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APPLICATION OF THE TRAVEL COST METHOD (TCM): A CASE STUDY OF ENVIRONMENTAL VALUATION OF DHAKA ZOOLOGICAL GARDEN

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ABSTRACT

This paper uses the travel cost method (TCM) to determine willingness to pay for the services of the Dhaka Zoological Garden. Every year three to four million people visit the zoo to enjoy both entertainment and educational experiences. In addition, the zoo provides protected habitat for endangered and extinct species and offers opportunities for captive breeding and preservation of genetic diversity. A questionnaire survey was conducted to collect information on visitors and their expenses to visit the zoo. The data were analysed to find out the origin of visitors, distances travelled, income groups represented, and travelling expenses. Visitors were zoned in concentric circles on the basis of distance from site. The willingness to pay per visitor day was calculated from the sample data. Several demand curves were generated using regression analysis to describe the relationship between travel costs and number of visits. Additional information on mode of transport used by the visitors and income groups represented has been compiled. The features that attracted the visitors have been identified and listed. Problems of the zoo as identified during the survey from key informant interviews have been documented and recommendations have been made in the light of the results of this case study. Comments have been made about the potential to apply TCM to other cases in Bangladesh.

DHAKA ZOOLOGICAL GARDEN: AN OVERVIEW

The Dhaka Zoo was first conceived of in 1950 when the former Pakistan Government passed a resolution to establish a zoological-cum-botanical garden in the suburbs of Dhaka. The current site at Mirpur was selected in 1960 and officially designated in 1964. After that, little progress was made during the Pakistan period except moving the tiny zoo that had been located in the High Court Mazar area to the new location. After independence, the zoo was officially opened to the public on June 23, 1974. It is the only major zoological garden in Bangladesh. Its total area is 213.41 acres, with two water bodies, four restaurants, three pagodas, one animal museum and one fish aquarium. Public facilities such as toilets and card phones are available in the premises.

Total visits to the zoo per annum range between two and three million. The zoo provides recreation and education for the visitors by housing a wide variety of common, exotic, rare and endangered species of animals. Captive breeding is carried out for selected species and often surplus animals are offered for private ownership. Reintroduction of species to their natural habitats is also under consideration. The Dhaka Zoo is the only facility in the country for the preservation of animal genetic diversity.

The Dhaka Zoo is operated by the Government of Bangladesh under the jurisdiction of the Ministry of Fisheries and Livestock. The chief of the zoo is the Curator (Deputy Secretary rank), who is accountable to the Director General (DG). The DG communicates with the Ministry when higher level decisions are required. The zoo has a workforce of 213 regular employees in addition to temporary day labourers and 20 Ansars (security people). The types of creatures housed in the Zoo are summarized in the following table.

Table 1: Zoo creatures by category

	Number of Species	Total Number
Mammal	69	570
Reptile	14	49
Bird	96	915

The annual operating budget of the zoo is between 15 and 20 million (1.5 and 2 crore) taka. About half of this is spent for salaries and the rest for food and care of the animals (7 to 8 million, or 70 to 80 lakh) and miscellaneous expenses (1 to 1.5 million, or 10 to 15 lakh). The zoo generates a major portion of its revenues from entry fees, parking, and rent for the restaurants inside the zoo, which are leased through open tenders. From these sources, the zoo may generate about 15 million (1.5 crore) taka. In the 1996-97 period, entry fees generated 12 million (1 crore 20 lakh) taka. The zoo also makes some money from selling poultry, fish and fruits grown inside the facility. The remaining expenses are subsidised by the government.

This subsidy, as well as the fact that the zoo occupies 214 acres of high-value land in close proximity to Dhaka, raises the question of the economic justification for the zoo. For this reason, we are interested in estimating its actual value to the visitors. Such a valuation exercise can influence policy decisions on future allocation of funds for the development of the zoo. Like most other public recreational facilities around the world, the Dhaka Zoo offers an array of environmental, ecological, zoological and recreational services whose value is not reflected in the small entry fee charged to its visitors (Tk. 5.00 per person per visit). A valuation study on the Dhaka Zoo is therefore a useful exercise, an important input to national accounting, and an aid to policy makers and development planners.

TRAVEL COST METHOD (TCM): AN OVERVIEW

Several methods of valuing environmental goods and services have evolved in recent years. One of them, the travel cost method (TCM) has been used extensively around the world to value public recreation sites with minimal or no admission charges. TCM is now well established as a technique for valuing the non-market benefits of outdoor recreation resources (Hanley and Spash, 1993). It originated in a letter from Harold Hotelling to the director of the US Park Service in 1947, but was formally introduced in the writings of Wood and Trice (1958) and Clawson and Knetsch (1966). The method is often referred to as the Clawson-Knetsch approach. Numerous applications exist in the US, Europe, and Australia. In the USA, government agencies have used it to model demand for national parks, national forests and other recreational facilities. In the UK, the Forestry Commission have started to use it quite extensively (Willis and Benson, 1989). In recent years, several studies have been conducted in developing countries, such as Kenya, Costa Rica, Madagascar, and Thailand (Markandya, 1992).

The travel cost approach is based on the theory of consumer demand. The fundamental principle of TCM is that the value people attach to a location of environmental significance can be inferred from the cost they incur in travelling to it. Value is placed on non-marketed environmental goods by incorporating the patterns of consumption in related markets. Such costs of consuming the services of an environmental asset include travel costs, entry fees, on-site expenditure, outlay of capital expenditure necessary for consumption, and the opportunity cost of time. The method assumes a complementarity between an

environmental asset and consumption expenditure, and thus can also be applied to determine the marginal utility of quality improvements. Therefore, if consumption expenditure becomes zero, the marginal utility also becomes zero. For example, if the travel cost to a national park becomes so expensive that the number of visitors is zero, then the marginal social benefit of an increase or decrease in quality is also zero. TCM has also been applied to determine the willingness to pay (WTP) for sites where the cost of visiting substitute sites is also taken into account.

In general, the total cost for each individual "i" to visit a given site "j" can be represented by the following function (Hanley and Spash, 1993):

$$C_{ij} = C(DC_{ij}, TC_{ij}, F_j) \text{ where, } i = 1 \dots n$$

where C_{ij} = Total cost for individual "i" to visit site "j".

DC_{ij} = Distance costs for each individual dependent on the distance the person has to travel and the cost per mile of travelling.

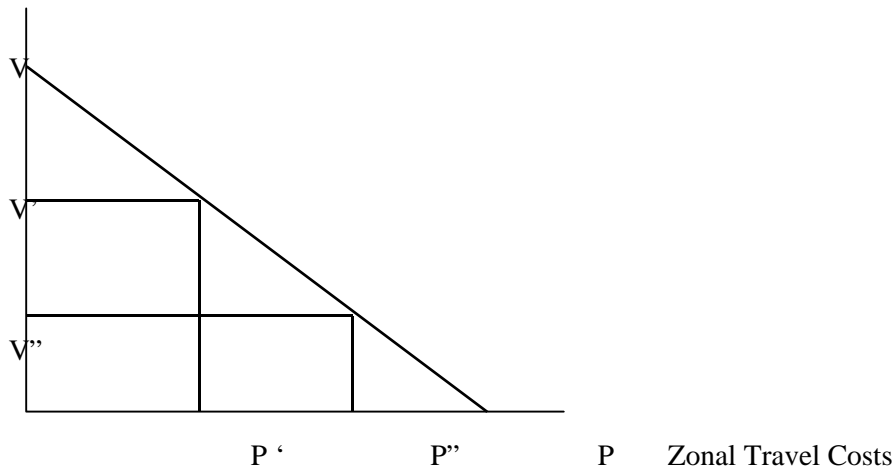
TC_{ij} = Time costs which include the time spent in travelling to the site, the time spent inside the site and the value of the individual's time.

F_j = Entrance fee to the site

Wood, Trice, Knetsch and Clawson used an approach to TCM known as the zonal model. In this approach, the area around the site is divided into several zones and travel costs for each zone are calculated to generate the demand curve. Typically the surrounding area of the site is divided into concentric circles of specified distance with some reference to the administrative districts. The demand curve is estimated by regressing the number of visits from each zone against the travel costs. People's willingness to pay for the given site is expressed as cost per visitor day. Another model for generating the demand curve is to take the number of visits made by each individual as the dependent variable, rather than number of visits per zone (Hanley and Spash, 1993.) In this case study the zonal model has been used.

In order to estimate willingness to pay for an increase in quality for a site, a trip generating function (TGF) is used where number of visits from each zone is divided by the zonal population as the dependent variable. The TGF is used to derive the demand curve, which shows the number of visits in relation to a change in price. In any case, the key assumption is that, as the travel costs increase, the number of visits falls. A typical TCM demand curve is shown below:

Visits to site j



In the above graph, we see that as cost per visit increases, the number of visits decreases. At price P, the cost of travel will be so high that no one will visit the site.

METHODOLOGY

Literature Review

A comprehensive literature review was carried out at local libraries. Results and experiences of similar case studies from around the world were studied and the methodology for this specific case study was developed. Official documents and other related literature regarding the features, attributes and services of the Dhaka Zoo were collected.

Field Survey of Visitors of the Zoo

The TCM requires information about the visitors to a recreational site. This information was collected by conducting an on-site survey of visitors to the Dhaka Zoo. The survey questionnaire, prepared in both Bengali and English, asked about origin of the visitors, mode of transportation used, travel expenses, miscellaneous expenses at the site, income group, time spent at the zoo and other data required for the travel cost analysis. Experienced surveyors were hired to carry out the task under direct supervision of the author. A sample size of 1,000 was selected. However, the actual survey produced information on 2347 visitors, as single questionnaires were used to interview groups with one earning member. The survey was carried out in the third week of October over seven days, to account for variations in the composition of visitors on weekdays and weekends. The time of year represents an average season in terms of the number of visitors. Random sampling of the visitors was done throughout the day to capture variations in the origin of visitors at different times of the day.

Key Informant Interviews

Key informant interviews were conducted with the Curator of the zoo to extract information about the budget, expenses, current problems, future development plans and major constraints of the zoo.

Representatives of the contractors who operate the admissions booths were also interviewed to extract information on the number of visitors during the sampling period.

ANALYSIS

Data from the questionnaires were entered into a spreadsheet to calculate travel costs for each visitor. Administrative districts of the Government of Bangladesh were selected as the computation level for the zonal model. Number of visitors per district, income groups represented by the visitors and travel costs were calculated. Measures were taken to minimize the common biases of the TCM. The sample included visitors from 58 out of the 64 administrative districts. Distances have been taken from the mid-point of the districts concerned to the mid-point of Dhaka district. A summary of the data by district is given in Table 2.

Table 2: District wise travel costs and other TCM related data

District	Number of Visits	Distance from Site	Population	Travel Cost
Bagerhat	11	370	1489250	813.03
Bandarban	6	338	246301	662.50
Barguna	5	361	804964	399.22
Barisal	42	277	2299382	514.38
Bhola	13	317	1532361	516.38
Bogra	35	228	2798798	536.43
Brahmanbaria	28	102	2267632	253.71
Chandpur	40	169	2149820	363.56
Chapai Nawabganj	6	320	1231596	402.96
Chittagong	76	264	5743969	724.71
Chuadanga	2	267	843981	438.89
Comilla	35	97	4263538	341.68
Cox's Bazar	2	415	1502067	821.67
Dhaka	1210	0	6163045	101.41
Dinajpur	8	414	2371183	599.58
Faridpur	78	145	1558211	372.03
Feni	16	151	1158117	502.99
Gaibandha	27	301	2040940	733.31
Gazipur	39	37	1682990	195.09
Gopalganj	5	232	1097003	645.00
Habiganj	14	179	1611334	799.69
Jamalpur	23	187	1942752	266.29
Jessore	27	273	2192138	706.05
Jhalakathi	6	290	694071	812.96

Jheneidah	18	228	1419759	508.95
Joypurhat	7	280	801903	576.71
Khulna	23	335	2130373	474.54
Kishorganj	15	140	2388348	312.70
Kurigram	11	394	1680660	449.19
Kushtia	17	277	1562504	418.37
Lakshmipur	8	216	1391324	314.44
Madaripur	4	220	1106551	251.25
Manikganj	21	68	1216763	238.61
MouloviBazar	9	214	1454000	824.81
Munshiganj	17	27	1229389	221.27
Mymensing	30	122	4096486	493.75
Naogaon	4	233	2250600	605.03
Narail	8	307	681800	605.03
Narayanganj	70	17	1818944	327.13
Narshindi	15	52	1709992	123.37
Natore	6	223	1455197	287.96
Netrokona	10	159	1790785	741.28
Noakhali	19	191	2347010	632.71
Pabna	45	161	2016627	513.68
Panchagar	4	494	745978	700.69
Patuakhali	24	319	1322662	623.00
Pirojpur	7	304	1103894	273.73
Rajbari	8	136	865556	213.88
Rajshahi	6	272	1988061	573.31
Rangpur	72	335	2269516	765.03
Satkhira	10	343	1659911	949.61
Shariatpur	15	238	986027	389.04
Sherpur	10	203	1178921	395.56
Sirajganj	21	142	2373912	418.12
Sylhet	34	278	2281903	1216.96
Tangail	20	98	3108085	202.67
Thakurgaon	2	459	1059522	649.72
Foreign	3			

Zonal Model: Actual Visits

The zonal data model was developed using concentric circles at 50 km intervals from the site. This resulted in 10 different travel zones. Data for foreign visitors have been ignored in the analysis. The total number of visitors to the site over the seven day survey period was 82,200. Therefore the sample can be converted to real data by multiplying the observed number of visitors by a factor of $(82,200/7)/2344 = 5$. The TCM data compiled for these zones are shown in Table 3.

Table 3: Zonal model of the TCM analysis

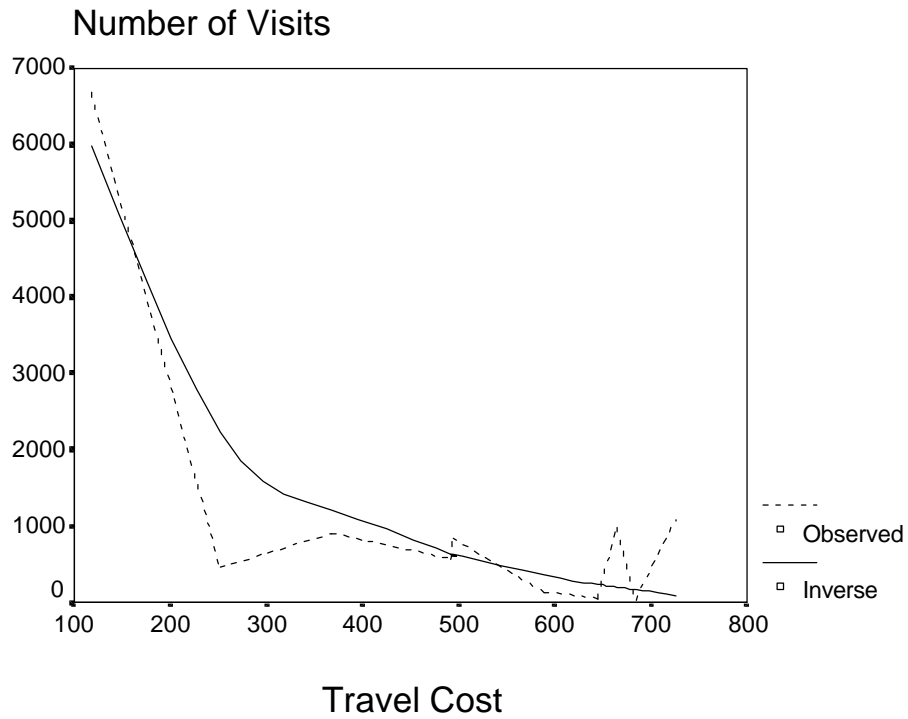
Zone	Distance from site (km)	Population (P)	Observed Number of Visits (V)	Actual Number of Visits (V _R)	Travel Cost (Taka)
A	0 - 50	10894368	1336	6680	117.50
B	51 - 100	10298378	91	455	251.36
C	101 - 150	13550145	180	900	367.32
D	151 - 200	13016445	167	835	493.77
E	201 - 250	15890298	114	570	491.62
F	251 - 300	19284801	217	1085	725.65
G	301 - 350	16451892	196	980	663.81
H	351 - 400	6390108	27	135	588.17
I	401 - 450	3873250	9	50	644.00
J	451 - 500	1805500	6	30	683.70

Statistical regression was carried out on the zonal model with the actual number of visits (V_R) as the dependent variable. The output shows the results of fitting a curve to describe the relationship between zonal travel costs and number of visits. The results of the regression are shown in Box 1. A plot of the fitted model of the demand curve generated through the regression is shown in Figure 1.

Box 1

Dependent variable.. VISITS		Method.. INVERSE			
Multiple R	.91814				
R Square	.84298				
Adjusted R Square	.82335				
Standard Error	829.84057				
<u>Analysis of Variance:</u>					
	DF	Sum of Squares	Mean Square		
Regression	1	29575877.0	29575877.0		
Residuals	8	5509083.0	688635.4		
F =	42.94853	Signif F =		.0002	
<u>Variables in the Equation:</u>					
Variable	B	SE B	Beta	T	Sig T
TC	826331.073161	126089.7930	.918139	6.554	.0002
(Constant)	-1048.424909	428.554286		-2.446	.0402

Figure 1: Demand curve of visits to the Dhaka Zoo



Equation of the curve:

$$\text{Number of Visits} = 826331.073/\text{Travel Cost} - 1048.43$$

Zonal Model: Visits per Population

The demand curve in Figure 1 is biased by the fact that the furthest zones falling in the outermost circles may include areas outside of the national boundaries. To account for this, visits per population were calculated for the above zones as shown in Table 4.

Table 4: Visits per population from different travel zones

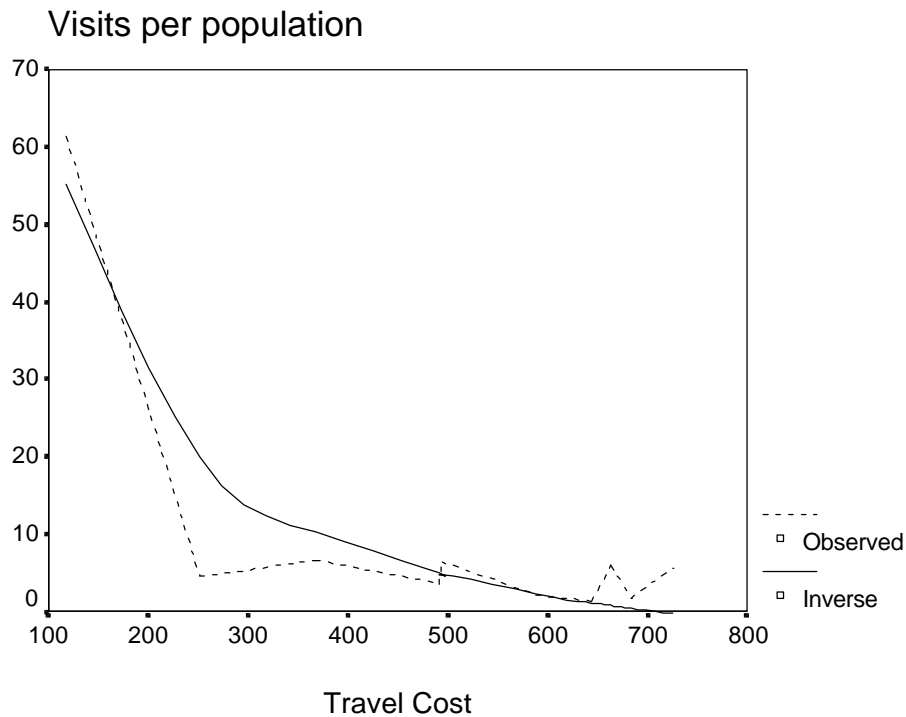
Zone	Distance from site (km)	Population (P)	Actual Number of Visits (V _R)	V _R /P (x.00001)	Travel Cost (Taka)
A	0 - 50	10894368	6680	61.32	117.50
B	51 - 100	10298378	455	4.42	251.36
C	101 - 150	13550145	900	6.64	367.32
D	151 - 200	13016445	835	6.41	493.77
E	201 - 250	15890298	570	3.59	491.62
F	251 - 300	19284801	1085	5.63	725.65
G	301 - 350	16451892	980	5.96	663.81
H	351 - 400	6390108	135	2.11	588.17
I	401 - 450	3873250	50	1.29	644.00
J	451 - 500	1805500	30	1.66	683.70

The regression was carried out on the zonal model with the actual number of visits (V_R) per population as the dependent variable. The output shows the results of fitting a curve to describe the relationship between zonal travel costs and V_R /P. The regression results are shown in Box 2 and the plot of the fitted model of the demand curve generated through the regression is shown in Figure 2.

Box 2

Dependent variable.. VAR00001		Method.. INVERSE			
Multiple R	.93762				
R Square	.87912				
Adjusted R Square	.86401				
Standard Error	6.70245				
<u>Analysis of Variance:</u>					
	DF	Sum of Squares	Mean Square		
Regression	1	2613.7577	2613.7577		
Residuals	8	359.3831	44.9229		
F =	58.18321	Signif F = .0001			
<u>Variables in the Equation:</u>					
Variable	B	SE B	Beta	T	Sig T
VAR00002	7768.155863	1018.401679	.937616	7.628	.0001
(Constant)	-10.970724	3.461346		-3.169	.0132

Figure 2: Demand curve of visits per population to the Dhaka Zoo



Equation of the curve:

$$\text{Number of Visits per Population} = 7768.15/\text{Travel Cost} - 10.97$$

Zonal Model: Travel Cost Ranges

The demand curves in Figure 1 and 2 are both biased by the fact that more than half of the observed visitors (1336) came from the first travel zone. This is because 1210 of the visitors surveyed came from Dhaka city to visit the zoo. To account for this bias, a separate analysis was carried on the entire dataset where travel costs were divided into ranges. The range intervals were determined by looking at the histogram and frequencies of the data. Data on the number of visits for different travel cost ranges are given in Table 5. We call this the travel cost ranges model.

Table 5: Number of visits to the zoo for different travel cost ranges

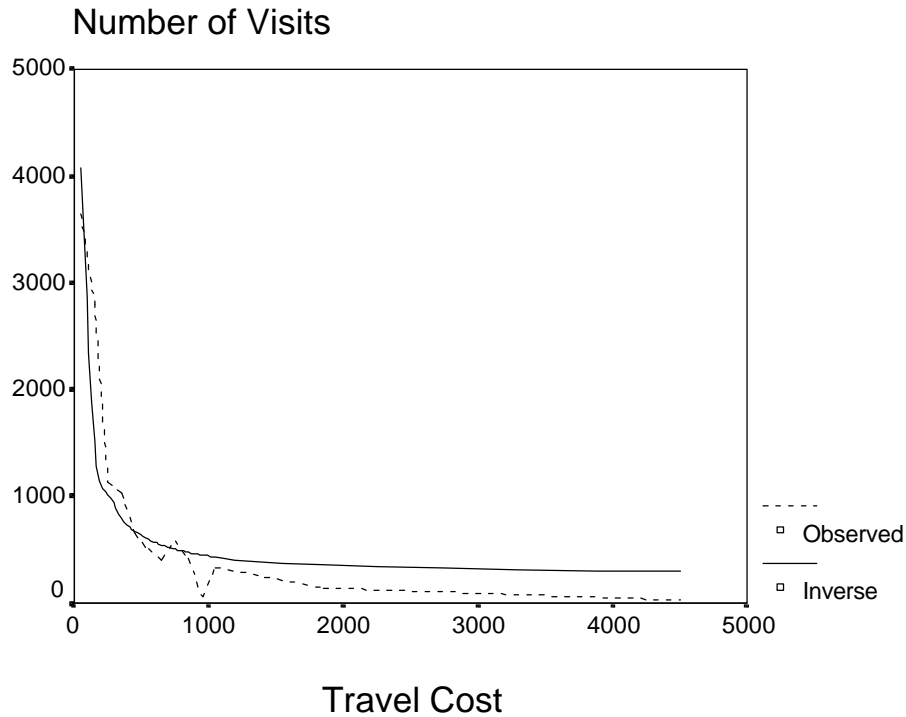
Travel Cost Range	Travel Costs at Mid-point	Observed Number of visits V_1	Actual Number of Visitors V_2
0 to 100	50	729	3645
101 to 200	150	561	2805
201 to 300	250	227	1135
301 to 400	350	206	1030
401 to 500	450	130	650
501 to 600	550	100	500
601 to 700	650	81	405
701 to 800	750	117	585
801 to 900	850	83	415
901 to 1000	950	11	55
1001 to 1100	1050	66	330
1101 to 2500	1850	28	140
2500 to 6500	4500	5	25

The regression was carried out on the travel cost ranges model with the actual number of visits (V_2) as the dependent variable. The output shows the results of fitting a curve to describe the relationship between V_2 and travel costs at the mid-point of the ranges. The results of the regression are shown in Box 3 and a plot of the fitted model of the demand curve generated through the regression is shown in Figure 3.

Box 3

Dependent variable.. VISITS		Method.. INVERSE			
Multiple R	.91995				
R Square	.84630				
Adjusted R Square	.83233				
Standard Error	448.87468				
<u>Analysis of Variance:</u>					
	DF	Sum of Squares	Mean Square		
Regression	1	12203895.9	12203895.9		
Residuals	11	2216373.3	201488.5		
F =	60.56870	Signif F =	.0000		
<u>Variables in the Equation:</u>					
Variable	B	SE B	Beta	T	Sig T
TC	191371.791961	24589.73147	.919946	7.783	.0000
(Constant)	248.220862	150.153427		1.653	.1265

Figure 3: Demand curve of visits to the Dhaka Zoo for different travel cost ranges



Equation of the curve:

$$\text{Number of Visits} = 191371.79/\text{Travel Cost} + 298.22$$

This demand curve is biased by the fact that the fitted curve differs significantly from the observed data on the right end. This may be corrected by replacing the constant (298.22) with the observed lowest value (25).

ASSUMPTIONS TO ELIMINATE TCM BIASES

The travel cost method has some common biases which were accommodated in the calculation of travel costs for each individual. The value of time has been taken as one-third of the regular wage (McConnell and Strand, 1981; Markandya, 1992). Also, time spent inside the zoo by visitors has been recorded and incorporated in this calculation. Sometimes visitors come to Dhaka for multiple purposes – one of them being to visit the zoo. In this case, the cost of travel and the discounted cost of time been halved for purposes of the analysis. It may also be noted that statistically the dependent variable is truncated since only visitors to the site have been sampled and no information was available on the determinants of the decision to visit the site. The calculation of time cost may also be biased by two facts. First, one-third of the daily wage has been used based on TCM studies carried out elsewhere in the world and may not be correct. Second, there are no plausible alternate sites on which to base opportunity costs. To account for this bias, willingness to pay was also calculated without considering the opportunity cost of time. Both results have been given to enhance the scope of this report for future use.

SUMMARY OF FINDINGS

The survey and analysis have produced the following findings:

- People's average willingness to pay for the services and attributes of Dhaka Zoo as derived from the sample data is:

Willingness to pay (WTP) = Tk. 300.64/- (App. US \$ 6.46/-) per visitor day

1 US Dollar = 46.55 Taka (as of April 29, 1998)

According to the 1995 exchange rate, WTP = US \$ 7.46 per visitor day

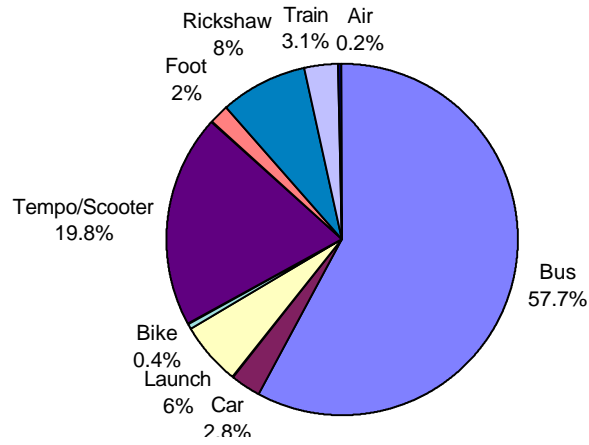
- Average number of visitors per day = 11,743
- Total number of visitors per year = 4,286,195
- Revenue from gate ticket = 21,430,975 Taka
- Yearly willingness to pay by consumers based on this study = 1,288,601,665 Taka
- Yearly willingness to pay by consumers for the features and services per acre of land in the zoo = 6,021,503 Taka
- People's average willingness to pay for the services and attributes of Dhaka Zoo as derived from the sample data without considering the opportunity cost of time is:

Willingness to pay (WTP) = Tk. 267.91/- (App. US \$ 5.76/-) per visitor day (1 \$US = 46.55 Taka)

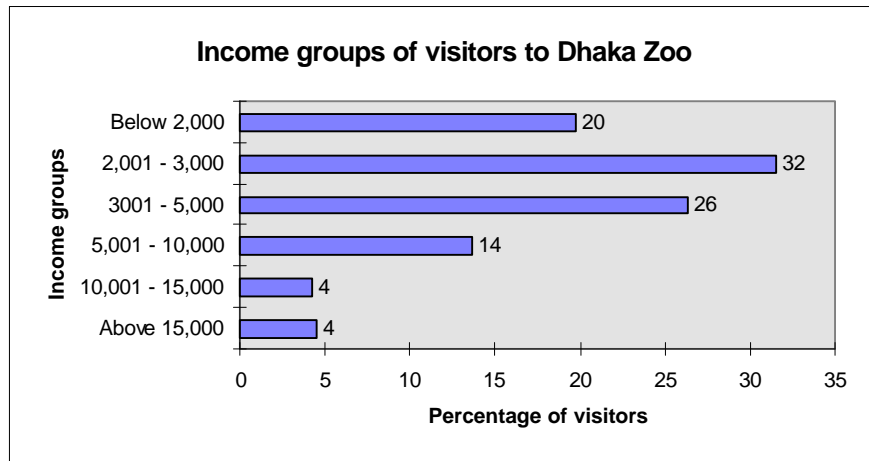
Adjusted for purchasing power parity, this would be equivalent to a willingness to pay of \$US 51.47 per visit.

The zoo primarily serves the people of Bangladesh and more specifically the people of Dhaka city. 52% of the visitors sampled were from Dhaka followed by Faridpur, Chittagong, Rangpur, and Narayanganj – each claiming about 3%. Only 3 visitors (0.12%) sampled were expatriates. The primary mode of transportation used is bus. The breakdown by mode of transportation is shown in Figure 4.

Figure 4: Mode of transportation used by the visitors of Dhaka Zoo



The zoo is a main source of entertainment to people belonging to lower income groups. 78% of the visitors of the zoo have monthly income less than Taka 5,000 (US \$ 107). The different income groups represented by the visitors of the zoo are shown below:



People visit the zoo to enjoy a variety of features. The survey revealed the consumers preferences about the features and services of Dhaka zoo as shown in Table 7.

Table 7: Consumer Preferences for Zoo Features

Feature/service of attraction	Percentage of visitors	Actual Number of visits per year
All	62.39	1135150
Bear	0.60	10950
Birds	2.21	40150
Camel	0.20	3650
Chimpanzee	0.40	7300
Crocodile	0.60	10950
Deer	0.70	12775
Dolphin	4.71	85775
Elephant	0.40	7300
Fish	0.20	3650
Giraffe	1.50	27375
Gorilla	0.50	9125
Hippo	2.21	40150
Horse	0.10	1825
Lion	1.40	25550
Monkey	1.30	23725
Nature	0.60	10950
New	8.53	155125
Porcupine	0.10	1825
Recreation	1.81	32850
Rhino	0.30	5475
Snake	0.50	9125
Tiger	7.92	144175
Zebra	0.80	14600

Visits to the zoo and interviews with zoo officials and visitors revealed several problems that need to be addressed to improve the operation and attractiveness of the zoo. Most of these problems are related to budget allocation issues. These include:

- The entry fee is too low and does not generate any surplus for financing the development plans for the Zoo.
- The Ministry puts low priority on the zoo and bureaucratic processes necessary for planning and development are too complicated.
- The allocation for procuring new animals is scanty; in the current development plan, only 5.8 million (58 lakh) taka have been allocated.
- The budget for developmental activities is inadequate. The 60 million (6 crore) taka development plan currently underway will alleviate some of the problems

- Living conditions of the animals are not satisfactory - cages looked small and dirty, food quality and health care arrangement appeared to be inadequate. No animal waste disposal facility was observed.
- Many of the signs and notices in the zoo are damaged or illegible. They should be renovated in both Bengali and English.
- There are only two poorly maintained rest rooms for women and children.
- There are occasional security problems within the zoo, as its manpower is limited.

RECOMMENDATIONS

The zoo has great potential as a holiday and recreational site. The Curator, Dr. Afsar Ali is very hopeful that some of the potentials mentioned below will be explored soon, such as renovating the children's park. Others, such as those suggested below for future development plans, will require long term commitment by the government.

- The entry fee to the zoo may be raised to 10 taka. This would immediately generate enough additional revenue to cover the operating and maintenance expenses of the zoo. This study suggests that people would be willing to pay a much higher price for the zoo.
- Since visitors to the zoo come from a variety of income groups, the zoo may consider developing several levels of service with progressively higher fees. The simplest option is to allow the visitor a self guided tour. The next level may include a briefing at the information center with a documentary on the zoo that will help the visitors make a better plan. At the third level, the package may include a fully guided tour along with refreshments. The idea is to cater to the needs of the visitors of differing socio-economic and cultural backgrounds.
- Additional funds for maintenance and renovation may be allocated to improve the quality of the facilities of the zoo.
- Introduce luxury bus service within Dhaka City to get to the zoo. The busses currently in operation are less likely to attract people of higher income groups. Also, offer package tours in collaboration with travel agencies for large groups and distant visitors. The study findings indicate that people are willing to pay a high enough price to render these feasible.
- Currently the zoo houses only 14 species of reptiles and one fish aquarium. The zoo should expand in both these areas, especially in aquatic and marine creatures. They are not easily visible in their natural habitats, so introduction of such species should attract a large number of new visitors. According to the survey, only 0.2% and 0.5% of the visitors to the zoo consider fish and reptiles of the zoo as the main feature of attraction.
- Finally, the information in this study on willingness to pay, composition of visitors by income, mode of transportation used, and features of attraction should be used in the national budget, in preparing development plans for the zoo, in identifying areas of weaknesses, and in assessing the benefits derived from the Dhaka Zoological Garden.

CONCLUSIONS

The Dhaka Zoo can be a major holiday attraction to the millions of people who visit it every year. Because of resource constraints and bureaucratic complications, however, its development has been hindered for too long. The time has come for major restructuring, to develop the zoo as a self-sustaining nature conservation project.

This case study produces interesting information about the value people attach to Dhaka Zoological Garden. While the entry fee remains at Tk. 5.00 per visit, people's WTP is Taka 300.64, about 60 times higher. This provides economic justification for the government planners to place a higher priority on the maintenance and development of this site.

This case study may serve as a reference for other similar studies in the future. Comparative studies of the national parks and other recreational sites around Dhaka city will provide interesting information. Case studies to determine people's willingness to pay for quality improvements of these environmental goods will also be useful.

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