

## **Chapter 3**

### **Methodology**

#### **3.1 Research Design**

##### **3.1.1 Overview**

It is important to understand what makes tourists satisfy with their travel destinations; what do tourists value most or least at a site. The result would provide the guidance necessary to develop policy recommendation to make that site a popular tourism spot.

This methodology would provide means to determine how much tourists value their destination in monetary terms according to their own personal preferences. Therefore, the outcome would imply the economical value, and the contribution of the environment amenities at the destination.

In addition, this study assumes that the level of the tourists' satisfaction depends, in some degree, on the environmental quality of the destination. Therefore, in some degree, the total revenue from the tourism industry at a certain destination would correlate to the state of its environment.

This study approaches a range of economical tools for data collection and analysis to answer the research questions, which have been mentioned earlier. It will employ close-ended Contingent Valuation Method to measure the potential user value of coral reef at Coral Island. Then, an econometric model, which is the Logistic model will be employed in order to estimate the tourist's willingness to pay, and SPSS program is utilized for statistical analysis.

### 3.1.2 The Model

Logistic model is a useful model for situations in which the study want to be able to predict the presence or absence of a characteristic or outcome based on values of a set of predictor variables. It is similar to a linear regression model but is suited to models where the dependent variable is dichotomous. Logistic regression coefficients can be used to estimate odds ratios for each of the independent variables in the model. Logistic regression is applicable to a broader range of research situations than discriminate analysis. (Gujarati, 1995)

In this method the consumer's preference towards hypothetical package tour will be estimated parametrically. According to Hanemann (1984), if there exists a representative consumer who has an indirect utility functions  $V(P, M, Q, S)$ . The level of the individual depends on price (P), income (M), socio-characteristics (S), and quality (Q).

The questioner will ask whether he/she would be willing to purchase the given hypothetical package tour at the given price, P. The respondent will respond yes if

$$V(M-P, Q^1, S) > V(M-0, Q^0, S) \quad (1)$$

Equation (1) shows that the respondent will answer yes if his/her utility deriving from taking trip ( $Q^1$ ) and paying the price (P) is higher than not taking the trip ( $Q^0$ ) and not paying the price ( $P=0$ ). If  $V(P, M, Q, S)$  is the observable component of the utility the probability of the respondent saying yes is

$$\text{Prob (yes)} = \text{Prob} \{ V(M-P, Q^1, S) + \varepsilon_1 > V(M-0, Q^0, S) + \varepsilon_0 \} \quad (2)$$

Where  $\varepsilon_1$  are unobservable components of the utility. If the random term is randomly and identically distributed with Type I Extreme Value distribution then this probability is expressed as

$$\text{Prob (yes)} = (1 + e^{-\Delta V})^{-1} \quad (3)$$

Where  $-\Delta V = V(M-P, Q^1, S) > V(M-0, Q^0, S)$

The recreational benefit of the hypothetical package tour is measured as WTP using a one-day trip tour package as the vehicle of payment. The values incorporated in the tour and is defined as the following:

$$V(M-WTP, Q^1, S) > V(M-0, Q^0, S) \quad (4)$$

Hanemann(1989) indicate that if  $V(M-P, Q, S)$  is linearly specified then the probability of the respondent saying yes is

$$\text{Log} \{ \text{Prob}(\text{yes}) / (1 - \text{Prob}(\text{yes})) \} = \alpha_0 - \beta_1(P) + \beta_2(Q) + \sum \beta_i S_i(1) \quad (5)$$

Parameters  $\alpha_0$  and  $\beta_i$  will be estimated parametrically and the benefit of package tour to Coral Island or WT P will be obtain by calculation. To calculate the mean WTP, formula (6) will be used (Hanemann, 1989).

$$\text{Mean WTP for a Packge Tour} = 1/\beta_1 * (\text{Ln} (1 + \text{Exp} ( \alpha_0 + \beta_2 (Q) + \sum \beta_i S_i))) \quad (6)$$

The value of the better coral reef quality will be calculated by:

$$\text{WTP for better coral reef quality} = \text{Mean WTP}^{\text{PIC}=1} - \text{Mean WTP}^{\text{PIC}=0} \quad (7)$$

Where PIC is the coral reef quality and is an attribute of Q variable.

### 3.1.2 The Study Site: Coral Island or Koh Hey

Coral Island is one of the most popular destinations for one-day trip from Phuket. It assumed that popularity comes from its natural beauty with easy access from Phuket. Both Thai and foreign tourists visit the island, majority of them are foreign tourist especially Japanese. The approximate number of visitors to Coral Island is investigated as follows.

**Table 3.1 Number of Visitors to Coral Island (persons)**

Year	Number of Visitors to Coral Island
2000	32,400
1999	39,600
1998	43,200

Source: an interview with Mrs. W. Prachanpiboon GM of Phuket Cabana, Apr 18,2001.

Coral Island is introduced as one of traveling site frequently from TAT; Coral Island is located in Phuket's south coast. It is well known for its coral reef that it is often referred to simply as Coral Island. In addition, there are two fine beaches on the north and west. Coral Island is part of a marine preserve, but accommodations, restaurants various water-sports and diving are all available. (TAT)

This island has been generating revenue from tourism industry, because of its natural beauty, however the source of economic activity is damaged and gradually becoming not attractive anymore, therefore it is needed to understand the importance of this island.

Tour operators have noticed the degradation of coral reefs at Coral Island, and they assumed that it is caused by over coming of tourists. This assumption is very cross to the realty, because the business there on Coral Island is only based on the tourism.

According to the research of Thailand Coastal Resource Management Project, Office of National Environment Board in 1989, it also pointed out the negative impact on coral reefs from tourism on Coral Island. (Lemay, 1989)

In order to sustain tourism business on the island, it is time to consider the environmental problem seriously on the island. Also, as the point of view of environmental economics, it is an interesting place for the study above evidence, therefore this Coral Island is selected as study site.

## 3.2 Survey Design

### 3.2.1 Questionnaire Design

In order to achieve the objective of this study, the questionnaire was carefully designed on the basis of NOAA recommendations (NOAA, 1993). It is basically divided into the three parts.

The first part is to elicit tourist's WTP for going to see coral reefs at Coral Island, and a closed-end contingent valuation survey were used. In order to measure tourist's WTP, a hypothetical one-day tour was offered to respondents.

Two sets of coral reef photographs were provided to respondents in order to prove or disprove the hypothesis. Those pictures were categorized in two sets, unhealthy and healthy quality. There were two pictures in each group. A marine scientist at the Office of Environmental Policy and Planning (OEPP) assisted in determining the quality of coral in each photograph.

In the second part, socio-economic information that was assumed to play a role in determining the magnitude of WTP was included. They were gender, age, occupation, educational level, and income.

In the third part, the questionnaire aims to gauge preference in marine tourism activities, and what is the main attractiveness to Phuket and other factors that were assumed to effect the tourists' WTP.

In the contingency valuation survey, the range of prices for the trip were 500 to 3,000 bath, and each respondent was to provide only one answer on a price level given to them. Also, respondents would be given information regarding the type of coral reefs, which were the actual quality at Coral Island and the improved hypothetical quality of the corals. This is to test the effect of coral reef's quality of the level of the tourist's satisfaction.

The questionnaire was translated into Thai and English in order to provide a better understanding to respondents.

### 3.2.2 Sampling Design

Mitchell and Carson suggested that the contingency valuation survey should be conducted on at least 600 samples for the real decision making use. (Mitchell and Carson, 1989)

The study focus the tourists who were going to Phuket for their holiday, in order to estimate the potential use value of coral reef at Coral Island, Phuket. With the limitation of time and budget, this study interview 300 people, which is nearly 0.01% of total tourist arrivals to Phuket in 1998.

The sampling design used was base on the Statistical Report of TAT in 1998. There were 750,922 Thai tourists and 1,879,016 foreign tourist arrivals; all together is 2,629,938 arrivals to Phuket in 1998.

Therefore, the population was divided into two groups, which were Thai and foreigners by applying the technique of the proportion allocation as follows;

$W_1$  = weight of Thai tourists

$W_2$  = weight of foreign tourist

$$W_1 = 750,922 / 2,629,938 \cong 0.29$$

$$W_2 = 1,879,016 / 2,629,938 \cong 0.71$$

Thus, the proportion of sample number is to be  $W_1 : W_2 = 3 : 7$ , then the number of the least samples should be divided into 90 sample for Thai tourists and 210 sample for foreign tourists, and total number of 300 sample.

This study assume that a part of attractiveness of Phuket is its natural beauty, and in order to determine the potential use value of coral reefs at the study site therefore, the survey will target the tourists who are going to Phuket as their holiday, and never visited Coral Island. In-person interview was employed for this survey.

### **3.3 Data Collection**

The survey was conducted on 5<sup>th</sup> and 6<sup>th</sup> of May 2001, and took place at the departure lobby of domestic flight, Dong Muang Airport, Bangkok, Thailand in May 2001. A total of 330 questioners were collected, but 18 of them were incomplete. 312 questionnaires were used for analysis. SPSS for Windows were used as assistant for statistical analysis.