A Quantified Triple Bottom Line for Tourism: Experimental Results

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ABSTRACT

The tradition of tourism businesses and regional tourism industries is to measure their value to the host community by jobs, wages and tax revenues even though every member of that community is impacted on a daily basis though a broad variety of impacts. This paper demonstrates a conceptual approach for measuring the relative importance of the major dimensions of community quality of life that can be influenced by the tourism industry in order to calculate an indication of overall impact on the well being of community residents. Furthermore, we have formulated a conjoint model that values this overall performance in monetary units. A conjoint model for estimating importance is successfully implemented using samples of college students and tourism industry professionals in the US and Cyprus. A monetary version of Triple Bottom Line impacts is calculated for the impacts of a specific hypothetical tourism business development.

Keywords

Tourism Impacts, Triple Bottom Line, Corporate Social Responsibility, Sustainable Communities, Conjoint Analysis

1. Introduction

A growing shift towards sustainable development has resulted in a renewed significance of the environmental, social, and economic impacts of tourism within communities. The potential positive and negative impacts of tourism have been thoroughly discussed in past studies (Andereck, Valentine, Knopf, and Vogt, 2005; Brunt and Courtney, 1999; Dogan, 1989; Haralambopoulos and Pizam, 1996; Milman and Pizam, 1988; Pizam, 1978; Dyer, Aberdeen, and Schuler, 2003; Nyaupane, Morais, and Dowler, 2006; Tyrrell and Johnston, 2001), and a variety of measurement instruments and frameworks have been employed in the attempt to measure the community quality of life impacts resulting from tourism development. Many of these instruments have been developed during the quest for sustainable development requiring a shift away from individualism to an emphasis on community and the shared responsibility for socio-economic well-being and environmental quality (Schumacher, 1973; Wackernagel and Rees, 1998, Ife, 1999; Rogers and Ryan, 2001). In 1987, *Our Common Future* (WCED, 1987) articulated the interdependent relationship between community quality of life and the well known pillars of sustainability: environmental quality, economic prosperity, and social well-being (Rogers and Ryan, 2001). In order to achieve the global objectives, Agenda 21 was proposed as a blueprint for local action with an emphasis on community participation in decision-making (UNCED, 1993).

Community decision-makers trying to implement their new sustainability goals have sought measurement tools to simplify their struggle to allocate limited revenues between traditional public services and apparent new initiatives including tourism. For the tourism industry the most readily available measurements disguise the full range of impacts on QOL.

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The actions of tourists and activities of tourism businesses impact nearly every member of a destination community on a daily basis through a broad variety of social, economic and environmental impacts. There is a significant need to quantify the wider range of social, economic and environmental impacts and benefits of tourism within the community system. However, quantitative measurements of tourism impacts routinely emphasize jobs, wages, and tax revenues which are universally understood and can be aggregated for use as simple decision-making indicators. Integrated assessments (i.e., economic, ecological and societal assessments) have been developed to help bridge the gap between sustainability principles and application (Coffman and Umemoto, 2010). Nonetheless, Kidd and Fischer (2007) argue that integrated assessment tools and good governance through participatory planning can compromise the effectiveness of the assessments if individual economic goals are favored over broader community objectives. This suggests that there is a need for the development of a integrated community assessment of the impacts of tourism on community quality of life that incorporates the prevailing values of a community (Olsen, Canan, and Hennessy, 1985), measures the performance of the tourism industry, and provides concise and straightforward information in a format that allows decision makers to make informed decisions about tourism within the greater community system.

The purpose of this paper is to demonstrate a conceptual approach for 1) measuring the relative importance of the major dimensions of community quality of life that can be influenced by the tourism industry and 2) measuring the performance of tourism businesses in these same dimensions in order to calculate an indication of overall impact on the well being of community residents. Furthermore, we have empirically demonstrated a model that values this overall performance in monetary units. Although other units of measure could be used, money is the

unit used for decisions involving private business and public goods and services (Moons, 2003; Dupris, 1985, Pearce and Howarth, 2000). It is important to situate social and environmental impacts on a common footing with economic impacts for decisions involving tourism industry development.

A primary contribution of this paper is its attempt to address the experimental design issues associated with building a practical but representative model of the contribution of tourism to community quality of life. Given that the primary goal is to build a useful and estimable model the issues include: What QoL attributes should be included? How can they be linked to tourism development and operations? How can they be explained to community members? How do the attributes related to one another and QoL? How can community members be asked about attribute trade-offs? And how can the resulting model be translated into useful results? We have not resolved them all, but have made some progress.

2. Tourism Impacts and Quality of Life

Beyond Economic Impact

The demand for ROI evidence has been felt by every public entity and every private industry. The reaction has been to measure economic return on investment. The Destination Management Association International (DMAI) response, for example, has been to develop guidelines for measuring performance described as "the amount of return is typically what the CVB returned to the destination (visitor spending, economic impact, tax dollars)" (DMAI, 2005). The voluntary nature of the reporting of social and environmental impacts of tourism on a community has in many instances been used for image or reputation improvement rather than measuring the actual effects on community quality of life. Several reasons for this include the

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perception that the measuring and reporting of non-economic returns has little financial benefit or the inability to collect the data needed to measure potential non-economic returns (Faux, 2005). Similarly, the investment in tourism as a mechanism for sustainable development regularly links sustainable tourism projects with poverty alleviation and/or environmental conservation (Epler Wood, 2004). While these projects often have lofty goals related to improving quality of life of local communities, they often fail after donor funds are no longer available, which Epler Wood (2004) argues is because of insufficient evaluation tools that can be used to guide and evaluate the economic, environmental, and social returns on the investments.

A frequent claim for tourism is that it ultimately enhances community quality of life by providing jobs, improving services and infrastructure through tax revenues, and attracting restaurants, shops, festivals, cultural and sporting events that cater both to visitors and locals (Andereck and Nyaupane, 2010). It is also recognized that unmanaged tourism can have negative social and environmental consequences. Very little formal attention has been paid to measuring the broader quality of life impacts of the industry, and certainly nothing compares to the economic ROI calculations.

Nobel laureate in economics Amartya Sen (Sen, 1999; Nussbaum and Sen, 1993) argued that the definitions of well-being and QOL need to move beyond the use of economic indicators. Attention to the non-economic dimensions of QOL is not new. Since the 1930s, researchers from diverse fields have worked to define, investigate, and measure QOL (Massam, 2002; Eadington, 1975). Quality of life can be defined and measured on multiple scales including individual, community, and national levels. For example, each year since 1990 the United Nations has published the Human Development Index which looks beyond GDP to a broader definition of national well-being. The aggregation of individual's quality of life to the community level can be

a useful when measuring broader impacts of development on the quality of life in a community. Cutter (1985) suggests, "When an individual's quality of life is aggregated to the community level, the concept is linked to existing social and environmental conditions…It includes both tangible and intangible measures reflecting local consensus on the community's values and goals (p.1)."

Certificate programs and published indicators have given emphasis to social and environmental qualities of life, but policy makers currently have not adopted a standardized method for reconciling the many dimensions of sustainability or valuing those dimensions based upon community values. Diener and Seligman (2004, p. 1) proposed that rigorous measurement should be a primary policy imperative and that "well-being needs to be assessed more directly, because there are distressingly large, measurable slippages between economic indicators and well-being." The values of non-market amenities (e.g. air quality, views, culture, heritage, safety, variety) are becoming increasingly important to both tourist markets and residents of destinations.

Considerable progress has been made in the past few decades in the measurement of social amenities and environmental resources (Smith, 1996). Market-based efforts to brand sustainable and eco-friendly businesses have provided businesses with a myriad of available certifications (The Center on Ecotourism and Sustainable Development, 2006; Forest Stewardship Council; Rainforest Alliance). Recent initiatives are converging on similar ideas related to the well-being of community residents related to Corporate Social Responsibility (Whitfield and Dioko, 2012; Sheldon and Park, 2011; Henderson, 2007; Kasim, 2006; Holcomb, Upchurch, and Okumus, 2007; Carroll, 1991; Carroll, 1999), Social Return on Investment

(Olsen, 2003 and Olsen and Nicholls, 2005), and Sustainable Communities (Sustainable Communities Network, 2002; Roseland, Connelly, and Hendrickson, 2005).

Frameworks for incorporating social and environmental dimensions with economic measures of 'tourism yield' have been developed recently (Lundie, Dwyer, and Forsyth, 2007; Northcote and Macbeth, 2006) as potential assessment and decision-making tools for tourism planning. While both of these studies cited provide important steps towards the measuring broader quality of life impacts of tourism, they had some limitations. Lundie, Dwyer, and Forsyth (2007) described a hybrid approach to measuring economic and environmental yield of tourism. Even though they did not include a social dimension, they did note the importance of measuring the social value of tourism for a destination. Northcote and Macbeth (2006) presented a conceptual model that included a multidimensional concept of tourism yield that incorporated a 'triple bottom line' perspective. While making a strong contribution conceptually, they only presented a simple demonstration of the framework's functionality. Both studies noted that there are necessary tradeoffs between quality of life dimensions, but neither presented a rigorous method for calculating these tradeoffs.

Several terms have been used to label approaches to assessing impacts and directing planning and decision making for sustainable development. These include Integrated Assessment, Sustainability Assessment (Hacking and Guthrie, 2008), 3-E (environment, economic, and equity) Impact Assessment (Sadler, 1999), and Extended Impact Assessment (Wilkinson et al., 2004). While many of the sustainability assessments that have been developed focused on project level assessment (Hacking and Guthrie, 2008), there have been efforts to develop assessments on the community level (Olsen, Canan, and Hennessy, 1985).

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A multitude of concepts and tools, developed to assist in the implementation of sustainable tourism practices, have been developed by international organizations that promote sustainable tourism practices including the World Tourism Organization, World Travel and Tourism Council, UNEP, and UNESCO (Epler Wood, 2002; UNEP, 2003; WTO, 2000). Schianetz, Kavanagh, and Lockington (2007) provided a comprehensive review of sustainability assessments at the tourism destination level that cover a wide range of sociocultural, economic, and environmental issues. These included Sustainability Indicators (WTO, 2004), Environmental Impact Assessment (Warnken and Buckley, 1998), Life Cycle Assessment (ISO 14040, 1997), Environmental Audits (Ding and Pigram, 1995), Ecological Footprints (Gossling et al., 2002), Multi-Criteria Analysis (MCA) (Zografos and Oglethorpe, 2004) and Adaptive Environmental Assessment. While the review highlighted the wide range of assessment tools, Schianetz, Kavanagh, and Lockington (2007) are careful to point out that only the 'Sustainability Indicators' and MCA were able to be used in a holistic manner encompassing all three sustainability aspects, and even in these cases they fall short to biases as economic indicators are more measurable.

The integration of sustainability dimensions and indicators is one of the major difficulties faced when developing a holistic sustainability assessment. While many of the assessment frameworks currently applied include social, environmental, and economic dimensions, they fail to properly integrate the multiple dimensions. As George (2001, p.99) argues, "to draw together economic, social, and biophysical objectives into a single list does not integrate them." To overcome this limitation Morrison-Saunders and Therivel (2005) argue that separate assessments for each dimension should be brought together at the decision-making level, but this approach is limited as it does not consider the interconnectedness of the dimensions. Arguably, the pursuit

of sustainable development requires that the linkages and interdependencies of the environmental, social, and economic systems be considered in a comparable manner so that the trade-offs are revealed in the outcomes (Hacking and Guthrie, 2008). At the core of decision-making for sustainable development is the clarification of these tradeoffs (Sadler, Verocai, and Vanclay, 2000).

The clarification of the tradeoffs between the multiple dimensions of sustainability is often clouded by the method by which the indicators are integrated. Many studies have adopted a quantitative integration approach where sustainability indicators are assigned a numerical value and then are integrated mathematically (Morse et al., 2001). An often used method to integrate sustainability indicators is to simply add them together, which lends itself to the issues of differing levels of measurement and the weighting of each measure in the aggregation calculations. Even the most rigorous of these methods lend themselves to a certain level of 'qualitative integration' as certain subjective value judgments are inevitable (Morse et al., 2001).

This study attempts to address some of these issues by proposing and applying an integrated triple bottom line assessment that incorporates community value weightings. The holistic sustainability assessment has been developed so that the interdependencies and trade-offs of the economic, environmental, and social dimensions are built into framework. The outcome, which is made empirical in a simple discrete choice model, is a comparable monetarized value for each dimension, which allows for a straightforward comparison to be made between the dimensions for decision-makers, and an assessment tool for tourism businesses to gauge their contributions, economically, socially, and environmentally, based upon community importance. The next section outlines the background of the Triple Bottom Line (TBL) concept and the application of the TBL as an assessment framework.

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3. A Triple Bottom Line for Tourism

The Triple Bottom Line (TBL) concept is consistent with the sustainable development thinking that emerged in the late 1980s (WCED, 1987). Elkington (2004), who originally coined the triple bottom line, suggests that, "developing this comprehensive approach to sustainable development and environmental protection will be a central governance challenge—and, even more critically, a market challenge—in the 21st century" (p. 16). The TBL was developed as a framework for measuring and reporting corporate performance beyond the traditional, single "Bottom Line" focused on economic profitability. The TBL adds socio-cultural and environmental bottom lines in order to put these dimensions on a more-equal footing with the traditional economic benchmark (Elkington, 1994). The TBL is meant to be more than just a method of accounting and reporting (Vanclay, 2004), as it is hoped that the implementation of the framework would lead to the embracement the ideals of sustainable development (Elkington, 1997; Faux, 2005).

The TBL has been advanced as a planning and reporting mechanism and a decision-making framework both for internal management and external reporting (Dwyer, 2005). TBL assessments have been adopted by businesses and organizations in many industries as part of a larger group of corporate assessment initiatives. The TBL has also received a strong endorsement from the World Business Council for Sustainable Development, a coalition of 160 international businesses (Vanderberg, 2002). Government agencies around the world and at all levels have been required to implement the TBL (Vanclay, 2004; Wight, 2007). The TBL has also been subject to political misuse such as camouflaging destructive practices, diluting research efforts or environmental activists, or to divert attention away from issues (Buckley, 2003).

The tourism industry provides a unique opportunity for the promotion and development of the TBL, as it is made up of many commercial enterprises and forms of tourism that seek to generate gains in conservation, community quality of life, and for multiple stakeholders, simultaneously (Buckley, 2003). Through active engagement with the TBL, the tourism sector can provide leadership towards the adoption of the sustainable development philosophy, which reflects the ideals of the societies in which tourism entities operate (Faux and Dwyer, 2009).

Conceptually, the TBL has been applied in a variety of tourism settings, likely because of the interrelatedness between tourism industry and the natural and social environments in which it operates (Faux and Dwyer, 2009). Faux and Dwyer (2009) suggest that the TBL approach to hospitality and tourism management offers several benefits including: efficiencies and cost savings, improved market positioning, better stakeholder relationships, improved strategic decision-making, and wider destination benefits and competitiveness. While the merits of the TBL approach have been highlighted as a means for tourism development to be more sustainable and for tourism enterprises to be responsible and accountable for their multiple impacts on the communities they operate, most applications of the TBL approach have been more philosophical than practical. In cases where a measurement mechanism is used, this is primarily from the business side only (Faux and Dwyer, 2009). There have been some attempts to employ the TBL as a foundation for more robust frameworks for assessment and planning. Notably, Northcote and Macbeth (2006) used the TBL concept as a basis for proposing a multidimensional model to assist assessment and decision-making in planning, which they illustrated using Rottnest Island in Australia as a case study. Their model provided a more robust framework for assessing the impact of tourism along multiple dimensions, however their model falls somewhat short as it less robust in dealing with the real world trade-offs that exist between the dimensions of the TBL. In

the case study they presented, they were less concerned with the empirical techniques and data collection methods employed in their model, instead focusing on the conceptual development and potential application for sustainable destination management. The lack of discussion of the empirical techniques means that they did not account for some of the more challenging aspects of employing the TBL approach in a real-world setting, including the objective development of value weightings for each dimension and the accounting for trade-offs between the dimensions within the model. Similarly, Epler Wood (2004) proposed a 'triple bottom line sustainable tourism project development framework' for donors to track their investments in tourism as a sustainable development tool, but stopped short of explaining the empirical techniques for doing so. The TBL has also been used, conceptually, to set a research agenda for pro-poor tourism in the developing world (Font and Harris, 2004). In South Africa, the TBL has been used to direct the development of national responsible tourism guidelines meant to encourage more balanced development and to help guide and benchmark the progress of the private sector and rural communities towards economic, including pro-poor, social and environmental tourism benefits (Goodwin, Spenceley, and Maynard, DATE; Kotze, 2002). In the testing of the national responsible tourism guidelines application among a sample of tourism enterprises they found that even though they had a detailed methodological framework for assessment, they faced trouble in the collation of data across the enterprises. The aggregation of data is one of the challenges facing the meaningful application of the TBL assessments.

TBL sustainability has also been employed as a guiding principle in the planning for wildlife tourism, and to further situate the understanding of wildlife tourism within a wider social context (Higginbottom and Scott, 2004). The TBL concept has crossed over into guides for independent travelers as evidenced by Lonely Planet's publication of a guidebook on responsible

travel for independent travelers called *Code Green* (Lorimer, 2006) that provides guidelines for travelers to take into consideration triple bottom line issues. Buckley (2008) notes that the *Code Green* is vague about how these triple bottom issues are assessed, but they do represent a broad level congruence with the academic literature on TBL. Despite some of the measurement and methodological challenges, the TBL philosophy and assessment framework has proliferated the tourism industry at multiple levels from consumers to tourism businesses to regional, national, and international tourism entities, and the academic literature reflects this. One area that has yet to receive much attention in the academic literature is the orientation of the TBL as a community assessment (Rogers and Ryan, 2001).

Community assessments provide public officials and community leaders with information to make decisions about community planning and development. Community assessments can be used to examine the quality of life impacts on a community as well as provide direction for future decisions, but in order to do so effectively, they must incorporate the prevailing values in a community and the various populations within that community (Olsen, Canan, and Hennessy, 1985). Community QOL assessments have traditionally included an objective evaluation of community indicators and a subjective measure of community values. Olsen, Canan, and Hennessy (1985) contend that "it is impossible to assess the quality of life in a community without grounding that assessment in value decisions…that all quality of life studies should begin by constructing profiles of the major values in the communities being examined" (p.328). Andereck and Nyaupane's (2010) recent study on the impacts of tourism on residents' quality of life incorporated a subjective measure of community residents' values. Their measurement compelled resident's to compare existing circumstances to a future ideal thus

providing residents' perceptions of the quality of life impacts of tourism and personal importance of these attributes in relation to their opinions about the current state of their communities.

The TBL approach can be valuable when recast for community application and becomes a "process for evaluating performance, focusing on the integration of social wellbeing, environmental protection and economic viability goals (Rogers and Ryan, 2001, p. 281)." An integrated TBL community assessment of quality of life impacts must provide a means of incorporating the community values into the process. In section four of this paper, the process of incorporating community values is presented. In short, this process uses a conjoint analysis of the quality of life attributes to quantify residents' importance of these attributes. These importance values are used to weight the three dimensions of the TBL, a departure from previous studies. For example, Northcote and Macbeth (2006)'s multidimensional framework of sustainable tourism yield employed weighting estimates based upon a post hoc assessment of policy and practices outlined in publically available reports.

While the TBL has been widely adopted, Vanclay (2004) argues that many of the agencies and businesses have lost sight of the wider vision and philosophy of the TBL, instead focusing too much on responding to reporting requirements. Findings of a survey of 32 organizations that use the TBL framework in Victoria, Australia conducted by Vandenberg (2002) found that there was considerable confusion among the organizations about the philosophy and definition of TBL. Additionally, several challenges have been noted for integrating the TBL into business and organization operations. Vanclay (2004) suggests that much of the literature on and many of the applications of the TBL have ignored the field of impact assessment, implying that "the naïve adoption of a TBL framework will be a regressive step" (p. 271). Coffman and Umemoto's (2010) review how the triple bottom line concept was

used at the policy and planning level and led to a process that polarized economic and environmental interests during the development of the *Hawaii 2050 Sustainability Plan.* They argued that "adopting popular notions of sustainability [TBL], without critical examination of how the respective policy frames diverge or interrelate, can lead to 'tautological traps'" (p. 597).

Another major difficulty for the TBL has been the defining and operationalizing of the non-economic dimensions. Economic and to some extent environmental impacts have been quantified in TBL studies, but difficulties have been noted in quantifying the social impacts (Koch, Massyn and Spenceley, 2002; Vanclay, 2004). Some of the literature strongly suggests that social impacts cannot be precisely defined or quantitatively valued because they are not consistent across a community (Vanclay, 2004). A similar difficulty has been noted in the application of the TBL in tourism settings. Dwyer (2005) notes that social and environmental costs and benefits are usually measured using qualitative techniques, and the market values of environmental and social impacts cannot be used to identify individual's preferences for these values. Dwyer's list of challenges for the TBL includes "identifying and selecting appropriate indicators, adopting an appropriate framework for TBL accounting and monitory purposes, and confronting TBL implementation costs" (p. 84). Another challenge in the application of the TBL is to avoid allowing entities to use TBL to legitimize their activities by reporting only positive aspects of their performance (Faux, 2005).

As a result of these challenges the Triple Bottom Line has been considered to be intractable (Vanclay, 2004), regarded only as a "metaphor" for the task of measuring multi-dimensional impacts (Allen Consulting Group, 2002). Vanclay (2004) echoes this sentiment, suggesting that TBL is not a decision making algorithm because it is meant to be a philosophy about corporate social responsibility. It has even been rejected as "an unhelpful addition to

current discussions of corporate social responsibility" (Norman and MacDonald, 2003, p. 243). Despite these harsh criticisms of the TBL, some have argued that there is an increasing need for quantification of the TBL for accountability purposes (Christiansen, 2004), and academic tourism research can make a meaningful contribution in this regard, particularly to the quantification of environmental and social elements (Kelly, 2006). The contribution of tourism to environmental and social well being in a region are well documented in the tourism literature, however is has been argued that the many of the approaches for assessing these benefits are inadequate because they do not conceptualize these impacts using a common metric (Northcote and Macbeth, 2006), such as monetary value (Tooman, 1997).

Unmoved by its critics, the authors of this paper are optimistic that a quantified TBL can become an empirical tool for comprehensive analysis of the performance of the tourism industry and its businesses. Only through quantification of impacts, using a common metric, can social and environmental bottom lines be put on equal footing with the economic bottom line. Our research method focuses on a model that describes how community residents perceive the impacts of tourism development and can be applied to measure performance by tourism businesses. To test the methodology we have conducted a discrete choice experiment with students and tourism industry professional in the US and Cyprus and interviewed CVB and resort managers in the Phoenix–Scottsdale Arizona area.

4. A Proposed Tourism TBL Estimation Methodology

Our proposed methodology for a quantified tourism TBL includes the formulation of a discrete choice experiment that reflects the breadth of the three bottom lines which can be accurately and feasibly estimated for a single community but still has practical value to local

tourism businesses and the tourism industry. Myers (1987) emphasizes that single community oriented measures are more relevant than comparisons across communities. The research challenge was to account for this accuracy, feasibility and practicality in a single procedure. Accuracy was approached by depending heavily on previously developed lists for TBL items. Feasibility was dictated by the average ability and willingness of survey respondents to make a series of choices between sometimes-complex bundles of items. Practicality was determined by the advice and opinions of current tourism business managers. Our procedure consisted of an iterative sequence of model designs, pilot surveys and business manager interviews.

Triple Bottom Line Dimensions and Attributes

Each community values a unique set of quality of life attributes that might be related to its appreciation (or lack of appreciation) for tourism business activities. The TBL framework suggests that these attributes might be put into social, economic and environmental categories. The human development, sustainable communities' and sustainable tourism literatures offer a long list of attributes for each of these categories (Pattanaik, 1997, United Nations Human Development Report Office, 2008, Canadian Center for the Study of Living Standards, 2008, Miller, 2001, Choi and Sirakaya, 2006, Sherwood, 2007). A very comprehensive list was provided by the Global Reporting Initiative (GRI) (2002), an independent organization established to give support to the triple bottom line and sustainability reporting guidelines (Faux, 2005). The GRI list of reporting guidelines includes more than sixty indicators. Our main goal in constructing the indicator lists for our study was to maintain a balance between the economic, environmental and social dimensions, and to reduce the number of the indicators to a more manageable number. This process started with the compilation of all the indicators listed above. Then each member of the research team individually removed individual indicators that were

either less relevant or overlapping. The research team them met to compare lists, and those items that remained were then discussed one by one for their usefulness and measurement feasibility in the context of our project. An example of a removed item would be “supplier break down by organization and country” or “total materials use other than water, by type.” Ultimately we selected ten items from these lists (three social, four economic and three environmental attributes) to represent the three dimensions of the TBL. These were chosen and rephrased to be easily understood by a wide range of survey respondents and also to correspond to tourism business activity outcomes. Based on previous literature and the limitations of the experimental design (described later) it was decided this number of attributes (10) was the most that could be included in the study. Each attribute was described by a short title and a brief explanation for use in the survey instrument.

INSERT TABLE 1 HERE

A set of business assessment items was developed for each of the ten TBL attributes as the basis of a tourism business performance audit. Ultimately the audit consisted of seventy-one questions about whether or not the business conducted certain activities or had adopted certain policies that impacted one of the ten TBL attributes. These were further evaluated in site assessments at three resort properties in the Phoenix-Scottsdale, Arizona area. The development of the business audit questions lead to the specific wording and definitions used in the choice experiment. A copy of the business assessment audit score sheet is available from the authors.

Triple Bottom Line Modeling Considerations

Several alternative models were considered including rankings, scoring, several versions of the stated preference model, and an Analytical Hierarchy Process. After examining the

alternative models we settled on a choice-based conjoint model to estimate a linear scoring equation that assumes that differences in respondent satisfaction can be represented by the sum of values of differences in the ten social, economic, and environmental attributes. Conjoint experiments developed by Louviere and Hensher (1982) and Louviere and Woodworth (1983) are now common in the valuation literature. Timmermans, Borgers, Van Dijk, and Oppewal (1992) and Timmermans and Van Noortwijk (1995) have used conjoint analysis to examine housing decisions. Haider and Ewing (1990) have applied it to tourist destination choice. Riganti (2006) used a conjoint analysis to study tourism congestion and carrying capacity. Our conjoint analysis asks respondents to choose between two hypothetical businesses on the basis of which one would contribute more to their community, where each is characterized by a different set of practices and policies. One example survey question is illustrated in figure 1. Algebraically, the differences between two levels of each attribute are represented by Δx_i (e.g. $x_{i,high} - x_{i,low}$) and the per unit value are represented by β_i of in a linear index of the value of the overall difference:

$$I = \beta_1 \Delta x_1 + \beta_2 \Delta x_2 + \cdots + \beta_{10} \Delta x_{10}$$

where the subscripts indicate the attribute.

It was assumed that the value of this index would determine the respondent's choice between the hypothetical bundles of attributes and that probability of choosing a certain bundle in the i^{th} comparison follows a binomial logit distribution. Coefficients can then be estimated by the usual method of maximizing the likelihood of the sample of T observations:

$$\ell(\beta) = \prod_{i=1}^{T} \left[P(I_i)\right]^{y_i} \left[1 - P(I_i)\right]^{1-y_i} \qquad \text{where } P(I_i) = \frac{1}{1+e^{-I_i}}$$

$P(I_i)$ is the probability of a value less than or equal to I_i and y_i takes a value of 1 if the first attribute bundle is chosen and 0 if the second attribute bundle is chosen.

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The choices made by individuals are personal preferences for their community. Thus, the parameters estimated for the model over all individuals in a sample are weighted averages of the parameters for individuals. This could be viewed as a model of community wellbeing only if individuals put no value on impacts on other individuals in the community.

Furthermore do not interpret the estimated coefficients as "part-worth's" in the traditional conjoint sense since they do not reflect a disaggregation of an easily identifiable total value into its parts. The individual βcoefficients measure the relative importance of the difference between a low and high level of one TBL attribute. At best they measure the relative worth of a single change to the total worth of simultaneous changes in all attributes. Thus, we interpret them simply as average relative importance weights for change.

INSERT FIGURE 1 HERE

Experimental Design

The conjoint analysis method consists of asking respondents to choose between alternative bundles of attributes based on their perception about which would maximize their satisfaction. In addition to selecting a practical set of TBL attributes, the method requires that the levels of the attributes be chosen in a way to allow for the efficient estimation of the coefficients. Each of our attributes can take on any of a number of hypothetical levels corresponding to different degrees of business performance. Non-linearities and interactions can be estimated more efficiently when more attribute levels are evaluated. However, more levels translates into more hypothetical choices for respondents to make on each questionnaire. For example, if we wished to use 7 levels for each of our 10 attributes, the number of possible hypothetical bundles of attribute combinations is an unmanageable at 282,475,249. Therefore we

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limited the number of values of each attribute to two: a “low” value and a “high” value, thereby reducing the number of possible combinations to 1024. However, this permits only a linear model to be estimated.

Another difficulty with the hypothetical choice bundle method is that when bundles contain many attributes, then it is difficult for respondents to deliberately consider all of them when choosing between bundles. Mazzota and Opaluch (1995, p. 509) found that “question complexity appears to become an important issue when alternatives differ by four or more attributes.” Therefore we limited the total number chose pairs of bundles for the survey in which five or fewer attributes were different between the choices.

Finally, we designed a fractional factorial experiment to estimate main effects only (no main effects are confounded with 2-factor interactions) reducing the number of required bundles from 1024 to 32. These 32 bundles were further paired to form 16 pairs of approximately orthogonal bundles. We considered asking about only a few attributes at a time but this would have required many more comparisons. The final survey instrument consisted of the corresponding set of 16 choices designed to efficiently estimate the linear effects of the attributes.

The design matrix represents the explanatory variables used to elicit the choices made by the respondents. The correlations between these variables are purposely chosen to be as small as possible in order to minimize variances of the estimates – this is the opposite of the goal for internal consistency when several variables are used to measure the same concept. The quality of a design in fact depends on the lack of correlations a characteristic which is sometimes measured by an optimality criterion such as D-efficiency which is related to the determinant of the correlation matrix in comparison to the correlation matrix of the theoretical “yard stick” of a

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perfectly orthogonal design, which is frequently impossible to achieve. The design described above has a D-efficiency was 54.3% which is reasonably efficient (an orthogonal design with 32 bundles rather than the 16 selected would require only 54.3% of the sample size to produce the same efficiency). Unfortunately, this and other traditional efficiency measures do not account for the non-linear transformation implied by the logistic formulation, and it is only a rough indication of the design's ability to minimize generalized variances of the estimated coefficients.

5. Three TBL Experiments

Three experiments have been conducted to explore the feasibility of our proposed methodology: a 2009 class project of senior undergraduate students who participated in both a survey and business manager interviews, a 2009 survey of rural community development professionals in Arizona and a 2010 survey of Cypriot business professionals. The statistical results are shown in Table 2. Each experiment helped us refine our methodology and confirm the feasibility and practicality of our approach.

In the spring term of 2009, 36 senior Arizona State University tourism students participated in a series of experiments to determine the most effective way to ask survey questions about the preferences for alternative hypothetical tourism businesses. Three choice variables were tested: the rank of each attribute bundle, a numeric rating from 1 to 100 of each attribute bundle, and a choice between 16 pairs of bundles. Ultimately it was decided that a printed survey using paired comparison version would be easiest for respondents. The most acceptable format was a side by side comparison of two bundles. After being introduced to the nature of the approach, the definitions of the TBL attributes and the associated business audit questions, the students in 6 groups of 6 members were asked to make group choices between the

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16 pairs of attribute bundles where representing 32 hypothetical tourism business entering the community.

In addition, separate groups of students participated in interviews of resort managers and their staff at three resorts in Phoenix and Scottsdale Arizona. The business audit was conducted and several changes were suggested in the audit. The results of the class efforts were presented at the TTRA Annual Conference in June, 2009.

A second experiment was conducted on March 27, 2009 of 17 professionals at a rural Arizona economic development conference as part of a presentation on tourism and the triple bottom line. Each was asked to respond as a resident of their local community rather than as tourism industry professional. The major change in the method was that respondents were asked to respond individually rather than in groups.

A third experiment was conducted in Nicosia, Cyprus on 2010 of business consultants and tourism development specialists at a KMPG conference focused on a quantitative triple bottom line as a practical business performance measurement tool. The major change was that the background instructions and the written questionnaire were translated into Greek by local business translators. A special interpretive introduction was given to the survey by a multilingual Cypriot member of the research team.

Exploratory experiments across three groups were not designed for conducting inferential tests about specific parameters of the estimated models but to evaluate the practicality of data collection methods across different life stages, experience and culture. Each sample was convenient but also uniquely distinct from the others. The ASU student sample consisted of tourism majors involved in the study of sustainable development. The Arizona professional group was chosen specifically to explore differences because of their age and professional

employment experience. The Cyprus professionals group was chosen to explore the difference between cultures and the feasibility of using a translated version of that same survey.

The students responded in groups six rather than individually. Individuals in the other groups responded separately. The differences shown in the table are intended only to illustrate the results that can be achieved by the model. While better than a purely convenience sample or a simulation experiment, the implied test statistics do not carry the credibility of large sample results. Nevertheless, the results of shown in the table suggest that professional groups are similar across cultures and after translation, and that the differences for the tourism students are as socially and environmentally oriented as might be expected.

INSERT TABLE 2 HERE

Positive signs for all coefficients indicate that the attributes contribute positively to respondent satisfaction as expected. The coefficients reflected the relative importance of each of the ten attributes to each sample as they increase from low to high levels. Each of the Chi-squared statistics for the model fit is large, but only four coefficients were twice as large as their standard errors (the traditional test of significance at the 5% level).

The results illustrate the differences in importance of attributes in the different groups. Larger numbers indicate greater importance for changes in attributes. Notice the relatively greater importance for employment of local residents by both professional groups and lack of importance to students – in general, ASU placements of tourism students are not in their home town. Notice also the high importance given to social and environmental attributes by students and the low importance given to these attributes by professionals.

Since the sums of coefficients are not the same across experiments it is difficult to make direct comparisons. We have experimented with several visual representations of the

standardized levels of coefficients. One such representation is the spider chart shown in Figure 2. In the original of this drawing three colored regions highlight the social (yellow), environmental (green) and economic (blue) dimensions of the triple bottom line. The black and white version of the drawing suggests these dimensions with different shades of gray. This diagram makes it more clear that in Arizona students find social and environmental attributes relatively more important that economic attributes and have a strikingly different pattern from Arizona and Cyprus professionals who find the economic dimension attributes more important than social and environmental attributes.

INSERT FIGURE 2 HERE

6. Assessing Performance of Tourism Businesses

Our investigation of the potential for tourism business performance was conducted in parallel with our first experimental analysis of perceptions of importance. As each of the attributes was identified for the conjoint analysis survey, it was translated into a set check sheet items that could be asked of tourism businesses. After several rounds of revision by the authors, the check sheet was validated in interviews with managers of three resort properties in the Phoenix-Scottsdale area. The items on the check sheets were subsequently revised to reflect the degree to which they could be reliably answered by resort management while avoiding proprietary information. The descriptions of the ten attributes of the residential survey were also revised to better reflect the tourism business performance measures. While scientific objectivity suggests we should not avoid proprietary business information or adjust theoretical concepts for

ease of explanation, our long term goal of developing tourism industry partnerships requires that we be sensitive to industry needs.

The interviews revealed new areas of resort business performance leading to new check sheet items and different ways to ask questions. In the future more refinement of the check sheet will be needed.

While the business performance audit was designed to score individual tourism businesses, the contribution of an entire regional tourism industry to community QOL can be calculated from the scores of individual businesses if they are converted to a common measurement unit. Since different tourism businesses use different types of inputs and production technologies, a single TBL score based on average industry performance will not reflect the diversity in the industry. However if the scores for individual businesses are converted to monetary units, such as the equivalent in local tax revenues, the dollar values can be added for an overall value contributed by the regional industry.

Monetarizing the TBL

While there has been progress in the monetarization of non-economic externalities, for example 'willingness to pay' studies (Hacking and Guthrie, 2008), the monetarization of the TBL has been a contentious issue in the literature. Several case studies presented in *The Mays Report* (Mays, 2003) attempted to reduce the TBL to a single dollar value. Faux (2005) argued that this narrowed perspective led to confusion among stakeholders and ignored broader social and environmental effects on community well-being. Instead of reducing tourism impacts to a single dollar values, Lundie, Dwyer, and Forsyth (2007) used the dollar as a common metric to set the environmental effects of tourism alongside standard economic measures, and they suggested future studies should attempt to add the social effects.

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The monetarization of the TBL in the model presented in this paper uses the dollar as a common metric for the comparison of the economic, social, and environmental impacts of tourism on the community. The coefficients of the index at the heart of the conjoint model provide the means of comparing the relative values of changes in different attributes. These coefficients reflect trade-offs between community amenities (Kahneman and Krueger, 2006). For example, the value of a one unit change in any attribute can be converted to its tax equivalent by multiplying its term in the index by the ratio of gross revenues (GR) to the coefficient of Percent of Gross Revenues to Local Taxes (β_7). If the entire index of changes is multiplied by that ratio it is converted into a monetized triple bottom line for the set of changes:

$$mTBL = \frac{GR}{\beta_7} I = \frac{GR}{\beta_7}\beta_1 \Delta x_1 + \cdots + (GR)\Delta x_7 + \cdots + \frac{GR}{\beta_7}\beta_{10}\Delta x_{10}$$

Each term in this equation represents the equivalent increase in tax dollars that would be generated by an increase of the respective attribute from its low to high value. The monetary value of the net gain (or loss) in residential quality of life caused by all changes in tourism industry activities can be calculated as the sum of values over businesses.

Using the conjoint analysis results from the sample of 17 Arizona tourism professionals we have calculated the equivalent in tax dollars collected from a business with gross revenues of $1 million that increases all its performance attributes from low to high levels. Increasing local taxes paid from a low rate (2%) to a high rate (5%) would generate an additional $30,000 in local taxes paid. If all attributes were raised from low to high levels they would generate benefits to the community equivalent to $372,035 in local tax revenues. Of this, the largest of the three bottom lines would be in economic benefits ($169,067) followed by social benefits ($101,249)

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and then environmental benefits ($71,719). Table 3 shows the tax equivalent values of all the changes.

INSERT TABLE 3 HERE

7. Conclusions and Recommendations

This paper describes conceptual development of a quantified triple bottom line for tourism with preliminary empirical results and industry validations. The argument for the quantified TBL for tourism made in this paper provides a foundation for future steps in the development of a working system that bridges the gaps between sustainable tourism development, community quality of life impacts, and community values. The quantified TBL provides a practical tool for evaluation of tourism impacts within a community system as well as a tool for proactive sustainable tourism development. As with all exploratory projects "additional research is required." The choice of attributes, the formulation of the conjoint model and the experimental design each need further investigation. The business activity scoring system and performance measures also need refinement. Finally, research is needed to determine the generally applicable dimensions of the TBL. In particular, the assumption that the there are three primary dimensions of community QOL associated with tourism needs to be tested.

Clearly, larger samples and more refined questions are needed to conduct rigorous tests. In addition, the experimental design trade-offs between choices per respondent, numbers of respondents and numbers of individuals determining each response need to be further explored along the lines suggested by Lusk and Norwood (2005.) It is our opinion that group choices might be more reliable than aggregated individual responses and that sample sizes should be

determined after the choices per respondent has been optimized for orthogonality as well as practicality. Respondents can be strategic, lazy and easily confused.

This research might be extended towards development of a system of evaluating and enhancing tourism's beneficial role in the community. Ideally, the implementation of such a system would be a collaborative initiative, with support and participation by both tourism businesses and the general public. If successful, the estimated TBL could lead to a valuable exchange of information about business performance goals and community values. Additionally, future research could focus on applying quantified TBL approach in a variety of specific contexts such as: the valuing heritage tourism sites, the return on investment for pro-poor tourism developments, and the evaluation of specific developments (cruise tourism, airport construction, etc). We are also confident that the quantified TBL approach presented in this paper could be useful in assessing the differing values of different stakeholder groups within a community, or even adapted to help decision making regarding other industries. The tourism field is in a unique position to progress the sustainable development movement as it is operates within and is interrelated with the economic, social, and environmental systems of communities. The sustainability philosophy has been well articulated in relation to tourism, as have the calls for more practical mechanisms for evaluation and planning for sustainability in 'real world' situations. This paper contributes to the evolution of sustainable tourism through the measurement of sustainability values defined by communities.

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Table 1. Ten Triple Bottom Line Attributes

Social

1. Community Health, Safety and Security (Traffic congestion, Security on property, Health measures on property)
2. Community Charity (Percentage of gross revenues provided for local charitable contributions).
3. Openness to Public and Local Culture (openness to the non-guest general public)

Economic

4. Employment of Local Residents (employees who maintain a local residence)
5. Average Hourly Wages and benefits compared to national average).
6. Local Suppliers and Customers (goods produced and purchased locally)
7. Local Taxes Paid (as a percent of gross revenues)

Environmental

8. Green Building and Infrastructure (Environmentally friendly management, policies, and governance).
9. Water, Energy and Material Practices (Energy conservation, Use of environmentally friendly products)
10. Waste Management and Reduction (Recycling, Wasted reduction).

Table 2. Experimental TBL Model Estimates: 3 Samples

Attribute	Cyprus Professionals	Arizona Professionals	ASU Students
(1) Community Health, Safety and Security	**0.97***	**0.34**	**1.06***
s.e.	0.31	0.26	0.51
(2) Community Charity	**1.08**	**0.69**	**1.15**
s.e.	0.92	0.59	1.35
(3) Openness to Public and Local Culture	**0.53**	**0.48**	**0.43**
s.e.	0.46	0.36	0.55
(4) Employment of Local Residents	**1.28***	**0.97***	**0.34**
s.e.	0.53	0.45	0.61
(5) Average Hourly Wages	**0.79**	**0.92**	**0.60**
s.e.	0.56	0.55	0.80
(6) Local Suppliers and Customers	**1.19**	**0.65**	**0.91**
s.e.	0.71	0.46	1.20
(7) Local Taxes Paid	**0.66**	**0.45**	**0.19**
s.e.	0.66	0.41	0.66
(8) Green Building and Infrastructure	**0.44**	**0.32**	**0.85**
s.e.	0.39	0.27	0.52
(9) Water, Energy & Material Practices	**0.45**	**0.14**	**0.57**
s.e.	0.44	0.35	0.62
(10) Waste Management and Reduction	**0.59**	**0.61**	**1.13**
s.e.	0.88	0.54	1.59
T	21	17	6
T*16	336	272	96
X^2 (9) =-2ln(Likelihood ratio)	150.4	79.5	39.2

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Table 3. Tax equivalent monetary values of changes in community quality of life.

Attribute	Beta	Per tax $	For Tax of $30,000	TBL
(1) Community Health, Safety and Security	0.34	0.76	$22,727	
(2) Community Charity	0.69	1.55	$46,424	
(3) Openness to Public and Local Culture	0.48	1.07	$32,097	$101,249
(4) Employment of Local Residents	0.97	2.15	$64,586	
(5) Average Hourly Wages	0.92	2.04	$61,248	
(6) Local Suppliers and Customers	0.65	1.44	$43,234	$169,067
(7) Local Taxes Paid	0.45	1.00	$30,000	
(8) Green Building and Infrastructure	0.32	0.71	$21,396	
(9) Water, Energy & Material Practices	0.14	0.31	$9,236	
(10) Waste Management and Reduction	0.61	1.37	$41,087	$71,719
	5.57		$372,035	

Figure 1. Example Survey Question

Compare the overall contributions of these businesses to your community
Circle the one of each pair that makes the biggest overall contribution

	32	1
Positive Contributions to:	**Level (Score)**	**Level (Score)**
Social		
(1) Community Health, Safety and Security	High (15/21)	Low (5/21)
(2) Community Charity	High (3%)	Low (0%)
(3) Openness to Public and Local Culture	High (4/6)	Low (2/6)
Economic		
(4) Employment of Local Residents	High (2/2)	Low (1/2)
(5) Average Hourly Wages	High ($12)	Low ($8)
(6) Local Suppliers and Customers	High(3/4)	High(3/4)
(7) Local Taxes Paid	High (5%)	High (5%)
Environmental		
(8) Green Building and Infrastructure	High (4/5)	High (4/5)
(9) Water, Energy & Material Practices	High (10/14)	High (10/14)
(10) Waste Management and Reduction	High (4/5)	High (4/5)

Rate this project as a contributor to your community
(0 means no contribution, 100 means the highest possible contribution)

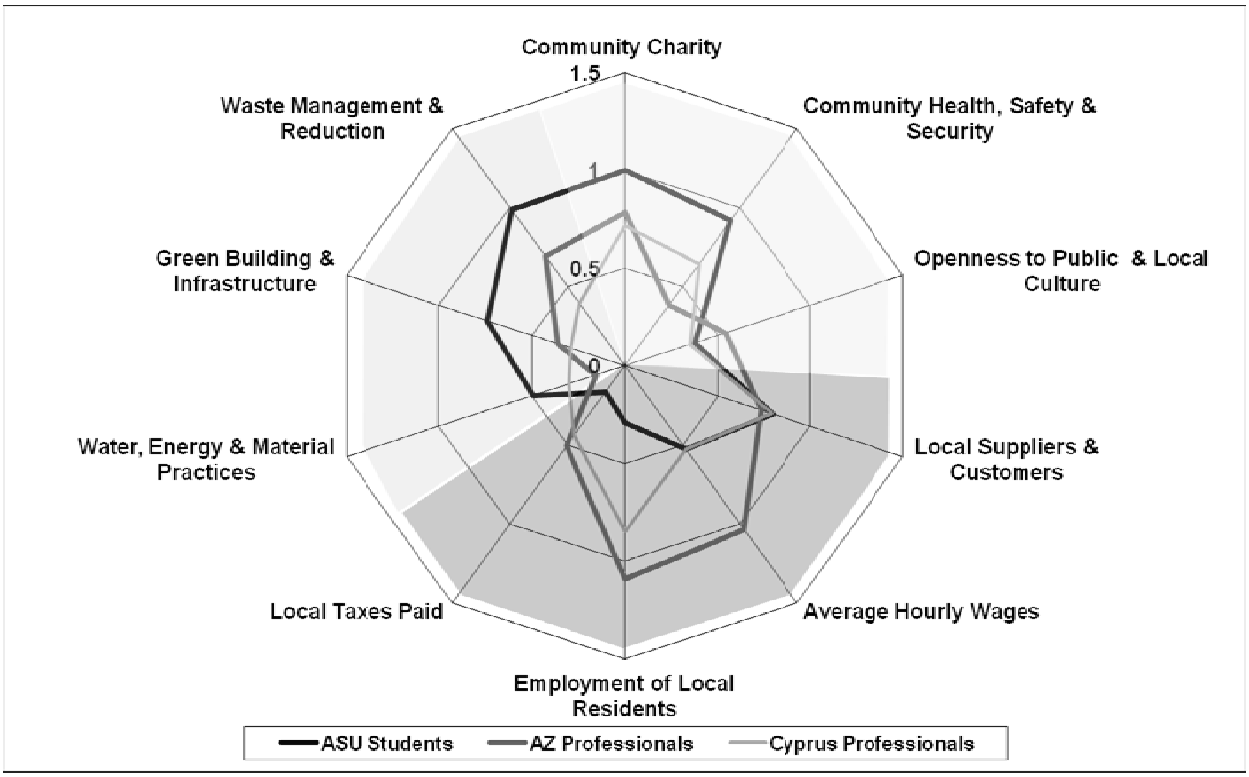

Figure 2. Comparison of the importance of TBL attributes

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