

Research Paper

**WILLINGNESS TO PAY FOR LOCAL RESIDENTS OF LAHORE CITY FOR
PRESERVATION AND ECOTOURISM VALUE OF RIVER RAVI**

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Abstract

Present study estimated the willingness to pay (WTP) of the residents of Lahore city, Qasoorpura, Farakhabad & Taragarh, Shahdara and on site visitors for the conservation of River Ravi. Reconnaissance survey of the site was initially made to document the prevailing threats to the site and later on a contingent valuation based questionnaire was designed and was conducted in the selected sites. Questionnaire was a mix of open ended and closed-ended questions to probe respondent's perceptions, attitudes and behaviors towards preservation of River Ravi. Data was collected via face to face interviews from a sample of 300 respondents in the age group of 18 - 70 years. Out of 300 respondents, 263 were males and 47 were females. The results showed that 117 (39%) of the respondents visited River Ravi with their friends and 8 (2.7%) visited alone, maximum respondents i.e. 145 (48.3%) wanted to use Kamran Baradari's green spaces for recreational purposes and only 8 (2.7%) perceived it to be used for holding musical festivals. Out of 300 respondents, 299 were strongly in favor of preservation of River Ravi's landscape and especially green spaces. Out of total 300, only 159 (53%) were willing to make one-time donation for preservation of River Ravi. Mean WTP calculated for River Ravi was PKR 149. Out of total, 110 respondents opted that provincial government should manage this site and only 4 (1.3%) wanted that federal government should manage this site. The study concluded that there is strong urge in people to see River Ravi as a healthy and thriving ecosystem therefore a plan of establishing a river greenway at River Ravi has been proposed.

Key words: Preservation, River Ravi, Green spaces, Recreational and ecosystem.

INTRODUCTION

The Lahore city that contains unique traditions was founded on the name of Prince Lava who was the son of Rama. The Lahore city is located between 31°15'—31°45' to north and 74°01'—74°39' to east longitude.

The Lahore city is expanding day by day and existing green spaces are shrinking. The urban sprawl is major cause of city expansion so invading green spaces and reducing the remaining ones (Mazhar & Jamal, 2009). 1307.08 tons of waste materials are added on the daily basis in

river Ravi. The rivers contain the native animal and plant species on the banks. As the rivers have major native vegetation so it is maintained over the years. There is linkage between active flood plains and wetlands to maintain ecological processes. The Ravi has been transformed into 'Dead River' due to dumping of sacrificial meat, industrial waste and sewage of local communities. Many plant species has been destroyed and aquatic fauna and flora lost. Untreated waste is added daily into the river which highly pollutes the water and then joins Bulloki head works. The water in the river cuts recreation as vegetation reduces and flora diminished. The unplanned growth on banks, cultivation of river bed for crops and grazing for buffaloes are main causes of unplanned growth. It is need of hour, to promote public involvement in preserving the river Ravi (Khan, 2004). There are principles for riparian right that the upstream water users should not damage the water uses of downstream so mostly the pollution of water arise from different angles (Embid, 2003). Riparian area is located between terrestrial environment and water bodies of rivers so the interactions between these areas are site specific. The studies show that river Ravi was irrigated most of fertile lands of Lahore area but the unplanned forces of population growth reduces its normal size to very small land which also degraded most of fertile lands of world (Clive et al. 2006).

The study was conducted to develop strategies for management of riparian vegetation. The riparian vegetation provides buffer against floods to the city population on any disaster occurrence (Du & Wang 2012). So, as a result, provides benefits in case of ecologically and economically sustainable solutions.

It is necessary to conduct this study because River Ravi is highly degraded with heavy loads of pollution from upstream areas and within vicinity of Lahore city. Riverine vegetation and natural forests are almost vanished at the banks of River Ravi. Anthropogenic activities, urbanization, water scarcity and drainage of polluted water are major factors responsible for degradation of this historical river witnessed thousands of years.

Analyzing the present status of green spaces at river Ravi and determine different activities that should be stopped to conserve the river landscape. The recreation and visits and economic benefits achieved by the conservation of river Ravi's different entities. The aim of study was to determine the socio- economic and demographic characteristics of respondents dwelling in different parts of Lahore city and near River Ravi and elicit their choices to conserve green spaces of river Ravi. By using Contingent Valuation Method determine the willingness to pay for conservation of River Ravi.

METHODOLOGY

GENERAL SURVEY OF RIVER RAVI

A general survey of River Ravi was conducted in order to observe the present conditions of site. The study area was assessed by images taken and visual observations. Personal interviews were made from boat men and canteen owner to observe the people's interests in visiting River Ravi place in present conditions. Initially a survey to Ravi National Park at Saggian Bridge was made.

Contingent Valuation Based Survey

The survey was conducted and data was collected to those people who came there for enjoying leisure time. The questionnaires were conducted from people who were at River Ravi. The respondents were from different parts of Lahore city but they were included in conducting questionnaires. Some people came there with families but others were in groups and friends.

SURVEY DESIGN FOR QUESTIONNAIRE

Data regarding the stakeholders' willingness to pay for preservation of five study sites was collected from individuals of Lahore City, Taragarh, Shahdara, Qasoorpura, River Bridge and Kamran Bara Dari. By using the following sample selection formula given by Kasely and Kumar (1989) and Brase and Brase (1995), a sample size of 400 individuals was calculated:

$$n = (Z/h)^2 \times PQ$$

Where

n = size of the sample

Z = confidence level (normal variate) with 95% error limit

h = accepted margin of error in the estimates (5%)

Probability of success is represented by P and of failure by Q which is taken as 50% for each.

$$n = (1.96/0.05)^2 \times (0.65)(0.25) = 288.16$$

Sample size of 300 individuals was taken as per convenience. Then did a simple random sample of $f = n/N$ in each strata. Stratified random sampling generally has more statistical precision than simple random sampling.

Sample Population

The sample population was divided into 5 study sites e.g. Taragarh, Shahdara, Qasoorpura, River Bridge, Kamran Bara Dari and Lahore city. This was done by dividing population into groups (i.e. N_1, N_2, N_3, N_4, N_5 such that $N_1 + N_2 + N_3 + N_4 + N_5 = N$

Where

N_1 = **Residents** (The group of individuals present on the 1st study site i.e. Lahore city)

N_2 = **Visitors** (The group of individuals present on the 2nd study site i.e. River Ravi's Brdge and Kamran Bara Dari)

N_3 = **Residents** (The group of individuals present on the 3rd study site i.e. Taragah)

N_4 = **Residents** (The group of individuals present on the 4th study site i.e. Qasoorpura)

N_5 = **Residents** (The group of individuals present on the 5th study site i.e. Shahdara)

Sampling Units and Survey Design:

The sampling unit of the questionnaire based survey was an individual's who not less than 18 years of age was. The contingent valuation questionnaire was conducted from individuals from the sample population of 300 respondents. Five study sites near the study area i.e River Ravi, were selected to conduct the questionnaire.

The study sites included Taragarh, Shahdara, Qasoorpura, Kamran Bara Dari and Ravi Bridge Lahore city

From each of these four sites, 50 questionnaires were conducted. While, 100 questionnaire were filled from Lahore city residents.

SURVEY INSTRUMENT

The survey instrument was a semi structured contingent valuation questionnaire comprised of mostly closed ended and questions along with few open ended questions.

QUESTIOAIRE DESIGN

The major goal of the contingent valuation based questionnaire was to evaluate individual's willingness to pay for preserving River Ravi's green ways. The questionnaire contained different sections i) Socio- economic and demographic characteristics of respondent ii) Perception of respondent about green way iii) Use Value of River Ravi iv) Non- Use Value of River Ravi v) Willingness to pay for preservation of River green way. Total numbers of items included in the questionnaire were 49.

Socio-Economic and Demographic Characteristics of the Respondents

The first part of questionnaire is the socio- economic and demographic characteristics of respondent for collecting personal information. This section probes information about the person's gender, highest qualification, monthly income, employment status, occupation and family size etc.

Perception of respondent about River Green way

This section investigates about the personal perceptions about green way. In this section they were asked about their knowledge about green spaces, benefits, temperature reduction, riverine vegetation, Kamran Bara Dari, aesthetic beauty and recreation, land use, slums, and water quality of river Ravi.

Use Value of River Ravi

This section investigated from respondents about various uses of river Ravi e.g. visits, fishing, activities at Kamran Bara Dari, and sand mining

Non-Use Value of River Ravi

This section included questions about River Ravi's existence value, option value, altruistic value, and bequest value of River Ravi.

Willingness to Pay for Preservation of River Ravi

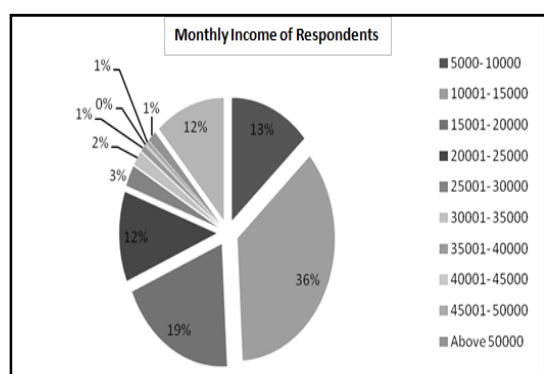
This part probe's the respondents willingness to pay for preserving river Ravi and river green way. Payment card elicitation format for WTP was used. The bid amounts were PKR 100, PKR 200, 300 PKR 400, PKR 500, above 1000 PKR. The individuals who were not willing to pay were asked for their motives of refusal.

RESULTS

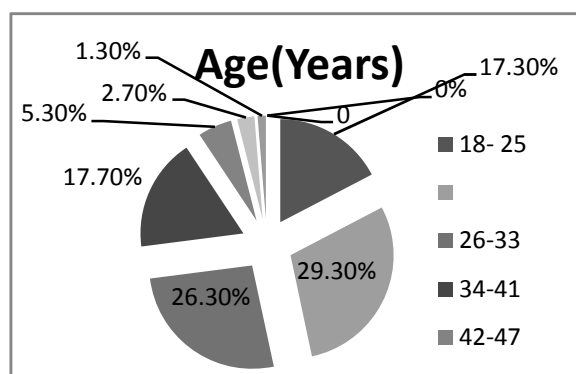
DESCRIPTIVE ANALYSIS OF THE QUESTIONNAIRE DATA

Demographic and Socio-Economic Characteristics of the Respondents

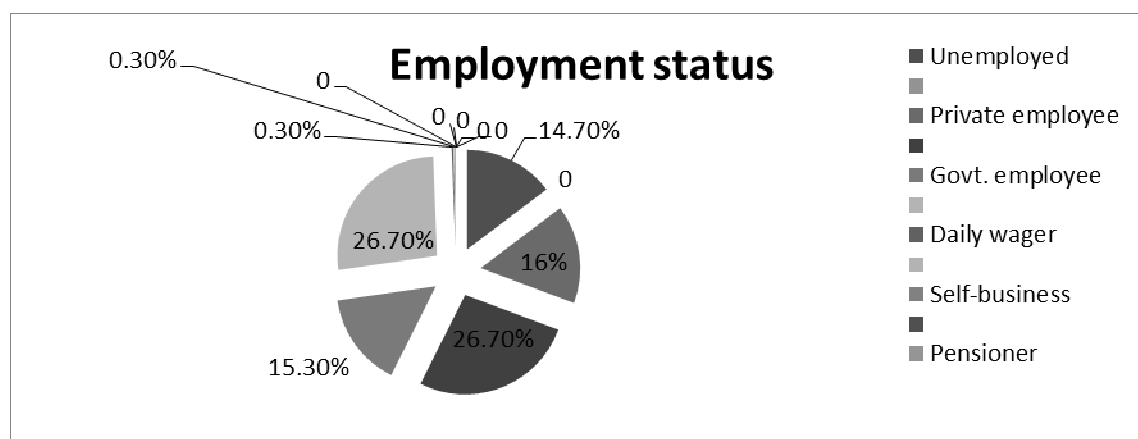
This is the first section of the questionnaire and shows the personal information of the respondents comprising of age, gender, education, marital status, household size and employment status. Out of the 300 respondents that were face to face interviewed, 263 were males and 47 were females and majority lied in the age group of 26 - 41years (55.6%). As far as education qualification of respondents is concerned, 21% were graduates and lowest value was shown by respondents holding DAE (0.3%). The maximum percentage of the respondents were married (66%) and rest of them were single (34%). Out of the total respondents, maximum number of respondents were either Government employees (26.7%) or had self-business (26.7%) and lowest value for this variable was shown by Pensioners (1%). Joint family system was more prevalent among the respondents (65.3%). Out of the total 300 respondents, majority had a household size of 5-10 persons (56%).



(a)



(b)



(c)

Figure: (a) Monthly Income of Respondent (b) age of respondent (c) Employment Status

PERCEPTIONS OF RESPONDENTS ABOUT RIVER RAVI

This section investigated the perceptions of different respondents about green spaces in general and River Ravi in particular. Out of 300 respondents, 1.3% responded that Grass grounds are green spaces and 62.3% opted for all of the above option which meant that they consider Riverine vegetation, Domestic gardens, Neighborhood gardens, Indoor plantation, Green roof, Agriculture land, Grass Grounds and Public Parks as Green Spaces. All the respondents replied that Green Spaces have benefits. All the respondents replied that vegetation act as barrier against floods. Out of 300 respondents 92.7% respondents believed that Kamran Baradari is a patch having intact riverine vegetation and 0.3% was against it. All the respondents answered that Kamran Bara Dari provides recreation and aesthetic beauty. All respondents were of this view that Ravi is facing a lot of threats. Respondents were aware of the banks facing threats due to encroachments. In the point of view of 14.7% respondents Buffalo grazing should be allowed in river area (14.7%) whereas 85.3% were against this use of river bed. All the respondents agreed that slums pose threats to River Ravi banks. Out of 300 respondents, 93.3% agreed for displacement of slums to some other area while 6.7% were uncertain. All the respondents owned no agricultural area in the river bed. According to 27.7% respondents the owners of the river land were local people, 25% believed it is owned by contractors, 47% view it as government's property and 0.3% have other beliefs. Respondents who replied that the causes of river vegetation degradation was logging were 39.3% and 1% think PHA is responsible. All the respondents when asked about degrading water quality of river Ravi. Respondents who believed that agriculture runoff is polluting river water were 0.7% while majority of 59.7% believed that river is polluted by many factors.

USE VALUE OF RIVER RAVI

This was the 3rd section of the questionnaire and probed about the use value of River Ravi like recreation, boating, and sand mining, use as livestock trampling area etc. Out of the total 300 respondents, 74% have visited River Ravi in last six months while 26% have not visited. The 39% of respondents visited River Ravi with friends and 2.72% alone. Out of 300 respondents, 10.3% have done fishing and 87.7% have not in previous years. The respondents have done fishing between 5 to above 20 years ago. Then they were asked if the Kamran Baradari can be used for different activities. A total of 48.3% out of 300 respondents responded that it should be used for recreation and 6.3% were in favor of using it for Jashn-e-baharan. In the opinion of the respondents, 31.3% think river land is government property, 25.7% think it is privately owned and 43% believe that it is owned by contractors. After that they were asked that whether sand mining is disturbing River Ravi's natural beauty, 46% agreed while 20.3% disagreed. Out of 300 respondents, 27.7% agree, 21.7% strongly agree and 6.7% strongly disagreed that sand mining be allowed in River bed area.

NON-USE VALUE OF RIVER RAVI

This is the fourth section of the questionnaire and was developed to determine the non-use value of River Ravi (Table 1). When the respondents were asked whether it should be preserved for future generations or not, 99.7% respondents agreed and 0.3% were not in favor of preservation. In another question it was asked whether preservation of River Ravi be done for local and global communities and all respondents agreed on the question. Almost all the respondents agreed that River Ravi should be preserved or visit some other time (99.7%).

Table : Non-Use Value of River Ravi

Section. 4. Non-Use Value of River Ravi

Description	Variables	Frequency	Percentage	Mean (M)	Standard Deviation (SD)
Do you think that preservation of River Ravi is good for future generations (Bequest value)?	Yes	299	99.77	1	0.06
	No	1	0.3		
Do you think that from preservation of river Ravi local and global communities should gain benefits (Altruistic value)?	Yes	299	99.7	1	0.06
	No	1	0.3		
Do you think that it is best to preserve River Ravi so that it may sometime offer benefits in future (Existence value)?	Yes	299	99.7	1	0.06
	No	1	0.3		
Do you think that River Ravi so that you may visit it sometime in future benefits in future (Option value)?	Yes	299	99.7	1	0.06
	No	1	0.3		

WILLINGNESS TO PAY FOR CONSERVATION OF RIVER RAVI

This is the last section of the questionnaire and included the questions to check the willingness to pay of respondents for the preservation of river Ravi. In this section when respondents were asked that if river Ravi is to be preserved to provide better services for visitors such as

recreation, enjoyment, boating and physical exercise reducing mental stresses and cleanliness. However it was asked whether green space at River Ravi should be preserved or not. The 299 were in favor and 1 was against preservation. The respondents were asked about one-time donation for preservation of green spaces, maximum of the 53% of respondents were agreed and minimum of 0.3% were not applicable. Then they were asked how much maximum they want to donate, maximum 46.7% were not applicable for donation and minimum were 3.3% who wanted to donate above 1000 PKR. Out of all the respondents 36.7% of in the favor of government, 18.3% were ready that PHA should manage the site. At last it was determined to those respondents who were not ready to donate of conservation, their answers were, 27% of people answered that government should manage it, and minimum of 3.31% said that they spent their payment wisely.

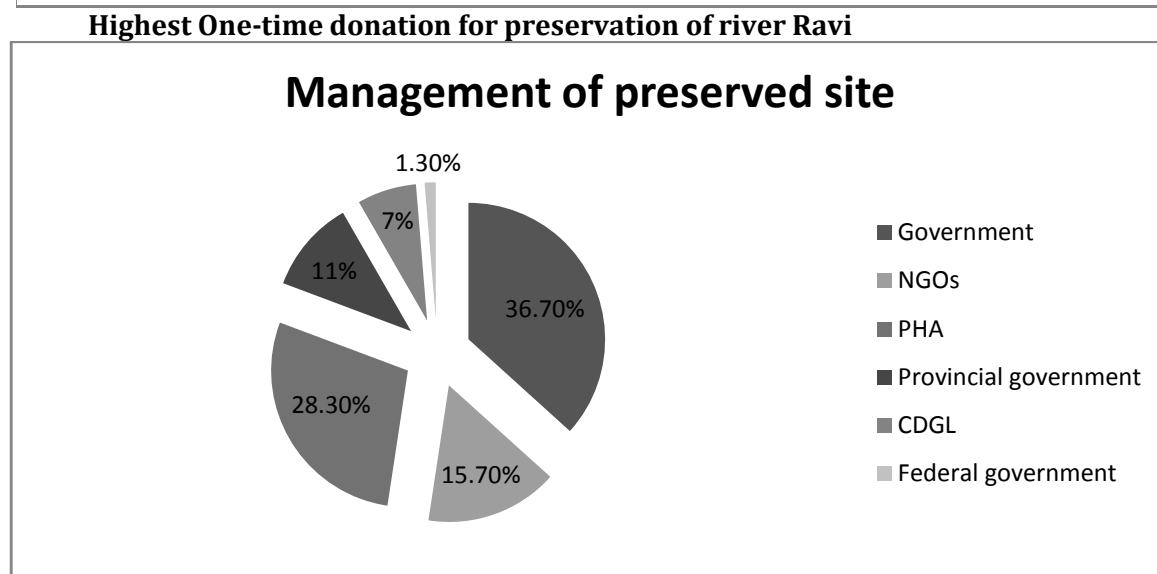
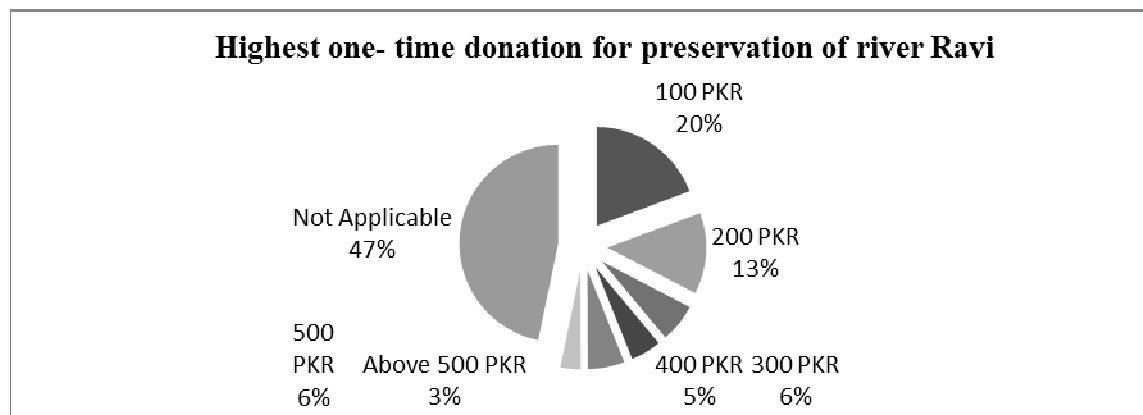


Table 2: Mean Willingness to Pay for the preservation of River Ravi

Sr. no	No. of respondents (N)	Willingness to Pay (WTP)	Total Willingness to Pay = N x WTP
1	58	100	58 x 100 = KRR 5800
2	40	200	40 x 200 = PKR 8000
3	19	300	19 x 300 = PKR 5700
4	15	400	15 x 400 = PKR 6000
5	18	500	18 x 500 = PKR 9000
6	10	Above 1000	10 x 1000 = PKR 10000
7	140	Not Applicable	140 x 0 = 0
Total = 5800 + 8000 + 5700 + 6000 + 9000 + 10000 + 0 = PKR 44500			

Mean Willingness to Pay = $44500/300 = \text{PKR } 148.3$

DISCUSSION

The importance of rivers depends upon the water quality as it increases the number of trips. It was observed in the present study that people were least when there was flow of industrial waste and local abides sewage and others were answering that all the waste determines the pollution of river. Minimum of 0.7% respondents answered that agriculture runoff associated with polluting the river but majority 59.7% answered that all the factors polluting the river Ravi. But many people were present when there was natural flow of water in the river. Maximum people who came with friends were 39% and least came individually were 2.72%. It was observed when there was rainy season in June and July and there was fresh water in the River Ravi the number of trips were high. As the natural flow of water started and water was released from Indian Territory it was seen that people were enjoying the beauty of river Ravi. From July to October there is fresh water in the river so people enjoyed fishing (Buck & Freeman, 2003). But as there is license issued by government to different fishers so people hesitate to catch fishes (Choumert, 2010). So, in such circumstances every person is asked for donation for the preservation of river banks. In my study, it was determined from respondents that how much they pay for preservation of river green spaces so that the beauty of site should be managed. So, 53% were willing to pay for conservation and 43.6% were against the conservation.

CONCLUSION

This study provides a way for raising funds from public for the preservation of a common property resource i.e. River Ravi. The River Ravi holds great value which base on its various tangible and intangible benefits. So, it is urgent need to preserve the River Ravi landscape and enhance its green space area to make it a healthy ecosystem. The River Ravi faces many threats from land encroachments, waste dumping, sand mining and livestock trampling and effluent discharge of industries which has degraded its ecosystem health. There is common understanding and perception among all the people about the polluting factors of river Ravi and questionnaire survey has revealed that they are much worried about Ravi's deteriorated condition. They know it has been a tragedy of the commons and they want improvement and preservation so that this place may provide recreation, appear healthy with its scenic beauty. Ravi receives much water only in the monsoon season and it is the time when a lot of people come to enjoy boating. The only attractive site in Ravi is Kamran Baradari and the shrine where people come for offering prayers. People have shown their willingness to pay for preserving River Ravi.

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