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Tourists' Willingness To Pay And Sustainable Tourism Policies In Mauritius

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There exists a significant gap on the issue of Willingness to Pay (WTP) studies of Small Island Developing States (SIDS), particularly those located in the South West Indian Ocean basin. Mauritius, which is a very popular tourist destination, provides no exception as regards to such gap. Hence, this paper intends to at least extend the literature and address the issue of WTP by exclusively focusing on a monetary valuation of the recreational activity of tourists in Mauritius within a context of sustainable development. The travel cost technique is applied for this purpose and our findings show that there is a potential for tourists to pay more than what they currently pay to visit the island. Hence, this offers local authorities with better scope for sustainable tourism by potentially extracting the corresponding Marginal WTP (MWTP) to conserve the fragile natural assets of this small island economy while safeguarding the coastal and marine eco-systems. Moreover, computation of the MWTP based on data from 21 different countries reveals that each tourist may be willing to pay $38 that could be used to protect tourism-based assets. This figure represents 5% over and above what a tourist actually pays on average to visit the island. Altogether, the paper makes a case for the government to extract this amount with the possibility of introducing an ecological tax. However, the latter must be worked out in such a manner to achieve the most effective conservation outcomes albeit with least distortionary impacts.

JEL CLASSIFICATION : Q2, Q22, Q21, Q26

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1. Introduction

Small island states, in general, are regarded as very attractive recreational natural resorts for tourists coming mostly from the developed world due to their location in tropical seas, volcanic topography and coral reefs. Moreover, such inheritance from nature represents a comparative advantage in that it provides the most spectacular and unique range of animal, plant or insect biodiversity as

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well as cultural diversity. It is a fact that small island developing economies (SIDS) derive a great deal of their income from the recreational activity that their natural assets generate. Not surprisingly, tourism constitutes one of the major industries, if not the major industry, as in Mauritius, Seychelles, Comoros and Maldives, amongst others in this part of the Indian Ocean. However, while tourism industry could be one major source of income for an island economy in the short run, it could as well be detrimental to economic growth over the long run; particularly when sustainable development strategies are absent in current policy making exercises. It is instructive to note that the fragility of natural assets in SIDS is highly vulnerable to degradation and destruction with increasing human interaction. Tourism may actually provoke an ecological stress through the high influx of arrivals, substantial hotel construction and over-exploitation of coastal and marine resources.

Society is directly concerned because the pay-offs accruing to the community today may well compromise the resource needs of future generations in the absence of a rigorous policy mechanism. Necessarily therefore, government intervention would be required to correct for any observed market imperfections by adopting relevant fiscal measures; for instance, introducing an ecological tax. But, sustainable policies, per se, would be better addressed through a careful monetary valuation of specific components of natural assets in SIDS. In the appropriate literature, the economic value of recreational activity can be ascertained using the travel cost method (TCM). Originated from theories of constructed markets, the TCM is an indirect valuation method in which travelers' or tourists' costs to a given recreational site constitute a proxy variable for the price paid to enter that site, while the visitation rate translates into the amount of recreation purchased. Estimates of visitor's welfare in terms of consumer surplus are thus derived through variations in travel costs and visitation rate to obtain a monetary valuation of a given recreational activity. Such valuation, as already indicated, is deemed necessary to address issues pertaining to natural resource conservation and, more importantly, the sustainability of the services generated by the market that characterizes this recreational activity.

Referring to the case of developing countries, (Mäler, 1992), for instance, pointed out that valuation could be useful to ascertain the potential benefits of improving the quality of a particular site of ecological importance. The economics of outdoor recreation, as (Mc Connell, 1996) highlighted, constitutes a tool to evaluate the benefits of environmental improvements. Since the earliest studies in the early 1960s, the TCM has been applied across different areas, for example, (Brown et al, 1964; Mc Connell and Strand, 1981; Smith et al, 1983; Samples and Bishop 1983, Brown and Henry, 1989; Smith and Kaoru, 1990; Navrud and Mungatana, 1994; Tisdell, 2001). These studies have shown the various complexities and intricacies involved in the valuation of outdoor recreational activities pertaining to the divergences between theoretical predictions and empirical estimates. The interesting aspect of the TCM is that there is always something new to be learnt

with regard to the empirical estimate or case specific study in which there are various socio-economic characteristics involved and the nature of the recreation being surveyed. However, the existing current empiricism on TCM has very little to provide on (SIDS) and more so in the case of Mauritius, as a favorite beach-based tourist destination.

By virtue of its geographical location and of its volcanic origin, Mauritius has been gifted with natural assets that attract a very high number of tourists every year. With improvements in air links, public infrastructure, social and political stability altogether with world-wide publicity, the island is becoming increasingly a more important tourist destination. The tourist industry now represents the second pillar of the country's economy. The tourist population is equivalent to around 70% of the total population of the island, which is 1.2 million, and is unevenly spread across a year. Tourists who come mainly from Europe are basically interested in sun, sand and sea and do spend several nights at the beach hotels surrounding the island. Concurrently, the number of hotels keeps increasing. Over the past decade, tourist expenditure has doubled and the latter represents an income multiplier of 0.96 (Swarbrooke, 1998). The coastal community being generally vulnerable and poor depends a lot on this industry, obviously, through creation of employment and indirect economic activity. Hotels provide all sorts of recreational activity such as deep-sea diving, snorkeling, wind-surfing, golf-courses, fishing, and several other activities related to the coastal and marine assets of the island.

At this stage, a major concern of tourist's development is carrying capacity. Needless to say, there would be a pronounced trade-off between current and future yield emanating from services provided by the eco-system should the latter continue to bear greater environmental stress. The exponentially increasing tourist arrivals lead to the construction of more hotels and an aggressive invasion of the coastline that would eventually and undoubtedly threaten the marine eco-systems and altogether fisheries biodiversity. Such market failures, coupled with meager government intervention, would exacerbate this threat to the fragile natural assets and hence the sustainability of tourist industry in Mauritius. In fact, (Sobhee, 2004, 2006) have already highlighted the declining fish catch and fisheries biodiversity due to overexploitation of marine resources and their implications for the coastal community.

To address the complex issues of protecting natural assets, sustainability and better recreational opportunities, it makes a lot of sense to evaluate the consumer surplus of tourists who have visited Mauritius and to capture thereafter their willingness to pay for improving the quality of the site. In this way, data would be generated to track the potential revenue that the authorities could exploit, through some well-designed fiscal tool, in protecting these recreational assets, or at least some of their components, to ensure simultaneously sustainability of the tourism industry in the long run.

Hence, this paper attempts to fill up a particular niche in the literature on recreational demand by analyzing a specific island economy, that of Mauritius, which is highly exposed to international tourism and vulnerable at the same time. In particular, two objectives are set in line with the aim of the paper; firstly, to model the demand for recreational visits by the international community, and secondly, and, more importantly, to compute tourists' willingness to pay for coastal and marine resources conservation through this demand. Rest of the paper is organized as follows: the next section provides a theoretical framework of recreational visits to one site as discussed in the travel cost literature. Section 3 discusses the data and empirical findings and this is followed by section 4, in

2. The Theoretical Framework

We choose a single site travel cost method as our underpinning framework in which we model the preferences of the individual foreign visitor, j, who chooses a single or preconceived site that would stand for Mauritius in our case. The basic choice problem is standard in the literature on site-demand functions; see for instance, (Mc Connell, 1996) which we apply in this paper. The representative agent faces the following problem:

$$Max \{U_j = a_j X_j^{\theta_1} R_j^{\theta_2} / Y = pX + cR,\ T = H + X(t_1 + t_2)\} \quad (1)$$

Where:
U = Quasi-concave utility function
X = Hicksian commodity bundle of other goods
R = Number of trips to a given site
T = Total time available
Y = Money income
p = Price of Hicksian bundle of other goods
c = out-of- pocket costs per trip
H = Time spent working
t_1 = Travel time per trip
t_2=Time spent on site per trip
$Y = Y_0 + wH$
w = Wage rate

In this model, individuals are assumed to trade between work and leisure at a constant wage rate. Models that exclude the opportunity cost of time would, in principle, underestimate the true value of travel cost to visit a given site and may well bias the consumer surplus estimates. Authors have argued at length, see (Tisdell, 2001; Freeman, 1999; Kolstad, 2000) amongst others on the opportunity cost of time, in particular, whether visitors derive any utility or disutility in traveling to a given site. Should visitors derive utility while traveling, an overestimation of travel cost values would arise. However, in this exercise and as stated in the assumption below, our model assumes that visitors do not derive either utility or disutility in traveling to the site. Altogether, the valuation of time spent in traveling to a site may constitute a major problem that has to be addressed because

visitors may be involved in different travel plans and part of which would be visit to the site being surveyed. Additionally, visitors might have chosen alternative modes of transport leading to differences in transportation costs. There is thus a set of assumptions that need be made to enable a theoretical model to be empirically and consistently tested. For more discussions on the issues and intricacies involved see (Mc Connell, 1996). Moreover, though the approach of individual travel cost method involves a stupendous task, it could be criticized on the ground that the sample size surveyed may not be representative of the entire tourist populations. To do this, both a lot of money and efforts would be required, but nevertheless such models have proven to be simple and insightful in valuing recreational assets.

Thus combining the opportunity cost of leisure in the budget constraint, we obtain the representative problem as:

$$\text{Max } \{U_j = a_j X_j^{\theta_1} R_j^{\theta_2} / Y^* - c^*R - pX\} \qquad (1)$$

Where $c^* = w(t_1 + t_2) + c$, the full cost of the trip and $Y^* = Y_0 + wT$, the full income where a is a scale parameter, θ_1 and θ_2 are impact elasticities. Solving the first order conditions, the following reduced form equation is obtained in the log form as:

$$\text{Log } R_j = \text{Log } A + A_1 \text{ Log } c_j + A_2 \text{Log } Y_j \qquad (2)$$

Equation (2) is actually the travel cost demand function for a single site and is found to be determined by price faced by the tourist to visit the site or the full travel cost, c_j, and the income of the visitor, Y_j. One important observation at this stage is that the empirical equation may include beyond the usual control variables mentioned already, other characteristic variables to improve the fit of the demand function and to capture site-specific traits. Thus, in the context of Mauritius, we add three more variables, namely Q, an index of quality of the site, as perceived by the visitor; S, the average size of each party to which the tourist belongs to and variable E that represents employment status of the tourists being interviewed. The extended function is therefore given by:

$$\text{Log } R_j = \text{Log } A + A_1 \text{Log } c_j + A_2 \text{Log } Y_j + A_3 \text{Log} Q_j + A_4 \text{Log} S_j + A_5 \text{Log} E_j \qquad (3)$$

Moreover, we can establish theoretically the partial derivatives that dictate the following expected signs of the parameters of the demand function (3):$A_1 < 0$; $A_2 > 0$, $A_3 > 0$, $A_4 > 0$ and $A_5 > 0$. The next section addresses this demand empirically and would allow us to subsequently derive the inverse demand function and the willingness to pay of tourists. We do not explain the theoretical postulates of the inverse demand function and the WTP computation here, the empirical aspects do refer to these in section 4. However, for a more concrete discussion on WTP theory, refer for instance to (Cornes and Sandler, 1996; Kolstad, 1999; Mäler *et al*.,1994; Mc Connell, 1996 ; Freeman, 1999).

3. Data and Empirical Issues

This study uses data on international tourist arrivals in Mauritius from a sample of 21 countries and they have been obtained mainly from the Survey of Outgoing Tourists carried out by the Ministry of Tourism and Leisure in 2002 and from the Handbook of Statistical Data on Tourism 2002. However, these sources were complemented by author's own estimates and computations from raw data and from the International Financial Statistics Yearbook of 2002. In this exercise, the responses given by 15009 interviewees are used and as generated by the Survey which actually covered 15907 interviews. Below, we make the necessary assumptions which are pertinent for the empirical exercise and a set of explanations with respect to the construction of variables as they would appear in the empirical equation.

3.1 Assumptions and Clarifications

- It is assumed that visitors' responses to travel cost changes are identical to changes in some hypothetical admission fee when computing the overall and final demand function as the consumer surplus estimates.
- Also, each trip to the site is assumed to be definite in itself, that is, not necessarily part of another travel plan or visit to another/other sites(s).
- Furthermore, the visitor is assumed to derive no utility or disutility from the time spent traveling to the site. Should the visitor derive any utility while traveling to the site, equation (9) would simply overestimate travel cost or otherwise.
- Wage rate is used as the relevant opportunity cost of time in the model and in the relevant empirical estimates.
- This is a site-specific exercise implying no substitute site faced by individuals.

3.2 Defining the Variables

- *Visitation rate*

We calculated the total visits conditional upon three aggregates for the year 2004, namely, number of visitors from each zone or country, total number of visitors at Mauritius and the total population of all the countries involved in the study for that particular year. Based on such information, we calculated the visitation rate for each country for the year in question per thousand of the population of each zone. Then the numbers of visits for each zone were computed from varying the total cost of visiting the site using population data and the visitation rate V. This is reported in the table below.

- *Full travel cost*

The transportation cost is obtained from the Survey for each zone as revealed by its average. To a large extent, 62% of the visitors came on package tour, providing concessionary travel and boarding rates. Most of the European tourists

(70% and above) came on package tours. However, to have the overall cost, we had to sum up the opportunity cost of travel time to the site with the time spent at the site. To obtain the former cost of time we used the per capita income data for each zone divided by 2000 hours (assuming that workers worked uniformly an average of 250 eight-hour days annually; this has been the practice in the literature, see for instance, (Navrud and Mungatana, 1994). Data on the time spent in traveling and visiting the site have been obtained from the 2002 Survey of Outgoing Tourists. Thus, the overall travel cost includes expenditure made locally, traveling expenses and the opportunity cost of time.

- *Income of Visitors*

With respect to the income used in this analysis, it has to be mentioned that no information is available on this variable as it is not collected by the Survey of Outgoing Tourists. What is available however is information on the occupation of visitors, in terms of professionals, skilled, retired, unskilled, household or student. Now to make up this gap, we have had to use per capita income data for each of the countries in the sample and these are taken from the International Financial Statistics and averaged over 4 years to smooth the data for better representation. This proxy was also used to determine the wage rate as the opportunity cost of time in the empirical equation. Given the varied profile of the respondents such as housewives, students, the retired as non-income earners and income earners, the use of per capita income and average lagged values of income per head would be a reliable proxy for such an exercise.

Other Variables

A vector of socio-economic variables have also been introduced besides the control variables, namely, size of parties in which the respondent tourist forms part of, and tourists perception of the quality of beach environment and tropical image as a proxy for environmental quality. The data shown are in ratio form. In particular, the data on quality of the environment relates to rating the environment as being excellent in Mauritius. Data published by the Ministry of Tourism from the survey do not report on age and gender for each zone and country. The overall information provided on these two variables is that 72% of the respondents were aged between 20 and 49 years with mean age being 40.1 while 67% of them were males. Moreover, 84% of the respondents were employed whereas 10% were retired individuals. Data on size of parties, environmental quality and employment status are shown in Table 2 below. We found it more sensible to apply the lagged values for environmental quality, that is, data from the last survey conducted in 2000 (this survey is undertaken in alternate years) are used as a motivating factor to better explain current visitation rate. Many new tourists learn in principle from those who have visited the island in the recent past and, in particular, about the environmental quality.

Table 1: Data on Economic Variables and Country of Origin

Country	Travel Cost	Income	Visitation rate
Reunion	703.3	6000	124.5155
South Africa	786.3548	7541	997.3131
Madagascar	791.2914	836	606.6482
Hong Kong	851.3777	2486	252.2373
Kenya	1132.073	1244	50.07976
Seychelles	1282.506	10241	165862.1
India	1324.418	22358	3357.024
Switzerland	1380.26	22856	654.2936
Italy	1849.539	21780	662.8153
Zimbabwe	1891.89	26413	2417.676
Belgium	1901.741	22190	1349.94
Austria	2034.305	23781	1031.695
Germany	2264.792	23676	1082.861
Sweden	2275.107	18047	194.6052
Singapore	2363.493	23635	523.8417
UK	2454.117	2479	20.57046
Spain	2569.775	24675	15.42716
Japan	2601.759	26699	176.6956
France	2676.679	32000	775.0124
Australia	3185.644	25559	14.94429
USA	3378.918	33293	437.8034

Source: Author’s Computation from Ministry of Tourism Data

Table 2: Socio-economic Characteristics of Tourists

Country	Environment Quality	Employment	Average party size
Reunion	0.16	0.73	2.2
South Africa	0.31	0.89	2
Madagascar	0.17	0.79	1.6
Hong Kong	0.2	0.94	1.6
Kenya	0.43	0.88	1.5
Seychelles	0.09	0.82	2.1
India	0.38	0.93	2
Switzerland	0.2	0.88	2.1
Italy	0.21	0.92	2
Zimbabwe	0.31	0.75	1.9
Belgium	0.23	0.87	2.1
Austria	0.26	0.91	2
Germany	0.27	0.9	2
Sweden	0.27	0.93	1.9
Singapore	0.16	0.9	1.9
UK	0.36	0.85	2.2
Spain	0.31	0.96	2.1
Japan	0.16	0.84	1.9
France	0.19	0.82	2.1
USA	0.24	0.91	1.7
Australia	0.23	0.84	1.7

Source: Author's Computation from Ministry of Tourism Data

Having defined our variables, we are now in a position to estimate equation (3) and present our results thereafter.

$$\text{Log } V_i = 11.22 - 3.9\text{Log}C_i + 1.05\text{Log}Y_i + 0.276\text{Log}Q + 5.04\text{Log}S + 4.5\text{Log}E$$
$$(2.07) \quad (-4.4) \quad (2.55) \quad (2.43) \quad (1.82) \quad (1.12)$$
$$\bar{R}^2 = 0.725 \qquad F = 10.99$$

This regression equation shows that the coefficients of interest have got the appropriate signs and all the coefficients are significant at less than 5% with the exception of the Employment status variable. The primary results indicate that the variables fare rather well in the empirical demand function. Moreover, the coefficients of both, income and price, actually representing the income and price elasticities of demand respectively, reveal that the travel cost demand function for Mauritius is consistent with that of a luxury good. Changes in both the price and income variables lead to more than proportionate changes in the visitation rate. This finding is consistent because Mauritius is an expensive destination and not many people could afford to come over for holidays. The highest number of tourists in fact comes from high per capita income economies.

Environmental quality and group-size do indeed affect the travel cost demand function besides travel cost and income of visitors. More precisely, an improvement in environmental quality would increase the visitation rate and so would more group arrangements and tours. This equation is used as a prelude to establish the final demand function conditional on simulated access to the site in the form of an entrance fee. In this way, the numbers of visits at various levels of the travel cost would represent the demand function for each zone or country. By summing total visits across all zones at a given travel cost, one obtains a point on the user demand curve whose equation is given by:

$$\text{Log } V_j = 13.45 - 3.3P_j$$
$$(2.67) \quad (-3.54)$$

(t-statistics in parentheses)

$\overline{R}^2 = 0.45$ F = 6.43

As per the rule, from this equation, the inverse demand function was generated and its equation is reported below as:

$$\text{Log } P_j = 4.035 - 0.3V_j$$

Using this function, the consumer surplus estimates were made using the following integral formula:

$$\int_0^{13.45} 56.54V^{-0.3}\,dV$$

The estimated consumer surplus turns out to be \$25,672,165, representing \$38 per head of the actual number of visitors {\$25,672,165/Log^{-1}(13.45)}. In fact, this figure represents 8% of the value added of tourism to hotels and restaurants, that is, 0.51% of the country's GDP for the year 2004. Furthermore, it can be inferred that each tourist would be willing to pay an amount equivalent to \$38 to visit Mauritius over and above what he or she is already paying. For purpose of representation, the average expenditure of a tourist in 2002 may be compared which amounted to roughly \$800 and this marginal willingness to pay is only 5% of this figure. Now, this surplus amount could be used towards conservation of the environment since constant damages to the coastal environment may affect the tourism industry in the near future through more substantial exploitation of seafood, inappropriate location for the construction of hotels, ill-designed jetties and recreational angling that damages coral reefs. The various forms of conservation policies that could be financed by extracting this surplus are:

- *Awareness Campaigns*

This would require substantial expenditure by all stakeholders concerned and in particular the government in sensitizing both local citizens and foreign visitors about the fragility of the coastal and marine eco-systems. The use of different forms of media and communication techniques would require an extra budget to save these natural assets. Greater investment would be made to encourage more effective environmental-friendly actions by installing relevant sign-posts and reinforcing the support of beach authorities and coast guards.

- *Cost of Environmental Impact Assessment (EIA)*

EIAs are undertaken by the government to evaluate the potential damages that may be caused by the construction of a hotel or business entity located in a strategic place, mostly, at the beach. Sometimes EIAs may necessitate much more profound surveys and analyses that would require the appointment of several experts in the fields of environment and ecology. This is indeed a costly Endeavour and precisely when these have to be done efficiently for effective outcomes.

- *Public Infrastructure to Protect the Coastline*

Government would have to seek additional resources to provide proper access to the beaches and hotels while ensuring environmental-friendly infrastructure and networks. Choosing a more relevant and less environmental unfriendly site for the construction of a hotel or restaurant may necessitate longer travel hours, more robust public infrastructure and additional socio-economic overheads requiring more financial resources. Altogether, there is need to prevent land erosion around the island especially during the passage of a tropical cyclone or during flooding. Lack of intervention would simply and quickly degrade the coastal environment and badly alter the coastal morphology.

- *Pollution Abatement Techniques*

Many hotels around the coast do not have either proper plant or facilities to dispose of their wastes. The state may facilitate access to better technology for sound treatment of hotel wastes. In many instances the government may co-finance the acquisition of such technology or there may be more public-private ventures to circumvent the problem. Whichever option adopted, there would be a need for additional resources from the government.

- *Research and Development*

To prevent over-exploitation of the lagoons due to the rising demand for sea-food, the government may encourage more fish farming such as aquaculture. The latter may be an expensive venture and the government may provide concessionary loans to encourage this practice and more research and development to promote fresh water fish rearing. Needless to add, this type of conservation policy would as well necessitate high investment and substantial public investment.

Necessarily therefore, the willingness to pay amounting to $38 could be extracted and appropriated by the government to protect and safeguard the fragile coastal environmental and marine eco-systems. However, one convenient way of doing this through the imposition of an ecological tax which should be imposed in the most effective manner and causing the least distortion to all the parties concerned. Hotel owners (current and potential) and government would have to seek the best mix of policies to address conservation issues while appropriating the receipts from this potential form of environmental tax. In this respect, a strategy of sustainable tourism development and economic growth would altogether be ensured.

4. Conclusions and Policy Implications

This paper has applied the individual travel cost method to estimate the demand for recreation by international visitors in Mauritius. Data for the year 2002 Survey of the Outgoing Tourists conducted by the Ministry of Tourism are used with respect to 21 different zones or countries to derive the travel cost demand function. After establishing a preliminary demand function that relates visitation rate to economic and other variables, the next step was to calculate the willingness to pay. This was done by simulating travel costs through the creation and variation of a hypothetical admission fee to obtain the final demand function for recreation. We found that the final demand curve yields elasticities in absolute terms greater than one indicating clearly that the demand for recreation in Mauritius is elastic and could well support the credence of a luxury-type product. In addition, it was observed that group traveling promotes the demand for tourism in that it would lead to relatively cheaper travel costs than individual arrangements either through group tours or special holiday packages. Besides, the tropical image and the environmental quality do matter in the context of Mauritius as the coefficient of the variable proxying environmental quality has a positive and significant sign.

Computation of the consumer surplus yields an estimate of $770mn (Rs23,000 mn) or an amount equivalent to $38 that an international visitor is willing to pay to visit Mauritius. This figure is obviously far in excess of the actual receipts from tourism for the year 2004 by 26.2%. Of what significance is this valuation? Actually, there are several avenues that warrant careful investigation to find out how the potential benefits could be used to promote a sustainable tourism industry in Mauritius. Some of the possibilities could be to make use of the willingness to pay of tourists for resource conservation. One mechanism proposed in this paper is the introduction of an ecological tax of $38 which could be earmarked towards environmental conservation. To date, not much is being made to restore or conserve marine eco-systems and the environmental damages caused by the tourism industry in terms of reduction in fish catch, destruction of corals and distortions to the coastal environment through ill-designed hotel infrastructures. Preserving such natural assets would be identical to preserving recreational assets that would ultimately promote greater

recreational demand. The introduction of an ecological tax would, for instance, be suitable in that the generated revenue could be used to compensate for these damages. All in all, to reap the potentially higher benefits, all stakeholders, comprising the state, hotel owners and the civil society, might have to establish strategies that would improve the quality of the physical environment in Mauritius. Since traveling in groups promotes visitation, there is further scope for promoting demand, expanding existing recreational activities and still reaping higher benefits while ensuring sustainable development. Hence, there is tremendous scope for promoting recreational activity within Mauritius to take advantage of the potentially higher benefits that could accrue to the economy as a whole. There are several avenues through which conservation policies could be addressed while appropriating the marginal willingness to pay to have the most effective outcomes.

References

Albion Fisheries Research Centre. *Data on Fish Catch* (Annual Reports), Albion: Mauritius

Arrow, K., Daily, G., Dasgupta, P., Levin, S., Mäler, K-G.,Maskin, E., Starett, D., Sterner, T. and Tietenberg, T. 2000, 'Managing Ecosystem Resources', *Environmental Science and Technology*, vol. 34, pp 1401-1406.

Brown, Jr,G and Henry, W.1989, 'The economic Value of Elephants. The London Environmental Economics Centre, London, Paper89-12 (Unpublished).

Cornes, R. and Sandler, T.1996, *The Theory of Externalities and Club Goods*, Cambridge: Cambridge University Press.

Dasgupta, P and Mäler, K-G. 1991, 'The Environment and Emerging Development Issues', *Beijer Reprint Series*,1.

Folke, C., Holling, C.S and Perrings, C. 1996, 'Biological Diversity, Ecosystems and the Human Scale', *Ecological Applications*, vol 6 pp 1018-1024.

Kolstad, C D. 1999, *Environmental Economics*, Oxford: Oxford University Press.

Mäler, K-G. 1992, 'Production Function Approach in Developing Countries', *Beijer Reprint Series*, 6.

Mäler, K-G, Gren, I-M. and Folke, C. 1994, 'Multiple Use of Environmental Resources: A Household Production Approach to Valuing Natural Capital', *Beijer Reprint Series,* 23.

McConnell, K. 1996, 'The Economics of Outdoor Recreation', in Handbook of Natural Resource and Energy Economics, Vol 2, (eds Kneese A V and Sweeney J L), North Holland, pp 677-722.

McConell, K and Strand, I. 1981, 'Measuring the Cost of Time in Recreation Demand Analysis; An Application to Sportfishing', American Journal of Agricultural Economics, vol 63, pp153-156.

Ministry of Tourism and Leisure, *Handbook of Statistical Data on Tourism* (Various Issue), Government of Mauritius, Port-Louis, Mauritius.

Ministry of Tourism and Leisure, Survey of Outgoing Tourists (Various Issue), Government of Mauritius, Port-Louis, Mauritius.

Navrud, S and Mungatana, E D.1994, 'Environmental Valuation in Developing Countries: The Recreational Value of Wildlife Viewing', Ecological Economics, vol 11, pp 135-151.

Sobhee, S. K. 2004, 'Economic Development, Income Inequality and Environmental Degradation of Fisheries Resources in Mauritius', *Environmental Management***,** vol 34, pp 150-157.

Sobhee, S K. 2006, 'Fisheries Biodiversity Conservation and Sustainable Tourism in Mauritius', Ocean & Coastal Management, vol 49, pp 413-420.

Swarbrooke, J.1998, Sustainable Tourism Managemnt, Oxford: CABI Publishing.

Smith, K, Desvousges W H. and McGivney M P, (1983), 'The Opportunity Cost of Travel Time in Recreation Demand Models', Land Economics, vol 59, pp 259-278.

Smith, V. K and Kaoru V.1990, 'Signals or Noise? Explaining the Variation in Recreational Benefits Estimates, American Journal of Benefit Estimates, vol 72, pp 419-433.

Tisdell, C 2001, Tourism Economics, the Environment and Development: Analysis and Policy, Edward Elgar Publishing, UK.

World Bank Publication, *International Financial Statistics Yearbook* (Various Issues), The World Bank, Washington DC, US.