

Willingness of residents to pay and motives for conservation of urban green spaces in the compact city of Hong Kong

Abstract

People attach multiple values to urban green spaces which play varied roles in cities. Properly designed monetary valuation surveys can ascertain their non-market value and underlying motives. This study investigates Hong Kong residents' recreational use of urban green spaces and assesses their monetary value. A total of 495 urban residents from different neighbourhoods and socio-economic groups were interviewed. About 70% of the respondents visited urban green spaces at least weekly. Major companions during patronage were family members and then children. Exercises and clean air topped the list of visit purposes. The recreational pattern is associated with the cramped private living condition that pushes people to public open areas which are construed as extension of home space. The valuation question solicited overwhelming support, with over 80% of the respondents willing to pay to recover a possible loss of urban green spaces area by 20%. It yielded a monthly average payment of HK\$77.43 per household for five years. Non-instrumental aspects played some role in the respondents' bidding decision. The findings could assist green space planning and nature conservation. A pluralistic view of public psyche should be

taken on the part of the city planning management.

Keywords: Urban green space; Urban park; park patronage habits; Willingness to pay;

Bidding motives; Hong Kong.

Introduction

Greenery plays a key role in urban ecosystems by supplying a wide range of services and amenities. Urban green spaces (UGS), consisting of greenery in open spaces, contribute notably to a healthy living environment. They provide residents with outdoor recreational opportunities and contacts with nature to nurture a harmonious people-environment relationship (Kaplan and Kaplan., 1989; Miller, 1997; Jim, 2004). Properly managed UGS can facilitate engagement in the neighbourhood and socially cohesive human encounters. By promoting a sense of place, UGS could confer social and cultural connotations (Burgess et al., 1988; Benton, 2008; Woolley, 2003). High quality UGS around residences have universal appeal. Estimating their value could help to match public expectations, and inform and rationalize relevant planning decisions.

The stated preference approach is an economic technique to estimate the monetary value of non-marketed goods such as UGS. It asks people directly the value they attach to these goods in a carefully designed experimental context. In this family of research techniques, the contingent valuation method (CVM) has been commonly used in environmental analysis. It uses survey questions to elicit people's preference expressed in monetary terms. An institutional context is created with a hypothetical change in the quality or quantity of environmental goods. The hypothetical scenario is

presented to respondents who will state the maximum amount of money they are willing to pay to avoid the change (WTP), or the minimum amount they are willing to accept to compensate for the change (WTA). The estimated WTP or WTA could indicate the value of the environmental goods or services, as an input for cost-benefit analysis especially of public projects.

The stated preference approach and CVM in particular have been increasingly adopted due to its relatively simple implementation and applicability to a wide range of value categories, especially the non-use type (Mitchell and Carson, 1989; Bateman et al., 2002). Applications to the context of UGS did not emerge until recently, with variations in survey design depending on context and research aim (Brefle et al., 1998; Tyrväinen and Väänänen, 1998; Lorenzo et al., 2000; Kwak et al., 2003; Pepper et al., 2005; Jim and Chen, 2006; del Saz-Salazar and García Menéndez, 2007; Li and Cao, 2007; Nielsen et al., 2007; Vesely, 2007; Bullock, 2008; del Saz-Salazar and Rausell-Köster, 2008; Bernath and Roschewitz, 2008). Many of these studies focused on statistical robustness of the obtained monetary figures. Few gave adequate attention to the motives behind the intended behaviour of paying. To the best of our knowledge, no CVM study on an environmental topic has been done in Hong Kong.

In Hong Kong, environmental conservation is envisaged as a utilitarian pursuit (Lee, 2003). The planning and management of UGS has been dominated by city

administrators and technical experts and undertaken in a technocratic manner. Overseas experiences suggested that the public psyche comprised moral and symbolic dispositions (Bernath and Roschewitz, 2008; Getso and Peterson, 2005). These would hint a new role of public participation to enable an expressive type of policy communication (Sagoff, 1988; Renn et al., 1995). Environmental policy-making in Hong Kong rarely incorporated such perspectives. We therefore attempted to establish an alternative view by investigating the citizens' motivations behind preservation of UGS. This study assessed the value of UGS in Hong Kong using CVM, explored the motives behind the intended behaviour of paying, and identified the residents' recreational pattern in using UGS. We discuss the possible linkage between the urban form and park-visiting habits.

Study area and methods

Study area

Hong Kong is situated at the southern coast of China. It is characterized by high population and building densities, with seven million people accommodated in a small area of 1100 km². The rugged topography dominated by steep hill slopes leaves little easily developable lands. Urban areas are squeezed into merely 16 per cent of the land, with two-thirds were situated on terraced hill slopes and the remainder largely on flat

areas reclaimed from the sea with earth fills (Jim, 2000). The development mode is characterized by high-rise expansion and juxtaposition of multiple land uses. The excessive compactness curtails the quantity and quality of open spaces and plantable sites. Conflicts with development, low standard of tree care, and inadequate statutory shields are ineffective in protecting urban greenery (Jim, 1994, 1998). In 2008, the public open space stock in Hong Kong included 22 major parks, 668 playgrounds and 1412 small local sites (small parks, gardens and sitting-out areas) (Leisure and Cultural Services Department, 2008). From 2003 to 2007, open space areas (including parks, sports stadia and playgrounds) have increased by 11 per cent, from 2.97 to 3.30 m² per person (Planning Department, 2009).

Questionnaire design

The questionnaire survey is commonly adopted in CVM to assess the non-use aspects of UGS, such as its existence value. The NOAA report (Arrow et al., 1993) offered official recognition to CVM, and recommended the face-to-face interview, which could reduce sample selection bias and allow visual aids. CVM employs three major value elicitation formats, namely dichotomous bidding, open-ended question, and payment card. The dichotomous bidding (i.e., accept to pay or not a partially random amount given by researchers) is more consistent with economic theory and

easy to understand by respondents, but it requires a large sample size (preferably greater than 1000). It also suffers from the starting point bias and limited information about the respondents' actual preferred values (Boyle and Bishop, 1988; Ready et al., 1995). The open-ended question could better understand the variations in WTP estimates, but it incurs difficulty to people unfamiliar with such a bidding game (Hanemann, 1994). It risks underestimating the value (Boyle et al., 1996). The payment card approach has emerged as a hybrid of the above two approaches, inheriting some of their strengths and weaknesses. Its recent applications in valuating urban forests have been demonstrated by Tyrväinen (2001), Jim and Chen (2006), and Bernath and Roschewitz (2008).

The present research selected the payment card approach. The problems associated with the alternative methods could be fairly significant in the context of the study topic. The dichotomous bidding was less suitable because of resource constraints. The open-ended question was not chosen because most Hong Kong people may not understand the notion of 'purchasing' public environmental resources. The payment card approach offered a compromise. Presentation of bid amounts can be facilitated by visual aids to expedite and improve the survey process.

The WTP question began by introducing the hypothetical scenario of a 20% reduction of UGS area in Hong Kong within the next five years as a result of urban

development (see Appendix). A compensatory greening programme was proposed to offset the loss. Respondents were asked to specify the maximum amount they would be willing to pay for the greening programme. A response card presented to respondents listed ten bid amounts from HK\$0 to HK\$500. The monetary values, unless stated otherwise, are Hong Kong Dollars, at the officially pegged exchange rate of HK\$7.8 = US\$1.0. The bid amounts were selected based on the regular expenses of an average person, such as the price of a lunch, a movie ticket, and a few occasional luxury items. The respondents could freely pick one amount from the list or suggest one. The option of 'cannot choose (or decline to answer)' was provided. The payment was set as a monthly household contribution for five consecutive years. Respondents were reminded to consider their personal financial and related circumstances before making the choice.

After stating their WTP, respondents were presented with six close-ended debriefing questions to ascertain the motives of their bidding decisions. Two sets of debriefing questions were used depending on the WTP responses. Positive bidders (WTP > \$0) were asked of the reasons for paying to support the greening programme, with three questions for each of the ethical and utility-based categories on a four-point scale. Non-positive bidders (WTP = \$0 or 'cannot choose or decline to answer') were presented another set of questions, also divided into these two categories.

The questionnaire then explored the respondents' habit of visiting UGS. The first two questions recorded visit frequency and companions. Another eight questions dealt with the purposes of visit, each with three options: 'often', 'sometimes' and 'seldom'. The questionnaire ends with gleaning the respondents' socioeconomic information.

Sampling method and data analysis

Stratified sampling was adopted to ensure residents from different parts of the territory were involved (Table 1). Comparable sample size was taken from urban and suburban areas. Public and private housing estates were equally represented to echo the population distribution in Hong Kong, with each make up about half of the share (Hong Kong Housing Authority, 2009). In-person interviews were conducted in the selected residential areas. The residential blocks in each estate were assigned a number, from which 2-5 were randomly selected. Depending on the number of required samples and the overall population size, a fixed number of addresses were randomly identified from different floors (e.g. 4-5 addresses from floors 3rd, 6th, 9th and so forth). Only one resident aged 18-70 from each residential unit was interviewed. A pilot test was conducted with 20 individuals with different backgrounds from the study areas. Eight university students were recruited and

coached to conduct the survey in January to March 2008 on Saturday and Sunday afternoons.

The data were analyzed using the SPSS software. An average WTP was calculated for the UGS in Hong Kong. Linear regression models were constructed to identify the factors associated with the stated WTP. The ratings of the two categories of motives were ranked and compared.

Results

Response rate and socioeconomic characteristics of respondents

A total of 495 questionnaires were completed through face-to-face interview at home or in front of their apartment doors, with a response rate of 39%. Several practical difficulties suppressed the success rate. Most residential buildings in Hong Kong are 20-30 storey high-rise blocks, into which non-resident access is strictly controlled. The estate management imposed stringent conditions on the interview process, requiring the interviewers to obtain prior consent from the residents through an intercom phone at the ground floor entrance of the building. This prevented face-to-face contacts with prospective respondents prior to their acceptance. Also, the elderly, new immigrants and economically deprived individuals living in public housing estates were often indifferent to opinion surveys.

Non-response rate for individual questions (except income) is low, ranging from 0% to 3.6%. Understandably, some respondents were unwilling to disclose their household income due to privacy concerns, leading to the highest non-response rate of 6.5%. Six questionnaires were discarded due to incomplete data. In all study sites, the valid responses were sufficient for statistical analysis.

For socioeconomic profile of the respondents (Table 2), most were 30–49 of age, with < 30 comparable to > 50. For monthly household income, 27.3% indicated ‘< \$10,000’ and about one-third ‘\$10,000–\$19,999’. Less respondents indicated higher income levels i.e. ‘\$20,000–\$40,000’ and ‘> \$40,000’; both occupy no more than 25%. About one-third attained tertiary education, and about half secondary, and the remaining primary education or none. The respondents were rather evenly distributed between male and female. Most were not retired. By years of residence, 18.8% moved into the present flats in the last 5 years, nearly half 5-15 years, and the rest > 15 years. About one-third had children under 12 years old in their family.

The socioeconomic data are compared with corresponding information from the 2006 Hong Kong population census, except ‘Years of residence’ and ‘Children’ which were not recorded in the published dataset. Income, gender and retirement status matched the census data well ($p > 0.05$; Table 2). Age and education attainment, however, deviated from the census data ($p < 0.00$). The younger generation is

relatively underrepresented because only > 18 were interviewed, but all age groups were included in the territory-wide census. People in their fifties tend to be more concerned about their community and more motivated to participate in the survey. Younger residents usually do not stay at home during the weekend. Comparing with the census, less individuals were educated at primary level or below, and more secondary and tertiary. Due to the discrepancies, the data may slightly overstate the views of the older and better educated individuals.

Habit of using urban green space

The survey gathered information on the frequency, companionship and purpose of visiting UGS. High frequent visits (at least weekly) were reported by over 70% of the respondents (Fig. 1), with 22.8% daily, 25.3% 2-6 times per week and 24% weekly. Low frequency visits were relatively uncommon, with 12.9% monthly and 14.9% rarely. Chi-square tests showed that age, gender, status of retirement, years of residence and having children were significantly associated with visit frequency (all at $p < 0.05$). The elderly, retired, male and individuals with children tended to visit more frequently. The data on at-least-weekly visits are similar to a Finnish study (Tyrväinen et al., 2003). The visit intensity of Hong Kong residents also closely matches those of Guangzhou (Jim and Chen, 2006), which is analogous to the findings of Tyrväinen et

al. (2007). Besides cultural differences, variations in research methods and definitions of visits could generate different results across studies.

Nearly a quarter of the respondents visited with their children (24.3%), and about one-third with other family members (29.4%) (Fig. 2). This suggests that UGS could strengthen family ties by providing places for family and parent-child interactions (Taylor et al., 1998; Chiesura, 2004). Some 16.9% were accompanied by neighbours or friends, and 26.7% were solitary visitors. Only 2.7% came with pets which are prohibited in most public parks in Hong Kong.

UGS visits are induced by multiple motives, the understanding of which could inform park design and management. The most common activities were exercise or strolling (Table 3). Few dwellings in Hong Kong have backyard or household garden. Public open areas often constitute the only outdoor space for exercises. Breathing clean air was another popular demand. The declining air quality in the territory has encouraged contacts with vegetated spaces for fresh air, tranquillity and relaxation. Enjoying the natural landscape, however, received less support. This could be attributed to the poor landscape quality and overcrowding problem in many urban parks, especially in inner-city areas, that degrade the quality of recreational experience (Chenoweth and Gobster, 1990). The ranking of park visit motives differed notably from Chiesura's (2004) Danish study, in which the motive of 'to sport'

attracted only 11% of the users, whereas 'to relax' topped the list with 73%, followed by 'to be in nature' with 54.4%. The lower preference for sports pursuits, and higher for passive recreation, may be associated with cultural differences.

Chatting or gathering with friends and taking children to playground were less common, both at the fifth rank. The views on the latter were more divided as indicated by the infrequent visits and relatively high standard deviation (Table 3). Whiling away time was less common probably due to the busy lifestyle of Hong Kong people. Lastly, enjoying the cool environment provided by trees was the least common. It is likely to be linked to the hot-humid summer and the prevalence of air-conditioning in Hong Kong.

Willingness-to-pay for urban green space

The monetary estimate generated from CVM responses could indicate the perceived value of UGS. The survey solicited 477 valid responses for the WTP question, of which 407 gave positive bids, showing earnest willingness to pay for recovering a significant loss of urban greenery. There were 70 zero bids, with 18 unable to choose any amount or refused to choose. The mean WTP of \$77.43 per household per month amounted to \$46,458 over five years, suggesting that Hong Kong people were willing to pay a notable sum for the hypothetical greening

programme. Protest zeros were not censored in the estimation of WTP, as such a treatment is considered ambiguous and inappropriate for reasons explained later.

A linear regression model was constructed to identify the WTP factors (Table 4). The 18 non-responses or refusals were not included. The model explains 19% of the variance in WTP levels and this satisfies the benchmark of 15% recommended by Mitchell and Carson (1989). Age and Income were significantly associated with the WTP levels ($p < 0.01$). Age had negative association, indicating that younger respondents would pay more whereas the older were hesitant. WTP might be related to the higher environmental consciousness and preparedness to commit that characterize the younger generation, despite its limited patronage of the green sites. Frequency of visits (VISITFREQ) was a strong predictor in the model, indicating that more frequent use is matched by a disposition to preserve the land. Tyrväinen and Väänänen, (1998) and Kwak et al. (2003) obtained similar findings. The income effect was also obvious. Household income had a strong positive effect on WTP level, reflecting a heightened concern about financial constraints in making a ‘purchase’ decision.

Bidding motives

Relatively few UGS studies have investigated bidding motives in details (e.g.

Tyrväinen and Väänänen, 1998; Lorenzo et al., 2000; Vesely, 2007; Bernath and Roschewitz, 2008). Conventionally, more attention is paid to the numerical estimates. Specific reasons for giving financial contributions remain largely unknown, particularly in the context of a Chinese city. To fill this void we solicited our respondents' motives behind paying for UGS and compared two different motivation categories.

The six debriefing questions in our survey probed the motivations for paying for the hypothetical greening programme. They corresponded to personal-household and social well-being functions, labelled respectively as utilitarian and ethical motives. Table 5 shows the results. Paying for the benefits of air purification (PB1) topped the list. It indicates that the residents were worried about the aggravating air pollution in Hong Kong and believed that more greenery could alleviate the problem. Many respondents were motivated to pay for the amenity benefits (PB3), perhaps reflecting the inadequacy of greenery especially in the city core. Less people would pay for recreational and social functions (PB5), probably because alternative venues for such activities are commonly available in Hong Kong. The existence rights of trees (PB2) were widely recognized. It implies that the UGS were conceived not only for pragmatic needs, but also the ecocentric belief that trees have inviolable rights to exist. The idea that paying for the greening programme represented commitment as a citizen

(PB4) received some support, denoting an innate demand to fulfil moral satisfaction.

The altruistic motivation to benefit other members of the community (PB6) attracted an exceptionally low score. Lee (2003) observed that many Hong Kong people were environmentally conscious, but they were reluctant to contribute to the collective good because of the scepticism that others would not follow.

Over 80 respondents chose zero bids, or they refused or were unable to choose any amount in response to the WTP question. The six debriefing questions solicited their motivations. The descriptions and rankings of these motives are given in Table 6. The ethical or social considerations were dominant. Most respondents wondered why the greening programme was not supported by public funds but directly by the citizens (NB1). They criticized that the government is shirking its responsibility and discharging the burden on the people. Hong Kong government traditionally pays for most environmental programmes using tax revenue, including public parks which are established and managed by public funds. The citizens do not pay directly any entrance or maintenance fees. Thus people were sceptical of funding the public project.

Some respondents refused to assess the environment in monetary terms (NB2) and did not accept removing UGS because of the inviolable rights of trees (NB3). There is a fairly strong belief that urban trees have their existence rights and are

non-tradable, such that the hypothetical transaction in the CV scenario was deemed unlawful. On the other hand, utility-based non-positive bids were less common in the present study. Some non-positive bidders reported financial constraints for restricted participation (NB4). This is reasonable as many respondents came from the low income group. Not many of them agreed that cutting trees is acceptable (NB5) or relatively unimportant (NB6). This mentality reflected public discontent about urban development depriving vegetation of growth spaces.

Discussion

Constrained household space and sociospatial implications

The findings indicated that UGS could offer common outdoor recreational venues for Hong Kong people. The visit intensity varied notably by socioeconomic categories, being more popular among some user groups (e.g., the elderly). It also hints that UGS use may be related to the high-density living environment.

Over 70% of the residents visited UGS at least weekly. The visit frequency is high and comparable to other cities, even though UGS landscape quality in Hong Kong commonly falls below good international standards. Site attractiveness (Sugiyama and Thompson, 2008), naturalness (Caula et al., 2009) and park crowding (Arnberger and Haider, 2005), being key considerations in other places, had subdued

influence in Hong Kong. Most sites are small and the vegetation poorly maintained (Jim, 1994, 2000). Particularly in inner city areas, the UGS are crowded and situated adjacent to main roads and high-rise buildings that incur poor air and noise impacts. Some local sites are beset by the problems of homeless people, illegal hawking, and public security (Democratic Alliance for Betterment of Hong Kong, 2000; Xue et al., 2001). Green spaces in new towns are better planned, but visitation remains relatively low comparing with the urban-core counterparts (Lo, 2009).

The cramped household living condition may fuel UGS patronage. Lau et al. (2005) proposed that public spaces in Hong Kong act as a virtual extension of the home. This idea apparently contrasts with the emphasis on private family life in Western countries. Hong Kong people have a stronger motivation to 'borrow' space from public areas for leisure activities because of inordinately limited private living space. Domestic living space in public housing, which accommodates half of the seven million population in the low income bracket, is merely 12.4 m²/person in 2009 (Hong Kong Housing Authority, 2009). Children living in high-density housing in Hong Kong are encouraged by their parents to play in public areas to temporarily relieve overcrowding within the cramped dwelling units (Mitchell, 1971). A corroborative finding (Liang, 1975) indicated that lower-income Hong Kong residents avoided staying at home during their leisure time.

Such recreational behaviour can be described as a decanting phenomenon. A recent study found such an effect amongst elderly individuals (Lo, 2009). The decanting effect may partly explain the major purpose of visiting green spaces in this study. Most residents have insufficient space for physical exercises at home. Most public parks are conveniently located near homes, which facilitates use by local residents for exercises and other leisure activities.

The major motivation to visit UGS in Hong Kong deviates from western societies. Western people visit green areas often for nature appreciation and a sense of peace (Clark et al., 2000; Chiesura, 2004; Tyrväinen et al., 2007). Hong Kong UGS are small and excessively developed with too many paved areas and buildings and limited natural ingredients. Deprived of frequent contacts with a natural landscape, people's desire for nature appreciation has been muffled and subdued. Chronic exposure to the cramped urban form has subtly moulded people's recreational behaviour.

Motives behind the intended behaviour of paying

Green spaces in Hong Kong were valued for their instrumental as well as moral aspects. The survey results suggested that the residents' intention to pay is more based on pragmatic needs than moral or altruistic reasons. The dominant motive of

improving air quality reflects general anxiety about the chronic health-threatening problem. Introducing tree species that are more able to ameliorate air pollution could win public support. On the other hand, defending the existence rights of trees was offered as a major motive. It is a sufficient reason for tree conservation which was often ignored by the city administrators in Hong Kong. Altruistic concerns were not too important, reflecting the generally weak community ties in Hong Kong (Forrest et al., 2002). This calls for more community activities in green sites so as to nurture the collective value associated with UGS.

Only a handful of studies have investigated the motivations of not participating in the CV bidding game (Tyrväinen and Väänänen, 1998; Lorenzo et al., 2000). The priorities of bidding motives in these studies are generally comparable to this study. Yet the present findings did not follow the usual approach of requiring single selection of motives, because it was more reasonable to presume that individuals take multiple considerations in expressing support to environmental conservation. The results suggested that refusal to pay or participate was more likely to be an attitude expression than a revelation of the relatively low perceived value of UGS. Moreover, our first-hand experience indicated that respondents often harbour both categories of motives at the same time. For instance, they might object to putting a dollar value on nature as a matter of principle while admitting that they could not afford to pay.

Single selection would mask one of the motives, which is likely to be the ethical one. As a common practice, exclusion of protest bids is mainly based on the stated motives. The treatment could bias WTP estimation because those included might still hold protest beliefs which should be excluded. The criteria of exclusion are therefore ambiguous. Given the [unresolved dispute over the identification of protest and true zeros](#), protest responses were not censored in this study. [We avoided manipulation in the face of such uncertainty, following the recommendation of Jorgensen and Syme \(2000\) and Meyerhoff and Liebe \(2006\)](#). Future research could explore such non-economic considerations rather than arbitrarily excluding the anomalous response.

Ethical concerns are playing some role. Lee (2003) observed that the environmental beliefs of Hong Kong people tend to be pragmatic with a clear focus on the associated costs and benefits. Their environmental behaviours were less influenced by collective and biocentric motives than personal and anthropocentric ones. Our study supported this view with regard to the positive responses. Nevertheless, the unwillingness to pay might comprise a different set of motives. It might indicate a political reaction and be manifested as an uncooperative behaviour to the bidding request. Our findings provided initial clues that financial contributions to trees conservation might be discouraged by a feeling of distrust and frustration

towards the authorities. To motivate these people, better policy communication on responsibility sharing might be more effective than mere education on the specific environmental benefits. Further research could seek a more extensive investigation about the relations between social and political perceptions and motivations for trees conservation.

Conclusion

The study explores green space value through public views, serving as a contribution to the integrated understanding of UGS under the experience theme (James et al, 2009). The willingness to pay for UGS intuitively embraces the ethical dimension. The consumerist perspective of the conventional valuation practices may eclipse the ideal of environmental justice which is realized through accommodating pluralistic values. This study supports the view that UGS are not purely consumer goods. The respondents also express the citizen standpoint by voting on behalf of the society. Urban trees and parks play a collective socio-cultural role in cities and are recognized as a common asset for the good of society. Incorporating non-utility dimensions into value analysis is thus justifiable. It calls for a dual-perspective approach that can capture the multifaceted value of urban nature.

Hong Kong has little experience of conducting CV surveys. There is a need to

consider its applicability and the deeper meanings of the estimated value wider usage. The unusual idea of ‘purchasing’ the nature proves to be difficult to understand. Many respondents were puzzled by the CV scenario and question. Some thought of it as a strange or unrealistic idea and hence they did not take the question seriously. More details about the scenario, which could be made more realistic, should be provided. Visual aid to display the available bid options (for payment card approach) is highly recommended. Respondents should be allowed to revise the stated WTP amount at the end of interview, to allow time for contemplation and avoid the pitfalls of a hasty response. Some respondents misunderstood the CV question as a request for real payment. They might then tend to return a much lower bid regardless of their real preference or even terminate the interview. A clear message should be given prior to this question to avoid misunderstanding.

Monetary valuation of nature’s services could inform relevant policy and planning. Conservation initiatives can be rationalized by incorporating public views and the monetary estimates into relevant institutions. Wise use of such information can help balancing conservation and development objectives. The findings could inform planning by uncovering the subtle nuances of the value held by people. The implications and applications could extend beyond the monetary estimates and to the underling multiple motives. Based on the findings and recent development in stated

preference research, future studies using CVM could adopt a broad perspective by moving beyond the traditional economic ambit. The complex human psychology about the environment and public goods is worth exploring. Conservation disputes often centre on ethical beliefs or social principles which were frequently marginalized by planners and city administrators. Clarifying the alternative considerations can deepen understanding of public views and forestall unnecessary conflicts. In addition, the study could offer insights for tree conservation programmes initiated by the public sector. Understanding people's motivations could improve the performance of fund-raising activities organized regularly by local green groups. They can identify the key factors that motivate people and accordingly design fund-raising strategies and targets.

Recently, environmental and cultural conservation have become hot community issues in Hong Kong and other developing cities. Increasingly, more people recognize sustainability ideals and earnestly embrace human value in the ongoing urban development and redevelopment debate. A notable public focus concerns the diversity of value positions on the fate of trees and open spaces. The stated preference approach needs refinement to serve this objective well. Attempts to redirect the overwhelmingly growth-oriented city have to acknowledge the multiple perspectives and pluralistic values held by the citizenry.

Acknowledgements

The authors would like to express gratitude to the research grant support provided by the University Research Committee of the University of Hong Kong and the postgraduate studentship provided by the university.

Appendix

The WTP question:

Now suppose that research shows there will be 20% reduction of urban green space area in the areas around your housing estate within the next five years as a result of urban development. If the government and some NGOs now plan to carry out a greening programme to resume a similar land area for green spaces elsewhere as compensation, how much money are you willing to pay to support this programme? It is certain the money you pay will be entirely used in increasing green spaces, including building parks and planting trees. And the amount of the money you pay will directly affect how much green space area can be resumed. Before you make the decision, please consider the followings: a) your household income and expenditure; b) your habits and preferences; c) the social and environmental features of this district.

References

- Arnberger, A., Haider, W., 2005. Social effect on crowding preferences of urban forest visitors. *Urban Forestry & Urban Greening* 3, 125-136.
- Arrow, K., Solow, R., Portney, P.R., Leamer, E.E., Radner, R., Schuman, H., 1993. Report of the NOAA Panel on Contingent Valuation. *Federal Register* 58, 4601-4614.
- Bateman, I.J., Carson, R.T., Day, B., Hanemann, M., Hanley, N., Hett, T., Jones-Lee, M., Loomes, G., Mourato, S., Özdemiroglu, E., Pearce, D.W., Sugden, R., Swanson, J., 2002. *Economic Valuation with Stated Preference Techniques: A Manual*. Edward Elgar, Cheltenham, UK.
- Benton, T., 2008. Environmental values and human purposes. *Environmental Values* 17, 201-220.
- Bernath, K., Roschewitz, A., 2008. Recreational benefits of urban forests: explaining visitors' willingness to pay in the context of the theory of planned behavior. *Journal of Environmental Management* 89, 155-166.
- Boyle, K.J., Bishop, R.C., 1988. Welfare measurements using contingent valuation: a comparison of techniques. *American Journal of Agricultural Economics* 70, 20-28.
- Boyle, K.J., Johnson, F.R., McCollum, D.W., Desvousges, W.H., Dunford, R.W., Hudson, S.P., 1996. Valuing public goods: discrete versus continuous contingent-valuation responses. *Land Economics* 72, 381-396.
- Breffle, W.S., Morey, E.R., Lodder, T.S., 1998. Using contingent valuation to estimate a neighbourhood's willingness to pay to preserve undeveloped urban land. *Urban Studies* 35, 715-727.
- Bullock, C.H., 2008. Valuing urban green space: hypothetical alternatives and the status quo. *Journal of Environmental Planning and Management* 51, 15-35.
- Burgess, J., Harrison, C.M., Limb, M., 1988. People, parks and the urban green: a study of popular meanings and values for open spaces in the city. *Urban Studies* 25, 455-473.
- Caula, S., Hvenegaard, G.T., Marty, P., 2009. The influence of bird information, attitudes, and demographics on public preferences toward urban green spaces: The case of Montpellier, France. *Urban Forestry & Urban Greening*, 8(2), 117-128.
- Chenoweth, R.E., Gobster, P.H., 1990. The nature and ecology of aesthetic experiences in the landscape. *Landscape Journal* 9, 1-8.
- Chiesura, A., 2004. The role of urban parks for the sustainable city. *Landscape and Urban Planning* 68, 129-138.
- Clark, J., Burgess, J., Harrison, C.M., 2000. "I struggled with this money business": respondents' perspectives on contingent valuation. *Ecological Economics* 33,

- 45-62.
- del Saz-Salazar, S., and García Menéndez, L., 2007. Estimating the non-market benefits of an urban park: Does proximity matter? *Land Use Policy*. 24, 296-305.
- del Saz-Salazar, S., and Rausell-Köster, P., 2008. A Double-Hurdle model of urban green areas valuation: dealing with zero responses. *Landscape and Urban Planning*. 84, 241-251.
- Democratic Alliance for Betterment of Hong Kong, 2000. Survey Results on the Small Public Parks in Yau Tsim Mong District. Kowloon West Office, Democratic Alliance for Betterment of Hong Kong, Hong Kong (in Chinese).
- Forrest, R., La Grange, A., Yip, N.M., 2002. Neighbourhood in a high rise, high density city: some observations on contemporary Hong Kong. *The Sociological Review* 50, 215–240.
- Gelso, B. R. and Peterson, J. M., 2005. The influence of ethical attitudes on the demand for environmental recreation: incorporating lexicographic preferences. *Ecological Economics* 53: 35-45.
- Hanemann, W.M., 1994. Valuing the environment through contingent valuation. *Journal of Economic Perspectives* 8, 19-43.
- Hong Kong Housing Authority, 2009. Housing Statistics. Retrieved May 7, 2009 from <http://www.housingauthority.gov.hk/en/aboutus/resources/figure/0,,3-0-18562-2008,00.html>.
- James, P., Tzoulas, K., Adams, M.D., Barber, A., Box, J., Breuste, J., Elmqvist, T., Frith, M., Gordon, C., Greening, K.L., Handley, J., Haworth, S., Kazmierczak, A.E., Johnston, M., Korpela, K., Moretti, M., Niemelä, J., Pauleit, S., Roe, M.H., Sadler, J.P., Thompson, C.W., 2009. Towards an integrated understanding of green space in the European built environment. *Urban Forestry & Urban Greening* 8(2), 65-75.
- Jim, C.Y., 1994. Urban renewal and environmental planning in Hong Kong. *The Environmentalist* 14, 163-181.
- Jim, C.Y., 1998. Impacts of intensive urbanization on trees in Hong Kong. *Environmental Conservation* 25, 146-159.
- Jim, C.Y., 2000. The urban forest programme in the heavily built-up milieu of Hong Kong. *Cities* 17, 271-283.
- Jim, C.Y., 2004. Green-space preservation and allocation for sustainable greening of compact cities. *Cities* 21, 311-320.
- Jim, C.Y. and Chen, W.Y., 2006. Recreation-amenity use and contingent valuation of urban greenspaces in Guangzhou, China. *Landscape and Urban Planning* 75, 81-96.
- Jorgensen, B.S., Syme, G.J., 2000. Protest responses and willingness to pay: attitude

- toward paying for stormwater pollution abatement. *Ecological Economics* 33, 251-265.
- Kahneman, D., Knetsch, J.L., 1992. Valuing public goods: the purchase of moral satisfaction. *Journal of Environmental Economics and Management* 22, 57-70.
- Kaplan, R., Kaplan., S., 1989. *The Experience of Nature: A Psychological Perspective*. Cambridge University Press, Cambridge.
- Kwak, S.J., Yoo, S.H., Han, S.Y., 2003. Estimating the public's value for urban forest in the Seoul Metropolitan Area of Korea: a contingent valuation study. *Urban Studies* 40, 2207-2221.
- Lau, S.S.Y., Giridharan, R., Ganesan, S., 2005. Multiple and intensive land use: case studies in Hong Kong. *Habitat International* 29, 527-546.
- Lee, Y.S.F., 2003. Environmental consciousness in Hong Kong. *Southeast Asian Studies* 41, 15-35.
- Leisure and Cultural Services Department, 2008. *Statistics Reports. Leisure and Cultural Services Department, Hong Kong*. Retrieved August 19, 2008 from http://www.lcsd.gov.hk/en/ppr_statistic_ls.php.
- Li, Y., and Cao, Y. K., 2007. Analysis on the factors influencing the residents' willingness to pay to the urban forest ecosystem services - taking Harbin for example, 2007 International Conference on Management Science & Engineering (14th). Harbin, P. R. China.
- Liang, C.S., 1975. Overcrowding and environmental deterioration: the case of Hong Kong. *Journal of the Chinese University of Hong Kong* 3, 219-253.
- Lo, A.Y, 2009. *An Exploratory Study of the Multiple Values and Roles of Urban Green Spaces in Hong Kong*. Unpublished MPhil Thesis. University of Hong Kong, Hong Kong.
- Lorenzo, A.B., Blanche, C.A., Qi, Y., Guidry, M.M., 2000. Assessing residents' willingness to pay to preserve the community urban forest: a small city case study. *Journal of Arboriculture* 26, 319-325.
- Meyerhoff, J., Liebe, U., 2006. Protest beliefs in contingent valuation: explaining their motivation. *Ecological Economics* 57, 583-594.
- Mill, G.A., Rensburg, T.M.V., Hynes, S., Dooley, C., 2007. Preferences for multiple use forest management in Ireland: citizen and consumer perspectives. *Ecological Economics* 60, 642-653.
- Miller, R.W., 1997. *Urban Forestry: Planning and Managing Urban Greenspaces*, 2nd ed. Prentice Hall, Englewood Cliffs, NJ.
- Mitchell, R.C., Carson, R.T., 1989. *Using Surveys to Value Public Goods: The Contingent Valuation Method*. Resources for the Future, Washington, DC.
- Mitchell, R.E., 1971. Some social implications of high density housing. *American Sociological Review* 29, 210-217.

- Nielsen, A. B., Olsen, S. B., and Lundhede, T., 2007. An economic valuation of the recreational benefits associated with nature-based forest management practices. *Landscape and Urban Planning* 80, 63-71.
- Pepper, C., McCann, L., Burton, M., 2005. Valuation study of urban bushland at Hartfield Park, Forrestfield, Western Australia. *Ecological Management and Restoration* 6, 190-196.
- Planning Department, 2009. Planning Statistics. Planning Department, Hong Kong. Retrieved August 19, 2008 from http://www.pland.gov.hk/info_serv/statistic/landu_e.html.
- Ready, R.C., Whitehead, J.C., Blomquist, G.C., 1995. Contingent valuation when respondents are ambivalent. *Journal of Environmental Economics and Management* 29, 181-196.
- Renn, O., Webler, T. and Wiedemann, P. (Eds.), 1995. *Fairness and Competence in Citizen Participation: Evaluating Models for Environmental Discourse*. Kluwer Academic. Dordrecht; Boston.
- Sagoff, M., 1988. *The Economy of the Earth: Philosophy, Law, and the Environment*. Cambridge University Press, Cambridge.
- Sugiyama, T., Thompson, C.W., 2008. Associations between characteristics of neighbourhood open space and older people's walking. *Urban Forestry & Urban Greening* 7, 41-51.
- Taylor, A.F., Wiley, A., Kuo, F.E., Sullivan, W.C., 1998. Growing up in the inner city: green spaces as places to grow. *Environment and Behavior* 30, 3-27.
- Tyrväinen, L., 2001. Economic valuation of urban forest benefits in Finland. *Journal of Environmental Management* 62, 75-92.
- Tyrväinen, L., Mäkinen, K., Schipperijn, J., 2007. Tools for mapping social values of urban woodlands and other green areas. *Landscape and Urban Planning* 79, 5-19.
- Tyrväinen, L., Silvennoinen, H., Kolehmainen, O., 2003. Ecological and aesthetic values in urban forest management. *Urban Forestry & Urban Greening* 1, 135-149.
- Tyrväinen, L., Väänänen, H., 1998. The economic value of urban forest amenities: an application of the contingent valuation method. *Landscape and Urban Planning* 43, 105-118.
- Vesely, E.T., 2007. Green for green: the perceived value of a quantitative change in the urban tree estate of New Zealand. *Ecological Economics* 63, 605-615.
- Woolley, H., 2003. *Urban Open Spaces*. Spon Press, London.
- Xue, C.Q.L., Manuel, K.K.K., Chung, R.H.Y., 2001. Public space in the old derelict city area: a case study of Mong Kok, Hong Kong. *Urban Design International* 6, 15-31.

Recreational behaviours and motives for conservation of urban green spaces in the compact city of Hong Kong

List of tables

Table 1. List of sampling sites in different parts of urban Hong Kong.

Table 2. Comparison of respondents' socioeconomic characteristics with 2006 population census data of Hong Kong.

Table 3. Stated purposes of visiting urban green spaces.

Table 4. Linear regression model for the respondents' willingness- to-pay for recovering a 20% loss of urban green space area in Hong Kong (N = 444).

Table 5. Average scores of the motivations of paying for the hypothetical greening programme.

Table 6. Average scores of the motivations of not paying for the hypothetical greening programme.

List of figures

Fig. 1. Frequency of visiting the green spaces around residences for recreational purposes.

Fig. 2. Companions during visits of urban green spaces.