Social Performance of Communal Sky Garden in a Dense Urban City - Hong Kong

Dr. Catherine CHAN

22 April 2014
Part One
Introduction + Background

Social Performance of Communal Sky Garden in a Dense Urban City - Hong Kong
1. Background & Current Situations

**Typical scenarios of a dense city**

- Rapid urbanization in dense city $\rightarrow$ maximizing development potential
- High-rise residential development $\rightarrow$ typical quick-fit solution
- Opportunity cost of development $\rightarrow$ open spaces and greening spaces
- Limited open space results in $\rightarrow$ reduced communal gathering, leisure and greening
1. Background & Current Situations

**Scenarios of Hong Kong**

- High-rise residential buildings developed to meet the demand
- Critical periods of elevated green open space for high-rise residential building prototype:

  1. **1980’s** transfer-plate construction → podium offers alternative communal + greening space
  2. **2001-02 JPN 1 + JPN 2** → sustainable features and communal sky-garden emerged

Communal Sky Garden (CSG) in high-rise residential building
Hong Kong

Compact + Dense populated: Space for communal open spaces?
Part Two
Research details

Social Performance of Communal Sky Garden in a Dense Urban City - Hong Kong
2.0 Research Aim + Objectives

AIM
The study aims to examine the design elements which affect social performance of communal sky garden (CSG) for high-rise residential buildings in dense city.

OBJECTIVES
1. Investigate: different forms of sky gardens, their benefits and limitations;
2. Understand: relationship between green space and high-rise development in dense city
3. Identify: Constituents of a quality communal space;
4. Establish: Set of design elements for the provision of CSG; and
5. Explore: Role of CSG in a dense city.
2.1 Types of Sky Garden

1. **Rooftop garden**
   - At building roof: extensive type: inaccessible by people; intensive type: accessible by people

2. **Podium garden**
   - At podium: close to ground level and support both active and passive uses; common in Hong Kong residential development especially with transfer plate structure

3. **Garden at intermediate level**
   - At intermediate level: mainly design for passive use as communal sky garden
2.2 Scope of Research Works (Partial)

1. Examine the CSG of residential building located at the intermediate floor.
Evaluate **Social Performance of CSG** in high-rise residential building in Hong Kong

- Performance – perception & use pattern (by users)
- Social performance – on both personal health & well-being and social aspects
2.3 Research initiatives

1. Previous studies: importance of open/public space in foster vital urban life.
2. Lack of greenery and open spaces in dense city → **CSG is a supplement provision?**
3. **Lack of research** on CSG provision at intermediate level of a residential building to support this argument.
4. **Pioneer study**: evaluating the social performance of CSG in Hong Kong

**Diagram:** Communal Sky Garden v.s. Vertical landscape planning strategy

**Research:** Social Performance of Communal Sky Garden in Dense Urban City - Hong Kong
Part Three
Communal Sky Gardens Emergence in Hong Kong

Social Performance of Communal Sky Garden in a Dense Urban City - Hong Kong
3.1 Development control & CSG

RESEARCH: Social Performance of Communal Sky Garden in Dense Urban City - Hong Kong
3.1 Development control & CSG

1. Residential Building with only Refuge Floor before JPN
   - For residential building > 26 no. of floor, the Refugee floor (RF) is either located at intermediate level or at the roof.

2. Residential Building with CSG
   - Utilizing Refuge Floor for CSG according to JPN 1 and 2
   - Following typical residential floor footprint
   - Total no. of CSG = Total no. of Floor / 15
   - The lowest CSG should be 10/F higher than podium
   - The second CSG should be at least 10/F higher than previous CSG
   - At least 4.5m height room
   - Overall building height increase
   - Should provide cross ventilation at both opposite sides

3. Residential Building with modified CSG
   - All conditions same as Item 2 above
   - Overall building height increase
   - However, the modified CSG should occupied only 50% of one typical floor plate. Hence, 2 CSG level can be provided given total RF and CSG areas remained unchanged. An external staircase can be provided for the connection.

RESEARCH: Social Performance of Communal Sky Garden in Dense Urban City - Hong Kong
Part Four
Urban Life + Communal Spaces

Social Performance of Communal Sky Garden in a Dense Urban City - Hong Kong
4.1 Problems associate with urban life

A. Problems associate with urban life
   - Lack of open space
   - Crowding
   - Lower physical activity
   - Lack of personal space
   - Inhibited social interactions

B. Importance of urban greening
   - Benefits the urban environment
   - Makes city livable
   - Softening a highly built cityscape
   - Provide green retreats for social, recreational & leisure needs
   - Reduce stress of daily urban life
   - Innate of human attraction to nature
   - Higher well-being and public health
   - Improve workplace quality & effectiveness of office working
   - Enhancing quality of life
4.1 Problems associate with urban life

C. Importance of communal space
- City dweller’s desire & basic need for sociability & community in public
- Balance of private & public experiences for a healthy city life
- Social interaction to help stimulating supports & sense of community
- People express greater happiness
- Improve social well-being of communities
- Susceptible to sickness if in short of connection/ meaningful social contacts
- Street crime reduced

D. Integration of green and communal space
- Play a vital & integrated role in cities and enhance urban vitality
- A pleasant environment which offers opportunities for relaxation & recreation → positive city image & sense of identity for the citizens
- Improve quality of life
- Physical characteristics of neighbourhood space mark a considerable influence on social interactions →
  Green space to increase informal contacts → social interaction and fostering community development
- Positive relationship between presence of green and amount of using outdoor spaces and social activity
- Crucial role in creating vital neighbourhood spaces & catalyst on fostering neighbourhood ties
Part Five
Relationship between Human + Environmental Design

Social Performance of Communal Sky Garden in a Dense Urban City - Hong Kong
5.1 Association between human & environment

A. Human & environment
   • Environmental attributes ➔ dynamic & transactional engagement of people with space
     ➔ either help or impede uses/activities
   • Environmental psychology – a framework to study & understand the performance of a space, i.e. reasons of use & types of activities

B. Quality of the environment – crux of users perception
   • good design supports use
   • Design parameters – physical components of a space design (i.e. location, accessibility, size & scale, naturalness, micro-climate, facilities, varieties of quality, attractiveness & safety)
   • Spatial arrangement & landscape accessories ➔ determine potential activities (response to needs)
   • Interpreted by users – each place is unique
   • An interrelationship between physical features & perceived quality

C. Environmental perceptions (theories & perspectives)
   • When place is used ➔ perception
   • Interaction of behaviour, environment & personality ➔ to perceive quality of space, i.e. support, afford, preference ➔ satisfaction
   • Environmental supportiveness, Territorial Range Development, Affordance, Pleasure-Arousal-Dominance Hypothesis, Kaplan’s Preference Framework
   • An interactive & dynamic process

RESEARCH: Social Performance of Communal Sky Garden in Dense Urban City - Hong Kong
Part Six
Conceptualizing the Theories

Social Performance of Communal Sky Garden in a
Dense Urban City - Hong Kong
6.1 Conceptual framework of the Study

Theories & perspectives on human environment & perceptions
- Affordance
  - Social cognitive theory
  - Territorial range developing
  - Behavioral setting
  - Natural mapped environment
  - Latent image element

Behavior
- Activity / Users’ pattern

Needs?
- Learning?
- Restoration?
- Attention?

Environmental attribute
- Design parameters

Interaction

Perception

Users
6.2 Research Methods

Case Study Approach

→ Mixed method qualitative & quantitative sequential design

1. Desktop research
2. On-site measurement
3. Unobtrusive observation
4. Questionnaire survey (total 498 respondents)
5. Semi-structured interviews
6. Design analysis
Part Seven
Observations of CSG in Hong Kong

Social Performance of Communal Sky Garden in a Dense Urban City - Hong Kong
7.1 CSG provision from 2001 - 2011

- 24 no. private residential developments
- 1 no. public rental housing development
- 4 CSG typologies are observed

Legend
- Development with CSG (selected for case study)
- Development with CSG
- Development to be completed with CSG

RESEARCH: Social Performance of Communal Sky Garden in Dense Urban City - Hong Kong
7.2 Communal Sky Garden Design Typology

TYPICAL TYPE

- 1st type of CSG
- Coupled with refuge floor + follow guidelines of JPN 1 & 2
- Panoramic view: 4 sides

RESEARCH: Social Performance of Communal Sky Garden in Dense Urban City - Hong Kong
7.2 Communal Sky Garden Design Typology

**TYPICAL TYPE – The Orchards**

*RESEARCH: Social Performance of Communal Sky Garden in Dense Urban City - Hong Kong*
7.2 Communal Sky Garden Design Typology

**LINKED-TYPE**

- Linking up more than 2 Typical-type CSGs
- Further extend the possible usage and area of CSG
- Panoramic view: 3 sides

*Manhattan Hill*
7.2 Communal Sky Garden Design Typology

LINKED-TYPE – Manhattan Hill

RESEARCH: Social Performance of Communal Sky Garden in Dense Urban City - Hong Kong
7.2 Communal Sky Garden Design Typology

**DUPLEX TYPE**
- 2 levels of CSG connected by external stairs
- Higher headroom → promotes building permeability
- Panoramic view: 2 to 3 sides
7.2 Communal Sky Garden Design Typology

DUPLEX TYPE – The Palazzo

RESEARCH: Social Performance of Communal Sky Garden in Dense Urban City - Hong Kong
7.2 Communal Sky Garden Design Typology

**BALCONY TYPE**
- Pilot scheme for Hong Kong + provided in every 3 storey
- Not coupled with refuge floor
- Panoramic view: 1 side
- Different program set of each CSG

**Kwai Luen Estate**

**Social Performance of Communal Sky Garden in**
**Dense Urban City - Hong Kong**
7.2 Communal Sky Garden Design Typology

BALCONY TYPE – Kwai Luen Estate (Public Estate)

RESEARCH: Social Performance of Communal Sky Garden in Dense Urban City - Hong Kong
7.3 Common Features at CSG

(1) **Development location:** Close to shoreline + connected to MTR station (except Kwai Luen Estate)

(2) **CSG layout:** Follow existing typical floor foot-print + with a lot of partition structural walls + min. 4.5m headroom

(3) **Hard landscape elements:** Easy cleansing and replacement materials, e.g. AGT

(4) **Soft landscape elements:** Shrub planting + shaded tolerant + evergreen

(5) **Management and maintenance consideration:** Proper signage + CCTV + Emergency lighting

(6) **View:** Panoramic view
7.3 Common Features at CSG

Clear pathway + signage
7.3 Common Features at CSG

Sculpture + Neat materials

Harbour Green
7.3 Common Features at CSG

High headroom + good ventilation

The Palazzo
7.3 Common Features at CSG

Comfort site furniture

Lime Stardom
7.3 Common Features at CSG

Panoramic view
Part Eight
Findings of the Research Study

Social Performance of Communal Sky Garden in a Dense Urban City - Hong Kong
Urban open/ green space & urban life
8.1 Green space + urban life

1. **Use patterns of green space** (485 respondents)
   - 70% of respondents visited CSG, podium gardens, nearby open space or other type of open spaces
   - 80% visited open space within development or nearby open space
   - Visit during weekend and duration of **0.5 hour - 1 hour**
   - **Visiting objectives:** relaxation, exercise, leisure & play, social interaction, sense of peaceful & tranquility

2. **Urban problems encountered & use pattern**
   - Stressful urban life, lack of contact with nature/greenery, lack of social interaction with neighbours, congested living condition & lack of privacy
   - “almost everyday” – stressful urban life, lack of privacy, lack of contact with nature/greenery
   - ”at least once a week” – lack of social interaction with neighbour, crowded living environment

3. **Needs in daily life and needs addressed by Urban Open Space (UOS)**
   - Take exercise, enjoy nature, relax, enjoy sense of tranquility and leisure & play – similar ranking

4. **Views on provision of UOS (98% & correlation between role & functions of UOS)**
   - **Strong correlation** among restoration, relaxation, get some exercise, enjoy outdoor setting/nature
Design & considering factors & CSG
8.2 Design & considering factors & CSG

1. Design & considering factors and its importance when visiting CSG
   - Clean & tidy, well-maintained, tranquil environment, greening, openness, sufficient & nice seating

2. Correlation between design factors & performance
   - Strong correlation among accessibility, location, lack of nuisance, safety and headroom

3. Correlation between design factors & provision of CSG
   - Strong correlation among sufficient & nice seating, welcoming, well-maintained, greening, location, clean & tidy and openness

4. Design factor to be improved
   - Facilities, planting, size, design & variety of quality
Needs & problems & CSG
8.3 Needs & problems addressed by CSG

- **Addressed urban problems & needs by visiting CSG**
  1. to view nature
  2. to relax
  3. to enjoy sense of peacefulness and tranquility
  4. to be alone
  5. to meditate & gather with family

- **Use pattern & user profile**
  - Vary among **frequency of use** - “almost everyday” – to get exercise, to relax, to be alone, to enjoy sense of peacefulness & gather with family)
  - Vary among **age group & occupation**

- **Among cases**
  - **Kwai Luen Estate**: highest – to exercise, to leisure & play & to enjoy nature
  - **The Palazzo**: lowest – to exercise, to leisure & play, to enjoy view & to play with family
  - Addressed needs tally with **design & surrounding environment** of the respective development
Urban open space system & CSG 8.4
8.4 Urban open space system & CSG

• **Views on provision**
  - agree with provision of UOS: positively related to the provision of CSG
  - users – “like” and “agree” with such provision

• **Roles & functions of CSG – supplement insufficient open space within development**
  - Varies with the competing facilities, i.e. podium garden
  - Lower ranking - development with large podium garden – the Palazzo, Grand Promenade & Manhattan Hill
  - Public group ranks higher than user group

• **Roles & functions of CSG – supplement insufficient open space within district**
  - Varies with the competing facilities, i.e. nearby open space
  - Higher ranking - development without nearby open space – Grand Waterfront & Lime Stardom
  - Public group ranks higher than user group.

• **Role of CSG**
  • An extra merit
  • A complementary role
  • Cannot be overemphasized.
Social Performance of Communal Sky Garden in a Dense Urban City - Hong Kong
9.1 Conclusions

(A) Design factors and Social Performance of CSG

1. Correlation (Design factors v.s. Users perception)
   • Accessibility, location, lack of nuisance, safety and headroom

2. Design factors (First 5 Ranks)
   • (1) openness, (2) greening, (3) tranquil environment, (4) clean/tidy and (5) sufficient & nice seating

3. Performance correlates with ……
   • Design factors and availability of competing facilities

4. SIX factors tally with those good ones generated from literature
   • Accessibility, location, welcoming, greening (naturalness), safety and well-maintained

5. Unique and important factors to CSG (Affecting its performance)
   • Headroom, openness, lack of nuisance, tranquil environment and sufficient & nice seating (facilities)
9.1 Conclusions

(A) Design factors and Social Performance of CSG (Con’t)

6. Environmental attributes support to address problems/ needs of urban dwellers
   • Arrangement of the settings & features
   • Provide cues and interpreted by users as a doorstep communal space for relaxation and restoration
     *(Environmental perception theories & perspectives applied)*

7. Perceptions/ importance of design factors in line with the roles & functions and visiting objectives of CSG

8. Considerations for future provision
   • Size, greening and facilities
   • Flexible design to address changing needs
   • Design should subject to user types, site opportunities & constraints
     *(ambient environment & competing facilities)*
9.1 Conclusions

(B) Role & function of CSG / Value of CSG

1. Strong linkage with urban daily life (problems & needs) and mainly focus on those personal health and well-being aspects …
   • i.e. to enjoy view, to relax, to restore & relieve stress, to enjoy nature and improve quality of life

2. Use & popularity as success of space …
   • **NOT** totally apply to CSG.
   • Existence and value of CSG is confirmed… though low in using rate
   • … “any place must involve & social use”
   • … “value of place does not rests on evidence of people on site”.
9.1 Conclusions

(B) Role & function of CSG / Value of CSG (Con’t)

3. Role of social aspects
   • social interaction with neighbours, NOT significant.

4. A near home garden at doorstep
   • for relaxation, privacy, releasing stress & restoration.

5. Establish a vertical greening network within a building and development

6. Complementary role in the urban open space system …
   • … to offer an extra merit to the residents of the respective development

7. Existence and value of CSG is confirmed
   • … to improve cityscape and urban environment
Hong Kong
Compact + Densely populated:
Space for communal open spaces?
... could it be ... ?