**Valuing attributes of Biodiversity using Choice Experiment: A Case Study of Dachigam National Park in Jammu and Kashmir (India)**

**Abstract**

This paper employs Choice Experiment Method to elicit willingness to pay of 323 randomly selected households for biodiversity conservation. Data are analysed using the conditional logit model. The results reveal that respondents are willing to pay significant amounts in terms of an increase in annual water rates for the better management of selected attributes for biodiversity conservation. With the use of the benefits transfer method, this case study is expected to provide policy-makers with useful information for the conservation of biodiversity.

***Key Words:*** Choice Experiment Method, Biodiversity Conservation, Conditional Logit Model, Willingness to Pay.

1. **Introduction**

Biodiversity benefits human societies in a number of ways by providing diverse ecological, economic, social, educational, scientific and aesthetic services. People depend on biodiversity in their daily lives for food, fibers, livelihood security etc. However in recent times indiscriminate anthropogenic interventions in the natural ecosystems have resulted in loss of biodiversity (Pearce and Moran, 1997; Chopra, 2004). Current biodiversity losses are limiting future development options. Ecosystems are being constantly transformed, irreversibly degraded and a number of species have gone extinct or threatened with extinction, reductions in populations are widespread and genetic diversity is broadly on the wane. Any cutback in the rate of loss of biodiversity will contribute substantially towards achieving sustainable development (Brundtland Commission report, 1987). Biodiversity loss and changes in ecosystem services have altered disease patterns and human exposure to disease outbreaks and affected both material and non-material human welfare. As stated by IUCN data (International Union for Conservation of Nature), by Nov. 2015 around 1227 animal species out of 59,033 until now are extinct, 2542 are critically endangered, 3801 are endangered and 5539 are vulnerable. Among plant species 275 out of 20755 are extinct, 2347 are critically endangered, 3510, endangered and 5376 are vulnerable and 1622 are near threatened species. In recent years the number of globally threatened species has demonstrated an increasing trend. Against the backdrop of rampant biodiversity loss, in recent years a number of studies have been conducted to study biodiversity and biodiversity loss (see Christie et al., 2006; Pearce, 2001; Chopra, 1998; Garrod and Willis, 1997; Simpson, et al., 1996).

Policy makers have painstakingly endeavored to address worries over declining levels of biodiversity by initiating a set of policy measures including agri-environment and wildlife management schemes. Though it is rather easy to determine costs for such measures, but benefit estimation is not so easy. However, economics can be of much assistance to guide the design of biodiversity policy through eliciting public preferences on different attributes of biodiversity (Nunes and Van den Bergh, 2001; Christie et al., 2006). While quantifying the economic value associated with the protection of biological resources, several environmental valuation techniques can provide valuable evidence to support such policies. Pearce (2001) has emphasized that the measurement of the economic value of biodiversity is a primary step in conserving resources because pressures to reduce biodiversity are so large that the chances that we will introduce incentives (for the protection of biodiversity) without demonstrating the economic value of biodiversity are much less than if we do engage in valuation. OECD (2001) also acknowledged not only the importance of measuring economic value of biodiversity but also identified a various uses for such values, including demonstrating the value of biodiversity, in targeting biodiversity protection within scarce budgets, and in determining damages for loss of biodiversity in liability regimes.

Interestingly the role of environmental valuation methodologies in policy formulation is being acknowledged by policy makers. For instance, the Convention of Biological Diversity’s Conference of the Parties decision IV/10 recognized that economic valuation of biodiversity and biological resources is an essential tool for well-targeted and calibrated economic incentive measures. In the same way it encourages governments and various organizations to take into consideration economic, social, cultural and ethical valuation in the development of relevant incentive measure. Central to upgrading level of understanding of the cost that biodiversity loss imposes on society or the gains from its preservation is measurement and valuation of biodiversity of different ecosystems. Therefore policy makers and people alike necessarily need to have knowledge of the opportunity cost in terms of lost values.

What follows from the above discussion is that biodiversity valuation must be worked out both in terms of market linkages and the existence of value outside the market that is considered relevant by a set of pre-identified stakeholders. Therefore, the main objective of this study is to assess respondents’ willingness to pay for the conservation of biodiversity. A survey based on the choice experiment method was carried out at Dachigam National Park, an area threatened by human intervention and mushrooming concrete tenements. Attributes selected for analysis were endangered species, afforestration and research and education. A monetary attribute consisting of an increase in yearly water rates was also incorporated to estimate willingness to pay (WTP) for the enhancement of the selected attributes. The results contribute towards filling knowledge gaps regarding the socio-economic benefits of biodiversity conservation in protected areas.

The paper is organized as follows: Section two introduces the study area, section three delineates the methodology. Section four discusses the results and finally the main findings are summarized.

1. **Study Area**

Dachigam National Park is situated 18 km north-east of Srinagar in Jammu and Kashmir, India. It is divided into lower and upper Dachigam areas. Harwan Reservoir and New Theed Village formits base, while Mahadev Peak is the topmost among surrounding mountain range. Not only Mansar Lake exists within it, however famous Dachigam River flows through it. It is one of the most important protected areas in Jammu and Kashmir. Since Dachigam National Park has last viable population of Hangul (*Cervus elaphus hanglu*) in world as well as the largest population of Asiatic black bear, it has become a famous tourist destination. The National Park gives shelter to a variety of floral and faunal elements, viz., Himalayan Brown Bear, Himalayan Black Bear, Musk Deer, Leopard, Hyena, birds (150 species), vascular plants (661 species) etc. (Dar et al. 2002).

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***Source:*** Dachigam Management Plan, 2011-16

Originally in the first half of twentieth century (1910-1947) Maharaja of Jammu and Kashmir would carry out game in the area now falling under the Dachigam National park. It was a hunting reserve or *‘rakh’* of the Maharaja for a long time. Afterwards its supervision was transferred to Department of Hospitality and Protocol, Government of Jammu and Kashmir (Fisheries Department, Directorate of Game Preservation). The management of this area was ultimately handed over to the Forest Department (Wildlife Wing). In 1951 Dachigam was declared a sanctuary by state order no. 276/C (Holloway, 1970; Holloway and Wani, 1970). It was only after three decades that the Government of J&K upgraded Dachigam Wildlife sanctuary to National Park on 4 Feb 1981 (state order no. FST/20).Currently the Department of Wildlife Protection (formed in 1982) is managing the National park. For administrative convenience, it is divided into the Lower and Upper Dachigam which are correspondingly administered by Central and South Wildlife Division. Nowadays Dachigam National Park is managed in IUCN category- II.

Dachigam being very close to Srinagar, summer capital of Jammu & Kashmir, receives a large number of tourists in summer because of its natural beauty. Every year 10,000-15,000 tourists visit the park which includes students, naturalists, scientists, conservation activists, etc. Therefore, Dachigam National Park yields a range of onsite and offsite benefits. Given that park is managed for high levels of visitor use, recreational and tourism value of Dachigam is likely to be significant. Other economic benefits are likely to include ecosystem services such as water purification, soil conservation and landscape stability. Despite extensive range of economic benefits provided by Dachigam National Park, most of these benefits have never been defined in monetary terms.

**3. Research Methods**

*3.1. Choice Experiment Method*

The objectives of present study were realised by employing the Choice Experiment Method (CEM). The basic assumption in CEM applications is that consumers derive utility from the attributes possessed by goods instead of the goods themselves. Choice Experiment technique integrates the Lancasterian model of consumer behaviour with random utility theory to explain consumer choices within a utility maximizing framework. Since the first application of the CEM to environmental management problems by Adamowicz *et al*. (1994), there has been increasing interest in the use and development of this method both by academics and practitioners. In a choice experiment, respondents are presented with a series of alternatives, differing in terms of attributes and levels, and asked to choose their most preferred. A baseline alternative, corresponding to the status quo or do nothing situation, is usually included in each choice set.

To illustrate the basic model behind the CE presented here, consider a respondent’s choice for a national park management scenario and assume that utility depends on choices made from a set C, i.e., a choice set, which includes all the possible park management scenario alternatives. The respondent is assumed to have a utility function of the form:

where for any respondent *i,* a given level of utility will be associated with any park management scenario alternative *j*. Utility derived from any of the park management scenario alternatives depends on the attributes of the park scenario (*Zj*), -i.e., endangered species, afforestation, research and education and the monetary payment-, and the social, economic and attitudinal characteristics of the respondent *(Si)*.

Assuming that the relationship between utility and attributes is linear in the parameters and variables function, and that the error terms are identically and independently distributed with a Weibull distribution, the probability of any particular management strategy *j* being chosen can be expressed in terms of a logistic distribution. Equation (1) can be estimated with a Conditional Logit Model (CLM) (McFadden, 1974; Greene, 1997 pp. 913–914), which takes the general form:

………….. (2)

where the conditional indirect utility function generally estimated is:

………………… (3)

Where α is the alternative specific constant (ASC), which captures the systematic but unobserved information about households’ choices, *n* is the number of park management strategy attributes considered, and the vectors of coefficients 1 to *n* are attached to the vector of attributes (*Z*). The assumptions about the distribution of error terms implicit in the use of the Conditional Logit Model impose a particular condition known as the independence of irrelevant alternatives (IIA) property, which states that the relative probabilities of two options being chosen are unaffected by the introduction or removal of other alternatives.

*3.2. Willingness to Pay Estimation*

The CE method is consistent with utility maximisation and demand theory (Bateman et al. 2003), therefore when the parameter estimates are obtained by the use of the appropriate model, welfare measures can be estimated using the following formula:

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where WTP is the welfare measure, β*monetaryattribute* is the marginal utility of income represented by the coefficient of the monetary attribute in the CE, and *Vk*0 and *Vk*1 represent indirect utility functions before and after the change in park management. For the linear utility index the marginal value of change in a single park management attribute can be represented as a ratio of coefficients, reducing equation (7) to:

…………. (5)

This part-worth (or implicit price) formula represents the marginal rate of substitution between income and the attribute in question, i.e., the marginal WTP for a change in the attribute.

*3.3. Survey design and administration*

The CEM application involves selecting attributes and their levels, and developing an experimental design to create the choice sets or hypothetical scenarios for welfare assessment via the CE questionnaire.

Dachigam National Park is an important habitat as it supports many endangered species like Hangul, Leopard, Black bear etc. It was created in 1981 with the aim of preserving endemic species and the *in situ* diverse flora and fauna. The most important current threats identified for the Dachigam National Park are decline in the population of many species, extinction of endangered species, declining water quality, the clearing of remnant forest for cultivation, poaching, and the encroachment into riparian zones and water bodies. National Parks are noteworthy for supporting biodiversity and as a sanctuary habitat for avian and aquatic species, especially for endangered species. Management actions aiming to conserve the attributes of national parks need to consider local traditional culture in conjunction with scientific knowledge.

In CEM, choosing the attributes to be included to create choice scenarios requires that they are: relevant to the problem being analysed; credible/realistic; capable of being understood by the sample population; and applicable to policy analysis (Bergmann *et al.*, 2006). In addition to this, the attributes should vary across levels that are considered realistic by respondents. To determine the relevant attributes for the improvement of the Dachigam National Park, a process involving literature reviews, a thorough discussion with park staff, 15 local people, and university researchers was conducted.

After attributes were identified and defined, the levels of each attribute have to be determined. The levels of the attributes included were determined through a combination of literature review, consultation with botanists and ecologists, park staff interviews and discussions with local people. The alternatives in this choice experiment – the value of ecosystem services of the Dachigam National Park - were explained in terms of the price attribute. Hence, three attributes with two levels each and one attribute with four levels was selected for the determination of WTP to improve ecosystem services of the Dachigam National Park. The attributes and their levels are summarised in table-3.3.1

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| **Table: 3.3.1 : The summary of selected attributes and their levels** | | |
| **Attributes** | **Definition** | **Management Levels** |
| Endangered Species | Endangered species present in the park, their population levels, the number of different habitats and their size. Enhancing the population of endangered species leads to an improvement in ecosystems in the Dachigam National Park. | Low: Deterioration from the current levels.  High: 10% increase in the number of endangered species. |
| Afforestation | This includes plantation of more trees to cover the landscape with trees and grasses. This program will improve water quality through reducing silt and sedimentation into the park. These are problems which affect water quality and quantity which in turn affects the fish population and other biodiversity in and around the park. Having variety of trees increases the scenic view of the park and its environment and attractiveness of the area to tourists/visitors and hence other employment opportunities will be created. | Low: Decrease in current area.  High: 5% increase in area. |
| Research & Education | The research, education and cultural information that may be derived from the existence of the park, which will include visits by scientists, researchers and students to learn about ecology and nature and to carry out their research work in their respective fields like Zoology, Botany, Environmental Science, Environmental Economics, Ecological Economics etc. | Low: Deterioration from the current levels of opportunities that the Park withholds.  High: Improving the current level of research and education opportunities while improving the facilities. |
| One Time Payment (Determined through open-ended CV survey) | Finally, a monetary attribute is included in order to estimate welfare changes. A one-off increase in water rates was chosen as the payment vehicle. This one off increase was presented as a one-off special levy rather than an increase for all future time periods. This payment vehicle was chosen because a one-off increase in water rates might not receive the negative responses associated with ongoing taxes that may increase over time, and respondents may have the incentive to free-ride with voluntary donations (Whitehead, 2006). The levels for this attribute were chosen through a review of the valuation literature. A one-off payment for one year as a special levy that will go to the ‘DNP Management Fund’ and will be managed by an independent and trustworthy body. The attribute was determined through open-ended CV survey. | 1. 30 Rs. 2. 50 Rs 3. 75 Rs 4. 100 Rs |

In this regard protecting the endangered species particularly *the Hangul* which has become critically endangered and enhancing their population is likely to be a highly relevant attribute. Surrounding forest cover and increasing vegetation is another highly relevant attribute. Because of the degraded forest cover of the park surrounding, the park becomes highly susceptible for sedimentation, which in turn affects the depth of the park. Further, research and educational opportunities the park withholds is expected to contribute to social and economic values associated with cultural heritage and scientific knowledge.

The fourth attribute included in the CE is a monetary one, which is required to estimate welfare changes (Birol, et al 2005, Carlsson, 2005). The levels of the monetary attribute used in the CE and the payment vehicle employed were determined through an open-ended pilot contingent valuation survey.

Clearly, these choices could also be influenced by the policy making process through regulation and/or different economic instruments. Secondly, the respondents must also perceive the attributes as relevant. What this implies is that the environmental impacts that are considered important by the respondent should also be included as attributes in the choice experiment.

Experiment designs involve how to create choice sets in an efficient way and how to combine attribute levels into alternatives and choice sets. The standard approach and most commonly used experimental design is the so called orthogonal design, where the variations of the attributes of the alternatives are uncorrelated in all choice sets (Louvire et al, 2000). Four attributes are included in this study: endangered species, afforestation, research and education, and onetime payment that will go the Dachigam Management Fund. Three attributes with two levels and one attribute with four levels resulted in full factorial combination with thirty-two (23\*41 = 32) profiles. A large number of unique park management scenarios can be constructed from this number of attributes and levels. Experimental Design Techniques (see Louviere *et al.*, 2000) and SPSS Conjoint Software were used to obtain an orthogonal design, which consisted of only the main effects, and resulted in 32 pair wise comparisons of alternative park management scenarios. The full factorial design of 32 profiles was reduced to a fractional factorial design of 16 profiles which were further randomly allocated into eight choice sets.

A relevant question in designing a CEM is whether to include an opt-out choice or status quo option. Such an “opt out” option can be considered as a *status quo* or baseline alternative, whose inclusion in the choice sets is instrumental to achieving welfare measures that are consistent with demand theory (Louviere et al., 2000; Bennett and Blamey, 2001; Bateman et al., 2003). This study defined the opt-out option alternative as choosing neither Dachigam Management Policy option A nor Dachigam Management Policy option B.

The respondents were explained that if they chose the neither scenario option, they would not be expected to pay, however there would not be any active park management, in which case the conditions of the park would deteriorate to low levels for endangered species, forest area and research and education attributes (as defined in Table- 3.3.1)

The final questionnaire, developed through experimental design and pilot survey contained four sections. The first section was designed to collect socio-economic characteristics of respondents (gender, age, education occupation, household income, family size, marital status and background). The second section contained information regarding respondent’s attitudes about the problems, the environmental conservation and threats to the Dachigam National Park. The third section provided the hypothetical scenario and explained the proposed plan for park ecosystem restoration and the outcomes of different management policy alternatives.

It was outlined to respondents that the implementation plan would require a one off payment in the form of higher water rates to cover the costs. The one off payment would go the ***Dachigam Management Fund*** which would be managed by an independent and trustworthy body comprising of intelligentsia of the civil society (Birol, et al. 2006; Birol and Cox, 2007). The funds generated therefore will be spent to enhance the population of endangered species, afforestation of the degraded areas and fostering research and education opportunities the park withholds. An example of a choice set is presented in Figure 3.3.1.

Each questionnaire comprised of eight choice sets with three alternatives in each set. Hence, in this section, the respondents could clearly comprehend the choice set questions. They were told that each alternative or policy was composed of hypothetical outcomes and they were asked to choose which policy they think would be best for the Dachigam National Park in the future considering a hypothetical annual payment. The final section consisted of follow-up questions describing the respondent’s reasons for choice of the plans.

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| **Figure: 3.3.1. Example of a choice set** | | | |
| Given the following national park management scenarios, which one do you favour? A cost will be entailed upon you if you choose either A or B. However, no payment would be required for “Neither management policy” option, but the condition of the park would deteriorate to low levels of endangered species, afforestation and research and education attributes. | | | |
| **Choice** | **Dachigam National Park Management**  **Policy A** | **Dachigam National Park Management**  **Policy B** | **Neither management Policy A nor management policy B.**  **I prefer NO National park management** |
| **Endangered Species** | High | Low |
| **Afforestation** | Low | High |
| **Research & Education** | High | Low |
| **One Time Payment** | Rs. 50 | Rs. 75 |
| **Please tick as appropriate** |  |  |  |

The target population for the study consisted of residents of Dachigam National Park community aged eighteen years and over. This study used face-to-face interviews, as suggested by the National Oceanic Atmospheric Administration (NOAA) panel, for collecting information from respondents. The CE survey was administered in October and November of 2015 with face-to-face interviews with a total of 323 randomly selected households located in Dachigam Community. It was administered to be representative of the Dachigam Community in terms of gender and age, and only individuals aged 18 years or older were surveyed. During the interviews a map of the park and location and colour photographs were shown to each respondent. Enumerators described the Dachigam National Park, its location, ecological importance and threats to its existence, and reminded the respondents of their budget constraints and of alternative National Parks and other environmental goods in the state. Finally, the enumerators also explained that the attributes of the park management scenarios were selected as a result of prior research and were combined artificially, and each attribute was defined to ensure uniformity in understanding. In addition to the CE questions, data on the respondents’ social and economic characteristics, and environmental attitudes were collected.

**4. Results and Discussion**

Total number of completed questionnaires was 323 and number of choice sets available for analysis was 2584. The proportion of men and women who answered the questionnaire was 91.64 and 8.36 respectively. The enumerators first tried to interview the household heads who were the target group of this survey. However, in absence of the head of family, his elder son or daughter was interviewed. The average age of respondents was 47.25 years. The annual household income of respondents ranged between Rs. 2,500 to Rs. 500,000. The mean family size of respondents was 5 people, with an average of one child per household. On average, respondents had lived in the Dachigam National Park community approximately for 40 years.

*4.1. Conditional Logit Model Results*

The empirical specification of the utility levels underlying the Conditional Logit Model makes references to the attributes of each choice and was formulated as follows:

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Since U is the latent unobservable utility level that the *i*th individual obtains from choosing the *j*th programme, the observed choice is a reflection of this latent unobservable utility. Endangered Species, afforestration, research and education and one time payment are programme attributes considered in the choice set. The model described in equation (6) was formulated given the attribute levels and the responses to the choice experiment survey. A conditional logit model was estimated with the STATA version 12 within a Maximum Likelihood Framework to analyze respondents’ choice behaviour under the condition that different public programmes enhance different multifunctional elements. The estimates of the conditional logit model are presented in Table- 4.2.1.

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| **Table- 4.2.1: Results from Conditional Logit Model** | | |
| **Variable** | **Coef.** | **Std. Err.** |
| **Endangered Species** | 0.76867**\*\*\*** | 0.04587 |
| **Afforestration** | 0.40578\*\*\* | 0.05349 |
| **Research & Education** | 0.52253\*\*\* | 0.05401 |
| **One Time Payment** | -0.0062\*\*\* | 0.00121 |
| **ASC** | 2.23544\*\*\* | 0.15308 |
| **Model Summary** | |  |
| **N** | 2584 |  |
| **LR chi2 (5)** | 2119.99 |  |
| **Prob > chi2** | 0.0000 |  |
| **Pseudo R2** | 0.3734 |  |
| **Log likelihood** | -1778.8194 |  |

*Note:* \*\*\* denotes statistical significant coefficients at a 1% level or less

The three attributes (Endangered Species, Afforestation, and Research & Education) have the expected positive signs and are statistically significant at 1% or less. The positive signs of the coefficients mean an improvement of these attributes can increase the utility of the respondents. In other words, estimated coefficients with a positive sign imply that a change from the status quo option to the corresponding attribute increases the probability of choosing improvement plans over the status quo. In particular, respondents gave value for park improvement plans which result in enhancement of endangered species, new plantation of trees around the degraded areas of the park and improvement in research and education opportunities at the park. In other words, *ceteris paribus*, an improvement in any single attribute increases the probability of choosing the improved plan. The monetary attribute one time payment that will go to the Dachigam Management Fund has the expected negative sign, which is in agreement with the hypothesis that cheaper plans are preferred to more expensive plans after other characteristics are held constant. The negative coefficient of price, means that the respondent‘s utility was lower for an option having a higher price and also it is statistically significant at 1% level. Moreover, we may note that since the given attributes have not fully captured (explain) all variations in choice observations, the coefficient of Alternative Specific Constant (ASC) became positive.

The overall explanatory power of the model can be assessed using both the value of log-likelihood and the McFadden‘s (pseudo R2) which allows us to compare the fit of different models. The larger the value of Log-Likelihood, the better is the fit of the model to the observed data and also the larger the value of Pseudo-R2, the better is the fit of the model to the observed data (Christie et al. 2004). Pseudo R2 statistic value between 0.2 and 0.4 are said to be adequate (Hensher et al., 2005, Bennett and Blamey, 2001). Accordingly, in this study the reported R2 statistic is adequate compared to what is considered to be the standard.

The coefficient of the Endangered species attribute is greater than that of afforestation and research and education attributes which indicates that respondents give relatively greater emphasis to endangered species; their population levels, the number of different habitats and their size than others.

*4.2. Estimation of the Marginal Willingness to Pay*

The rate at which respondents are willing to trade off price for changes in any of the other attributes were calculated from the parameter estimates, i.e., the implicit price. Implicit price is the marginal rate of substitution between each attribute and the monetary attribute (Bennett and Blamey, 2001). It shows the amounts of money respondents are willing to pay for an improvement in the environmental attribute. The implicit prices can also be used to identify which attribute is more important to the respondents, which can be used by policy makers to assign more resources in favour of the attributes which have higher implicit prices. Using the coefficient of the attributes from the results of the CL model, the marginal willingness to pay (MWTP) which is calculated as the ratio of the coefficients for the attribute of interest and that of the monetary attribute, was estimated by using equation (5) and the results are reported in Table- 4.3.1. for respondents.

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| **Table: 4.3.1. Marginal WTP for Dachigam Management Plan attributes, Rs per household per annum** | |
| **Attributes** | **Rs/annum**  **CL Model** |
| Endangered Species | . 123.98 |
| Afforestation | 65.45 |
| Research and Education | 84.28 |

From table- 4.3.1, we observe that the implicit prices for all attributes are positive and significant, implying that respondents have a positive WTP for an increase in the quality or quantity of each attribute. The implicit prices suggest that respondents are willing to pay about Rs. 123.98 per annum for an increase in the level of endangered species, other things being constant. That is, respondents were willing to pay this amount for each increase in the level of endangered species from the status quo level. As well, respondents are willing to pay Rs. 65.45 per annum for afforestration and Rs. 84.28 per annum for an increase in the level of improved research and education opportunities the park withholds*.* The MWTP is higher for endangered species attribute compared to the afforestation and research and education i.e., respondents gave more value for endangered species population attribute than other attributes.

**Conclusion**

This paper contributes to the limited literature on the estimation of economic values generated by biodiversity conservation using the choice experiments method. Despite the increasing number of choice experiment studies carried out in developing coiuntries, this study reveals that the choice experiments method can be successfully employed in a developing country context with careful construction of choice sets and effective field data collection.

The study reported here represents one of the few attempts to use choice experiments to value the benefits of biodiversity and environmental services in the Indian sub-continent. Choice experiment results infer that people are willing to pay Rs 123.98 per annum for enhancing the population of Endangered Species, Rs. 65.45 per annum for planting more trees and vegetation and Rs. 84.28 per annum to foster research and education opportunities Park withholds. The findings inform main factors affecting respondents’ willingness to pay for the conservation of biodiversity of Dachigam National Park. The aim is that these results inform policy-makers about the preferences of the community. The CE results presented here can also be included as data for future benefit transfer analysis. Hence, they can also be potentially useful in informing policy-makers regarding preferences for conservation of biodiversity in India, as well as in other countries. Concerned authority should give due attention and design appropriate management plans consecutively for the increase in the number of endangered species, afforestation, and research and education or improvement in the alternative hypothetical scenarios after they do the cost-benefit analysis and depending of their capacity.

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