

Chapter 2

Literature Review

2.1 Economic Evaluation of Environmental and Natural Resources

2.1.1 Overview

Valuation techniques for environmental amenities are either market-oriented or survey-oriented. Market-oriented techniques use information on observed behavior, especially market prices. Survey-oriented techniques ask affected population about their willingness to pay for amenities or to accept compensation for losses.

Most studies done in the field of Tourism and Economics discuss relationships between a tourism industry and growth in an economy. Many studies concluded that tourism industry takes a significant role in boosting an economic growth.

However, many of the studies also pointed out to a dilemma: natural environment at a tourist destination, its beauty and its pristiness, contribute a great deal to its attractiveness, but as tourists brings about economic growth, environmental degradations follow. In turns, the tourism industry itself suffers from its very own success and the economy ceased to grow from tourism.

These studies always recommend that an establishment of effective policies and management strategies is needed in order to maintain the recover, the damage, and utilization of the resource for the benefit of the tourism industry.

It has been well understood that environmental degradation effect tourism industry negatively. However, only a few studies have discussed environmental quality changes in relation with an individual's welfare changes. It has been suggested that a proper way to determine individuals' welfare changes is to understand the economic values associated with a recreational site.

Therefore, economic evaluation of environmental or natural resource has become an important issue in creating a sustainable environment or natural resource management that is viable in the long run. In order to determine the economic value of them, there are two broadly classified approaches which are, 1) direct approach, and 2) indirect approach. (Pearce, 1990)

The first approach is to ask individuals to state their preference by directly asking them or by using questionnaires. Contingent Valuation Method (CVM) and Conjoint Analysis are a few example of this first type of approach.

The second approach is based on consumer behavior, using prices, which represent an individual's preferences in the market. Travel Cost Method (TCM), Hedonic Price Method, and Household Production Model are a few example of this second approach.

Table 2.1 Economic Valuation Techniques

Direct approach	- Contingent Valuation Method - Conjoint Method
Indirect approach	- Travel Cost Method - Hedonic Price Model - Household Production Function

Source: Summarized from Takeuchi, 1999, page 4

2.1.2 Contingent Valuation Method.

The contingent valuation method (CVM) uses a direct approach. The method involves asking people what they are willingness to pay for a benefit, and/or what they are willing to receive by way of compensation to tolerate a cost (Pearce, 1990). This asking process may be done either using questionnaires or by experimental techniques in which subjects respond to various stimuli in a set laboratory condition

The aim of the CVM is to elicit valuations or bids which are close to that would be revealed if an actual market were to exist. The bidding process involves

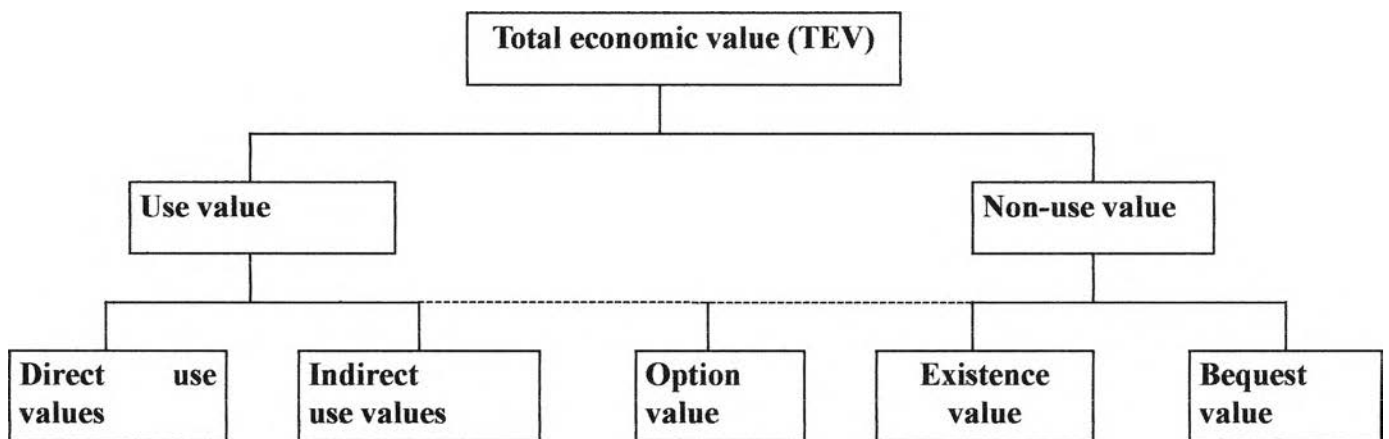
setting up a hypothetical market, which in this case uses the quality of coral reefs as goods.

CVM is a method to measure an individual's willingness to pay or willingness to accept for changes in the environment for a given hypothetical situation.

The advantage of this method is that it is able to determine the economic values of almost everything, particularly the non-use and the option value. On the other hand, the disadvantage of this method is that it is based on using a hypothetical market, therefore the reliability of this method is always a point of dispute.

The economic value of an environment or natural resources is measured by its Total Economic Value (TEV). It consists of 1) Use Value, 2) Non-use Value, and 3) Option Value. TEV is described in table 2.2.

Figure. 2.1 Total Economic Value



Source: Pearce, 1990

Table 2.2 Economic Value of Environmental Assets

Direct use value	The value, environmental assets make to current production or consumption.
Indirect use value	The value, environmental provides to support current production or consumption.
Option value	The value for premium that individuals are willing to pay for avoiding the risk of not having it available in the future.
Existence Value	The value, the simply environmental assets exists, even the value has no intention of using.
Bequest Value	The value reflects the desire to conserve environmental assets for the benefit of future generation.

Source: Kuriyama, 1998

Use Value is the value of the actual use of the environment that is categorized into direct use values and indirect use values. Direct use values are consumptive uses and non-consumptive uses. Non-use value is categorized into existence value, which represents the WTP of individuals or societies to maintain a resource for the future, either just so they know it is there, even they do not plan to use it, and bequest value which represents the WTP of individuals or societies leave the resource to their children or grandchildren.

Option Value is the amount of a person would be willing to pay to preserve the option of being able to experience a partaker environmental amenity in the future. People may even be willing to pay to preserve something they will in all likelihood never. Non-use Value represents the value for preserving the unique environmental assets that individual may never even see, expect perhaps in photographs, something, even they will not use them in the future. (Field, 1994)

2.1.2 Travel Cost Method

This is the traditional approach for economic evaluation of environmental amenities, especially recreational sites. The first studies with this TCM were in the 1960's, applied it to access problems arising from federal intervention in the development of water resource and definition of land ownership. In the 1970's and early

1980's, researchers saw that that if the methodology was useful for measuring the flow of recreational services provided by natural area it could also serve to measure the value of these flows in response to environmental quality changes. (Takeuchi, 1999)

2.1.4 Hedonic Pricing Model

Rosen (1974) has defined this method as the implicit prices of characteristics of a property such as, size, location, quality, and neighborhood characteristics of a housing unit. Also, it is revealed to economic agents from observed prices of differentiated properties and the specific amount of characteristics associated with them.

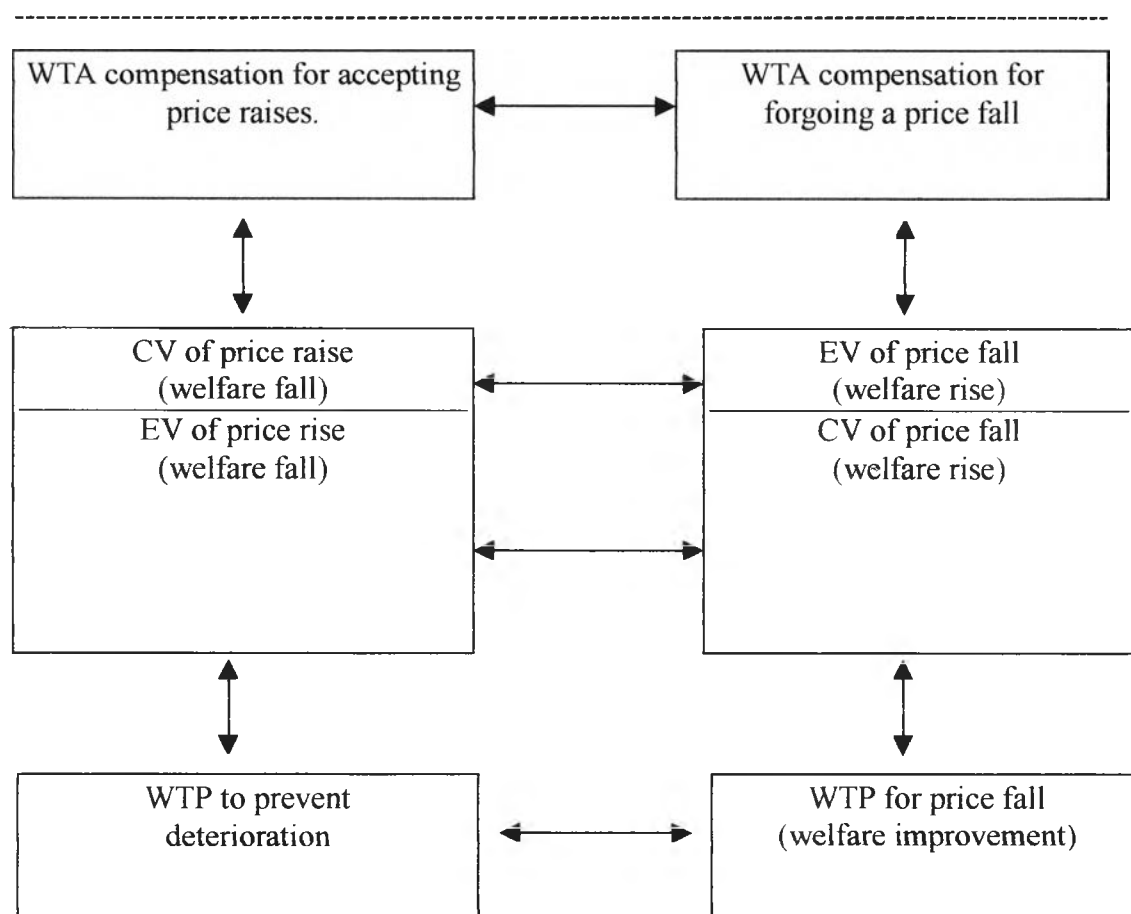
The use of this approach is based on the assumption that an individual's willingness to pay is appropriate for defining and measuring the benefit of improvement in any environmental quality. Therefore, many of early literature focus on the use of residential property values as the bias of estimating the benefits of improvements in air quality. (Maynard, *et.al*, 1983)

2.2 Measuring Welfare Changes

The concept of willingness to pay (WTP) and willingness to accept compensation (WTA) are frequently utilized as criteria for measuring the benefit to the consumer of a change in the price or quantity of goods.

WTP refers to the amount of money income an individual would be willing to pay to secure a welfare improvement, or equivalently to prevent welfare deterioration. WTA, on the other hand, would require to accept a welfare deterioration, or equivalently, or to forgo a welfare improvement. (Freeman, 1993)

Figure 2.2 Relationship between WTP and WTA



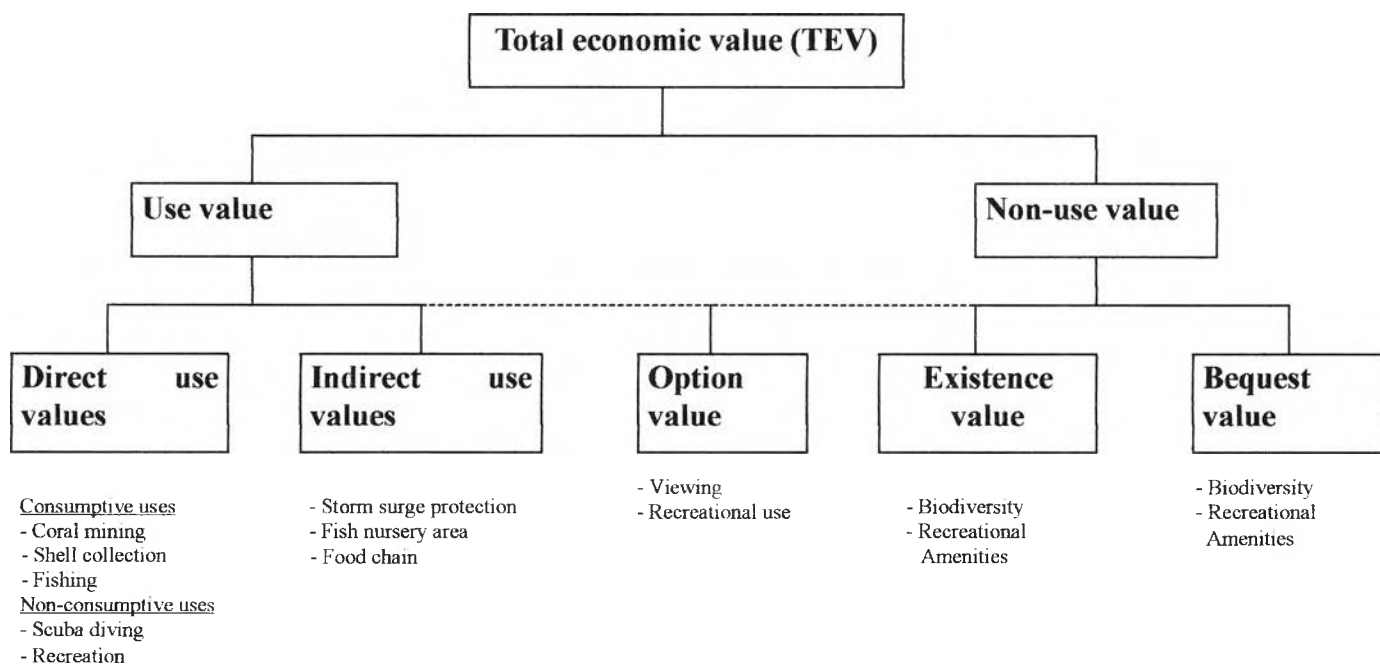
2.3 Economic Evaluation: The Studies of Coral Reefs.

There are some studies of economic evaluation of coral reefs for tourism and recreational use. TCM or CVM is typically employed to measure the tourism and recreational value of coral reefs.

Ruitenbeek (1999) review the researches, which reacted to economic evaluation of coral reefs. There are a few studies of economic valuation of coral reef for recreational use in Great Barrier Reef, Australia, and Bacuit Bay, Philippines. However, there are no studies of nonuse value or option use value of coral reef have carried out in South East Asia.

Dixon (1997) has defined the TEV of coral reef ecosystem follow.

Figure 2.2 The Total Economic Value of Coral Reef ecosystems



Source: The World Bank (1998), P158.

2.4 Economic Evaluation: The Studies of Recreational Resources in Thailand.

A number of economic evaluation studies on environmental assets have been done in Thailand. Some of these studies were conducted to estimate recreational value of national parks by employing TCM, CVM such as; Lumpinee Park (Grandstaff and Dixon, 1986), Khao Yai National Park (TDRI/HIID, 1995), and national parks in northern Thailand. (Israngkura, 1998)

Grandstaff and Dixon conducted the first CVM study in Thailand. The study also employed TCM and the both results were compared. In the TCM study, they applied the zonal travel cost method to estimate the consumer surplus of Lumpinee Park for its use value. It is estimated to be 132 million baths. In the case of CVM, the study applied open-ended CVM and estimated Lumpinee Park's use value to be 130 million baths.

The non-use value was calculated from the nonusers (referred to as social hypothetical value) and is reported to be 1,166 million baths. (Grandstaff and Dixon, 1986)

TDRI/HIID have done the study on Khao Yai National Park. (Kaosa-ard, 1995) This study also used both TCM and CVM to estimate user value and nonuser value as well. They also applied zonal travel cost method to estimate use value of Khao Yai National Park.

Both studies combined the TCM together with the open-ended CVM to determine WTP. TCM estimates the direct benefit of 1,420 baht per visit, of which 870 baht is the consumer surplus. The average WTP for entrance fees is 22 baht per person. The average WTP for entrance fees after some improvements is 44 baht per person. The average nonuse value for Thais is 730 baht per person per year. The average nonuse value for non-Thais is 183 baht per person per year. These findings indicate that the value of Khao Yai National Park is certainly positive and is of reasonable magnitude. After some improvements, the WTP for each park visit increases from 22 to 44 baht per person, which suggests some positive marginal benefit of park improvements. (Kaosa-ard, 1995).

Israngkura(1998) attempted contingent ranking method to measure the value of environmental benefits of the recreational areas, which are Doi Inthanon National Park, Doi Suthep, and Mae Sa Waterfall in Northern Thailand. Contingent ranking method is one of contingent valuation methods, which will ask respondent to rank the given hypothetical situations. It is considered that this ranking represent respondent's preference.

The study successfully measured the recreational values at the sites, and the outcome has used to be considerate of the entrance fees of each site. Moreover, it found that contingent ranking method, which is close-ended contingent valuation survey is easier than open-ended WTP format to indicate responder's preference. Additionally, the welfare measures obtained from this methodology will indicate the true value of the site.

Israngkura(1998) also noticed that the open-ended contingent valuation method

which can be less appropriate in the context of a developing country where people are used to enjoying recreational amenities either free of charge, in the case of Lumpinee Park or at a very low cost , in the case of Khao Yai.

When people are not familiar with the notion of having to pay for amenities, asking an open-ended WTP question may not be an appropriate way to elicit the true WTP, therefore, one may prefer to adopt other contingent valuation formats which do not force respondents to express an exact value.