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# **Factors influencing the willingness to pay a user fee for a state forest recreation visitor facility**

**Carlton Sambury<sup>1</sup>**

*Department of Agricultural Economics and Extension, Faculty of Food and Agriculture, The University of the West Indies, St. Augustine, Trinidad and Tobago  
e-mail: carlton.sambury@my.uwi.edu*

**Sharon Hutchinson<sup>2</sup>**

*Lecturer, Department of Agricultural Economics and Extension, Faculty of Food and Agriculture, The University of the West Indies, St. Augustine, Trinidad and Tobago  
e-mail: sharon.hutchinson@sta.uwi.edu*

**Dean H. Avril<sup>3</sup>**

*Department of Food Production, Faculty of Food and Agriculture  
The University of the West Indies, St. Augustine, Trinidad and Tobago*

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## **Abstract**

*Managers of the Public forest recreation areas face a daunting challenge to provide a high quality recreation experience, while maintaining sustained forest and related resource management, and simultaneously, steadily increasing visitor numbers, with resultant environmental damage. It is the hypothesis of this study, that visitors are willing to pay to use the Quinam forest recreation visitor shelter - a Trinidad and Tobago government forestry facility, equipped with most visitor services (cooking, wash, play areas) and which is currently provided free of charge on approval of the requisite application. A telephone survey was used to collect both quantitative and qualitative data during the period of April 24<sup>th</sup> – May 6<sup>th</sup> 2011 and a logistic regression model examined the socioeconomic factors explaining support for fees. This paper – a pre test for a larger MPhil study, assesses factors influencing visitors' willingness to pay for the reservation of the shelter. Data collected indicated that participants are willing to pay (WTP) a price as high as \$200 to use the facility. A total of 76% indicated willingness to pay to use the shelter while 23.9% were not willing to pay. Findings also showed that motivation and gender were key variables. However, many cells with no data and an overall unsatisfactory response for income data suggest the need for closer scrutiny of the questionnaire formulation and survey process. Nevertheless, even with the limitations of the data collected, these results potentially indicate that a fee could be implemented without losing visitors. This study will provide the basis and impetus for more research leading to the introduction of a user fee at this site and others in Trinidad and Tobago.*

**Key words:** User fees, visitor shelters, willingness to pay, Trinidad and Tobago State forests, logistic regression

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## **1 INTRODUCTION**

### **1.1 Nature and Scope of Problem**

Public forest park areas in many parts of the world including Trinidad have historically been managed at no cost to the public. However, with rapidly increasing visitors, and decreasing capital and recurrent financial resources, many managers are recommending implementation of entrance/ user fees at least to ensure adequate park maintenance and improvements. As may be stated by Bates (1999), forest recreation contributes as much as 74% of the total Forestry input to the US GNP – demonstrating that implementation of user fees is a possible solution to the lack of funding possibilities by State Agencies.

Quinam recreation park, situated within lush natural and teak forests of South east Trinidad, and adjacent to the popular Quinam beach, is the focus of this study. The public recreation facility, managed by the Forestry Division, contains visitor shelters, trails, and related infrastructure. The shelters are equipped with most visitor facilities and services including cooking, seating, toilets, and play areas. Approximately 150,000 individuals visit the park annually, some from as far as 60 km away (See Table 1 and Figure 1); however two visitor shelters can each accommodate an average of 30 visitors daily. The remaining visitors recreate at other smaller huts, in open areas along the road, or throughout the park. The major recreational activities engaged in at the shelters revolve around cooking of favorite dishes, while engaged in some sporting (Outdoors Trinidad 2011).

Accommodation at the visitor shelters must be reserved in advance by completing a form for that purpose. Hours of operation are limited to daylight hours of 8.00am to 5.00pm.

Increased visitor numbers have brought new challenges including

vandalism, indiscriminate dumping of garbage, and other irresponsible behaviors, and at the same time, inadequate funding for maintenance and development activities (Ramlochan 2010).

A reservation system for the use of minimal facilities was implemented specifically to control use numbers and subsequent impacts; however there has been no empirical data analyzing its impact. Hence research data is needed to inform decisions and new initiatives necessary to meet such challenges.

### **1.2. Can Fees Assist?**

There is wide agreement that implementation of user/ entrance fees for forest parks are important to solving a range of park management problems. Tisdell and Wilson (2003) listed a variety of reasons for the “use of entrance fees for national parks and protected areas”. These include the provision of better visitor facilities, the reduction of visitor numbers and resource damage, getting rid of competing and subsidized facilities which may be privately owned, collecting fees to ‘cover’ costs and in a more efficient manner, and reversing the public’s negative attitude toward more efficiently, achieving efficiency in revenue collection (d) creating positive attitudes towards reservation of large areas of State lands for parks.

In addition, Rosenthal, Loomis and Peterson (1984) established that user fees could be used by managers to limit use; Harris and Driver (1987) - to substantially improve the quality of recreation experiences, and Walpole, Goodwin and Ward et al. 2001; and Azahari (2001) - to decrease reliance on State budgets. Weerakoon et al. (2010) found that in the absence of relevant research pertaining to valuation of the forest resources and user fee implementation, the forest benefits are essentially being given away freely, and this leads to overuse, destructive use and

depreciation of the resources. (Radam and Mansor 2005) Also, Martin (1999) noted that user fees may be utilized by State Agencies to send a positive signal to other government authorities regarding the value of land dedicated to conservation. The need then arises for the formulation of relevant policy or at least a set of principles to be approved by the State if user fees are to be instituted on a National scale. (Martin 1999).

In terms of willingness to pay, provision of information, income and ethnicity and concerns about fairness are all important variables in relation to willingness to pay. Some argue that frequent forest recreation users should cover more of the management costs, especially since much of the literature has found that regular users are “not typically lower income”, but “non-minority, college educated, middle income wage earners.” (Reiling, Criner and Olthmanns 1988; Bowker, Cordell and Johnson 1999; USDA Forest Service 1992)

A number of complex issues must be considered before user fees are implemented on State forests (USDA Forest Service 2002). These include Agency trustworthiness, that is, the level of both financial and program accountability, public involvement, and serious concerns about inequitable effects, as these relate to local residents, low income visitors, or recreation related businesses. In regards to ‘equity considerations, Laarman and Gregersen (1996) notes that certain entrance fees may be appropriate for local communities, but be actually subsidizing recreation for visitors from ‘rich countries’. As such, a pricing (or price discrimination) system may be necessary which accommodates different subsets of visitors.

In addition, many forests (and national park areas) provide mixed goods which may have to be accessed by different people at different times. For example, within the Quinam forests’ study area can

be found teak plantations, and on its boundary – a wildlife sanctuary, each area with its own set of operations which may be regarded as incompatible with an intensive use recreation area. Also, in some cases, the fee collection technicalities and overall high costs may not justify the returns.

In Trinidad and Tobago, State forestry park areas are historically free for visitors. However, there have been few examples of fees charged for certain forestry related services, these include the use of the San Fernando Hill contemporary visitor facilities for parties, weddings, and related activities managed by a State appointed community based committee.

It is notable that an increasing number of user fee forest based recreation attractions have been developed over the past two decades with the support of State assisted (Forestry Division Units, etc), non government organizations, and individuals. These attractions have included ecotourism, hotel and guest houses developments, nature ‘parks’, and suchlike places.

Additionally, informal arrangements allow some organizations to operate freely on State forests and related resources (Caroni swamp and Nanan’s eco tours, Beach turtle resources and nature Seekers’, etc), and to implement very lucrative private user fee systems.

### **1.3 Purpose of Study**

The purpose of this study is to examine factors impacting the willingness of visitors to pay a fee to use the Quinam visitor shelter.

The primary research question explored is - Are users of the Quinam visitor shelter willing to pay a user fee?

Other research questions explored are - what are the factors impacting on willingness to pay? What is the maximum amount that visitors are willing to pay? Are users of the reservation system satisfied

with the process? Are users satisfied with the facilities and services offered at the site? How do education, age, frequency of visit and other variables affect user's willingness to pay?

#### **1.4 The Research Method**

The contingent valuation method (CVM) is the analytical tool used to determine whether visitors are willing to pay an entrance fee to the Quinam Park. The CVM is a direct method for evaluation in which the value of an environmental good is elicited directly, in answer to a question about willingness to pay (WTP) to have more of the good, or willingness to accept (WTA) less of it. Since environmental resources are difficult to value using market prices, a WTP survey is necessary in the valuation of biodiversity, or as in this study, the use of a recreation visitor center.

After enquiring from visitors/ users on willingness to pay or the amount of money that may be accepted for the environmental resource or service, a total value is then calculated by multiplying the average WTP with the 'population.' Many researchers consider five phases of the CVM process to include the creation of the theoretical market, data collection, determining the approximate payment or acceptance trend, determination of the value function, and finally the calculation of the final value (Belkayali et al. 2010).

Some researchers utilized hypothetical scenarios in which every representative of visitor groups is asked to indicate preference for one of two options, and then the maximum WTP for the option preferred by the interviewee is determined. The maximum WTP may be estimated by suggesting entrance fees from zero to the maximum amount (referred to as a bidding game). (Pak and Turker 2006; Hanley, Shogren and White 1997)

Weerakoon et al. (2010) assessed both local and foreign visitors' willingness to pay toward satisfactory facilities and

sustainable management of the Hurulu Eco- Park in Sri Lanka. That research found that group and family size and education level were important variables. The overall results of this study proved that higher budgets for further development of the park facilities were feasible, since the perception of value by visitors was much higher than the amount of entrance fee paid. Managers needing to support budget requests need such supporting documentation based on similar research. Bowker, Cordell and Johnson (1999) used logistic regression models to examine the socioeconomic factors explaining support for fees. Here income and ethnicity were two variables which were found to be significant. This study used telephone surveys in which visitors were asked their willingness to pay fees for a variety of services offered including visitor centers, trails, parking, restrooms. Also, multivariate logit methods to better understand factors influencing willingness to pay.

Important in implementation of the CVM is consideration of the positive, zero and protest bids, that is, the categories which explain the type of response to the WTP survey questions. Positive bids explain those willing to pay generously; zero bids are not prepared to pay for various reasons (and may return incomplete questionnaires), and protest bids – rejection of the 'payment vehicle' outright. (Christie 1999)

This work represents a limited contingent valuation study which will utilize open ended questions in determination of WTP. The focus will be on whether there is a willingness to pay for the experience by the users of the visitor shelter. Until now, no study has been located focusing on recreation visitor use of forest areas in Trinidad, and more specifically willingness to pay an entrance fee; this research will therefore contribute to evaluating the economic benefits of these unique resources, which can not only help to reduce the destructive use and

depreciation of these resources, but, in a direct and more visible way, contribute to the country's sustainable development. (Weerakoon et al. 2010)

## **2.0 Materials and Methods**

### **2.1 Data Collection**

A telephone survey was chosen as the primary research instrument, and was executed over the two week period of April 24<sup>th</sup> to May 06, 2011. Some guidelines from Dillman, Tortora and Bowker (1998) assisted in survey construction. In assessing user fees for a national recreation fees on US public lands, Bowker, Cordell and Johnson (1999) utilized data from a telephone survey consisting of information on individual and household characteristics, recreation activities participation, and related matters.

The telephone survey utilized in this study facilitated lower costs (dollars and time), and the availability of the contact information for telephone calls. A team of experienced graduate students of UWI Department of Agriculture Economics and Extension (DAEE), Faculty of Science and Agriculture (FSA) was engaged for the exercise, and phone calls were completed in the early evening hours – approximately between 4.00pm – 8.00pm on weekdays.

All applicants for reservation of the visitor shelters at the Quinam Forest recreation facility during the year 2010 – a total of 153 were selected and surveyed. The reservation process included a visit to the San Fernando Regional Forestry Office, where potential visitors supplied basic information on a 'registration form' including the planned date of visit, size of group, purpose for which shelter is requested, and related contact information.

A structured questionnaire was used to collect both quantitative data and qualitative feedback. The final version of the survey comprised 27 questions, inclusive of key demographic information

(respondents' age, ethnicity, income, household size, education, employment, reason for visiting, and frequency of visit); perceptions about the reservation process; perceptions of satisfaction with the recreation facilities, and finally, questions concerning the willingness to pay for use of the visitor shelter.

The questionnaire utilized the existing state of affairs as the basis for the hypothetical questions. Three main areas have been analyzed: not willing to pay; willingness to pay and willingness to pay as much as \$200. In addition, improvements were selected including more picnic tables, fire rings, information signs, toilets, play facilities.

All interviewees were first informed of the purpose of the research – “to evaluate the forestry visitor recreation facilities at the Quinam recreation site by surveying all individuals who had made a reservation at the San Fernando forestry office for use of the visitor shelter”. Most interviews were completed in approximately 15 minutes, and respondents were generally kind and cooperative.

### **2.2 Data Analysis**

Data were entered into a computer using Excel software and then merged into an SPSS 19.0 statistical program for analysis. Frequencies and Means were used to analyze socio-demographic characteristics of the respondents.

### **2.3 Statistical Analysis**

For the cvm analysis, the following questions were asked to capture all possible options:

**Question 1:** What is the most you would be willing to pay to enjoy the present shelter (0, \$1.00, \$5.00, \$10, >10)

**Question 2:** If you are willing to pay more than \$10, how much would you

be willing to pay (in a “whole” dollar amount in increments of \$5 e.g. \$15, \$20, \$25)?

**Question 3:** How much would you be willing to pay to enjoy the present shelter with more facilities provided (0, \$1.00, \$5.00, \$10, >\$10)

**Question 4:** If you are not willing to pay AT ALL, please indicate your reason(s)

Principles from Weerakoon et al. (2010), and Luangmany et al. (2009) were utilized in this study. While the socioeconomic profiles of the respondents in both studies differed with this Quinam study, the underlying principles are the same in the analysis of the relationship between stated willingness to pay, the demographic factors, and the implementation of the logit regression model. For example, one major constraint encountered was the low ratio of valid cases, especially so in the case of income, with only 47 cases.

The following multivariate model can be expressed as follows:

$$P_i (\text{probability of fee support}) = \frac{1}{1 + e^{-Z_i}} \quad (\text{logit distribution function})$$

$$Z_i = \beta_0 + \beta_1 \text{Gender} + \beta_2 \text{Income} + \beta_3 \text{Age} + \beta_4 \text{Educ} + \beta_5 \text{Times Visit} + \beta_6 \text{Motivation} + \beta_7 \text{Size\_group} + \beta_8 \text{OtherPks} + e_i$$

(Where  $e_i$  = error term; and where  $Z_i = \beta_1 + \beta_2 X_i$ )

### 3.0 Results and Discussions

#### 3.1 Demographic

From the analysis of the visitor data, 77.3% of the visitors making shelter reservations were male, and 22.7% female. This is understandable considering the long drive to the area through rural country and the need to consider security as important. Additionally, more visitors were of mature ages - 21.2% users were 18-30 yrs;

30.3% were 31-45 years and 58.5% at 46 years and above. Alig and Voss (1995) found that age is an important factor when considering future recreation participation. In addition, approximately 85% of users were of the East Indian ethnic origin, an important characteristic needing research.

In terms of education level, users were split almost down the middle, with 48.4% having attended high school, and the remainder 51.6% attended college or University. Most people were employed fulltime – 89.1% with the remaining almost equally divided between retired and unemployed. This is not surprising since visiting this shelter requires having access to a vehicle, and many travelled for comparatively long distances. (See Appendix – Figure 1 Distance (km) travelled by Respondents to the Quinam Site.)

Groups were almost equally divided between family (39.4%) and other social groups (54.5%), including secular colleagues. The site seems popular for many since approximately 60% visited this site more than four (4) times, with 26.6% visiting 11 or more times. These percentages are almost similar for those visiting other parks, indicating avid recreationists. Frequent visitation is usually a strong indicator of a variety of recreation related behavior – pro environmental behaviour (Nord et al. 1998); access and proximity of supply (Sievanen 2004); place attachment (Hailu et al. 2005). The high frequency of visitation to the Quinam site may indicate a high level of place attachment, and deserves close examination.

#### 3.2 Perceptions about the reservation transaction

Frequency of visit to a recreation area has been found to be influenced by any activity which may help to orient or to provide some guidance to visitors before the onsite

experience (Bitgood 1996). The visit to the office to reserve the shelter, allows the user an opportunity to ask additional questions about the site, and to be assured that the decision to visit was a good one, especially if available 'spaces' are not readily available. In addition, respondents were extremely positive of the 'reservation experience' as is illustrated in Table 2, and this experience may positively impact frequent visits.

### **3.3 Motivations for Visiting the Park**

In a study which sought to determine willingness to pay to visit a national forest recreation facility, Denny and Stein (2001) found that being with their friends and families was one of the prime motivations for their visits. Unlike that study, we sought to determine whether the motivation was '**family get together**' or '**gathering of friends**'. Results indicated that 55% was motivated by a gathering of friends while 45% was family oriented (See Figure 2 in Appendices).

### **3.4 Perceptions of Satisfaction with Park Services and facilities**

Satisfaction with past visits to this facility is one factor which will greatly impact on the user's willingness to pay for future use. The relationship between quality of the forest recreation experience and satisfaction has been so well researched that the goal of many recreation managers is defined in terms of how well visitors are satisfied. (Baker and Crompton, 2000)

Perception of satisfaction with this experience begins with the reservation experience. Data indicates that as many as 96% felt that the reservation process was satisfactory, and similarly, as much as 77% of visitors believed that the information was adequate (Table 3).

Additionally, in a study on visits to an outdoor amusement park, there was significant correlation between visitor

satisfaction and inclination for repeat visit (Wan-Yu Liu, 2011). At Quinam, most users of the shelter were satisfied with their eventual visit (57.8%). Approximately 50.82% were satisfied with adequate cooking equipment and facilities, and the same found that the toilet facilities were unsatisfactory. However, it must be noted that approximately 75% were willing to pay more for better toilets, indicating a problem in this area deserving attention by managers. Also, most users were satisfied with the presence of forestry recreation personnel (64.6%), as opposed to 35.4% who did not agree that there were adequate personnel present. Figure 3 shows that more than 25% of respondents visit some more than 11 times – an indication of loyalty to place (Kyle, Graefe and Absher 2002).

### **3.5 Willingness to pay**

As Figure 4 indicates, 23.9% were not willing to pay to use the shelter, with a total of 76% indicating willingness to pay to use the shelter: 19.6% at \$5.00; and the same at \$10.00; 6.5% at \$20.00; 4.3% at \$25.00 and at \$80.00; 17.4% at \$100.00 and 4.3% at \$200.00.

Figure 5 shows that respondents are willing to pay more for certain facilities/services. Additionally, when asked to list services for which respondents were willing to pay more, toilets was priority, followed by signs, play facilities, changing rooms, and more picnic tables. Surprisingly, comparatively few people wished to pay for more security.

### **3.6 Statistical Analysis**

The results of the Logistic regression model used to analyze the effects of various predictors on willingness to pay.

In Table 3.2.0 above both gender and motivation significantly affect willingness to pay ( $P < 0.05$ ) The other predictors do not



appear to have any significant effect on the response ( $P > 0.05$ ).

The data suggests that males predominate in the group of persons who pay to visit the site. Data also suggests that motivation by family members is the major influential factor affecting willingness to pay and visit the site. This result is expected for gender, since the Quinam 'lime' has been perceived by some as a 'cookout' for mainly men – inclusion of women is normally a 'treat'. In terms of motivation, the location lends itself to a family occasion, and it will not be surprising if most 'groups' included one or more family member.

### **3.7.0 Discussions**

Data collected indicated that participants are willing to pay (WTP) a price as high as \$200 to use the facility. Even with the limitations of the data collected, these results potentially indicate that a fee could be implemented without losing visitors. Also, improving the facilities, especially toilets, interpretative signs and play facilities will increase visitation and the willingness to pay.

The key findings are consistent with what is already known anecdotally, such as the prevalence of males in visits to this and related sites. Additionally, most groups visiting usually include one or more family members, hence the statistically significant finding of motivation (1= family group).

Samdin et al. (2010) has established that traditional socioeconomic variables such as Age, education, and income are important explanatory variables for WTP (McCarville 1995), such that verification of data and removal of related limitations are necessary for a better result.

As noted previously, a major limitation of this study was the low response rate. In terms of income, it has been found that measuring this variable can be risky. For example, community members will unlikely

be open to talking about their financial situation, and especially will this be so through a telephone survey. Future research must consider, among other things, the use of indirect questions, placement and other considerations so as to achieve a better response rate. (Dillman et al. 1998) Additionally, analysis of three bid categories, especially the relevance of protest bids, is necessary.

The results represent only the perceptions of those who made reservations for the visitor shelter, and cannot therefore be readily interpreted to represent all Quinam park users or the general public. Some reliable data related to the total population of individuals visiting will be necessary in order to design a survey that can be generalized to all park users.

Also, motivation choices were very limited. Better described motivations for respondents should include, in addition to visiting with families or other groups, choices such as to experience or learn about nature, and to relax. In addition, factor analysis may be utilized if the motivations are numerous and grouping is desired. (Stein and Lee 1995)

### **Recommendations**

In future studies, both logit and OLS regression models should be utilized to test various socio-demographic factors in explaining support for user fees. Such models will facilitate the testing of a number of hypotheses, and comparison of the results of both methodologies. And to inform the models, possible development scenarios must be clear and specific; and finally, the scenarios may include upgrading facilities, expanding and improving, and leave as is.

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## APPENDICES

### Topic: Factors Influencing the Willingness to Pay a User fee for a State forest recreation visitor facility

The following applies:

Variable Name	Label	Type (width)	Value Codes	Missing codes
Amt	Amt Willing to pay	Dollar	In dollars	
WTP	Resp. willing to pay or not	String	0=Not WTP 1=WTP	
gender	Male or female	String	0=female 1=Male	
Age	Age on April 2011	String	18=31 32-46 >46	
Income	Personal monthly earnings	String	< 5,000 5-15,000 15001-25,000 >25,000	-99*
Education	Primary or University Education	String	0=less than University 1=University	
Timesvisit		Numeric	none	
Motivation	Motivation by family or friends	String	0=friends 1=Family	
Sizegroup	Number in group visiting park	Numeric	None	
Otherpks	Number in group visiting other parks	Numeric	None	

\* See "Missing Values" SPSS Help (simply state the variable and coded values in the text)

**Table 1: Comparison of visitation at some selected national park areas with Quinam Bay Recreation Park 2005-2007**

<b>Site (specific feature/s)</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>
Clever Woods Recreation Park <b>(recreation)</b>	35,000	3500	36,000
Quinam Bay Recreational Park <b>(Recreation, scenic landscape)</b>	150,000	150,000	150,000
Matura Nature Park (Proposed) <b>(National park, recreation)</b>	13,000	16,700	15,000
Aripo Savannas Scientific Reserve <b>(Scientific reserve)</b>	3,200	1,031	760
River Estate Museum and Waterwheel <b>(natural landmark)</b>	6,800	5,000	750
Lopinot Historical Complex <b>(Recreation, scenic landscape, natural landmark)</b>	80,000	55,000	60,000
Fort George <b>(scenic landscape, natural landmark)</b>	32,000	6,000	18,000
Caroni Swamp <b>(National park, scenic landscape, natural landmark)</b>	30,429	20,013	22,131
San Fernando Hill <b>National park, scenic landscape, natural landmark</b>	130,000	140,000	150,000

Source: Pantin and Ram (2010)

**Table 2: Reservations Perceptions**

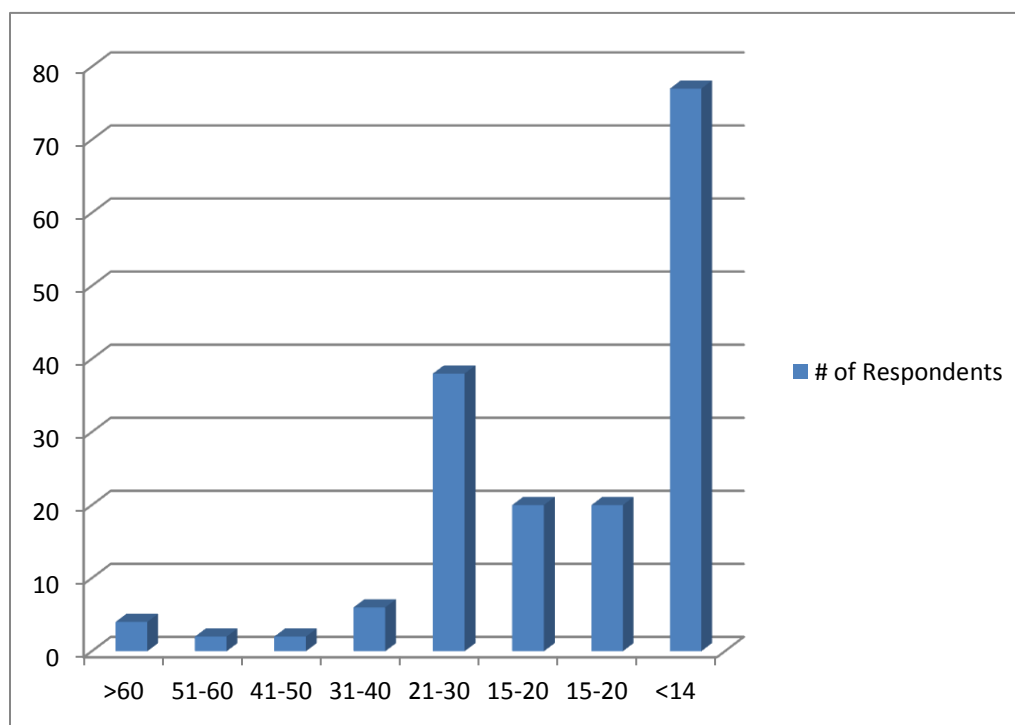
<b>Reservation Questions</b>	<b>% YES</b>		<b>% NO</b>
Overall the reservation process was satisfactory	96		
The reservation process is unnecessary	28.8		30.3
Too much information was requested	21		77

# Yes: (Combination of 'Strongly agree', 'agree' and 'neutral')

# No: (Combination of 'Strongly disagree', 'disagree')

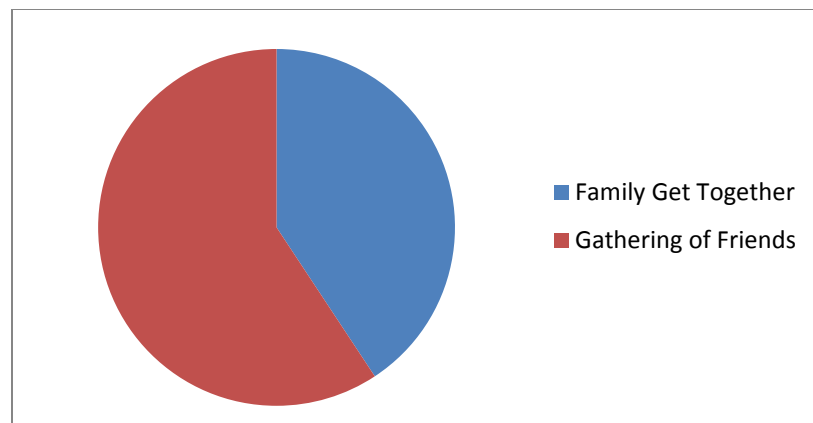
**Table 3: Including Gender, Income, Education, Times visit, Motivation, Predictor variables in the Logistic Regression Equation**

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 1 <sup>a</sup>	gender(1)	-3.116	.942	10.954	1	.001	.044
	Motivation(1)	-2.438	1.081	5.083	1	.024	.087
	Education(1)	-1.293	.999	1.673	1	.196	.275
	Timesvisit	.004	1.046	.000	1	.997	1.004
	Income			4.264	4	.371	
	Income(1)	3.162	1.726	3.358	1	.067	23.620
	Income(2)	.901	1.503	.359	1	.549	2.462
	Income(3)	2.084	1.700	1.504	1	.220	8.037
	Income(4)	19.567	40192.970	.000	1	1.000	3.146E8
	Constant	2.925	2.086	1.966	1	.161	18.625

**Figure 1 Distance (km) travelled by Respondents to the Quinam Site**

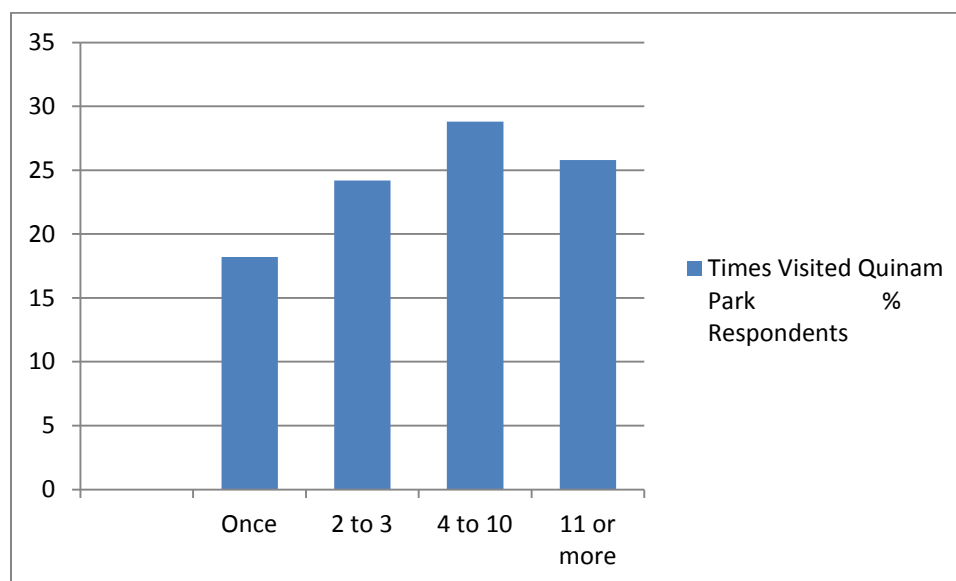
(out of a total of 153 visitors to the facility for 2010, the distance travelled ranged from more than 60 km for only three respondents to less than 14km for 74 respondents)





**Figure 2: Motivations for Visiting Park**

- Family (45%); Friends (55%)



**Figure 3: Respondents' Repeat Visits (18.2%; 24.2%; 28.8%; 25.8% )**

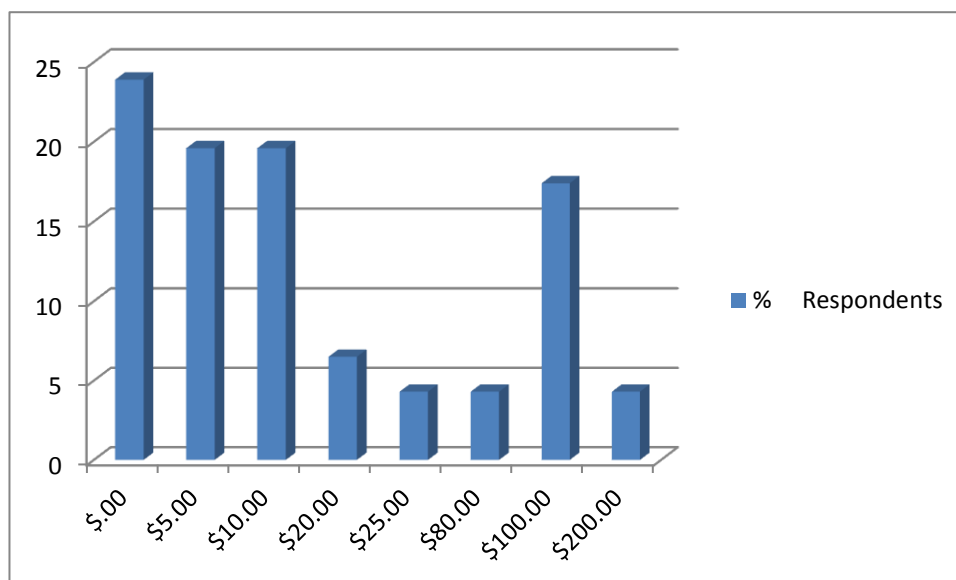


Figure 4: Maximum Amounts Respondents Willing to pay

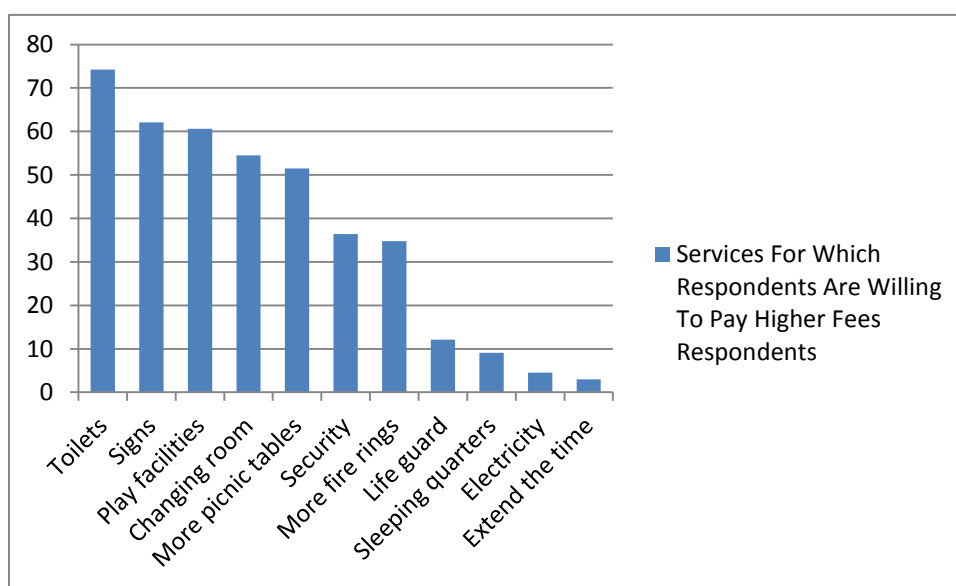


Figure 5: Services for which respondents are willing to pay Higher fees