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Citizen attitude and expectation towards greenspace provision in compact urban milieu

ABSTRACT

Residents' views are pertinent in urban-park design and management, yet they are often ignored. Social-empirical studies could enhance socially relevant park design. As a compact city, Hong Kong's limited greenspaces are often too small, surrounded by incompatible activities, and fail to meet user demands and expectations. This study explores the response of citizens living in the crowded urban milieu to inadequate greenspace provision. A questionnaire survey gleaned opinion from residents in representative residential neighbourhoods in old city and new towns. Green sites are appreciated more for pragmatic microclimatic and amenity benefits than social and high-order environmental functions. The principal limitations are deficiency in sports facilities and greenery. Respondents favour more trees, dispersed seating design and large parks. The preferences are mainly related to age, income, education and retirement status. The high-density living milieu may have weakened attitude and perception towards urban nature. The findings could inform public policies and programmes on urban parks. An institutional restructure to allow a greater degree of public engagement in park planning and management is essential.

Keywords: Urban greenspace, Urban park, Environmental benefit, Social function, Compact city, Hong Kong

Introduction

Urban greenspaces (UGS) refer to open spaces situated within city limits with a vegetation cover planted deliberately or inherited from pre-urbanization vegetation left by design or by default (Jim and Chen, 2006a). Comprising natural and artificial elements, UGS exist mainly as public parks, play areas, outdoor sports facilities, greenways, and remnant or created natural areas. As part of the urban ecosystem, they furnish diversified functions, including ecosystem services, nature experience and recreational opportunities. Natural areas in cities are earnestly appreciated for environmental, amenity, psychological and health benefits. They foster a harmonious human-nature relationship (Kaplan and Kaplan 1989; Jim, 2004).

Open spaces also facilitate social interaction and cohesion, and a sense of place and belonging amongst residents (Burgess et al., 1988; Kweon et al., 1998; Woolley, 2003). Green spaces near homes promote physical activities, improve the health of residents, and contribute to the quality of life in cities (Hobden, 2004). Homeowners are willing to pay a premium to acquire proximity to and view of pleasant green spaces (Saz Salazar and Garcia Menéndez, 2007; Sander and Polasky, 2007). Such capitalization of the innate value of UGS, as reflected in the property investment behaviour, is relevant to both single-family as well as high-rise properties in compact cities (Jim and Chen, 2010).

The urban form could influence public perception of UGS. In compact cities, proximity of parks to residents offers convenient leisure venues. Greenspaces near homes often serve as extended living rooms for people dwelling in cramped flats (Lau et al., 2005). Vegetated areas offer opportunities to contact nature in the otherwise artificial milieu (Beer et al., 2003; Jim, 2004). The high land cost of compact cities could curb greenspace provision, rendering them particularly precious. They call for high-quality design and management to ensure full utilization. Social-empirical

research could understand community needs and inform the political process and management of UGS (Schmithüsen and Wild-Eck, 2000).

Due to the severe shortage of easily developable land, Hong Kong has adopted an exceptionally compact urban form, imposing physical and institutional constraints on urban greening (Jim 1998, 2000). Its UGS provision is probably the lowest in the world for cities of a comparable size. UGS also suffer from inadequate design and management, poor environmental quality and proximity to incompatible land uses. The small green sites curtail the variety of leisure opportunities and ecological services, and the fulfilment of multiple roles.

It is worthwhile to assess how residents would react to the insufficient UGS supply in such a cramped urban milieu. As most related studies were conducted in western cities with a lower development density and better UGS provision (e.g. Chiesura, 2004; Tyrväinen et al., 2007; Vesely, 2007), a knowledge gap exists in relation to the many compact cities in Asia and other regions. This study investigates Hong Kong people's views on UGS with reference to four aspects: (1) the perceived importance of UGS; (2) the perceived significance of negative impacts; (3) performance of existing UGS near homes; and (4) preference for UGS design. Variations according to socioeconomic variables are examined. Implications of the findings on planning and management are discussed.

Study area

Hong Kong is situated on the subtropical coast of south China. The tiny land area and rugged terrain has imposed physical limitations on urbanization, and urban areas are squeezed into merely 16% of the land (Jim, 2000). The compact city holds 7 million people in only 1100 km² of land, yielding an average population density of 6,330 persons/km², which is among the highest in the world. The vertical accent of

buildings (over 30 storeys for most new residential buildings, with extremes exceeding 60 storeys) and juxtaposition of multiple land uses have become a hallmark of the urban form.

The city's development history has been underscored by a continual struggle to win urban land from adjacent hills and seas. It is perhaps understandable to have nurtured a community mentality, within and without the government, to make the most out of the precious urban land resource. Furthermore, the land is beset by serious topographical constraints, with some 80 per cent at > 100 m elevation associated with steep slopes difficult for development, and compounded by a sad history of slope failures in developed areas. The grave shortage of plantable space has constituted a physical limitation to tree growth in urban Hong Kong.

Hong Kong has a chronic shortage of recreational open space. Due to recent efforts, open space increased from 2.97 to 3.38 m²/person in 2003-2010 (Planning Department, 2011). The main increase occurred in new towns; the old urban core continues to suffer from inadequate provision. The juxtaposition of incompatible land uses has degraded UGS quality and greenery (Jim 1994, 1998). The inner-city UGS are also beset by poor public security and hygienic condition (Xue and Manuel, 2001; Xue et al., 2001), with some residents refraining from visiting them.

Methods

Social survey has been widely used to assess public views on UGS (Payne et al., 2002; Lohr et al., 2004; Jim and Chen, 2006b). A questionnaire investigated Hong Kong citizens' attitude toward UGS. The first part defined the meaning of UGS with the help of photographs of selected UGS scenes assisted by a verbal statement: 'Urban green spaces are vegetated areas located within built-up areas, including natural and planted trees, grass, shrubs and flowers' and a brief explanation of UGS

categories. The second part probed the attitude towards the contributions of UGS. The 18 questions gauged views on UGS functions, ranging from ecological to social. Respondents selected answers from a four-point scale from ‘very important’ to ‘not very important’. Another five questions explored opinions on the negative impacts of UGS, with four options from ‘strongly agree’ to ‘strongly disagree’. The word ‘negative’ was avoided in asking the questions. The third part evaluated the quality of existing UGS and preference for UGS design. Eight questions solicited views on the limitations of UGS. Three more questions detected the preferences for key UGS design elements. The last part gathered respondents’ socioeconomic information.

Stratified sampling was adopted to reach residents from a wide range of districts, in order to ensure a demographically representative sample. The samples were taken from urban districts (Shek Kip Mei, Sham Shui Po, Ping Shek, Mong Kok and Yau Ma Tei), suburbs (Pokfulam, Hang Fa Chuen and Sham Tseng), and new towns (Tin Shui Wai and Tseung Kwan O) (Figure 1). Public and private housing areas were equally represented to echo the local domestic-unit composition (Hong Kong Housing Authority, 2009). Residential blocks and units were randomly chosen from the target areas. One resident aged 18-70 from each unit was invited for the 20-minute face-to-face interview. Twenty pilot tests were conducted to provide real-world experience and feedback to refine the questionnaire. Eight university students were trained to implement the interviews in January-March 2008 on Saturday and Sunday afternoons.

Results and discussion

Response rate and composition of respondents

A total of 495 completed questionnaires were collected, with a response rate of about 40% due to some practical difficulties. Most people in Hong Kong live in

high-rise residential buildings (usually more than 20 storeys) guarded by security gates. Reaching the residents is difficult without the estate managers' approval and help. Unfortunately, the estate management imposed tight restrictions on the interview process. Without seeing a human face, residents are less likely to participate in a questionnaire survey (Dillman, 2000). Also, the elderly, new immigrants and economically deprived individuals living in public housing estates were often indifferent to opinion surveys. An unusually low response rate (17.5%) was recorded in a recent local telephone survey concerning urban parks (Wong, 2009).

Many respondents (43%) were aged 30 – 49 years, and 28.9% and 27.7% were <30 and >50 respectively. For monthly household income, about 27.3% indicated '<\$10,000', and 30.5% '\$10,000–19,999' (Hong Kong Dollars at an officially pegged exchange rate of US\$1.00=HK\$7.80). For higher-income households, 24.8% and 17.5% indicated '\$20,000–40,000' and '>\$40,000' respectively. Only 30.2% attained a tertiary qualification, and over half (56.5%) secondary. About 13.4% attained primary education or had no formal education. Gender spread was almost even, with 47.3% male and 52.7% female. The majority (84.8%) were not retired. For residence duration, 18.8% were ≤ 5 years, and 45.9% 6-15 years. Some 21.4% had stayed for 16-25 years, and 13.9% ≥ 25 years. About one-third (33.7%) had children <12 years old in their family.

Socioeconomic profile was compared with the 2006 population census (Census and Statistics Department, 2007), except residence duration and presence of children which were not gleaned in the census. Chi-square tests show that income, gender and status of retirement match the census data well ($p > 0.05$). However, age and education attainment deviate from the census data ($p < 0.05$). The young are underrepresented because we interviewed only those aged >18. Fewer respondents are educated to primary level or below, and more to secondary and tertiary levels.

Attitude towards UGS functions

The average scores of 2.49-3.49 indicate general importance accorded to the 18 park functions (Figure 2). The top six functions are related to microclimatic and personal health benefits, with air cleansing ranked first. Hong Kong suffers from severe and chronic air pollution due to massive urbanization and industrialization of the Pearl River Delta Region (Wong et al., 2001; Environmental Protection Department, 2008). The results strongly express an expectation of more vegetated spaces to improve air quality. Aesthetic enhancement and positive effects on physical and mental health are rated as important. Urban Hong Kong is overcrowded with predominance of artificial cover. Amenity relief is earnestly desired, reinforced by recent growing public-health concerns of new infectious diseases (Abdullah et al., 2003).

Two microclimatic functions of greenspaces, namely air temperature reduction and carbon dioxide sequestration, receive fairly strong support (Figure 2). Concern about the urban heat island effect and global warming has influenced this perception. The compact city with tightly packed high-rise buildings in the urban core is vulnerable to the heat island effect. The surge in very hot weather events (Leung et al., 2004) might have stimulated public demand for more urban vegetation to cool and clean the city (EPA, 2009). Green buffers are wanted to retain ground level open spaces to soften and open up the exceptionally bulky and dense city. It reflects the grave lack of open spaces (Jim 1994, 2000) and a desire to depart from past excesses in land use intensification. The high priority given to microclimatic functions differs from two Finnish studies (Tyrväinen, 2001; Tyrväinen et al., 2007) and a US one (Lorenzo et al., 2000), where they were considered only moderately important. Our results, however, match a recent study in Guangzhou in south China (Jim and Chen,

2006b), which has similar compact configuration and environmental problems.

The six functions on recreational benefits are rated relatively less important (Figure 2). They include children's playground, outdoor physical exercise, and relaxation and whiling away time. They differ from Tyrväinen et al. (2007) that recreational opportunities were the most important function to Finnish respondents. The availability, accessibility and preference for alternative leisure opportunities in Hong Kong, mainly indoor activities, may contribute to the lower ranking (Wong, 2009).

Shading is perceived as quite important, possibly due to the strong tropical sunshine in summer. This ranking is comparable to studies in Guangzhou (Jim and Chen, 2006b) and New Zealand (Vesely, 2007), but not in Nordic countries like Finland (Tyrväinen et al., 2007), where summer is not so hot and sunshine is welcomed. Contact with nature is rated moderately important, similar to Guangzhou (Jim and Chen, 2006b) and Finland (Tyrväinen et al., 2007). It echoes city-dwellers' intrinsic affinity for nature in city, treating UGS as nature's surrogate.

UGS are considered important in enhancing community image. As community focus or icon, their significance increases with historical and cultural association and public involvement in design and management (Gobster, 2001; Woolley, 2003). Since both enhancement factors are weakly expressed in Hong Kong, the importance attributed to UGS could be mainly connected with the pride of having good green sites per se.

Six functions with average scores near or below 3.0 are considered relatively less important (Figure 2), including indirect environmental, social and economic benefits. Soil erosion prevention and habitat for wildlife are ranked notably lower than the direct and tangible environmental benefits (e.g., air purification). They are unfamiliar to city-dwellers, and are less critical than the declining urban

environmental quality. The prevalence of small UGS and their proximity to built-up areas have limited wildlife presence. Residents are rather oblivious of the role of park design in permitting sharing of space between people and wildlife (Campbell, 2006). The perception of ecological functions is skewed towards tangible aspects and acute environmental problems. Noise abatement is considered not too important. UGS in Hong Kong are small and exposed to the spill-over environmental nuisance of surrounding roads (Lam et al., 2005). With chronic exposure to high ambient noise level, some residents have developed tolerance or a resigned attitude towards this ubiquitous annoyance (Wong et al., 2002). Some are ignorant of this function until prompted by the interviewers. Recognition of positive impact on property value ranks second last. Half of the respondents living in public rental housing are not concerned with property price.

Neighbour-social interaction and symbol of identity are ranked near the bottom. Empirical studies support the social role of UGS (Burgess et al., 1988; Coley et al., 1997; Kuo et al., 1998; Woolley, 2003). Our study and Wong's (2009), however, do not find this function important. Hong Kong people generally have a weak sense of neighbourhood (Forrest et al., 2004). Alternative venues and activities for social interaction are readily available in the city. Residents are less motivated to use public parks for gathering. Regarding the identity issue, Grove et al. (2006) observed that neighbourhood vegetation could represent one's membership in a particular lifestyle, but no clear evidence could support this mentality in the present study. Our finding is akin to a New Zealand study where only 13% voted for collective identity as a reason for tree preservation (Vesely, 2007). In compact Hong Kong, with many people sharing a limited pool of UGS, the sense of ownership is correspondingly curtailed. Comparing with Western countries, most Hong Kong middle-class residents live in denser areas with a tiny share of communal greenspaces. Moreover, most UGS are

publicly accessible and have to be shared with non-residents, indicating a weaker attachment to public greenspaces vis-à-vis private ones (Tarrant and Cordell, 2002).

Perception of UGS functions by socioeconomic variables

The overall perceived importance of UGS was measured by summing the scores of the 18 functions and compared with socioeconomic variables using F or t-tests (Table 1). In general, middle-aged, female, higher-income and better educated residents with children emphasize the importance of UGS. Age and gender show significant relationship, but not for the remaining variables.

Middle-aged (31-49) individuals attach more importance to UGS as an urban asset to enhance the quality of life. Age affects the perception of several functions. For example, 'very important' assessment to social-neighbourly interaction is given by 17.5% of ≥ 50 respondents, but only 11.2% and 11.6% for ≤ 30 and 31-49 groups ($X^2 = 16.933$, $p < 0.01$). Older residents have long-standing neighbours, less mobility, more leisure time, and more time spent in local UGS. Jorgensen and Anthopoulou (2007) found commonality and divergence amongst different age groups in enjoyment and fear in urban woodlands (a special type of UGS). On the other hand, more ≤ 30 respondents (24.5%) than ≥ 50 (12.5%) rank habitat for wildlife as very important ($X^2 = 13.297$, $p < 0.05$). This may be related to the better education and awareness of environmental issues amongst younger people. Moreover, females consider UGS more important than males. More females (46.4%) than males (40.8%) considered promoting mental and physical health as 'very important' ($X^2 = 13.214$, $p < 0.01$). Also, 35.2% of females vis-à-vis 29.9% males rate contact with the nature as very important ($X^2 = 12.460$, $p < 0.01$). A similar gender-differentiated pattern is observed for the symbol of social identify ($X^2 = 14.737$, $p < 0.01$). Overall, females tend to emphasize the health and socio-psychological benefits (Zelezny et al., 2000).

Attitude towards UGS negative impacts

The average scores of five negative UGS impacts range from 2.03 to 2.29 (Figure 3), suggesting rather non-negative perception. Security concerns are emphasized. Vegetation could be conceived as dark and hiding places for criminal elements. The poorly designed or managed UGS in inner-city areas suffer from public security problems. The juxtaposition of incompatible land uses and occurrence of illegal activities within and near UGS have discouraged use by most residents (Democratic Alliance for Betterment of Hong Kong 2000; Xue et al., 2001). Trees producing organic litter and blocking light are rated somewhat annoying. Hong Kong people are sensitive to new infectious diseases such as SARS, avian flu and human-pig flu. They are cautious about the bird droppings associated with trees which serve as bird habitats. The response to trees blocking light could be linked to the brightly lit city where people are conditioned to expectation of high light intensity even in UGS (Pun and So, 2009).

The negative impacts of inducing gang problems and occupying urban spaces attract less concern. Gang activities in Hong Kong usually occur outside UGS (Brahan et al., 1998). Some local greenspaces, however, attract teenage delinquency particularly at night (Lee 1997). The divergent views on UGS occupying urban space could be linked to the scanty presence of green covers, signifying that built-up areas have intruded plantable places rather than the reverse situation (Jim 1998, 2000). Some residents expect more UGS and disagree with this negative impact.

Attitudes towards UGS negative impacts by socioeconomic variables

Age, household income and education level have statistically significant impacts (all $p < 0.01$; Table 2). Less educated, lower-income and older individuals tend to

recognize the negative impacts. Diverse views are expressed on gang and security problems. For instance, more ≥ 50 individuals (33.6%) than ≤ 30 (17.5%) perceive the gang problem ($X^2 = 17.645$, $p < 0.01$). Since older people are more vulnerable to crimes, a greater concern about personal safety is understandable.

People with a higher household income and education are less concerned about security problems due to dark and hiding place. Only 21% of $> \$40,000$ /month earners are worried, vis-à-vis 47% of $< \$10,000$ /month ($X^2 = 34.201$, $p < 0.01$). Similarly, 25% of better educated (tertiary level) respondents are worried, vis-à-vis 45.5% of less educated (primary or below) ($X^2 = 20.680$, $p < 0.01$). People with better income and education live in better private housing areas where public security problems in UGS are mild. More females (39.8%) than male (29.6%) are concerned about safety ($X^2 = 8.927$, $p < 0.05$). Urban parks could induce an unsafe feeling due to limited unobstructed sight distance in vegetated areas (Jorgensen and Anthopoulou, 2007), predictable movement patterns (Luymes and Tamminga 1995), and fear of sexual attack and violence especially for women (Burgess et al., 1988; Madge 1997). Most Hong Kong parks have notable pedestrian flow, and few have dense vegetation cover. Sites in derelict inner-city areas, however, are often occupied by homeless people or intruded by drug-dealing and triad (illegal societies) activities to deter use by women or children.

Performance of UGS near residence

The average scores for eight UGS problems range from 2.13 to 2.79 (Figure 4), indicating general satisfaction. Greater concern for UGS physical setup has been expressed. Lacking sports facilities, noted by 55.6% of the respondents, is ranked first. With meagre indoor and outdoor private space in Hong Kong, exercising at home is difficult. Most schools are also seriously deficient in space for sports. Passive

recreational facilities (denoted by seats and pavilions) and greenery are considered inadequate by 41.8% and 37.2%. In addition, 34.1% opined there were too many people sharing the greenspaces.

The above deficiencies reflect the fundamental limitations of small individual sites and inadequate total UGS area. The official planning standard for open space remains very low at merely 2 m²/person for some decades (Planning Department, 2009). Most local parks in the old districts are tiny (usually <50 m²; Xue et al., 2001) by international standards, commonly converted from scattered brown sites trapped in cramped inner-city areas. Often added as an after-thought, they compensate for the almost absence of open spaces and greenery in the old city core. In new development areas with more greenspaces, the exceptionally high population density means a very low per-capita share of UGS. Poor landscape quality is noted as a problem by 26.5%. Poor hygienic condition and distant location are of less concern.

Preference for UGS design

Desire for greenery (57%) is strongly expressed in comparison with sports facilities (29%) and seats (14%) (Table 3). This desire is consistent with previous Hong Kong studies indicating preference for greenery (Au 1995; Lam et al., 2004). The result matches the concern about inadequate greenery and low landscape quality (Figure 4), suggesting expectation for improvements. The appeal for natural elements may be prompted by the acute shortage of urban greenery and the highly regimented and manicured design.

Park seating design is broadly classified as clustered or dispersed. The former can encourage social interaction, but it receives little support (11%) vis-à-vis the strongly-preferred dispersed layout (60%) (the remaining 29% have no preference). The dispersed design is favoured to maintain a semblance of privacy in the public

domain, and to avoid interference from and interaction with other park users. As park visitors elsewhere tend to seek peace, tranquillity and solitude by immersing in the pleasant landscape (Kaplan and Kaplan, 1989; Tinsley et al., 2002; Shin et al., 2005), the attitude of the Hong Kong respondents has not been notably diluted or conditioned by high-density living. Since many UGS in Hong Kong are small and crowded, the short separation distance between users may intensify the discomfort and militate against their expectation. In a study in Surrey, BC, residents prefer small and linear (greenway) UGS near homes to tap the benefits of mobility, environmental buffer and ecosystem services (Hobden et al., 2004). In Hong Kong, the small UGS embedded in the densely built-up urban core and deprived of such natural endowments could not realize such desirable functions.

For UGS size, over half (55%) prefer one large park than a collection of small venues (Table 3). A quarter (24%) chooses several small ones with the same total area, and the rest have no preference (21%). Hong Kong has not assigned sizeable space for public parks. The preponderance of small sites has shaped public expectation for big sites and the corollary of more facilities. The 77.3% who agreed that small site is a problem (Figure 4) favour large park ($X^2 = 20.628$, $p < 0.01$). Small sites scattered in different districts are highly accessible to local residents, but they are often beset by poor environmental quality and limited facilities. In a study in Roanoke, VA, residents tend to trade the size of UGS with proximity (Poudyal et al., 2009). They also found that the demand for park size is correlated with the cost of living space. The inordinately high property value in Hong Kong could have fuelled the quest for large UGS.

Preference for UGS design by socioeconomic variables

Preference for UGS design is compared with socioeconomic variables. The

choice of design elements is a function of age, education level, retirement status, and children in the family; gender, income and residence duration are statistically not significant (Table 3). The appeal for more trees is similar between age groups. The ≥ 50 cohort and the retired demand more seats, whereas the 31-49 and families with children, more sports facilities. Park seats are used for chatting, collective recreational activities (e.g. chess games) and watching passers-by. The need for seats among the older users reflects active engagement in passive recreation and social interactions. Middle-aged parents are more likely to have children to generate demands for active leisure pursuits. The well-educated (tertiary level) desire for more greenery but not more seats, suggesting a higher level of environmental knowledge and awareness.

Household income, education attainment and retirement status are associated with choice of park size (Table 3). More educated residents prefer one large park, which can supply more ecosystem services and recreational facilities. Large parks serve as a larger and more effective ecological repository to bring benefits to more users and species. Education has induced an environmentally benign option. Working respondents want a large park more than the retired. Small parks serve a local clientele, and they can be conveniently accessed by elderly residents. With less mobility, retired people are less amenable to travel a long distance to reach a large park. The lower education level of retired respondents may also account for the choice. Income demonstrates a mixed effect on park-size preference with no clear trend.

Policy implications

The expressed community wish reflects the harsh urban realities. Our case study suggests that city compactness may influence the ways that residents perceive and interact with urban nature. It would be reasonable to expect public policies to be similarly moulded. Public belief on UGS, however, is underrepresented in the

decision-making process. Green-space planners and managers often hold different views from users (Burgess et al., 1988; Coles and Bussey, 2000; Hunter, 2003). Landscape amenity and maintenance has been taken into consideration sometimes at the expense of social dimensions, which are harder to define with precision. Pedestrian access to managed lawns and gardens, for instance, is prohibited in many urban parks in Hong Kong. Older residential communities have different preferences about green-space designs than younger and richer communities. Universal park design standards lose applicability where community variation is significant. Regular exchange between park users and park managers including horticultural professionals is imperative.

Historically, however, the urban planning and (re)development processes in Hong Kong lack opportunities for active public participation. Local communities are only involved in later stages, such as project implementation and resident relocation (Ng, 2002). Town hall meetings merely play a consultative role. Private ownership of public spaces prevalent in the territory has a tendency to obstruct public access and constrain the variety of recreational and social activities (Cuthbert, 1995; Cheng, 2009). Consequently, green-space designs and management practice fail to account for public aspirations and societal needs properly and effectively.

Carefully designed and independent social surveys could provide useful inputs to planning processes. Research findings could inform policy, planning and management of UGS to cater to the need and expectation of users. To maximize community support and use, there is a need to incorporate public views into the planning regime of Hong Kong. Park design and location could move away from the patronizing approaches dominated by professional and government officers, to one that takes into consideration citizens' preference and behaviour.

In 1995, the Planning Department commissioned a study to assess the leisure

habits and recreational preferences of Hong Kong people (Llewelyn-Davis Planning, 1998). Recommendations of the study contributed to the revision of planning standards regarding open space provision approved in 1998. Implementation of the revised standards resulted in an increase in the number and areas of urban green spaces in Hong Kong over the past decade (Wong, 2009). Nevertheless, Wong (2009) notes that this quantitative improvement does not always have an qualitative equivalence. There is an increasing demand for a wider variety and enhanced quality of park facilities to cater the special needs of marginalized groups, such as the elderly, disabled people and immigrants. Lower-income individuals and immigrant families are major user groups of public parks in the old city areas of Hong Kong. Some of these open spaces remain obsolete and tiny, but play an important role of social inclusion (Kuo et al., 1998; Baycan Levent and Nijkamp, 2005). Qualitative considerations are crucial to unleash their diverse contributions to society.

Formal and informal community networks are a key component of a participatory approach to green-space planning in an effort to account for local demographics and constraints. Our findings indicate that less educated, lower-income and older individuals tend to recognize the negative impacts of UGS. These groups normally do not have access to or tend to refrain from the formal processes of town planning. Accessible means to reach the planning regime are limited or ineffective, making their concerns about park defects unheard. District Councils, the local legislative body in Hong Kong, are responsible for transmitting community voice to the authorities. They lack substantial administrative power, which remains in the hands of senior planning officials who are not elected and lean towards concentrated business interests. Small NGOs are actively involved in local planning processes and social movements, including the recent campaigns against the deprivation of public open spaces (Cheng, 2009). Daily leisure needs, however, are not a priority as the

activists tend to spend more energy on controversial issues to ensure political impacts. There are institutional barriers for public views about UGS to exert impacts on the formulation of urban planning policy.

Hong Kong needs a dedicated agency for planning and managing urban parks and trees (Jim, 2002). A tree council could fill the void by lending statutory power to a regulatory body composed of broad membership including government officials, elected representatives, professional planners, community and green groups, and members of the public. It must have the capacity to nurture close cooperation and coordination among these groups, and promote the involvement of community in the planning, execution and management of greening projects. Regular reports of community views, such as the results of our survey, should be communicated to the decision makers under formal administrative mechanisms. The desired regulatory integration entails a more accountable governance structure, which is under development in the wake of the recent democratic movements in Hong Kong.

Conclusions

Hong Kong people show an affinity for greenery and good landscape design in public areas. The ideal of immersing in a natural ambience through park patronage is warmly appreciated. The innate desire has not been muffled by the excessively high-density existence. Appeal of green open spaces seems universal and enduring, and hardly dampened by pervasive detachment from nature in compact cities. The perceived importance of UGS functions, however, is coloured by a utilitarian bent. Residents focus on microclimatic and amenity benefits more than social and ecological aspects. The public view to a certain extent is differentiated by

socioeconomic factors, especially age, income and education. Older people emphasize the social interactions, and females are more concerned about health, safety and socio-psychological issues. Income and education attainment jointly favour recognition of UGS as an urban ecological resource and wholesome outdoor recreational venues. To the less educated, lower income and some older individuals, the undesirable feature of UGS are underlined. The deficiency of sports facilities is identified as the principal limitation of existing UGS, whereas inadequacies in key design elements such as seats, pavilions and greenery are highlighted. Specifically, over half of the respondents desire for more trees, dispersed seating design and large park.

The appreciation of UGS emanates from pragmatic needs. Direct, tangible environmental and amenity benefits attract more attention. These functions have been commonly publicized and are easily recognizable. On the other hand, less direct ecological services such as habitats for wildlife and collective-social benefits receive limited attention. Being more complicated and subtle, the limited understanding of such high-order benefits implies inadequacy in environmental knowledge and awareness. The value of nature embedded in the overwhelmingly compact and artificial urban matrix is construed more as an instrument to improve the quality of the human living environment than a realization of the intricate human-nature harmony. Despite the earnest desire for more greenery, it is mainly based on practical use than an intrinsic appeal. The results corroborate Lee's (2003) observation that the general environmental attitude of Hong Kong people tend to be utilitarian. They deviate from Tyrväinen (2001) and Chiesura (2004) that the less tangible or immaterial natural services of urban greenery were emphasized by European respondents.

Artefacts are no substitute for natural elements. The deeply-ingrained development routine of Hong Kong has consistently and pervasively displaced nature

regardless of quality and value. The dearth of greenspaces proves to be detrimental to the quality of life and goes against the professed quest for a sustainable city. Our findings expose the latent public desire to ameliorate the chronic maladies of the excessively built-up environment with pronounced deprivation of natural elements. The proclivity of the residents is shaped by the extreme expression of the compact built form of Hong Kong, which has incurred the corollary problems of poor air quality, lack of ventilation and solar access, and urban heat island effect. There is a community-wide expectation for more open spaces filled by greenery to alleviate the unpleasant cityscape.

Beside the physical and landscape elements, park design could incorporate the social dimension with a view to fostering social interaction, integration and harmony. Social-empirical studies are necessary to provide the scientific basis for the next generation of socially inclusive, and well landscaped and managed parks. In addition, deliberative and open-ended approach could solicit valuable insights to understand the deep linkage between people and nature in the UGS context (O'Brien, 2003; Chiesura, 2004). Directly engaging the users in the spirit of meeting client requirements and wishes could be appropriately incorporated into the planning process. The key social roles of parks in fostering the sense of belonging, attachment, identity and place (Forrest et al., 2008) could be included into the modern park design package. The community's desire for contact with high-quality nature and to serve nature conservation objectives (Jim and Chen, 2006a) could be factored into green-space planning. The liveability and sustainability of a city is to a notable extent contingent upon the survival of urban nature. As Hong Kong society gets more mature in the social, political and environmental realms, public policies and facilities could be correspondently refined, elaborated and adjusted. Such a renaissance in urban park design could be more earnestly adopted by municipal authorities in developing

countries.

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Citizen attitude and expectation towards greenspace provision in compact urban milieu

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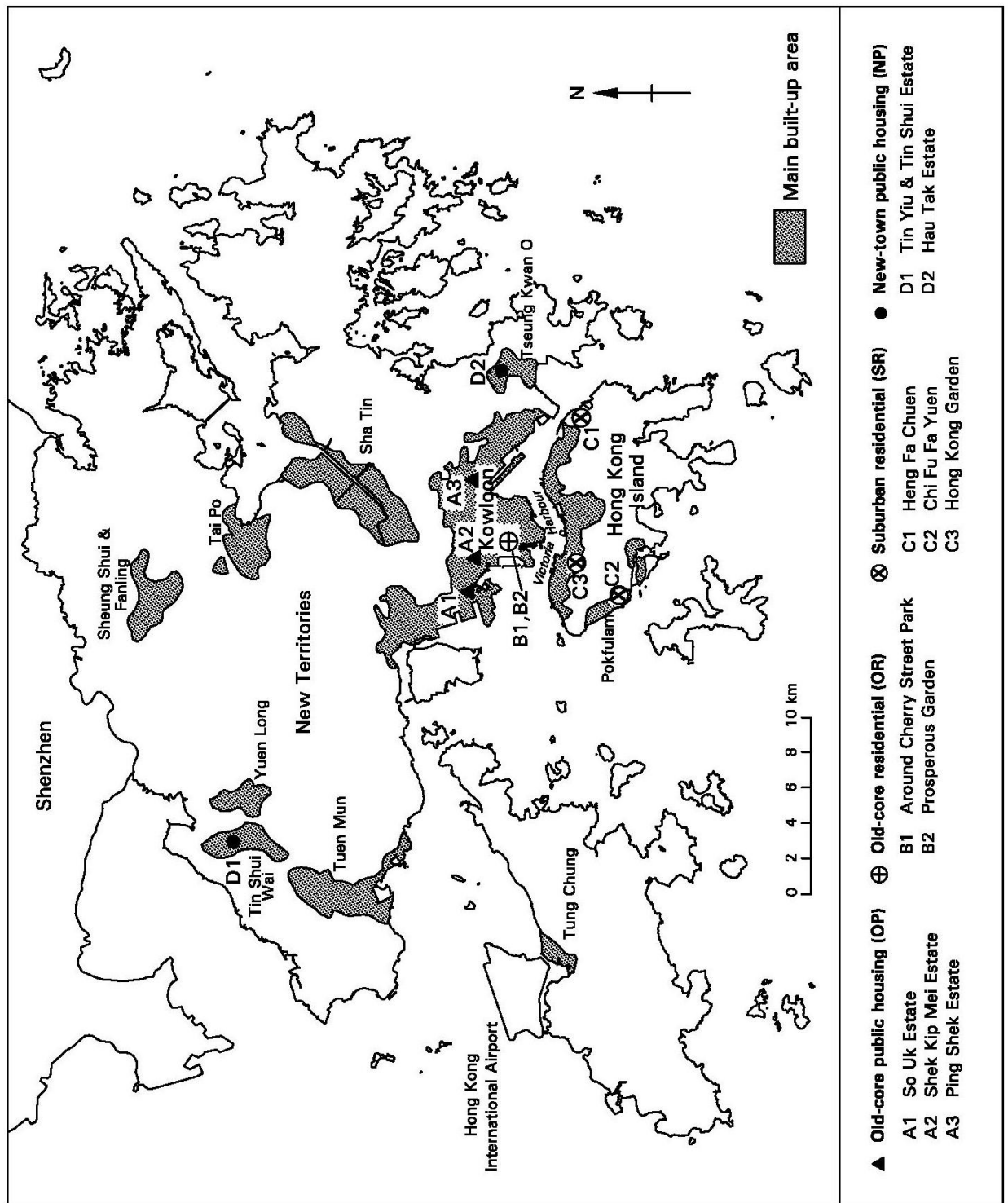


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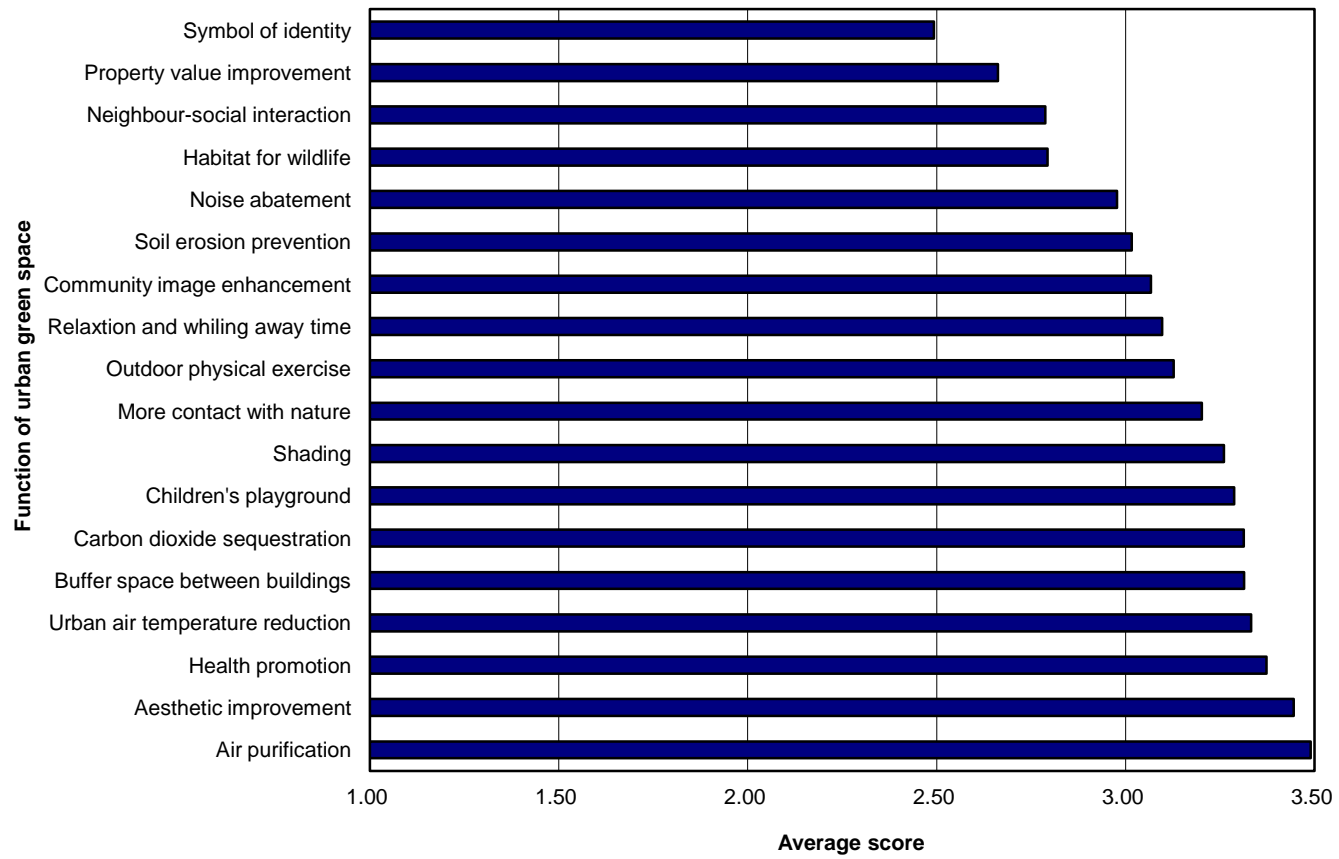


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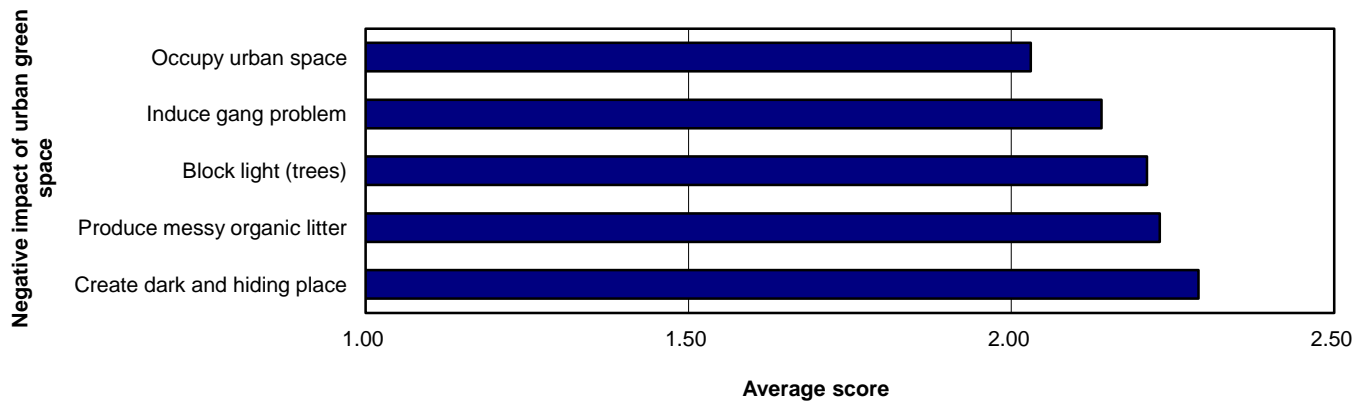


Fig. 3. Mean scores on the perception of negative impacts of urban green spaces Create dark and hiding places imply security and crime concerns (Average score: 4 = strongly agree, 3 = agree, 2 = slightly disagree, 1 = strongly disagree)

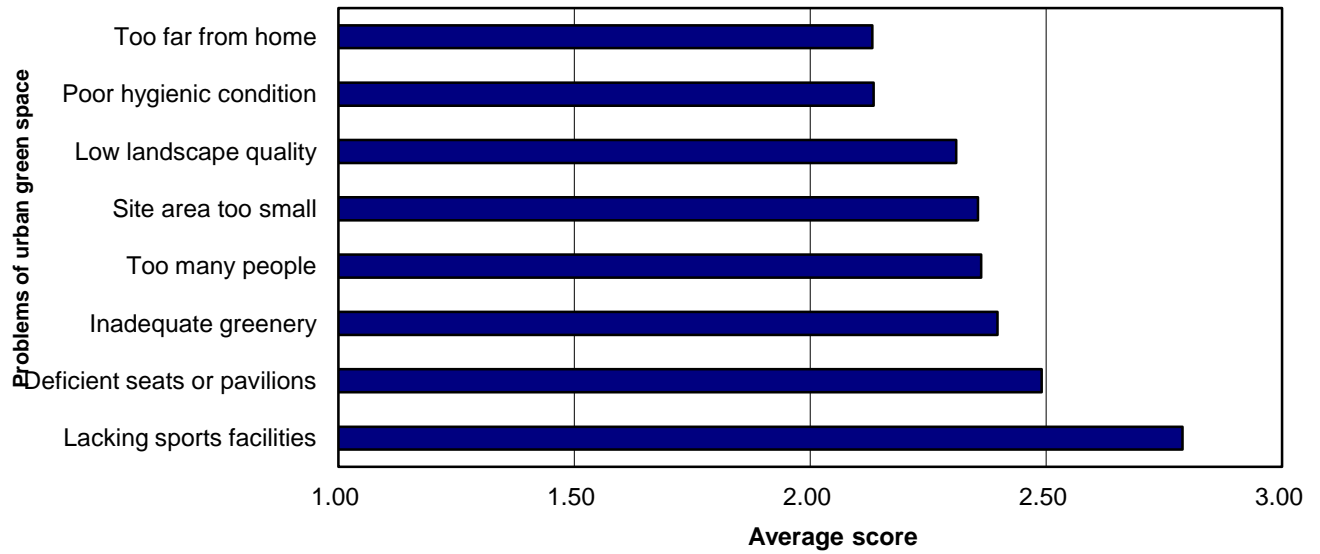


Fig. 4. Mean scores on the perception of problems associated with green spaces located near respondents' residence (Average score: 4 = strongly agree, 3 = agree, 2 = slightly disagree, 1 = strongly disagree)

Table 1 Overall perception of the importance of urban green space functions by respondents' socioeconomic variables.

Socioeconomic variables	Importance score [#]					F or t statistic	Probability
Age	≤30	31–49	≥50			F=3.598	0.028*
	55.13	57.25	55.9				
Monthly household income (HK\$)	Nil	<10,000	10,000–19,999	20,000–40,000	≥40000	F=1.694	0.15
	54.29	55.98	55.36	56.74	57.59		
Education	≤Primary	Secondary	Tertiary			F=2.242	0.107
	54.51	56.25	56.97				
Gender	Male	Female				t=-2.279	0.023*
	55.45	57.01					
Retired	Yes	No				t=-0.761	0.447
	55.63	56.38					
Residence duration (year)	≤5	6–15	16–24	≥25		F=1.877	0.133
	57.83	55.67	55.94	56.7			
Children	Yes	No				t=1.311	0.191
	56.89	55.95					

[#] Sum of scores of the 18 functions of urban green spaces

* Indicates significant at 0.05 level, and ** at 0.01 level

Table 2 Overall perception of the negative impacts of urban green spaces by respondents' socioeconomic variables.

Socioeconomic variables	Negative impact score [#]					F or t statistic	Probability
	≤30	31–49	≥50				
Age	10.34	10.98	11.34			F=5.147	0.006**
Monthly household income (HK\$)	No income	<10,000	10,000–19,999	20,000–40,000	≥40000	F=4.287	0.002**
	11.62	11.64	11.09	10.58	10.20		
Education	≤Primary	Secondary	Tertiary			F=8.515	0.000**
	11.97	10.93	10.33				
Gender	Male	Female				t=-1.592	0.112
	10.69	11.07					
Retired	Yes	No				t=1.782	0.075
	11.41	10.8					
Residence duration (year)	≤5	6–15	16–24	≥25		F=0.976	0.404
	11.08	10.73	10.79	11.29			
Children	Yes	No				t=-0.970	0.332
	10.72	10.97					

[#] Sum of scores of the 5 negative impacts of urban green spaces

* Indicates significant at 0.05 level, and ** at 0.01 level

Table 3 Respondents' preference for key elements of park design and park size by socioeconomic attributes.

Socioeconomic variable	Preference for design elements (percent of respondents)				Preference for park area (percent of respondents)			
	More trees	More seats	More sports facilities	Chi-square Cramer's V	Several small	One large	No preference	Chi-square Cramer's V
Age:								
≤30	59.4	12.6	28.0	0.168**	25.2	58.0	16.8	0.075
31–49	56.1	7.5	36.4		22.3	58.1	19.5	
≥50	58.1	24.3	17.6		25.5	48.2	26.3	
Monthly household income (HK\$):								
No income	64.3	17.9	17.9	0.098	6.9	55.2	37.9	0.137*
<10,000	50.5	18.6	30.9		21.6	51.5	26.8	
10,000–19,999	54.6	14.2	31.2		27.7	51.8	20.6	
20,000–40,000	62.3	12.3	25.4		20.9	63.5	15.7	
>40,000	64.2	7.4	28.4		29.6	56.8	13.6	
Education:								
Primary or below	51.5	22.7	25.8	0.109*	25.8	40.9	33.3	0.100*
Secondary	54.2	13.0	32.9		22.9	57.0	20.1	
Tertiary	66.4	10.7	22.8		25.5	58.4	16.1	
Gender:								
Male	61.6	12.5	25.9	0.077	26.9	53.8	19.2	0.065
Female	54.0	14.6	31.4		21.5	56.7	21.8	
Retired:								
Yes	55.4	27.0	17.6	0.177**	22.7	44.0	33.3	0.135*
No	58.0	11.2	30.8		24.3	57.4	18.3	
Residence duration (year):								
≤5	55.4	9.8	34.8	0.090	25.8	50.5	23.7	0.059
6–15	57.7	12.3	30.0		22.0	59.5	18.5	
16–24	55.7	16.0	28.3		27.4	51.9	20.8	
≥25	63.2	19.1	17.6		23.2	53.6	23.2	
Children:								
Yes	50.6	12.0	37.3	0.134*	25.1	55.7	19.2	0.028
No	61.2	14.4	24.5		23.5	55.2	21.3	

* Indicates significant at 0.05 level, and ** at 0.01 level (no significant results for preference on seating design)