

The Aesthetic Value of Trees, Boulevards, Man-made Lake and Urban Parks/Gardens in the Planned City of Chandigarh, India

Pradeep Chaudhry*

Indian Institute of Forest Management, Nehru Nagar, Bhopal

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*For Correspondence

Pradeep Chaudhry, Indian Institute of Forest Management, Nehru Nagar, Bhopal, India, Tel No. 0755 277 5716.

E-mail: pradeepifs@yahoo.com

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ABSTRACT

Ever increasing urban population, city congestions and busy life schedules, especially in developing countries, are gradually pushing city residents towards urban parks, gardens and lake shores during their leisure hours and morning/evening strolls. Studies involving quantification and valuation of the recreational benefits provided by urban green amenities are lacking in most of the developing countries. This article presents a brief account of two research studies conducted in the planned city of Chandigarh, India during 2002-04 and 2012-13 respectively for assessing recreational benefits of city's green assets and a clean water body in the form of a lake. The results of the study can be used by urban policy makers, planners, bureaucrats, civil society and others in planning and establishing parks/gardens/water bodies/tree patches or combination of these resources in newer cities which would be coming up in near future.

INTRODUCTION

Urban greens and lakes with good water quality provide significant amenity and recreational use value contributing towards quality of urban life. It is observed that politicians/bureaucrats/industrial houses, especially in developing countries, try to grab these green open spaces for creation of concrete jungle. Scientific understanding of how urban trees, parks, gardens benefit people is generally found lacking in majority of developing countries. This happens because non-market benefits of such areas are not correctly valued and incorporated in to cost-benefit analysis of so called development projects. Chandigarh is one of the planned cities of India, which is known in the world for its magnificent parks/gardens/urban greenery and was selected for quantification of recreational use value of urban forestry and Sukhna lake. The non-market value of recreational benefits provided by these resources of the city, from the point of view of residents as well as tourists was estimated. Chandigarh city is the first city of India to have its city emblem (an open hand) established in Sector-1 of the city **Figure 1**. The focus of two studies, in the form of Ph.D thesis and M.Tech dissertation, was on city's parks, gardens **Figure 2**, tree-avenues, reserved forests, Sukhna lake and the Sukhna wild life sanctuary of Chandigarh city. The main objectives were to estimate the recreational use value of above areas from the point of view of residents as well as tourists coming to the city and to assess the predictive abilities of various functional forms for developing suitable models to estimate willingness to pay (WTP) on the part of residents & tourists for the cause of greenery and better environment. Three economic valuation methods i.e., Contingent valuation method (CVM), Travel cost method (TCM) and Hedonic Pricing Method (HPM) were applied.

APPLICATION OF CVM AND TCM

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 was found at 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 and primary data was collected from

2358 residents of the city ^[4,2]. 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). Estimate of recreational use value provided by the TCM has been considered more reliable in Indian context, which was estimated as Rs. 92.40 millions ^[3]. 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 Rs. 120.00 millions. This amount is the recreational use value on the part of people using or having liking for this particular environmental asset and should not be misunderstood as environmental or ecological value. As revealed through the study, 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. 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 **Figure 3**. 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".



Figure 1. The Open Hand: City's Emblem.



Figure 2. Leisure valley garden of the city.



Figure 3. Zakir Rose Garden, Chandigarh.

WTP VS WTA MEASURE

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^[4]. It was suggested in the study that an entrance fee of Rs. 25/- could be charged at Rock Garden of the city in place of Rs. 10/- being realized now. It was also found in the analysis that there won't be any reduction in tourist population due to fee enhancement and additional revenue thus generated could be used for better upkeep of urban parks/gardens along with Rock Garden^[5]. Rock Garden was found number one choice of the tourists during survey **Figure 4**. 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 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 even educated and well-off 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.



Figure 4. Rock Garden, Chandigarh.

APPLICATION OF HPM

Results of linear function Hedonic Pricing Model (HPM) indicated that the rates of residential plots decreases @ Rs. 9.20 per sq yard for each metre of distance from the Sukhna lake of the city^[6]. According to double log with weighted least square and ordinary least square functional HPM, proximity to Sukhna lake and Leisure valley chain of green spaces raised housing prices by 10% and 2% respectively^[7]. Similar kind of trend was observed in a study conducted in eight towns of Netherlands using HPM where more than three thousand housing transactions were analyzed^[8]. It was found that an attractive landscape having combined effect of water bodies, trees and open space resulted in about ten percent more premiums on house prices over less attractive environmental settings. Similarly, Gupta and Mythili^[9] found that a house near water body in Navi Mumbai fetched Rs. 558 more value per sq feet and proximity to greenery/parks/gardens fetched more price of apartments in Central Mumbai^[2].

CONCLUSION

Science based evidence in above studies has established that the residents of the city were willing to pay for better environmental amenities through higher housing prices. Therefore, Chandigarh administration should fix higher collector rate for residential property located near resources like better maintained parks/gardens and good water quality lake. At the same time, proposal for Rock Garden gate fee enhancement should be considered for generating more revenue and subsequent better maintenance of city's ecological resources.

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