

An empirical assessment of residents' attitudes for sustainable tourism development: a case study of O'ahu, Hawai'i

Lisa Marie Assante
Southern Utah University

Hsing Ivan Wen
University of Hawai'i at Mānoa

Kimberly Lottig
Starwood Hotels

ABSTRACT

Understanding residents' perceptions helps tourism planners strategically utilize resources to improve resident involvement and, therefore, increase the sustainability of future tourism development. A model to understand these perceptions was created using concepts from the literature. Structural Equation Modeling (SEM) was used to analyze survey data collected from O'ahu residents. The results indicate that there is a strong relationship between residents' community satisfaction and their perceptions of the environmental impacts of tourism.

Keywords: sustainable tourism, socioeconomic impacts; resident attitudes; responsible tourism, tourism management

Introduction

Over 900 million tourists traveled internationally in 2007, with more than half traveling for pleasure (WTO, 2008; WTO 2006). Tourist spending in 2007 reached US\$856 billion, 5.6 percent more than in 2006 (WTO, 2008). Macroeconomic figures identify tourism as the biggest industry in the world, making up 11.7% of Gross Domestic Product and providing one in every twelve jobs on the planet (Álvarez, Martín, Casielles, 2007). While the economic benefits of tourism are well known, the benefits of tourism are rarely equitably distributed among stakeholders in traditional tourism development. These economic benefits also come with environmental and cultural costs that are unfairly borne by some stakeholders (Mortz, Ray, & Jain, 2005). To move away from this traditional tourism model towards sustainable tourism development benefits and costs must be justly distributed among stakeholders. Jamal and Getz (1995) argue residents are important stakeholders whose participation is necessary to move towards sustainable tourism.

Tourism in Hawai'i has been an important part of the economy for several decades. For example, seven and a half million tourists visited the state in the peak years of 2005 and 2006, 4.7 million of which came to O'ahu, and spent US\$11.9 billion (DBEDT, 2007). Waikiki Beach is a zone of intense urban development containing a high proportion of the hotel rooms for the entire state.

Increasing demands for resources from tourists and residents on O'ahu mean shortages or higher prices for energy, water, and land could occur. Imported fossil fuels are the island's primary energy source. Caprock aquifers vulnerable to pollution from overpumping are the island's groundwater source (Oki & Brasher, 2003). Paving land compounds the problem by limiting recharge to the aquifers and sedimentation damaging coral reefs. Urbanization also changes the character of the natural environment and fragments native species habitat. Mitigating the impacts from development, if possible, can be difficult, slow, and costly.

O'ahu residents should have an interest in making tourism development more sustainable, as it would help balance the demand for natural resources between residents and tourists. Understanding residents' perceptions are critical to fairly distributing the environmental, social, and economic costs and benefits of tourism; thus, ultimately increasing sustainable tourism development (Twining-Ward & Butler, 2002). The objective of this research is to test the model of O'ahu residents' perceptions of government management of tourism, environmental tourism impacts, community satisfaction, and sustainable tourism.

Literature Review

Tourism and the Environment

Tourists' transportation, accommodation, and activities at a destination alter the environment and consume resources. While tourism has some positive environmental impacts such as raising environmental awareness (Cohen, 1978), lack of good tourism planning causes many more environmental costs. Cohen (1978) examined the environmental costs of tourism development based on the following characteristics:

- 1) intensity of destination use and development;
- 2) resiliency of the destination's environment;

- 3) investment return schedule of a destination's stakeholders; and
- 4) transformational character of the tourism development.

The intensity of destination use and development can be related to Butler's (1980) destination life cycle. Destinations pass through the life cycle stages based on the volume and type of tourist it attracts. A small number of exploratory and adventurous travelers 'discover' the destination and are followed by mass tourism as the destination becomes more popular. Destination planners and tourism companies must supply the needed tourism development and infrastructure to accommodate increasing numbers of tourists. As tourist arrivals increase, the cumulative impact of tourists on the environment and demand for resources also increase (Christensen & Beckmann, 1998; Gössling, 2002). Moreover, Warnken, Bradley, and Guilding (2004) argue leisure travelers are more indulgent while on vacation, increasing demands for resources per capita. Waikiki has been intensely used by tourists for decades as it contains a large proportion of the hotel rooms and hosts most of the visitors to the state (Sheldon, Knox, & Lowry, 2005). Waikiki was transformed from a quiet beach to a densely-developed urban area in order to support the large number of visitor arrivals.

The destination's absorptive capacity for tourists and tourist impacts is another important feature for determining tourism impacts (Cohen, 1978). Urban infrastructure can better receive and accommodate large numbers of visitors compared to natural areas; therefore, natural environments give way to development. Impacts to islands are more intense because of resource limitations, increasing competition between tourists and residents for those resources (Cronk, 1997). The natural environment of Waikiki has given way to hotel/condo development and infrastructure to accommodate the demands of a large number of visitors.

The time horizon of tourism development investments is the third destination feature identified by Cohen (1978). Developers who demand short-term returns develop with less regard to the overall vitality of the destination and its potential to continue to attract tourists long into the future (Cohen, 1978). These speculative developers receive the economic benefits without paying the non-financial costs. Wen (1998) argues that "one fundamental cause for environmental problems is that those who exploit natural resources can obtain benefits immediately without having to pay the full cost (both economic and social) of depletion, while these costs, paid either now or in the future, are transferred to the society as a whole." This type of development can be controlled by government through zoning and permits and when tourism development is properly controlled by stakeholders with a longer-term perspective, resource exploitation and environmental and social costs can be reduced.

Tourism development transforms its destination, usually with many negative outcomes (Cohen, 1978). The natural environment or culture that originally attracted tourists was replaced by development and commercialization. Transformational tourism development, however, also alters the relationship that residents have with the environment (Ahn, Lee, & Shafer, 2002). Residents' relationships with the local environment become decontextualized (Gössling, 2002). Residents in mass tourism destinations face congestion, noise, neighborhood and environmental dereliction, and higher prices resulting from competition with tourists for scarce resources consequently resulting in decreased community satisfaction (Cavus & Tanrisevdi, 2003; Liu & Var, 1986).

Tourism and Natural Resources

Tourism requires resources, particularly energy, water, and land. Residents also need these resources for their daily activities. Tourists use energy for transportation, accommodations, and activities and this energy is supplied mostly by fossil fuels which need to be imported to O'ahu (State of Hawai'i Energy Resources Coordinator (SHERC), 2005). It is estimated that tourists consume approximately 40 percent of total energy use for the state (Tabatchnaia-Tamirisa, Loke, Leung, and Tucker, 1997). Tourist water use generates wastewater which must be sent to treatment plants to remove sewage, irrigation runoff, and cleaning chemicals (Christensen & Beckmann, 1998). Tourists use surface water for recreation activities such as surfing, boating, and snorkeling; and groundwater directly and indirectly for drinking, showering, toilets, restaurants, and irrigation (Christensen & Beckmann, 1998; Gössling, 2001). Misuse of water resources causes a number of issues including shortages and pollution. Finally, tourism requires large amounts of land for development of accommodations, airports, roads, visitor centers, landfills, golf courses, and other structures. Plantation agriculture decline and population growth are changing the land use on O'ahu, resulting in extensive urban and suburban residential development. Almost 26 percent of the land on O'ahu (98,663 acres) was developed as of 1998 (Klasner & Mikami, 2003), an increase of over 12 percent in 20 years (Oki & Brasher, 2003).

Sustainable Tourism Development

Sustainable tourism development (STD) is a long-term approach that cultivates economically viable tourism without harming residents' environment or society while simultaneously ensuring fair distribution of costs and benefits (DBEDT, 2006a). Decisions are based on economic, environmental, and cultural impacts; how wealth is generated and distributed; and the relative power and interactions among the stakeholders (Bramwell, 2006; Twining-Ward & Butler, 2002). STD balances industry's goal of profit with the needs of the environment and stakeholders (Bramwell, 2006). Stakeholder cooperation is necessary for sustainable tourism; otherwise only the most powerful will benefit (Dyer, Gursoy, Sharma, & Carter, 2007). To keep stakeholders satisfied with tourism development and their community, the environment and culture must be protected (Ahn et al., 2002; Hjalager, 1996). When tourism development enhances, rather than erodes the natural environment, a more sustainable tourism product can be offered to support the destination's economy (Batra & Kaur, 1996).

A government that effectively manages tourism creates benefits for all stakeholders (Jamal & Getz, 1995). Effective management is avoiding negative impacts through a combination of general protective measures; regulations to control development; and financial restraints (Cohen, 1978; Hjalager, 1996). Improvement of the environment can be achieved by ensuring that development is harmonious with the overall plan for the destination (Batra & Kaur, 1996). Necessary tourism infrastructure such as roads, airports, parks, and visitor centers are also the responsibility of government (Jamal & Getz, 1995). Maintenance of infrastructure and facilities is expensive and residents, through property taxes, should not be the only group to bear this burden (Wong, 1996).

Residents benefit when tourists spend money in the local economy and create jobs, as well as from the development of infrastructure that residents also utilize (Wong, 1996).

Residents in mass tourism destinations such as Hawai‘i depend on tourism for their standard of living (Liu, Sheldon, & Var, 1987). Because tourism development usually involves a tradeoff between economic benefits and environmental or cultural costs, residents cope by downplaying the negative impacts based and emphasizing the economic gains to maintain satisfaction with their community (Dyer et al., 2007; Cavus & Tanrisevdi, 2003; Faulkner & Tideswell, 1997). Residents with the most economic gain are the most supportive of the tourism industry (Harrill, 2004).

Cavus & Tanrisevdi (2003) found that the development process controlled by planners was the primary factor in residents’ negative attitudes towards tourism. When residents perceive that the costs of tourism outweigh the benefits, feelings of resentment and irritation towards tourists can develop and lower community satisfaction (Doxey, 1975; Faulkner & Tideswell, 1997; Ko & Stewart, 2002). Residents who feel that they have a voice in tourism planning are more positive towards tourism (Cavus & Tanrisevdi, 2003).

According to Choi & Sirakaya (2005), sustainable tourism is the development pathway to minimize the negative impacts of tourism. There are many ways to make tourism more sustainable but few tools for evaluating and testing a sustainable tourism framework (Choi & Sirakaya, 2005). Audits and resource valuation evaluate tourism’s costs and benefits so that they can be fairly distributed to stakeholders (Warnken et al., 2004; Wen, 1998). Limiting tourism growth (such as carrying capacity or limits of acceptable change) can also make development more sustainable (Cohen, 1978; Butler, 1980; Gössling, Peeters, Ceron, Dubois, Patterson, & Richardson, 2005; Christensen & Beckmann, 1998; Ahn et al., 2002). In these approaches, government management and stakeholder cooperation are necessary to reach a consensus for how to manage future tourism development.

In Hawai‘i, Waikiki is an established destination with well-developed tourism infrastructure and facilities (Tabatchnaia-Tamirisa et al., 1997). Hawai‘i’s economy has become dependent on tourism for employing residents directly or indirectly with the industry who want to maintain the high standard of living that tourism brings (DBEDT, 2006a). For instance, O‘ahu’s infrastructure is used by both residents and tourists, though tourists may use it more intensely (Sheldon, et al., 2005). Rising tourist arrivals put increasing demand on the island’s limited resources that must also sustain residents (Tabatchnaia-Tamirisa et al., 1997). The Sustainable Tourism Study Group was formed to organize several stakeholder groups to explore tourism on O‘ahu (DBEDT, 2006a). The objective was that “sustainable tourism will operate in harmony with our ecosystems, enhancing natural beauty and protecting the islands’ natural resources” (DBEDT, 2006a; 72). The group proposed finding alternative sources of water and energy; land conservation; and improving coordination of state and county transportation authorities to improve tourism management (DBEDT, 2006a). The group recommended the conceptual model for sustainable tourism monitoring developed by Twining-Ward and Butler (2002) in Samoa be adapted to Hawai‘i to manage sustainable tourism initiatives (Figure 1). The model develops economic, social, and environmental indicators to be monitored over time to record tourism’s impacts (DBEDT, 2006a). The indicators developed by DBEDT (2006a) rank respect for the land as a higher priority than stakeholders’ short-term interests (Sheldon et al., 2005). See Figure 1 (Appendix).

Resident Attitude Surveys

Resident attitude surveys assess sentiments about the impact of tourism on their community (Ahn et al., 2002). Demographic data collected allows the examination of differences within resident population groups (Ahn et al., 2002). Residents' attitudes towards tourism are influenced by several factors. Resident attitude surveys have found that residents who value economic impacts will have favorable attitudes towards tourism but their attitudes towards environmental and cultural change are negative (Lindberg & Johnson, 1997; Walpole & Goodwin, 2001; Yoon et al., 2001). Hawai'i Tourism Authority's (HTA) (2006) report on residents attitudes revealed that residents view tourism's impacts positively overall. Over three quarters (76 percent) of respondents feel that tourism creates more benefits than problems. However, 79 percent feel that O'ahu's economy is too dependent on tourism and 77 percent feel that the island is run for tourists at the expense of residents. Sixty-four percent of respondents feel that air and water pollution from tourism are a problem and forty-one percent of respondents feel that tourism has degraded the quality of air and water on the island. Eighty-two percent of respondents feel that tax money collected from tourism should be used for environmental preservation to better manage negative environmental impacts. Fewer than half (43 percent) want increased visitor activity in wilderness areas (HTA, 2006). One can conclude from these results that while many residents support existing tourism, they are aware of the negative impacts on O'ahu and want to restrict the continued growth of the industry. As such, their community satisfaction is related to the effectiveness of government management of tourism; tourism's environmental impacts; and their attitudes towards how sustainable tourism is on the island.

Problem Statement

Understanding resident attitudes is complicated because opinions towards tourism are formed from residents' perceptions of many factors. Perceptions of the government's ability to control and the environmental impacts of tourism affect residents' community satisfaction and their views on the sustainability of tourism development on O'ahu. The objective of this research is to understand how residents' attitudes on government management and the environmental impacts of tourism affect their community satisfaction and perceptions of sustainable tourism development.

Methodology

Research Design

Using the proposed model, these factors were tested by developing and administering a resident attitude survey to a sample of Hawai'ian residents (Figure 2). Literature relevant to the environmental impacts of tourism, sustainable tourism development, and resident attitude surveys were reviewed to develop the survey instrument and create a framework for this research design. See Figure 2 (Appendix).

The proposed model identified the following six hypotheses:

H1: Perceived effective government management of tourism will have a positive effect on overall community satisfaction.

H2: Perceived effective government management of tourism will have a positive effect on perception of environmental tourism impacts.

H3: Overall community satisfaction will have a positive effect on attitudes for sustainable tourism development.

H4: Favorable perception of environmental tourism impacts will have a positive effect on overall community satisfaction.

H5: Favorable perception of environmental tourism impacts will have a positive effect on attitudes for sustainable tourism development.

H6: Perceived effective government management of tourism will have a positive effect on attitudes for sustainable tourism development.

Sample Selection

The purpose of this research was to explore O‘ahu residents’ attitudes towards tourism’s environmental impacts. The population of interest were residents of the state of Hawai‘i. Due to time and financial constraints, it was impractical to administer the survey to the entire state. Hence, survey administration was limited to a convenience sample distributed and collected at local area malls and to smaller resident groups which researchers had access. A total of 440 completed surveys were collected, exceeding the recommendation from Tabachnick and Fidell (2001) of a minimum sample size of 200 for advanced multivariate statistical techniques such as structural equation modeling (SEM).

Instrument Development

To test the proposed model the Tourism Impact Attitude Scale (TIAS) (Lankford & Howard, 1994) and Sustainable Tourism Attitude Scale (SUS-TAS) (Choi & Sirakaya, 2005) were used as a basis for developing the survey instrument. Statements for the instrument were extracted from factors related to resident attitudes identified during the literature review. A small-scale pilot study on mall patrons on O‘ahu was run to test the instrument. Thirty-seven completed pilot surveys were collected and used for factor analysis to determine the optimal mix of statements for the final instrument. Green and Salkind (2005) define factor analysis as “a technique used to identify factors that statistically explain the variation and covariation among measures” (p. 312). Factor analysis of the pilot study instrument eliminated ineffective questions and identified confusing or vague questions for rewriting and grouped the statements into the following categories: environmental impacts; government management of tourism; sustainable tourism; and community satisfaction.

The validated final survey consisted of a demographic profile containing 14 questions. The remainder of the instrument had a series of 18 statements to which participants stated their level of agreement or disagreement on a 5-point Likert scale.

Data Collection

The final instrument was administered in paper form to mall patrons at three O'ahu malls, as well as to residents from local businesses whom agreed to participate. Only respondents that were state residents over the age of 18 were allowed to complete the survey. A total of 507 surveys were collected from March 24 through March 28, 2007. Sixty-seven of the surveys were rejected because they were incomplete or respondents were not residents over the age of 18. Of the surveys collected, 440 (86.8 percent) were usable.

Analysis of Data

Statistical Package for Social Science (SPSS) 15.0 and EQS 6.1 software packages were used for data analysis. Survey responses were hand-coded into SPSS and imported into EQS for analysis. Descriptive statistics, confirmatory factor analysis, and structural equation modeling (SEM) were used to analyze the collected surveys. SEM was selected because of the ability of this method to explore the interconnected relationships between the factors identified within the model (Hoyle, 1995).

Results and Discussion

Demographic Profile of Survey Respondents

Respondents were asked to select their gender, age, and primary race. Survey respondents were 51 percent male (Table 1) which is slightly higher than a study conducted by the state government (49.6 percent) (DBEDT, 2006b). The average respondent was 40 years old. Respondents selected the following as their primary race: Filipino (108), Japanese (101), Caucasian (80), and Native Hawai'ian (43). Of the 423 respondents who answered, 57.2 percent were Asian, 18.9 percent were Caucasian, and 16.3 percent were Native Hawai'ian/Pacific Islander. These proportions are similar to the most recent State of Hawai'i population characteristics provided on the DBEDT website (2006b): Asians comprised 57.5 percent, Caucasians encompassed 23.5 percent, and Native Hawai'ian/Pacific Islander consisted of 22.1 percent. Differences could be attributable to several respondents selecting more than one race or selecting 'other' as their race.

Respondents were asked about education level; personal income; the length of their commute; and whether they or another household member worked in the tourism industry. Forty-three percent had achieved a bachelor's or higher degree. The largest proportion (35.9 percent) reported personal annual income between \$20,001 and \$45,000. Most respondents (80.5 percent) reported driving to work or school with most commutes (67.9 percent) taking less than 30 minutes. Over 21 percent of respondents (113) worked in the tourism industry full- or part-time, primarily in hotels (45), restaurants (28), or retail (14). Over 17 percent of respondents (91) reported that household members worked in the industry full- or part-time.

Finally, respondents were asked to identify their island of residence as well as their length of residence in the State of Hawai'i and the island of O'ahu. The vast majority (91.4 percent) of respondents reside on O'ahu, with Hawai'i, Maui, and Kaua'i being the only other islands represented. Respondents lived in the state an average of 29.54 years and on O'ahu an

average of 26.51 years. Most respondents reported living in the state and on O‘ahu for between 21 and 40 years. See Table 1 (Appendix).

Descriptive Statistics

The study had 440 respondents and 13 observed variables. The final model included only thirteen variables out of the original 18 survey statements (Appendix I). Five variables were eliminated because they did not fit the proposed model due to low loadings during confirmatory factor analysis. Descriptive statistics of the 13 variables are presented in Table 2. The CFA model identified four factors: perception of government management of tourism (GM), overall community satisfaction (CS), perception of environmental tourism impacts (TI), and attitudes towards sustainable tourism (AS). Table 3 displays the descriptive statistics of the 13 variables. Based on a five point Likert type scale (1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, and 5 = strongly agree), the composite variable scores revealed that the three survey statements the respondents most strongly agreed with were: (a) GM3 “The quality of public services has improved on O‘ahu due to tourism” (M = 3.239), (b) TI3 “Tourists generate more wastewater than residents” (M = 3.177), and (c) TI4 “Tourism development threatens drinking water supply” (M = 3.176). The three survey statements respondents most strongly disagreed with were: (a) CS1 “Tourism causes more land to be developed” (M = 2.506), (b) CS3 “I enjoy interactions with tourists” (M = 2.757), and (c) GM1 “The state government does a good job balancing residents' and tourists' needs” (M = 2.886). The data were evaluated for fit with the assumptions of SEM: normality, linearity, multicollinearity and singularity, and adequacy of covariances. See Table 2 (Appendix).

Results derived within larger samples generally have less sampling error than smaller samples. Kline (2005) reasoned that “more complex models – those with more parameters – require larger samples than more parsimonious models in order for estimates to be comparably stable”. In the absence of absolute standards in the literature about sample size and path model complexity relationships, Kline proposes that the ratio of the number of cases to the number of free parameters be 20:1 as an ideal or 10:1 as a more realistic target ratio. This model contains 32 free parameters and the ratio cases to observed variables (13.75:1) met Kline’s ratio. Therefore, 440 is an adequate sample size for this study.

Respondents occasionally left some survey statements blank. To determine whether they were purposefully avoiding certain statements, missing value analysis (MVA) was performed using SPSS and EQS. EQS MVA determined that the data were missing at random (MAR); $p = 0.293$, indicating that respondents were not avoiding particular statements. SPSS MVA was performed to replace missing values with calculated expected values.

The data were evaluated for normality. Histograms of all 13 observed variables were not normally distributed. Both the Mardia’s coefficient of 42.81 and the normalized estimate of 22.74 indicated that the variables were not normally distributed. A scaling factor developed by Satorra and Bentler (1994) was used to correct the statistics for non-normality. Linearity was confirmed by examination of randomly selected pairs of scatterplots from SPSS GRAPHS. For the selected pairs, the assumption of linearity was not violated. No multivariate outliers were detected using Mahalanobis distance (using SPSS Regression) and cases with the largest contributions to Mardia’s coefficient (using EQS). The matrix determinant was determined by EQS to be 0.90265D-02 exceeded zero, indicating no singularity.

Preliminary Data Analysis

Confirmatory factor analysis (CFA) identified four factors underlying survey items: perception of government management of tourism (GM); overall community satisfaction (CS); perception of environmental tourism impacts (TI); and attitudes towards sustainable tourism (AS). Statement abbreviations are included in Appendix I. Factor correlations ranged from -0.026 to 0.720 (Table 3). Correlations between the four factors and the 13 variables ranged from 0.440 to 0.937 (Table 4). Variance (R^2) among the factors ranged from 0.0319 to 0.455. See Table 4 (Appendix).

Reliability, Convergent Validity, and Discriminant Validity

Cronbach's alpha, used to determine the reliabilities of multi-item factors, ranged from 0.485 to 0.841 (Table 5). The reliability level for attitudes towards sustainable tourism development (AS) did not meet the critical value of 0.7 suggested by Nunnally & Bernstein (1994).

Convergent and discriminant validity test results included covariance estimates between factors, variable loadings on factors, and measurement error for each variable (Table 6). The range of convergent validity values (0.440 to 0.937) had high standardized loadings on the respective factors, suggesting convergent validity. With the exception of attitudes towards sustainable tourism (AS), the discriminant validity demonstrated lower loadings than their original variables indicating discriminant validity. See Table 5 (Appendix).

Data Analysis

An SEM model was used to examine the hypothesized relationships between the constructs (factors) in the model using EQS. Model fit was initially tested using the overall fit and regression paths to determine whether observed variables were generated by the corresponding latent factors. The hypothesized model (Figure 2) was then analyzed. The model was modified based on the results of the analysis to find a better fit of the data and more adequately describe the relationships between the factors. The Lagrange Multiplier (LM) and Wald tests identified whether parameters fit the proposed model.

Measurement Model Results

The measurement model specified the following four factors: government management of tourism (GM); overall community satisfaction (CS); perception of environmental tourism impacts (TI); and attitudes for sustainable development (AS). Each factor loaded on the three remaining factors. For analysis, each variable was allowed to load only on the factor that it measured. Residuals for variables were fixed to be uncorrelated; equality constraints on factor loadings were not imposed; and factor covariances were free to be estimated. The model fit the observed data well (Table 6, Appendix). The large variance (R^2) in the variables, ranging from 0.440 to 0.937, was caused by corresponding factors (Table 5). The strongest factor correlations ($r = 0.667$ and $r = 0.539$) were noted between CS and TI and GM and AS, respectively (Table 7, Appendix).

Structural Model Results

To examine model goodness of fit, the measurement model was respecified with the imposed structure in the full SEM model. Figure 3 summarizes the results of the proposed structural parameters. The fit indices revealed that the model fit the observed variables well (Table 7). Wald test results found that all free parameters were reasonable and statistically significant and should not be fixed. LM test results suggested that no parameter should be added to the model to improve the fit. Additional examination of the model parameters ensured goodness-of-fit and found no evidence of improper solutions; measurement parameters were all statistically significant; confirmatory factor loadings were sufficiently large; and measurement errors were relatively small.

The results support five of the six hypotheses (Figure 3, Appendix). Hypothesis 3, overall community satisfaction will have a positive effect on attitudes for sustainable tourism development, was rejected. The ability of the model to predict attitudes on sustainable tourism was moderate ($R^2 = 0.319$). Perhaps indicating that the overall predictability of the model means additional factors not evident in the model might also influence attitudes towards sustainable development.

To better understand residents' attitudes on O'ahu, this study developed and tested a model adapted from Ko & Stewart (2002) along with relevant literature. The key factors identified included: government management of tourism; overall community satisfaction; environmental tourism impacts; and attitudes towards sustainable development. Hypotheses for the model came from the literature on environmental impacts of tourism in general and also specific to Hawai'i, as well as residents' perceptions of government management of tourism, community satisfaction, and attitudes towards sustainable development. The theoretical model supported five of the six proposed hypotheses.

Hypothesis 1: Government management and overall community satisfaction

Hypothesis 1 predicted that perceived effective government management of tourism would positively affect overall community satisfaction and was supported with a coefficient of 0.10. This confirms Batra & Kaur's (1996) statement that tourism development needs to be harmonious with the destination. It further supports the relationship identified by Wong (1996) that government planning is essential to residents' satisfaction of additional infrastructures with the caveat that such infrastructures are maintained by the government and are not allowed to bear the burden of tourism's detrimental impacts. The results also affirm residents can become irritated if tourism is not developed in a controlled manner with an effort to benefit the residents (Ko & Stewart, 2002; Faulkner & Tideswell, 1997).

The State of Hawai'i, through its tourism agency, the HTA, has developed the Hawai'i Tourism Strategic Plan (HTSP). The HTSP was designed specifically to manage tourism in the state while benefiting all stakeholders, including residents (HTA, 2005). As determined by data collected through the HTA resident attitude surveys, a principal consideration in creating the strategic plan was the decline in residents' satisfaction with tourism (HTA, 2005). One of the primary goals of the HTSP is to facilitate collaboration between stakeholders, which the HTA views as essential to successful tourism industry development. The result of taking residents' concerns into consideration is that tourism development will occur harmoniously with stakeholders' objectives and improve attitudes towards tourism, thus increasing community satisfaction.

Hypothesis 2: Government management and environmental impacts

Hypothesis 2 predicted that perceived effective government management of tourism would positively affect the perception of environmental tourism impacts, was supported with a coefficient of 0.20. Residents who feel government effectively manages tourism will be more positive towards the environmental impacts of tourism. The results indicate that O'ahu residents agree with Cohen (1978) and Hjalager (1996) in that government control can limit the environmental impacts of tourism development. The findings also concur with Cavus & Tanrisevdi (2003) that residents' negative attitudes, in this case towards the environmental impacts, are a function of the development process controlled by tourism planners.

The HTSP goal encouraging collaboration between stakeholders should address the relationship between government management and tourism's environmental impacts (HTA, 2005). An HTSP objective is collaboration between the state's main tourism groups (HTA, the private sector, and community groups/residents) and environmental agencies; primarily the Department of Land and Natural Resources (DLNR), but also other volunteer, county, state, and federal groups such as the Sierra Club; Department of Environmental Services (ENV); the Office of Environmental Quality Control (OEQC); and the Fish and Wildlife Service (FWS). This collaboration, in combination with the knowledge of residents' attitudes on specific environmental tourist related impacts, can enable more efficient use of resources to balance the demands of tourists and the needs of residents. For example, if residents are particularly concerned about fish stocks being depleted due to competition and overuse by tourists and local fisherman, coordination with the FWS can facilitate these concerns to be translated directly into tourism and FWS policies.

Hypothesis 3: Community satisfaction and attitudes towards sustainable tourism development

Hypothesis 3 predicted that overall community satisfaction would positively affect attitudes for STD but this was rejected as substantiated by an $R^2 = -0.23$. This contradicts the expected relationship identified by Cavus & Tanrisevdi (2003) that residents who feel included in tourism planning are more positive towards tourism. Resident participation is necessary for sustainable tourism which should have increased their positive feelings for the factor (Dyer et al., 2007; Ko & Stewart, 2002).

As attitudes towards tourism in Hawai'i have been declining (HTA, 2005), it becomes even more critical the state move towards further sustainable tourism development aligned with residents' needs. By the HTA requiring resident participation in executing the goals of the HTSP, residents' concerns about tourism can be taken into consideration. Goodwill of residents towards the tourism industry is necessary to sustain the industry in the long term. Thus, allowing tourism suppliers to create new tourism products residents approve of, while simultaneously increasing tourist satisfaction as interaction occurs with more content residents.

Hypothesis 4: Environmental impacts and community satisfaction

Hypothesis 4 predicted that favorable perception of environmental tourism impacts would positively affect overall community satisfaction and was supported with an $R^2 = 0.65$, the strongest relationship identified by the model. Residents who more positively perceive the environmental impacts of tourism will have higher overall community satisfaction. This is well documented as many authors have recognized the relationship (Cavus & Tanrisevdi, 2003; Cohen, 1978; Doxey, 1975; Dyer et al., 2007; Faulkner & Tideswell, 1997; Ko & Stewart, 2002).

The HTSP has great potential to impact how tourism development affects the environment by keeping it from moving to cross purposes. Based on hypothesis 4, the more tourism development is in tune with the environment, the more residents will be satisfied with their community. The HTSP encourages collaboration between the HTA; the private sector; residents; and environmental agencies which will illuminate the environmental issues that could most greatly impact residents' community satisfaction. While collaboration with entities such as the DLNR; Sierra Club; ENV; OEQC; and FWS is a good first step, the Board of Water Supply (BWS); Environmental Protection Agency (EPA); the Army Corps of Engineers (ACE); and the United States Geologic Survey (USGS) could also enrich the dialogue with precise areas of expertise.

Hypothesis 5: Environmental impacts and attitudes towards sustainable tourism development

Hypothesis 5 predicted that favorable perception of environmental tourism impacts would positively affect attitudes for sustainable tourism development, which was supported with an $R^2 = 0.12$. Residents who positively perceive the environmental impacts of tourism will have a more positive attitude towards sustainable tourism development (Choi & Sirakaya, 2005; Twining-Ward & Butler, 2002).

The goal of the HTSP is to guide stakeholders in working together to make the tourism industry in Hawai'i more universally beneficial and competitive with other destinations.

Fundamentally, the HTSP is designed to sustain the success of the tourism industry (HTA, 2005). The importance that residents place on their environment as determined by Liu & Var (1986) makes environmental sustainability a critical part of the future success of the Hawai'i tourism industry. Environmental degradation reduces residents' acceptance of tourism as a major industry and also tourists' perception of O'ahu as a beautiful natural destination.

Hypothesis 6: Government management and attitudes towards sustainable tourism development

Hypothesis 6 predicted that perceived effective government management of tourism would positively affect attitudes for Sustainable tourism development, which was supported with an $R^2 = 0.57$. Residents who feel the government is effective in its control of tourism development feel more positively towards sustainable tourism development. This reinforces the work of Twining-Ward & Butler (2002) and DBEDT (2006a) signifying residents who are part of the planning process and believe government can be effective in limiting tourism development will believe in the goals of sustainable tourism development. The HTSP is Hawai'i's roadmap to effectively managing tourism development (via the HTA, but in concert with other stakeholders and agencies) to encourage a more controlled, unified, and sustainable tourism product on O'ahu and across the State of Hawai'i.

Conclusions

The proposed model was tested and proven useful to better understand residents' attitudes towards tourism on O'ahu. As the survey statements determined, many residents feel tourists help increase their quality of life through public services that are mutually beneficial. However, the survey statements determined that respondents also feel that tourism competes for natural resources (i.e., drinking water) and adds a disproportionate burden to public services (i.e., wastewater disposal). Despite the recent efforts of the State, many respondents also felt the State must better balance needs of residents with the needs of tourists and the demands of the tourism industry. Perhaps, as the Hawai'i Tourism Strategic Plan (HTSP) is implemented; it will address these important issues.

The model was developed by extracting relationships from the literature between government management of tourism; overall community satisfaction; environmental tourism impacts; and attitudes towards sustainable development. These findings complement the extensive work of the Department of Business, Economic Development and Tourism's (DBEDT) Sustainable Tourism Study Group (DBEDT, 2006a) to provide a deeper understanding of how residents form their attitudes towards tourism and their priorities for their community. Future tourism development can be managed to work with residents' priorities through collaboration with the tourism suppliers, or by increasing the requirements of developer's environmental impact assessments to incorporate such priorities. Tourism management enlightened by the needs of residents enables tourism development that benefits residents while minimizing or eliminating negative impacts, particularly negative environmental impacts.

Five of the six hypotheses on relationships between factors identified by the literature were accepted. Supporting the findings of the earlier literature, the study results demonstrate a very strong relationship exists between residents' overall community satisfaction and their perceptions of the environmental impacts of tourism. Planners can make practical use of this

information by understanding that controlling tourism's detrimental environmental impacts will have a direct positive relationship with residents' community satisfaction. The HTSP is the State's effort to increase collaboration between tourism planners, such as the HTA and other important public sector agencies such as DLNR and citizen groups such as the Sierra Club (HTA, 2005). Government agencies are currently run quite independently in Hawai'i, however, the position of Tourism Liaison has recently been created to facilitate dialogue between all of the agencies involved directly or indirectly with the tourism industry to ensure transparent communication. Residents' perceptions of the connectedness between O'ahu's tourism development and environmental impacts, along with residents' prioritization of environmental impacts for their community satisfaction can lead to collaborative policy making between these agencies. Also, the allocation of government funds can be more effective if the relationship between community satisfaction and environmental impacts is better defined. By acknowledging and understanding that the environment is important to how residents feel about their community, more funds can be allocated to take advantage of this relationship; for instance, cleaning up pollution; treating wastewater and sewage; and creating and maintaining natural areas for residents and tourists to enjoy.

The HTSP was an effort of the Hawai'i Tourism Authority (HTA) with input from other stakeholder groups such as the private sector and community groups. Collaborative endeavors like this increase the ability of government to manage tourism to benefit all stakeholders. The cooperation for making O'ahu a more sustainable tourism destination will likewise ensure that this destination continues to attract visitors and create economic benefits for suppliers and residents alike. The HTA and other tourism groups should also continue to educate the residents about not only the positive consequences of tourism, but also the negative so that the need for more sustainable tourism practices is recognized by all stakeholders. This alliance should continue to solicit the perceptions of residents and other stakeholders to ensure the needs are prioritized and always being considered.

In summary, residents appreciate the economic importance of tourism. However, residents also recognize that these benefits come with a cost to the environment, which ultimately diminishes community satisfaction. Using policies to effectively manage tourism so that these benefits do not come at the cost of environmental degradation can create a more educated destination opting for what is best for stakeholders in the long term. Another benefit of managing the environmental impacts of tourism is that tourists will continue to be attracted to the stunning scenery and outdoor activities that O'ahu provides. An important part of the basis for these policies is the understanding of how residents' attitudes towards tourism are formed and translating it into tourism development policies that will make a difference in the sustainability of O'ahu tourism. The model presented in this research is clearly a starting point to understand the relationship of the factors affecting residents' attitudes.

Limitations

There were several limitations to this study. The limitations include the survey questions; nature of the sample; the procedures for data collection; and the ability of the proposed model to explain resident attitudes.

The survey was designed to explore residents perceptions of different factors related to tourism on O'ahu. However, the residents' ability to convey their attitudes was related to their understanding of the survey statements. For example, individual residents could have defined

the word “community” in the survey statements differently. The qualitative nature of the questions allowed differing interpretations among residents which could affect responses. The residents of Hawai‘i are comfortable with the existing model of mass tourism development that has been present for decades. Residents are less familiar with the characteristics and advantages of sustainable tourism development and therefore may not have fully understood the survey statements regarding this factor.

The survey respondents consisted of a convenience sample of mall patrons and some employees of local businesses. As a convenience sample, residents with certain characteristics (i.e., the elderly) might have been underrepresented. Certain areas of the island are not served by a local mall so residents from those areas might also have been underrepresented. In addition, the location where the individual surveys were collected was not recorded, making the exploration of differences in attitudes between malls and geographic regions impossible.

Mall patrons were asked to complete a survey at the mall, most often while dining. While surveys were only distributed to willing participants, it is possible that people agreed to fill out the survey and did not take time in considering their responses or did not adequately read and process each statement before filling in a response. Therefore, error could be introduced in that the instrument was not effectively gauging the attitudes of participants who were in a hurry to finish the survey.

Finally, the overall R^2 of the model of 0.312 exhibits that only 31.2 percent of residents’ attitudes could be explained by the model; meaning there are unidentified factors remaining that could partially explain residents’ attitudes. These latent factors were not identified and tested by the statements on the survey instrument.

However, despite the limitations, this research has proven useful in understanding how residents foster attitudes towards sustainable tourism development. This research extends the work of Choi & Sirakaya (2005) in exploring resident attitudes towards sustainable tourism development. As residents are critical stakeholders in sustainable tourism development, it is important to understand the attitudes of this group.

Recommendations for Future Research

An interesting follow-up for the data collected for this research would be a regression analysis between the demographic variables and the participants’ attitudes towards tourism. Also, a deeper look into residents’ concerns regarding how particular environmental issues affect residents’ community satisfaction would be helpful to guide future collaborations in conjunction with the Hawai‘i Tourism Strategic Plan. For example, it would be advantageous to explore what aspects of water resources are most distressing to residents, such as groundwater well contamination. If residents identified this as an issue of high concern, more resources could be allocated to managing well protection while simultaneously educating tourists about groundwater in the islands and optimal use. As another example, if residents are found to have a great concern over the amount of open space on the island, the State and municipalities can work on zoning laws that better protect these open spaces for the use of residents and tourists. Exploring the details of these relationships can do much to align the goals of both the tourism industry and government with those of residents.

While this model was useful in explaining some of residents’ attitudes towards tourism on O‘ahu, more research needs to be done to complete the picture. Future research endeavors should refine the survey statements to be clearer to residents and incorporate missing factors.

Regression analysis on the data would be helpful in identifying trends in how residents responded to the survey statements based on demographic characteristics. Also, identifying the latent factors that explain the remaining 68.8 percent of residents' attitudes would be useful. A more comprehensive conceptual model could be evaluated to better identify the relationships between residents' perceptions of the factors. Additionally, a more comprehensive model could be used to compare how O'ahu residents' attitudes towards the factors are changing over time, along with measuring the government's effectiveness in managing tourism development. In addition to identifying other factors, the relationship between the environmental impacts of tourism and overall community satisfaction can be more clearly defined by investigating how energy, water, and land resources determine residents' perceptions of environmental impacts. More specific concerns of residents regarding the environment should also be gauged to determine factors that would most affect community satisfaction. The model could also be applied in other destinations, particularly other island destinations, for a cross-destination analysis of resident attitudes. The information gathered would help government planners better understand the attitudes of O'ahu residents toward tourism. Considering the importance of the environment to resident satisfaction and how residents form attitudes towards tourism are crucial to the management of future sustainable tourism development; making O'ahu a more welcoming place for residents and tourists alike.

References

- Ahn, B. Y., Lee, B. K., & Shafer, C. S. (2002). Operationalizing sustainability in regional tourism planning: an application of the limits of acceptable change framework. *Tourism Management, 23*, 1-15.
- Álvarez, L., Martín, A., and Casielles, R. (2007, May). Relationship Marketing and Information and Communication Technologies: Analysis of Retail Travel Agencies. *Journal of Travel Research, 45*(4), 453-463. Retrieved April 15, 2009, doi:10.1177/0047287507299593.
- Batra, G., & Kaur, N. (1996). New vistas in reducing the conflicts between tourism and the environment: an environmental audit approach. *Managerial Auditing Journal, 11*, 3-10.
- Bramwell, B. (2006). Actors, power, and discourses of growth limits. *Annals of Tourism Research, 33*, 4, 957-978.
- Butler, R. (1980). The concept of a tourist area cycle of evolution: Implications for management of resources. *Canadian Geographer, 24*, 5-12.
- Cavus, S., & Tanrisevdi, A. (2003). Residents' attitudes toward tourism development: A case study in Kusadasi, Turkey. *Tourism Analysis, 7*, 259-269.
- Choi, H.C., & Sirakaya, E. (2005). Measuring Residents' Attitude toward Sustainable Tourism: Development of Sustainable Tourism Attitude Scale. *Journal of Travel Research, 43*, 380-394.
- Christensen, A. M., & Beckmann, S. (1998). Consumers' Perspectives on Tourism and the Environment. CEC Working Paper No. 7.
- Cohen, E. (1978). The impact of tourism on the physical environment. *Annals of Tourism Research, 5*, 215-237.
- Cronk, Q. (1997). Islands: stability, diversity, conservation. *Biodiversity and Conservation, 6*, 477-493.
- DBEDT (2005). Annual Estimates of the Population by Sex and Age For Hawai'i and its Counties: April 1, 2000 through July 1, 2005.

- DBEDT (2007). 2006 Annual Visitor Research Report - Revised.
- DBEDT (2006a). Planning for Sustainable Tourism Part 1: Summary Report.
- DBEDT (2006b). County Population Facts (as of March 22, 2007). Retrieved April 8, 2007 from <http://www.hawaii.gov/dbedt/info/census/population-estimate>.
- Doxey, G. (1975). A causation theory of visitor-resident irritants: Methodology and research inferences. *Travel and Tourism Research Associations Sixth Annual Conference Proceedings*, 195-198.
- Dyer, P., Gursoy, D., Sharma, B., & Carter, J. (2007). Structural modeling of resident perceptions of tourism and associated development on the Sunshine Coast, Australia. *Tourism Management*, 28, 409-422.
- Faulkner, B., & Tideswell, C. (1997). A Framework for Monitoring Community Impacts of Tourism. *Journal of Sustainable Tourism*, 5, 3-28.
- Gössling, S. (2001). The consequences of tourism for sustainable water use on a tropical island: Zanzibar, Tanzania. *Journal of Environmental Management*, 61, 179-191.
- Gössling, S. (2002). Global environmental consequences of tourism. *Global Environmental Change*, 12, 283-302.
- Gössling, S., Peeters, P., Ceron, J.P., Dubois, G., Patterson, T., & Richardson, R. (2005). The eco-efficiency of tourism. *Ecological Economics*, 54, 417-434.
- Green, S. B., & Salkind, N. J. (2005). *Using SPSS for Windows and Macintosh: Analyzing and Understanding Data*. Upper Saddle River, NJ: Pearson Prentice Hall.
- Harrill, R. (2004). Residents' Attitudes toward Tourism Development: A Literature Review with Implications for Tourism Planning. *Journal of Planning Literature*, 18, 3, 251-256.
- Hjalager, A.M. (1996). Tourism and the Environment: The Innovation Connection. *Journal of Sustainable Tourism*, 4, 201-218.
- Hoyle, R. H. (Ed.) (1995). *Structural Equation Modeling: Concepts, Issues, and Applications*. Thousand Oaks, CA: Sage Publications.
- HTA (2006). 2006 Survey of Resident Sentiments on Tourism in Hawai'i.
- HTA (2005). Hawai'i Tourism Strategic Plan: 2005 – 2015.
- Jamal, T.B., & Getz, D. (1995). Collaboration theory and community tourism planning. *Annals of Tourism Research*, 22, 186-204.
- Klasner, F., & Mikami, C. (2003). Land Use on the Island of O'ahu, Hawai'i, 1998. USGS.
- Kline, R. B. (2005). *Principles and practice of structural equation modeling* (2nd ed.). New York, NY: The Guilford Press.
- Ko, D. W., & Stewart, W. (2002). A structural equation model of residents' attitudes for tourism development. *Tourism Management*, 23, 521-530.
- Lankford, S. V., & Howard, D. R. (1994). Developing a Tourism Impact Attitude Scale. *Annals of Tourism Research*, 21, 121-139.
- Lindberg, K., & Johnson, R. (1997). Modeling resident attitudes toward tourism. *Annals of Tourism Research*, 24, 402-424.
- Liu, J., Sheldon, P., & Var, T. (1987). Resident perception of the environmental impacts of tourism. *Annals of Tourism Research*, 14, 17-37.
- Liu, J., Var, T. (1986). Resident attitudes toward tourism impacts in Hawai'i. *Annals of Tourism Research*, 13, 193-214.
- Mortz, D., Ray, C., & Jain, R. (2005). Major environmental problems facing the Hawai'ian Islands: management, policy, and technology transfer options. *International Journal of Technology Transfer and Commercialization*, 4, 79-104.

- Nunnally, J. C., & Bernstein, I. H. (1994). *Psychometric theory*. New York, NY: McGraw-Hill.
- Oki, D., & Brasher, A. (2003). Environmental Setting and the Effects of Natural and Human-Related Factors on Water Quality and Aquatic Biota, O‘ahu, Hawai‘i. *USGS Water-Resources Investigations Report 03-4156*.
- Satorra, A., & Bentler, P. M. (1994). Corrections to test statistics and standard errors in covariance structure analysis. In A. Von Eye & C. C. Clogg (Eds.), *Analysis of latent variables in developmental research* (pp. 399-419). Newbury Park, CA: Sage Publications.
- Sheldon, P., Knox, J. M., Lowry, K. (2005). Sustainability in a mature mass tourism destination: The case of Hawai‘i. *Tourism Review International*, 9, 47-59.
- SHERC. (2005). Annual Report, 2005. State of Hawai‘i DBEDT.
- Tabatchnaia-Tamirisa, N., Loke, M., Leung, P., & Tucker, K. (1997). Energy and tourism in Hawai‘i. *Annals of Tourism Research*, 24, 390-401.
- Tabachnick, B. G., & Fidell, L. S. (2001). *Using multivariate statistics* (4th ed.). Boston, MA: Allyn and Bacon.
- Twining-Ward, L., & Butler, R. (2002). Implementing STD on a Small Island: Development and Use of Sustainable Tourism Development Indicators in Samoa. *Journal of Sustainable Tourism*, 10, 363-387.
- Walpole, M., & Goodwin, H. (2001). Local attitudes towards conservation and tourism around Komodo National Park, Indonesia. *Environmental Conservation*, 28, 160-166.
- Warnken, J., Bradley, M., & Guilding, C. (2004). Exploring methods and practicalities of conducting sector-wide energy consumption accounting in the tourism accommodation industry. *Ecological Economics*, 48, 125-141.
- Wen, J. (1998). Evaluation of tourism and tourist resources in China: Existing methods and their limitations. *International Journal of Social Economics*, 25, 467-485.
- Wong, J. (1996). The Impact of Tourism on Local Government Expenditures. *Growth and Change*, 27, 313-326.
- (2008). Tourism Highlights 2008 Edition. Retrieved April 15, 2009, from World Tourism Organization (WTO) Web site: <http://unwto.org/facts/menu.html>. World Tourism Organization (2007). Tourism Barometer, February 2007.
- World Tourism Organization (2006). Tourism Highlights: 2006 Edition.
- Yoon, Y., Gursoy, D., & Chen, J. (2001). Validating a tourism development theory with structural equation modeling. *Tourism Management*, 22, 363-372.

Appendix

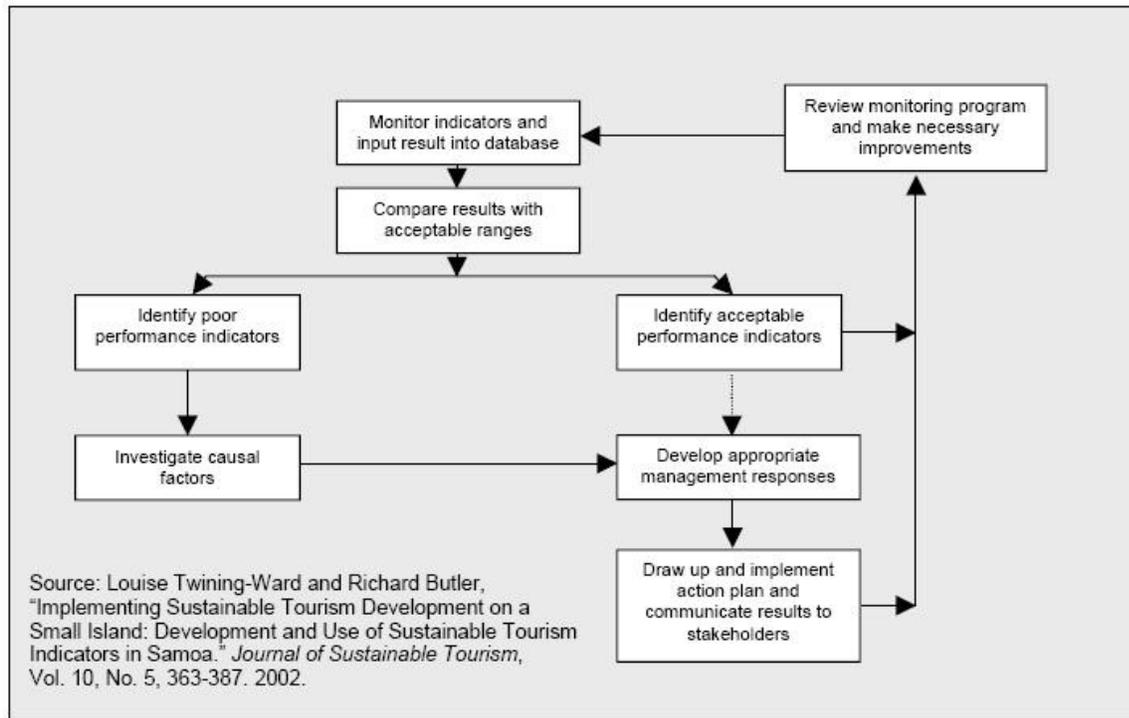


Figure 1. DBEDT general conceptual model for data-driven sustainable tourism system. Note. From DBEDT, 2006b.

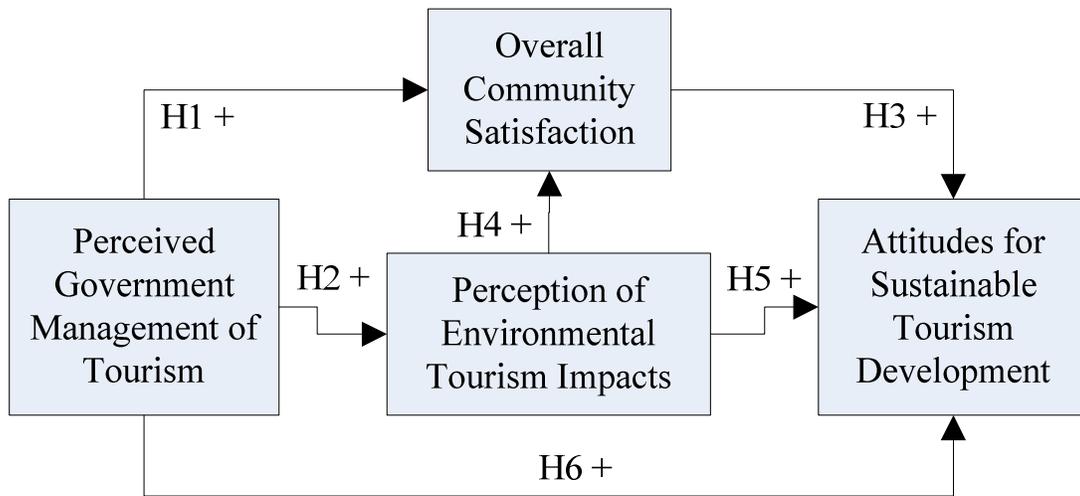


Figure 2. Relationships between residents’ perceptions of tourism impacts and attitudes for sustainable development. Note. Adapted from Ko & Stewart, 2002.

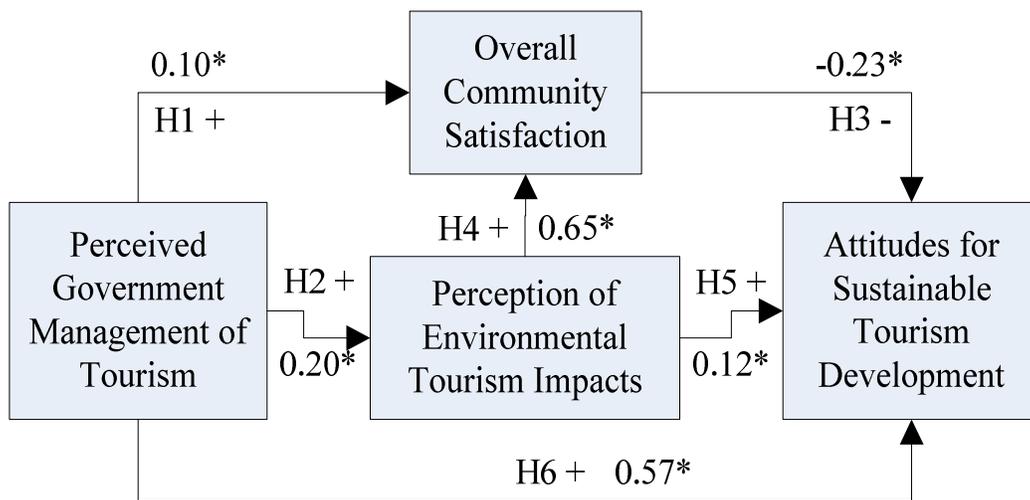


Figure 3: Final SEM Model Output

Table 1
Demographic profile of survey respondents

	N	%
Gender		
Male	224	50.9%
Female	214	48.6%
Missing	2	0.5%
Age		
18-25	64	14.5%
26-40	171	38.9%
41-55	148	33.6%
55 and over	53	12.0%
Missing	4	0.9%
Race		
Filipino	108	24.5%
Japanese	101	23.0%
Caucasian	80	18.2%
Native Hawai'ian	43	9.8%
Chinese	33	7.5%
Pacific Islander	26	5.9%
African American	2	0.5%
Other	30	6.8%
Missing	17	3.9%
Level of Education		
High School	153	34.8%
GED	14	3.2%
Associates Degree	82	18.6%
Bachelor's Degree	129	29.3%
Master's Degree	49	11.1%
Doctoral Degree	8	1.8%
Missing	5	1.1%
Income		
\$0-\$20,000	64	14.5%
\$20,001-\$45,000	158	35.9%
\$45,001-\$70,000	111	25.2%
Over \$70,000	89	20.2%
Missing	18	4.1%

Table 1
Demographic profile of survey respondents (continued)

	N	%
Tourism Employment		
Respondent		
Full-time	78	14.7%
Part-time	35	6.6%
Other industry	321	60.5%
Missing	6	1.1%
Household member		
Full-time	56	10.5%
Part-time	35	6.6%
Other industry	339	63.8%
Missing	10	1.9%
Commute		
No	79	18.0%
Yes*	354	80.5%
0-15 minutes	127	34.9%
15-30 minutes	120	33.0%
30-60 minutes	99	27.2%
Over 60 minutes	18	4.9%
Missing	7	1.6%
Island of residence		
O'ahu	402	91.4%
Hawai'i	27	6.1%
Kaua'i	7	1.6%
Maui	4	0.9%
Length of residence in state		
0-10 years	76	17.3%
11-20 years	63	14.3%
21-40 years	185	42.0%
Over 40 years	112	25.5%
Missing	4	0.9%
Length of residence on O'ahu		
0-10 years	109	24.8%
11-20 years	63	14.3%
21-40 years	174	39.5%
Over 40 years	93	21.1%
Missing	1	0.2%

*Note: some respondents reported a commute time though they do not drive

Table 2
Sample size, mean, and standard deviation of variables

Variable	N	Mean	Standard Deviation	Missing	
				Count	Percent
GM1	439	2.886	0.963	1	0.2%
GM2	437	2.929	0.968	3	0.7%
GM3	439	3.239	0.984	1	0.2%
CS1	433	2.506	1.108	7	1.6%
CS2	424	3.021	1.135	16	3.6%
CS3	437	2.757	1.168	3	0.7%
CS4	424	2.976	1.208	16	3.6%
TI1	437	2.915	1.084	3	0.7%
TI2	439	3.123	1.087	1	0.2%
TI3	440	3.177	1.035	0	0.0%
TI4	438	3.176	1.060	2	0.5%
AS1	420	2.941	1.017	20	4.5%
AS2	420	3.217	0.934	20	4.5%

Table 3

Model covariance of factors

Factor	GM	CS	TI	AS
GM	0.587	-	-	-
CS	0.130	0.565	-	-
TI	0.118	0.393	0.613	-
AS	0.305	-0.014	0.042	0.544

Table 4

Factor loading of variables

Factor	GM	CS	TI	AS
GM1	0.795			
GM2	0.865			
GM3	0.565			
CS1		0.677		
CS2		0.724		
CS3		0.863		
CS4		0.765		
TI1			0.721	
TI2			0.892	
TI3			0.937	
TI4			0.672	
AS1				0.729
AS2				0.440

Table 5
Reliability, convergent validity, and discriminant validity

Factor	Cronbach's alpha	Convergent validity	Discriminant validity
GM	0.777	0.565 to 0.865	0.196 to 0.539
CS	0.841	0.565 to 0.863	-0.026 to 0.667
TI	0.876	0.672 to 0.937	0.072 to 0.667
AS	0.485	0.440 to 0.729	-0.026 to 0.539
Model	0.830	-	-

Table 6
Model goodness of fit indices

Index	Value
Satorra-Bentler scaled chi-square (59, N=440)	136.656
Probability value	$p < 0.000001$
Bentler-Bonett normed fit index	0.937
Bentler-Bonett non-normed fit index	0.951
Comparative fit index (CFI)	0.963
Bollen's fit index (IFI)	0.963
McDonald's fit index (MFI)	0.916
Root mean-square error of approximation	0.055
90% confidence interval	0.043 - 0.067

Table 7
Factor correlations among factors

Factor	GM	CS	TI	AS
GM	1.000	-	-	-
CS	0.226	1.000	-	-
TI	0.196	0.667	1.000	-
AS	0.539	-0.026	0.072	1.000

APPENDIX I: Survey Statements

SURVEY STATEMENTS

Tourism Environmental Impacts		Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
TI1	1 Tourists use more energy than residents	1	2	3	4	5
TI2	2 Tourists use more water than residents	1	2	3	4	5
TI3	3 Tourists generate more wastewater than residents	1	2	3	4	5
TI4	4 Tourism development threatens drinking water supply	1	2	3	4	5
TI5	5 Air quality in Honolulu is poor because of the increased traffic due to tourism	1	2	3	4	5
Government Management of Tourism		Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
GM1	6 The state government does a good job balancing residents' and tourists' needs	1	2	3	4	5
GM2	7 The state government listens to residents about their concerns with tourism	1	2	3	4	5
GM3	8 The quality of public services has improved on O'ahu due to tourism	1	2	3	4	5
Community Satisfaction		Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
CS1	9 Tourism causes more land to be developed	1	2	3	4	5
CS2	10 Tourism is responsible for higher land prices	1	2	3	4	5
CS3	11 I enjoy interactions with tourists	1	2	3	4	5
CS4	12 Due to tourism, housing is not affordable on O'ahu	1	2	3	4	5
CS5	13 Natural resources can be protected on O'ahu	1	2	3	4	5
CS6	14 O'ahu is too crowded because of tourism	1	2	3	4	5
Sustainable Tourism		Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
ST1	15 I feel I can access the decision making process to influence future tourism development	1	2	3	4	5
ST2	16 Long-term government planning controls tourism's negative environmental impacts	1	2	3	4	5
ST3	17 Tourists are important to the community	1	2	3	4	5
ST4	18 Tourism development will continue to expand outside of Waikiki	1	2	3	4	5