Valuing recreational benefits of urban forestry-A case study of Chandigarh (India) city

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SUMMARY

Forests provide a range of benefits (both market and non-market) to the society. These non-market benefits (NMBs) or intangible benefits include open access recreation, public amenity and landscape benefits. Urban forests or urban greens are one of such resources, which are responsible for various environmental, social and educational benefits to the human society. Pressure of ever-increasing human and traffic population is not only telling upon cities'-infrastructure but also on green belts of these big cities. Certain unscrupulous elements in the society always try to grab such green open spaces, especially in developing countries, for creation of concrete jungles. This happens because NMBs of such areas are not correctly valued and not fully incorporated into cost-benefit analysis of different developmental projects and into decision making on resource allocation. In this way there always remains danger of diverting these areas for other, so called development purposes and in the end, the societal welfare is not maximised.

Chandigarh is one of the planned city, established after India got independence in 1947, which is known for its magnificent urban greenery (including its reserved forests and one wild life sanctuary). In India, very little work has been done on quantification of recreational use value of forest resources. Basically, these types of studies have been restricted so far to only few National Parks and Sanctuaries. No

study has been undertaken so far for finding out recreational use value of urban forestry of a big city. Therefore, Chandigarh city was selected for this purpose. The non-market value of recreational benefits provided by the urban forestry of the city, from the point of view of residents as well as tourists visiting the city, was estimated.

The salient findings of the study are summarized under following points:

1. The mean willingness to pay (WTP) for the betterment of existing green landscape features and for creating new parks/gardens on the part of each reasonably earning family residing in the city has been found to be Rs. 153/- per year for a period of five years, which converts to an annual recreational use value of city's urban forestry assets to Rs. 2.75 crores (Rs. 27.50 millions) at 2002-03 prices. Contingent valuation method (open ended) was used for this purpose.
2. Contingent valuation method, open-ended version (CVM) and Zonal travel cost method (TCM) were used to estimate the annual recreational use value of city's urban greenery on the part of tourists coming to the city. The reasons for variation in the results of two methods have been discussed. Inherent tendency of most of the Indian middle and upper middle class, which has the capacity to move as tourists, to reveal actual income on record (except Govt. servants) due to huge black economy of the country, has been found as one of the major reasons for poor results in CVM (OE). "Government Dependence" approach on the part of rich agriculturists is also one of the reasons for low or nil WTP for environmental resources. Estimate of recreational use value provided by the TCM has been considered more reliable in Indian context, which was calculated as Rs. 9.24 crores (Rs. 92.40 millions). Therefore, total annual recreational (use) value of city's parks/ gardens, boulevards, green avenues, reserve forests, wild life sanctuary and other landscape features on 2002-03 prices, comes out approximately to be Rs. 12.00 crores (Rs. 2.75 crores plus Rs. 9.24 crores). This amount is its recreational use value only on the part of people using or having liking for this particular environmental asset and should not be misunderstood as environmental or ecological value.

Terraced Garden

A Landscaped Roundabout

3. The urban forestry in Chandigarh city contributes to the extent of 87.67% in making the city attractive from tourism point of view. City's unique architecture, openness, comparative cleanliness and other features account for the rest of 12.33%. This exhibits the immense power of urban forestry in attracting tourists.
4. Chandigarh city's residents consider the urban greenery responsible to the extent of 55.65% in attracting people to reside/work permanently in the city. This shows that people of the city give more than 50% weightage to city's planned green landscape and urban forestry in comparison to other factors like employment, infrastructure etc. available in the city for settling down for residence purpose in the city.
5. Statistical tools like ordinary least square (OLS) and weighted least square (WLS) methods were used to establish functional relationship of willingness to pay (WTP) towards "Environment Fund" supposed to be maintained by Chandigarh administration, with other variables. Various socio-economic and environmental factors influencing willingness to pay function on the part of tourists and people of city have also been discussed. It has been found that education and household income have positive correlation with WTP function i.e., willingness to pay increases with increasing income and education status. Educated society has more environmental concerns and social awareness. In general, younger generation was found more inclined to contribute towards urban greenery. People of the city having interest in environmental activities were more interested for contribution towards "Environment Fund".

Bougainvillea Garden

Fitness Trails

6. The residents/people working in the city responded the survey and questionnaire more positively compared to the tourists. They openly expressed their views and perceptions about the current status of urban forestry of the city, its uses, maintenance and betterment in the interest of the whole city. Most of the respondents, particularly the residents, were very articulate in both positive and negative answers to the question about WTP towards “Environment Fund” for the creation and maintenance of urban greens. The tourists, especially from distant areas were enthusiastic about city’s parks/gardens and were more interested in paying towards “Environment Fund” than nearby tourists. This interest and zest on the part of both residents and tourists, suggest a keen potential role of urban greens in overall environmental conservation in polluted big cities. This should form a base for environmentally friendly urban policy.
7. Environmental Economics literature provides for two measures under contingent valuation method i.e. willingness to pay (WTP) on the part of an individual to obtain a particular good or service, which is clean and green urban parks/gardens of the Chandigarh city in the present study or willingness to accept (WTA) compensation i.e. amount of money that must be given to an individual by not allowing him/her to utilize a particular environmental asset i.e. parks or gardens of the city. The people of the city seem to have rejected the idea of receiving compensation (WTA) in lieu of not visiting green areas of the city for different purposes. Only 14% of the respondents chose to quote WTA value in monetary figures. This low response to WTA question is not a reliable result.

Therefore, WTP questions are the best option, instead of WTA measure, to assign a monetary value to the recreational aspect of an environmental amenity like urban parks or landscapes.

8. The analysis of data and results thereof indicated that Municipal Corporation of Chandigarh, which maintains most of the green areas in the city, could charge an entrance fee up to Rs. 25/- per visit (in collaboration with Rock Garden Society, which looks after the Rock Garden's administration), instead of Rs. 10/- being charged at present from the tourists at Rock Garden without the apprehension of reduction in number of tourists. This would result in generating 150% more revenue per year than the amount being realized at present. The study revealed that the tourists are enjoying a consumer surplus of Rs. 308/- per visit and revenue generation may also be maximized at this point (taking a conservative estimate of three lacs tourists visiting city per year) but charging this much amount per visit may not be possible, as the government has to make balance between revenue generation and social obligations. Revenue obtained in this way (i.e. charging Rs. 25/- per visit) can help in better management of existing urban gardens and also for creation of additional green belts in the city. In respect of residents of the city, mean WTP per year per family was found as Rs. 153/- (at 2002-03 prices) for above-mentioned purpose of proper maintenance of existing parks and for new ones. Municipal Corporation of the city can realize this much amount by other suitable means like charging with water-bill on monthly basis.

9. It is pertinent to mention here that surveys for assessing non-market benefits of forests and gardens are more common and familiar to the western countries. Generally respondents who are familiar with some sort of economics and who have had at least some experience with marketing surveys, feel more comfortable in answering contingent valuation surveys. In the present study, the respondents (mainly tourists) who were not familiar with these ideas, were more suspicious of the questions and they tended to be hesitant in providing personal information such as income, mode of travel, make of cars etc. It was also observed during the survey that a sizeable number of tourists mentioned low

monthly income and at the same time they were enjoying the luxuries of staying in good hotels and traveling in big cars of recent models as found using “Participant observation method” and Unstructured interview schedule” in addition to “Structured interview schedule”. A general model depicting the relation of TCM and CVM (OE) ratio with “Corruption perception index” was developed in case of tourists of various countries with different ranking in the world as far as parallel economy and levels of corruption were concerned. A clear cut conclusion can be drawn from the present study that CVM (open-ended) has to be applied with great care and precaution in case of respondents belonging to developing countries like India where a huge black economy, from which majority of middle and higher income group belong to, can influence the final outcome.

Rock Garden

Leisure Valley