EXTERNAL COSTS FROM INCREASED ISLAND VISITATION:  
CASE STUDY FROM SOUTHERN THAI ISLANDS

THEME D

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Introduction

Tourist areas that are based to some extent on the quality of a natural resource must face the problem of high visitation rates and diminution of resource quality. As visitation increases, the quality of the resource, and therefore the value of each additional visit, can be affected negatively by increased noise, trash, related development, congestion, and so on. These effects are similar to the external costs imposed by each additional user of an open-access resource on the existing users\(^2\) (Field, 2001). For tourism agencies to manage visitation efficiently, they must know the extent of these external costs.

Study Objectives

The prime objective of this study was to estimate the magnitude of open-access externalities resulting from increased tourism visitation rates, and to use this knowledge to derive conclusions about efficient visitation rates. Southern Thailand islands were chosen as the location for this research. The primary audience for the research is tourism management agencies. The results from this analysis can assist in evaluating the non-market value of the beach areas, and can be used for decision making about where and when to promote and develop beach areas (Adamowicz, 2000).

Data Collection, Instrument Design, and Sampling Frame

The first step was to develop a decision model that could be used to analyze beach area site choice in the face of changes to the beach area brought about by increased visitation. This decision model was constructed using a stated preference (SP) survey instrument. In this context, a SP survey asks people to choose between a set of hypothetical beach areas, where the attributes of the beach areas are different across the choices. From the responses collected in this manner, we can deduce the relative values of the factors affecting beach choice.

In order to assess which beach site attributes were important to island visitors in Thailand, and which should be included in the SP survey, a preliminary survey was employed. This preliminary survey was administered randomly to forty visitors on the

\(^1\) Contact author via e-mail at cushman@resecon.umass.edu
\(^2\) In economic terms these are the external costs that the marginal user inflicts on the average user.
island of Koh Samui, Thailand in April 2001. The attributes that had the greatest effects on demand for these island areas were beach characteristics (i.e. white sand, rock coral), sanitation (i.e. pieces of visible trash), people on the beach (i.e. people / day), total cost / day (i.e. cost / person), safety (i.e. access to police & hospital), noise (i.e. bar music playing (voice level)), and beach development (i.e. % land development).

After assessing the actual range of the above beach site attribute levels associated with the southern beaches, the SP survey was printed, and visitors departing six islands in southern Thailand were randomly selected to complete the SP survey. These islands included: Koh Samui, Koh Pha-Ngan, Koh Tao, Phuket, Koh Phi Phi, and Koh Lanta. There were 1626 surveys completed from tourists across six southern islands. The information collected from each beach visitor contained six components: (1) motivation to visit the island, (2) expenditures, (3) expectations prior to arrival, (4) length and location of stay, (5) demographical information, and (6) an SP task (Adamowicz, 2000). The SP task was presented as, “Suppose that you could take another island vacation to Thailand at some time in the near future, and you had to choose between a set of different beach areas, which one would you choose?”. An example of one of the SP choice sets is presented in Table 1.1 below.

**Table 1.1: Example Beach Area Choice Set**

<table>
<thead>
<tr>
<th>Vacation Option:</th>
<th>Beach Area 1</th>
<th>Beach Area 2</th>
<th>Non-Beach Area</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Beach Characteristic</strong></td>
<td>0% white sand (100% coral / rock)</td>
<td>50% white sand (50% coral / rock)</td>
<td></td>
</tr>
<tr>
<td><strong>Sanitation</strong></td>
<td>no pieces of visible trash (within 10m)</td>
<td>many pieces of visible trash (20+ pieces within 10m)</td>
<td></td>
</tr>
<tr>
<td><strong>People on the Beach</strong></td>
<td>400 people within 100m</td>
<td>400 people within 100m</td>
<td></td>
</tr>
<tr>
<td><strong>Total Cost / Day</strong></td>
<td>50$ per person / day</td>
<td>10$ per person / day</td>
<td></td>
</tr>
<tr>
<td><strong>Safety</strong></td>
<td>police station &amp; hospital within 90km</td>
<td>police station &amp; hospital within 50km</td>
<td></td>
</tr>
<tr>
<td><strong>Noise Level while at Beach</strong></td>
<td>no bar music playing</td>
<td>no bar music playing</td>
<td></td>
</tr>
<tr>
<td><strong>Beach Development</strong></td>
<td>50% of the land developed within 100sqm from beach</td>
<td>10% of the land developed within 100sqm from beach</td>
<td></td>
</tr>
</tbody>
</table>

If you were to choose one of the opportunities above, which ONE would you choose?

- [ ] Beach Area 1
- [ ] Beach Area 2
- [ ] Non-Beach Area
Policy Analysis: Economic Welfare Measurement

The objective of the SP task and associated model estimates was to quantify the external costs of increased visitation by changes in the associated attributes of beach areas. In this study, welfare measures refer to the amounts that individuals are willing to accept in reduced onsite cost per day to tolerate reductions in site quality (Adamowicz, 2000). Table 1.2 below depicts in monetary terms the value per individual of not allowing beach areas to increase development, trash, people, and noise.

Table 1.2: Welfare Analysis (Chaweng Beach, Koh Samui)

<table>
<thead>
<tr>
<th>Proposed Attribute Changes</th>
<th>WTA*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reduced Physical Quality</td>
<td></td>
</tr>
<tr>
<td>Trash (increase by 1 piece / 10 meters)</td>
<td>$7.23 / day</td>
</tr>
<tr>
<td>Development (increase by 10 percent / 100sqm)</td>
<td>$8.33 / day</td>
</tr>
<tr>
<td>Increased Congestion</td>
<td></td>
</tr>
<tr>
<td>People (increase by 10 people / 100 meters)</td>
<td>$0.78 / day</td>
</tr>
<tr>
<td>Noise (increase by 1 level)</td>
<td>$10.42 / day</td>
</tr>
</tbody>
</table>

* WTA – the minimum amount of income an individual is willing to accept to tolerate the proposed change in attribute levels.

The above monetary values are the external costs that visitors inflict upon one another. For example, if the physical quality of the Chaweng beach area is decreased because of one additional piece of trash per 10 meters, the average individual would have to be compensated $7.23 per day to be as likely to visit this beach, holding all else constant. In addition, if the physical quality of the Chaweng beach area is decreased by developing an additional ten percent of the land area within 100 square meters from the beach, the average individual would have to be compensated $8.33 per day to be as likely to visit this beach, holding all else constant.

In terms of congestion effects in the Chaweng beach area, an increase of ten people per 100 meters would mean that the average individual would have to be compensated $0.78 per day to be as likely to visit this beach, holding all else constant. For an increase in noise from the present level, which is just below voice level on average throughout the beach area, to just below noise one would have to talk over, an individual would have to be compensated $10.42 per day to be as likely to visit this beach, holding all else constant.

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3 The statistical software package LIMDEP was used to complete estimation of the underlying conditional logit model. Parameter estimates and model performance can be provided if needed. Please contact author.
4 In economic terms this is known as welfare measurement, which refers to the amount that individuals are willing to accept to tolerate quality changes.
It should also be noted, that additional analysis has been done with revealed preference (RP) data (i.e. actual market choices) throughout 55 beach areas in the southern Thai islands. This analysis also suggests the same types of external costs\(^5\).

**Conclusions**

The analysis presented above quantifies the external costs associated with reduction in beach area quality due to increased visitation. This information should be useful to governmental tourism agencies in comparing non-market values with existing market values in beach area decisions in order to provide the highest quality beach recreation opportunities to their countries tourists. These external costs can further be compared with the cost of enforcing legislation against polluters, illegal builders, and loud bar music in the beach areas. In addition, from a policy perspective, the external costs associated with reduced quality of the beach area resource should be compared with the market value of allowing these changes to occur.

**Biographical Note**

My first experience in Thailand was in July 1999 working as a general manager of a four star beach resort on the island of Koh Samui. During the time I was managing the resort I was awarded the *National Security Education Program (NSEP) Graduate Fellowship*, which funded my proposed future graduate research. After one year of graduate school I returned to Thailand in June 2001 to complete my research on assessing the southern Thai tourism industry with emphasis on cause and effect relationships to tourism demand. During this research I worked with the Tourism Authority of Thailand, Bangkok Airways, and Thai Airways International. The final report included government policy recommendations for the southern Thai islands.

I am currently a master’s degree candidate in the Department of Resource Economics at the University of Massachusetts, Amherst, with graduation expected in May 2002. Following graduation I will be returning to Thailand to pursue development of a 5 star beach resort. Investment into this resort is still welcomed. Please contact me for a copy of the prospectus.

**REFERENCES**


\(^5\) For further information on the RP analysis contact the author.