Taiwan

Chao-Chin Liu¹, Chun-Yi Chang², Chun-Nan Chen³, Yi-Hui Liu⁴, Kao-Lang Ni⁵

Abstract

The **Purpose** of this study was to analyse sport tourism's impact on the environment. The study **methods** of this study included the use of a self-devised "Outline for an interview about sport tourism's impacts on the environment" and "a questionnaire about sport tourism's perceived impacts on the environment" as two of the major tools. Local residents of Kenting traveling destination were targeted, 12 sport tourism business owners, employees within the tourism industry and local residents were selected for the interviews. In addition, 300 questionnaires were distributed to local residents, business owners, employees and 288 valid responses were released. The **result** of the collected data concluded the following: 1) Sport tourism's impact on the environment included problems like to outdoor recreational places and facilities increase, community peaceful interference, natural environment and resource destruction, rubbish and messiness, traffic jam and park dislocation, etc. However, the overall impacts were still negative of the sport tourism's impacts on the environment, especially the ecological environment destruction, traffic question, rubbish problem were comparatively serious. 2) The Influence factor of the perception of local residents toward sport tourism's impacts on environment including three factors of "life environment cognition", "natural ecology cognition" and "promote environment cognition". 3) The perception of local residents toward sport tourism's impacts on environment appeared to be more negative than positive, furthermore, locally born residents, the sport tourism businessmen, and the local employees' within the tourism industry recognition of the sport tourism's impacts on environment tended to be significant lower than temporary incoming residents. 4) Responses from various relationships to the tourism industries or normal residents in Kenting had similar perception, but 'promote environment cognition' were significant differences only. The **conclusion** of this study indicated that local residents of Kenting still recognized the sport tourism's impacts on environment in general were more negative than positive, but they had more tolerant recognition toward environment and shared similar common sense upon sport tourism's impacts on environment regardless their status and industry within sport tourism.

Keywords: sport tourism, tourism impact, environmental impact

¹ Professor, Department of Recreation Sport and Health Promotion in National Pingtung University of Science and Technology, Taiwan.

² Lecture, Department of Physical Education, National Hsinchu University of Education, Taiwan.

³ College student, Department of Recreation Sport and Health Promotion in National Pingtung University of Science and Technology, Taiwan.

⁴ Teacher, Pingtung County Chung Hsiao Elementary School, Taiwan.

⁵ Lecture, Department of Recreation Sport and Health Promotion in National Pingtung University of Science and Technology, Taiwan.

1. Introduction

1.1 Background

The Report 2005 of World Tourism Organization [WTO] indicated the global tourism industry grew by 5.5% despite the Indian Ocean tsunami in 2004 and set the record of 800 million people traveling abroad (WTO, 2006). Moreover, WTTC claimed in 2000 that the global tourism industry including tourism related fields, investment, tax income, etc. was 10.8% of the world's GDP which is equivalent to US\$3575 billion. It's estimated to reach 11.6% of the world's GDP which is equivalent to US\$6591.1 billion. There are 192.21 million people currently working in tourism industry in the world (8.33%) and the population is expected to reach 251.62 million in 2010 (Tourism Bureau, Ministry of Communication [TBMC], 2004). Consequently, the importance of tourism industry to the whole world or a single country reveals.

Regarding to the analysis of Taiwanese domestic tourism industry, 87.6% of the citizens over 11 years old traveled domestically at least once in 2006. In average, people in Taiwan travel 5.49 times (TBMC, 2007). People gradually pay more attention to traveling experience due to the increase of traveling in recent years (Kao, 2003). A significant increase in "body-building holiday" as the traveling purpose has become trendy. People favor the combination of sports and active leisure (Astrand, 1987; Long, 1990). Meanwhile, "sport tourism" becomes another option for traveling (Martin & Mason, 1987) and it is also with the most potential growth in tourism industry (Terry, 1996; WTO, 1985). The prosperity in Taiwan sport tourism demonstrated from the participations in Taipei International Marathon, Taroco International Marathon Race, Sun Moon Lake Marathon Swimming Race, Hengshen Peninsula Triathlon, White water rafting in Xiouguluan River and Laonong River, Snorkeling in Green Island, etc. and the growth of visitors.

Many people expect tourism to be a pollution free industry increasing income for local residents, simulating local prosperity, improving local infrastructure and enhancing life quality. Nevertheless, tourism appears to have very complex social implications that often have a profound impact on local economics, environment and culture (Lin, 1995; Ryan, 1991; Yen, 1994). Simultaneously, sport tourism often has a substantial negative impact on local environments. For example, Priester (1989) suggests sport tourism plays a role of not only victim but also aggressor towards the environment impact. Various forms of sport tourism activities also have a negative impacts on local environments (Allison, 1995 ; Strasdass, 1994 ; Vanreusel, 1993), and

the increasing pressure of leisure and loss of quality in these areas might result in bad correlation between the environment and recreations (Vanreusel, 1990). According to “The Report of Taiwan Tourism Survey in 2004” published by TBMC (2006), over 5 million tourists visited Kentin traveling destination which is the most popular sport tourist resort in Taiwan. To minimize the negative impact of sport tourism on the local environment, this study focused on Kentin traveling destination and discovered impacts on the local environment via interviewing and investigating the local residents. Furthermore, comparisons among different recognition of the local residents from various interested parties of tourism industries towards the impacts of sport tourism on the environments are carried out. Consequently, the results could contribute to related authorities for plans of sport tourism facilities, improvements of sport tourism service quality and strategies to further develop sport tourism.

1.2 The Purpose of Research

Regarding to the above background and motif, this research aims to study the impacts of sport tourism on the local environment and compare the recognition of residents from various backgrounds of tourism industries towards the impacts of sport tourism on the environments.

1.3 Definitions

1) Sport Tourism: Standeven and De Knop(1999) defined it as non-commercial or commercial purposed traveling for people to leave their residence to participate or watch sport activities. In this study, it is defined as the traveling activities to participate or view sport activities in Kentin traveling destination.

2) Tourism Impact: The impacts caused by tourism developments on the local can be divided into economic impact, social and cultural impact and physical impact (Chen & Kuo, 1995). In this study, it means the influence of participation in sport tourism activities on Kentin traveling destination.

3) Environment Impact: Tourism developments generally result in misuse or overuse resources that lead to environment damage and fast reduce in resources (Chen & Kuo, 1994; Ou, 1998). In this study, it means the interviewees who respond or score in “The Questionnaire of Outline and Recognition of Environment Impact Caused by Sport Tourism on Local Environment”. The stronger the response is and the higher score indicate the stronger impact and recognition on the environment caused by sport tourism, or vice verse.

2. Method

The purpose of this research is to study the impacts caused by sport tourism on the local environment and survey research was the main method including “in-depth

interview” and “questionnaire” techniques. Thus, related information, answers or the relationships among various variables can be collected (Fetterman, 1989).

2.1 Subjects

The choice of targeted people is based on the ones who can provide necessary data (Krippendorf, 1987); therefore, the local residents were chosen. 12 people (Table 1) including sport tourism managing directors, tourism industry managing directors, tourism related industry employees and general residents were interviewed in-depth (Brunt, 1999). 300 questionnaires were given to local residents as the convenient sampling method and 288 were efficient (83% efficiency) including 152 male responses (52.78%) and 136 female ones (47.22%). The interviewees aged from 20 to 50 are the majority (73.92%).

Table 1

The summary of background of study subjects

No.	Category	Sex	Age	Education	Occupation
A	Manager of Tourism industry	M	61	Elementary Sch.	B&B manager
B	Manager of Tourism industry	M	44	High Voc. Sch.	B&B manager
C	Sport tourism business owner	M	43	Junior High Sch.	Jet Ski Rental
D	Sport tourism business owner	M	45	High sch.	Surfing manager
E	Manager of Tourism industry	M	43	Junior college	B&B manager
F	Employee of Tourism industry	M	41	High Voc. Sch.	Restaurant manager
G	Employee of Tourism industry	F	47	Junior High Sch.	Restaurant staff
H	Local resident	F	26	Junior college	Clothing sale
I	Employee of Tourism industry	F	39	Junior college	Aquarium Manager
J	Local resident	F	29	Junior college	Staff of service section
K	Local resident	F	37	High Voc. Sch.	Staff of service section
L	Employee of Tourism industry	F	24	High Voc. Sch.	Part-timer

2.2 Instruments

The self-devised “the in-depth interview outlines about the impacts caused by sport tourism on the local environment” and “the questionnaire of local residents’ recognition towards the impacts caused by sport tourism on the local environment” are the tools of this research. The reliability (total scale $\alpha = .7900$; sub-scale $\alpha = .7779 - .8315$) and validity (internal consistency test $r > .301$, $p < .001$; Three factors including impacts on life quality, impacts on natural ecology and improvements on environment maintenance were extracted by principle component analysis method as total explained variance = 52.97%) analysis results were all acceptable (McAuley & Courneya, 1994).

2.3 Data Analysis

The qualitative data in this research were analyzed by grounded theory generated by Strauss and Corbin (1990) as descriptive events were transformed into analytic events. The implementations are as the following: 1) Number each observation or interview content and assign a key word as the topic to each paragraph. 2) Categorize the paragraphs according to topics. 3) Within the same category, paragraphs can be sub-divided into various patterns according to their types. 4) Finally, all the formats in the order of topics made up a meaningful story which represents the result of the data analysis. On the other hand, the quantitative data were analyzed by SPSS 10.0 and the statistic figures described the average, standard deviation, and order of people's recognition towards the impacts of sport tourism developments on the environment. The recognition of residents from various backgrounds of tourism industries towards the impacts of sport tourism on the environments was examined and analyzed by one-way ANOVA, and the level of significance $\alpha=.05$ as standard.

3. Results and Discussions

3.1 The qualitative analysis of the impacts by sport tourism on the local environment

As the result of in-depth interviews, the following reveal residents' opinions about the environment impact caused by sport tourism on Kentin traveling destination.

3.1.1 Sport tourism enhances outdoor recreational areas or public facilities.

Since Kentin is surrounded by the oceans and owns a national park and national tourist resorts, Kentin district is an important venue for sport tourism and can attract extensive visitors. Consequently, the government and private businesses would utilize the geographic conditions and natural resources to construct more and better outdoor recreational venues or public facilities (refer to the interview records A, B, F and K).

3.1.2 The impacts of sport tourist's behaviors on local living environment.

Due to the fact that tourists are from various places with different cultural backgrounds and lifestyles and mostly tend to have night activities and behaviors, local residents' living environment is disturbed. (Refer to interview records of C, D, E, G, H, I, J and K.) This matches the study findings indicating tourist's visiting activities and night activities would disturb the communities (Chang, 2007).

3.1.3 The impacts of sport tourism on natural environments.

The interviewed local residents considered sport tourism with certain activity-specific influences like snorkeling, mechanized-activity like Jet Ski, site-specific influences like popular event venues, use-impact relationship, and exceed carrying capacity that led to damages on local oceanic ecology including coral reefs

and environment along the coast. Fortunately, the Bureau of Kentin National Park [BKNP] enabled charge both the local residents and sport tourists to behave properly (Refer to interview records of C, D, E, G, H, I, J, K and L). The related researches all recommended that sport tourism will damage the natural environments (Davidson, 1992; Graefe, 1993; Roberts, 1989). The interviewed local residents of this study suggested that although some damage was made on local oceanic ecology and coastal environments, the managements and restrictions made by the BKNP have limited the environmental impacts to acceptable level.

3.1.4 The litter problems caused by sport tourists.

The interviewed residents claimed a high volume of tourists visit Kentin on the weekends and national holidays. The litter they bring undoubtedly causes the local certain problems, especially at the popular tourist spots and the beach. In addition, rubbish cannot be left on the ground as the policy of the local government and there are no large-sized trashcans around, such litter problems become intense during the holidays (Refer to interview records of A, B, C, D, E, G and L). The related studies suggested sport tourism developments would cause litter problems (You, 2000; Ou, 1998; Chen & Kuo, 1995). Thus, developing sport tourism requires attentions on rubbish issues.

3.1.5 Sport tourists bring negative influence on the traffic.

5 million tourists visit Kentin every year and the high volumes of visits over the holidays and peak seasons lead to local bad traffic and car parking problems. Some local residents think such problems can't be solved due to the complex public construction application procedures required by BKNP. Therefore, applications aren't easily approved generally and the traffic problems keep getting worse (Refer to interview records of A, B, C, D, E, F and L). Such result is similar to the related researches (Kuo, 1999; You, 2000) which indicated developing sport tourism requires solutions on the traffic and car parking issues.

3.2 The local residents' recognition towards environment impacts by sport tourism

The investigation of the local residents' recognition towards environment impacts caused by sport tourism scored 2.53 in average. Thus, the recognition seems negative. Sport tourism prompted the residents to pay more attention on environment and natural ecology preservation and protection in terms of positive impacts. Moreover, the development of sport tourism also indirectly promoted perfect protection of community environment and improved the local life quality. On the other hand, sport tourism made the environment dirtier and the traffic more

congested. Sport tourism also caused damage to the natural scenery and more noise problems as the negative impacts (Table 2).

Table 2

Table of Kentin residents' recognition towards sport tourism development

	Item	M	SD	Order
1	Sport tourism causes crowd and traffic congestions.	1.92	.63	12
2	The public facilities are improved along the requirements of sport tourism development.	3.93	.82	1
3	Sport tourism development makes the environment dirtier.	1.81	.74	13
4	Sport tourism development produces more noise.	2.00	.73	10
5	Sport tourism development pollutes the air.	2.09	.74	5
6	Sport tourism development damages wild animals and plants.	2.05	.76	8
7	Sport tourism development damages the original natural scenery.	1.99	.75	11
8	Sport tourists disturb residents' daily routines.	2.08	.80	6
9	Sport tourism accelerates consume of natural resources.	2.05	.74	8
10	Sport tourism damages the ecology environment in Kentin.	2.07	.73	7
11	Sport tourism development makes residents pay attention to environmental conservations and protection of natural ecology.	3.60	.86	3
12	Sport tourism development indirectly ensures the community under proper protections.	3.60	.89	3
13	Sport tourism development improves life quality.	3.78	.78	2
The recognition of impacts on the whole environment		2.53	.35	

Note: The higher the score is, the more positive the impact of tourism is. On the other hand, the lower the score is, the more negative the impact of tourism is.

3.3 The comparisons of various types of residents' recognition towards environment impacts caused by sport tourism.

Table 3 lists the comparisons of various types of residents' recognition towards environment impacts. "Life quality impact", "natural ecology impact", and "the overall environment impact" all appeared significant difference. After compared by Scheef, the temporary visitors' recognition towards environment impact seems higher than the local residents', employers' and employees'. The research result might match Butler (1980) theory of tourism development lifecycle and AP and Comption's (1998) theory of tourism development process. Kentin traveling destination still remains at involvement stage, stable developing stage, and consolidating stage or

embracing stage and tolerant stage; therefore, the local residents' and employers' recognition towards the negative environment impacts produced by sport tourism seems to be weak. Likewise, Chen and Kuo (1995) and Ou (1998) declared that tourism recreation industry development have significant positive influence on local economics. Consequently, local residents, employers and employees tend to be more tolerant with negative impacts on the environment.

Table 3

The comparisons of various types of residents' recognition towards environment impacts caused by sport tourism (N=288)

Factors	Groups	N	M	SD	<i>F</i>	Post-test
Life quality impact	A. Local residents	177	9.44	2.07	37.425*	C > A, B
	B. owner or employees	79	10.73	2.50		
	C. temporary visitors	32	13.22	3.33		
natural ecology impact	A. Local residents	177	8.01	1.91	11.260*	C > A, B
	B. owner or employees	79	8.38	2.66		
	C. temporary visitors	32	10.06	2.91		
Environment maintenance	A. Local residents	177	14.84	2.38	2.198	
	B. owner or employees	79	15.38	2.27		
	C. temporary visitors	32	14.47	2.40		
The overall environment impact	A. Local residents	177	32.28	4.01	21.740*	C > A, B
	B. owner or employees	79	34.49	4.91		
	C. temporary visitors	32	37.75	6.50		

* $p < .05$

3.4 Comparisons among the recognition of residents from various interested party of tourism industries towards the impacts of sport tourism on the environments

From Table 4 "Comparisons among the recognition of residents from various backgrounds of tourism industries towards the impacts of sport tourism on the environments," only "environment maintenance" appeared significant while "life quality impact", "natural ecology impact", and "overall environment impact" all appeared insignificant. Therefore, the recognition of residents from various backgrounds of tourism industries towards the negative impacts of sport tourism on the environments remain the same. The outcome might match the theory of McIntosh and Goeldner (1995) that tourists and the local residents' harmonious social interactive relationship leads to their same tolerant attitudes towards negative

environment impacts caused by sport tourism no matter the local residents are directly or indirectly involved in tourism industry.

Table 4

Comparisons among the recognition of residents from various interested party of tourism industries towards the impacts of sport tourism on the environments (N=288)

Factors	Groups	N	M	SD	F	Post-test
Life quality impact	A. Directly tourism owner	59	10.46	2.66	.420	
	B. Sport tourism owner	39	9.92	1.60		
	C. General Commerce owner	27	9.93	2.66		
	D. Part-timer	61	10.08	2.42		
	E. local residents	102	10.34	3.06		
Natural ecology impact	A. Directly tourism owner	59	8.14	2.34	.586	
	B. Sport tourism owner	39	8.67	1.88		
	C. General Commerce owner	27	8.74	2.38		
	D. Part-timer	61	8.16	2.20		
	E. local residents	102	8.32	2.56		
Environment maintenance	A. Directly tourism owner	59	15.31	2.55	2.873*	Insignificant between group
	B. Sport tourism owner	39	15.21	1.94		
	C. General Commerce owner	27	14.85	2.48		
	D. Part-timer	61	15.46	1.73		
	E. local residents	102	14.35	2.59		
The overall environment impact	A. Directly tourism owner	59	33.90	5.26	.398	
	B. Sport tourism owner	39	33.79	3.45		
	C. General Commerce owner	27	33.52	5.41		
	D. Part-timer	61	33.70	4.12		
	E. local residents	102	33.02	5.51		

*p<.05

4. Conclusion and Suggestions

4.1 Conclusion

To sum up, the residents, tourism industry managers and employees mostly agreed that sport tourism can bring in substantial economic benefits. However, sport tourism causes more negative environment impacts in general even though it helps to build more outdoor recreational venues and public facilities. The quantitative analysis result claimed the residents' recognition towards environment impacts caused by sport tourism development also appeared more negative. Nevertheless, the locally born residents, employers and employees expressed much weaker recognition towards environment impacts compared to temporary visitors. In addition, the recognition of residents from various backgrounds of tourism industries towards the negative impacts of sport tourism on the environments appeared little difference;

consequently, the recognition of all background of the residents reached an agreement.

4.2 Suggestions

Regarding to the outcome of this research, sport tourism development causes negative impacts on the local environment; thus, the government and related authorities should prepare preventions and solutions. The sport tourism developments' negative impacts are generally caused by tourists' misbehaviors. So education on tourists, explanation service and managements become necessary to minimize the negative effects, especially damage on ecology and traffic and litter problems that require intensive improvements. The bureaus of local national parks and residents' private organizations can also involve in planning, management and marketing campaigns, and negotiations to reduce the level of negative impacts. The employers' concepts of capacity and long-term business running need to be strengthened so that visitors and offspring can continue benefit from such wonder resources. Future studies could aim at Kentin's future tourism development planning by collecting not only residents', employers' and employees' feedbacks but also the local government's opinions as important reference to maximize the possibility of implementations and promotions. Moreover, the number and geography of targeted study group can be stretched and use regression analysis to examine the influence of various characteristics of residents on their recognition towards tourist resort environment impacts. Further researches can also discover residents' satisfactions with community environments and attitudes towards long-term tourism developments that haven't been done much regarding to tourism environment impact studies.

Reference

- Allison, L. (1995). Sport, planning and environment in England and Wales. In Center for Research into Sport and Society (Ed.), *Module 3 –Unit 5*. Leicester, Great Britain: Center for Research into Sport and Society.
- Ap, J. & Crompton, J. L. (1998). Residents strategies for responding to tourism impacts. *Journal of Travel Research*, 32 (1), 47-49.
- Astrand, P. O. (1987). Setting the scene. In Coronary Prevention Group (Eds.), *Exercise heart health* (pp. 5-20). London: Coronary Prevention Group.
- Brunt, P. & Courtney, P. (1999). Host perceptions of sociocultural impacts. *Annals of Tourism*, 26(3), 495-515.
- Butler, R. W. (1980). The concept of a tourist area cycle of evolution: Implications for management of resources. *Canadian Geographer*, 24, 5-12.
- Chang, K. C. (2007). Residents' Perceptions of Tourism Impact and Tourism Development in Hualien, Taiwan. *Taiwan Hospitality & Tourism Journal*,

4,117-136.

- Cheng, S. R., & Kou, P. T. (1995). Cognition of local residents towards the impact of tourism development in Kwan-In Mountain Scenic Area. *Journal of Tourism Studies, 1*(2), 48-58.
- Davidson, R. (1992). *Tourism in Europe*. London: Pitman.
- Graefe, A. (1993). Visitor impact management: An integrated approach to assessing the impacts of tourism in national parks and natural areas. In A. J. Veal, P. Jonson, and G. Cushman (Eds.), *Leisure and tourism: social and economic change* (pp. 74-83). Sydney, Australia: University of Technology.
- Fetterman, D. H. (1989). *Ethnography: Step by step*. Newbury Park, Calif: Sage Publications.
- Kao, C. H. (2003). Sport tourism: Its planning and development. *National Sports Quarterly, 32*(3) , 7-11.
- Krippendorff, K. (1980). *Content analysis: An introduction to its methodology*. Beverly Hills, CA: Sage.
- Kuo, C. C. (1999). A-Lie-Shan aboriginal residents' perception and attitude toward tourism development. Unpublished master's thesis, Chinese Culture University, Taipei, Taiwan.
- Lin, Q. H. (1995). Influences of tourism development on environmental perception and landscape image of vernacular settlements. Unpublished master's thesis, Taiwan University, Taipei, Taiwan.
- Long, J. (1990). Leisure, health and wellbeing: Editor's Introduction. In J. Long (Ed.), *Leisure, health and wellbeing*. Conference papers No. 44 (pp.233-252). Eastbourne, Great Britain: Leisure Studies Association.
- Martin, B. & Mason, S. (1987). Social trends and tourism futures. *Tourism Management, June*, 112-114.
- McAuley, E. and Courneya, K. S. (1994). The subjective exercise experiences scale(SESS): Development and preliminary validation. *Journal of Sport and Exercise Psychology, 16*, 163-177.
- McIntosh, R. W. and Goeldner, C. R. (1995). *Tourism: Principles, practices and philosophies*. New York: Wiley.
- Priester, K. (1989). The theory of management of tourism impact. *Tourism Recreational Research, 14*, 15-22.
- Roberts, J. (1989). Consumable packaging. In B. Brown (Ed.), *Leisure and the environment. Conference papers No. 31* (pp. 1-17). Eastbourne, Great Britain: Leisure Studies Association.
- Ryan ,C. (1991). *Recreational tourism: A social science perspective*. London: Great Britain Press.

- Standeven, J. & Knop, P. D. (1999). *Sport tourism*. Canada: Human Kinetics.
- Strasdas, W. (1994). *Consequences of trends in leisure on the environment*. Aschen, Germany: Meyer & Meyer Verlag.
- Strauss, A., & Corbin, J. (1990). *Basics of qualitative research: Grounded theory procedures and techniques*. New York: Sage Publications.
- Terry, L. (1996). Holidaysers seek thrills. *Leisure Management*, 16(6), 14.
- Tourism Bureau, The Ministration of Communications (2004). *White Paper of Tourism Policy in Taiwan*. Taipei, Taiwan: Tourism Bureau, The Ministration of Communications.
- Tourism Bureau, The Ministration of Communications (2007). 2006 Investigate of travels status in Taiwan. Retrieved September 10, 2007, from [http://admin.taiwan.net.tw/statistics/File/200612/95 countrymen summary.htm](http://admin.taiwan.net.tw/statistics/File/200612/95%20countrymen%20summary.htm).
- Vanreusel, B. (1990). The relationship between sport, recreation and environment. *Vlaams Tijdschrift voor Sportbeheer*, 100, 42-43.
- Vanreusel, B. (1993). Toward a socio-ecological perspective on sport participation in nature. In M. Buekers (Ed.), *Quality in physical education* (pp.177-195). Leuven, Belgium: ACCO.
- World Tourism Organization. (1985). *Guidelines for the collection and presentation of domestic and international tourism statistics*. Madrid, Spain: Author.
- World Tourism Organization. (2006). *International tourism up 5.5% to 808 million arrivals in 2005*. 2006/1/24 Available at http://www.world-tourism.org/newsroom/Releases/2006/january/06_01_24.htm.
- Yen, H. H. (1994). A study on the perception of tourism impacts in Kin-Men. Unpublished master's thesis, National Chung Hsing University, Taichung, Taiwan.
- Yu, J. C. (2000). A study on spatial behavior pattern and tourism development of pei-pu traditional settlement. Unpublished master's thesis, Tunghai University, Taichung, Taiwan.