PLACE ATTACHMENT OF RESIDENTS TO GREEN INFRASTRUCTURE NETWORK IN SMALL TOWN
Objectives

This study explores attachment of town residents towards green infrastructure network in Taiping, an old town in Central Peninsular Malaysia.

The properties and attributes of the green infrastructure of the town including diversity, coherence, naturalness and the attributes of the environment play significant roles for the sense of attachment.
Definition Of Green Infrastructure

Greenery and open spaces linked by streets, waterways and drainage ways around and between urban areas, at all spatial scales (Tzoulas et al. 2007).

Embraces the experience of using parks and open spaces, ‘loose-fit’ places (Dovey et al. 2002), residual spaces (Davidson, 1999) and streets (Ward Thompson, 2002) as valuable land use components.
Focus of Study

The attachment formed with places may involve three most dominant factors (Relph, 1976, Branderburg and Carrol, 1995 and Stedman, 2003a)

- Characteristics of the physical environment
- Human use and experience with the environment
- Social, psychological and cultural interpretations and constructed meanings of people-place interactions

Research Questions

(a) Are residents familiar with the range of green infrastructure land uses in Taiping town?

(b) What are residents’ perceptions towards the green spaces that lead to familiarity and bonding to the green spaces?

(c) What are the relationships between the properties and attributes of green infrastructure and attachment of residents towards the green spaces?
The bonding of people to places is termed as ‘place attachment’ (Altman and Low, 1992).

Place attachment also uses concepts

- place bonding (Hammit et al., 2006),
- sense of place (Tuan, 1977),
- community attachment (Kasarda and Janowitz, 1974; Kim and Kaplan, 2004),
- place identity (Proshansky, 1978; Proshansky et al., 1983)
- place dependence (Stokol and Shumaker, 1981).

Attachment dimensions

- place familiarity
- belongingness (Hammit et al., 2006)
- rootedness (Tuan, 1983).
6 important dimensions:

- Place familiarity
- Favourite place
- Meaningful place
- Emotional feeling towards physical attributes of green spaces
- Concern over the green infrastructure
- Satisfaction.

The physical properties and attributes explored are:

- Diversity of spaces,
- Coherence
- Naturalness

The experience evokes positive cognitions, thus, encouraging positive meaning towards the spaces.

These meanings are expressed from residents’ preference for various types of space for their outdoor activities.

Landscape preference affects place attachment and is influenced by experience and familiarity (Ryan, 1997).
**Attachment DIMENSIONS**

**FAMILIARITY**

- Greater knowledge of the locale (Hammit et al., 2006)
- Dimensions for familiarity in this study
  - Length of residency
  - Intensity of use of neighborhood facilities

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**Length of residency**

Length of residence in a community can increase familiarity in spatial knowledge and emotional domains of a place (Appleyard, 1969).

**Intensity of use**

Regularity of visit to green spaces increase residents familiarity and pleasant memories of leisure and physical activities, thus stimulate attachment to the green spaces.
People’s use of particular places for self and emotion regulation (e.g. Korpela and Hartig, 1996) - a favorite place, which appears to afford restorative experiences that aid emotion- and self-regulation processes.

Favourite place is visited to relax, calm down and clear minds (Korpela, 1991).

Familiarity is important to nurture favourite place of people.

When people are familiar towards a place, they often develop an affective-memory and memory-achievement familiarity (a feeling of sense of belonging, identity, dependence or even possessiveness towards places).

Indicate a sense of belonging towards their place and to community.

Measured based on the perceptions and preferences of residents towards physical attributes of green infrastructure.

Increase in satisfaction and preference typically influence levels of attachment. Attachment to green space is depended upon one’s satisfaction towards the physical attributes that green space has to offer.
Physical Properties and Attributes of the Green Infrastructure DIMENSIONS

**DIVERSITY**

A variety of space, scale, distribution and a mixture of elements of open spaces distributed in a town.

An array of open spaces allows more outdoor experiential choices for urban residents, resulting in regular contact with various green spaces.

**COHERENCE**

Legibility of places and good connectivity allow accessibility and assist wayfinding and orientation of residents.

Readability of its environments, for example, noticeable landmarks and routes that connect to green areas offer a strong knowledge base for familiarity of residents to access and participate in activities.

**NATURALNESS**

The presence of lush greenery and water element attract residents to participate regularly in outdoor spaces.

The aesthetically pleasing environment may evoke pleasant memories and give character to the town, hence enhance familiarity of residents. The qualities on physical characteristics may result in positive interpretation and meaning to the places that residents visit. With time, they develop an attachment for the places.
Taiping is one of small province in the district of Larut Matang along with its immediate provinces including Kamunting, Tupai and Assam Kumbang. It was the first town established by the British in 1874 and developed rapidly in the 19th century after tin was discovered. The landscape was much modified by the tin mining activities, leaving many lakes and sand tailings, which was turn into a park some 120 years ago. Taiping is composed of residential land, low-density commercial area and a significant amount of green spaces.
Green Infrastructure Network in Taiping

- The Lake Gardens (17% of the town area) with large rain trees, lakes, recreational amenities and zoo.
- Open spaces i.e. Dataran Esplanade.
- Hill sites of Bukit Larut and Burmese Pool.
- Open spaces of public buildings i.e library and museum.
- Pocket spaces between shop houses such as Laman Pasar.
- Green spaces for school playfields and river corridors.
- Street landscape that connects places within commercial areas, with the Lake Gardens and to residential areas.
- Residential neighbourhoods with community parks, playgrounds and home gardens (13% of green area of the town).

Figure 1: Distribution of green and pocket spaces in Taiping
Green Infrastructure Network in Taiping

- The Lake Gardens
- Street landscape
- Pocket space in town
- Pocket space in town
MEASURE

- Survey questionnaire that measure behavioural responses of residents from experience with green spaces in the town.
- Contents:
  - Socio-demographic information - age, gender, ethnicity and length of residency.
  - Dimensions of attachment in multiple response scale, Likert scale and bipolar adjective rating scale perception, feeling and preference of activities.
  - Sense of attachment to a range of green infrastructure.

ADMINISTRATION AND RESPONDENTS

- Taiping town, Kamunting, Tupai and Assam Kumbang using purposive sampling method.
- A variation of the drop-off survey:
  (a) drop-off door to door in the neighbourhoods and government office
  (b) public space intercept in town centre and green spaces.
- Respondents – from two types of neighbourhood housing areas (terrace housing and village-like neighbourhood), spaces in town centre and the Lake Gardens.

THE ANALYSIS

- The analyses were carried out to discern the uses of green spaces and contributions of the physical properties and attributes of the green spaces to residents’ feeling of attachment.
### Results

#### Table 1: Socio-demographic information of town residents

<table>
<thead>
<tr>
<th>Survey item</th>
<th>Levels</th>
<th>Per cent n = 335</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td>Male</td>
<td>57%</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>43%</td>
</tr>
<tr>
<td>Ethnicity</td>
<td>Malay</td>
<td>69%</td>
</tr>
<tr>
<td></td>
<td>Chinese</td>
<td>19%</td>
</tr>
<tr>
<td></td>
<td>Indian</td>
<td>10%</td>
</tr>
<tr>
<td></td>
<td>Others</td>
<td>1.5%</td>
</tr>
<tr>
<td>Age group</td>
<td>Adolescent (12-18 yrs old)</td>
<td>8%</td>
</tr>
<tr>
<td></td>
<td>Adult (19-55 yrs)</td>
<td>86%</td>
</tr>
<tr>
<td></td>
<td>older adult &amp; elderly (&gt;55yrs)</td>
<td>6%</td>
</tr>
<tr>
<td>Year of residence</td>
<td>1-10 years</td>
<td>30%</td>
</tr>
<tr>
<td></td>
<td>11-30</td>
<td>52%</td>
</tr>
<tr>
<td></td>
<td>31-50</td>
<td>16%</td>
</tr>
<tr>
<td></td>
<td>&gt; 50 years</td>
<td>2%</td>
</tr>
</tbody>
</table>
Results

**Familiarity**

- Familiarity is measured, (a) Regularity of visits to green spaces, and (b) Length of residency in the town. Familiarity imbue attachment to an array of green spaces available in the town.

### Regularity of visits

77% of residents visit various green spaces at least once in two weeks. This shows the intensity of use of the green infrastructure is high and predicts that residents are familiar with their green spaces.

**Table 2:** Regularity of visit to green space

<table>
<thead>
<tr>
<th>Levels</th>
<th>Percent n = 335</th>
</tr>
</thead>
<tbody>
<tr>
<td>Twice per week</td>
<td>24%</td>
</tr>
<tr>
<td>Once a week</td>
<td>31%</td>
</tr>
<tr>
<td>Once fortnightly</td>
<td>22%</td>
</tr>
<tr>
<td>Once a month</td>
<td>19%</td>
</tr>
<tr>
<td>Other</td>
<td>4%</td>
</tr>
</tbody>
</table>

### Length of Residency

Crosstabulation is used between regularity of visit to green space (dependent variable) and length of residency (independent variable) to explore whether length of stay of residence in Taiping affect intensity of use of green spaces in the town.

- Finding indicates that there is no significant association between the two variables. It signifies that residents regularly used green space regardless whether they are new to the town or has been in Taiping for most of their lives.

**Table 3:** Crosstabulation result between length of residence and regularity of visit

<table>
<thead>
<tr>
<th>Length of residence/ Regularity of visit</th>
<th>Percent n = 335</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-10 years</td>
<td>77%</td>
</tr>
<tr>
<td>11-30 years</td>
<td>82%</td>
</tr>
<tr>
<td>31 to 50 years</td>
<td>76%</td>
</tr>
<tr>
<td>&gt;50 years</td>
<td>100%</td>
</tr>
</tbody>
</table>
Eight types of green infrastructure land uses.

The Lake Gardens (91%) and the hill sites (68%), suggesting that residents are more familiar with spaces that have distinctive physical properties and attributes such as the size and naturalness.

On the other hand, preferences for pocket spaces (11%) and streets (11%) in towns are low suggesting that residents hardly recognized the spaces potential for outdoor activities.

**Figure 2:** Types of green infrastructure that residents visit
RESULTS

Favourite and meaningful place

- Exploration of relationships between favourite place and age group of residents found that there is no significant association between the two dimensions.
- This suggests that all residents have their own favourite place to be and this is seems to be related with activities and places that suit the needs of all ages.

Table 5: Crosstabulation result between favourite place and age group

<table>
<thead>
<tr>
<th>Age group/Favourite place</th>
<th>Agreement Per cent n = 335</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adolescent (12-18 years old)</td>
<td>67%</td>
</tr>
<tr>
<td>Young adult (19-39 years old)</td>
<td>65%</td>
</tr>
<tr>
<td>Adult (40-55 years old)</td>
<td>78%</td>
</tr>
<tr>
<td>Older adult and elderly (&gt; years old)</td>
<td>68%</td>
</tr>
</tbody>
</table>

- Familiarity leads to regular activities in the green spaces where residents obtain diverse experiences. Hence, residents may have developed favourite place for visit.

Table 4: Favourite place

<table>
<thead>
<tr>
<th>Survey item</th>
<th>Per cent n = 335</th>
</tr>
</thead>
<tbody>
<tr>
<td>I prefer green infrastructure than any other type of space for outdoor activity</td>
<td>75%</td>
</tr>
<tr>
<td>Green infrastructure is my favourite place</td>
<td>69%</td>
</tr>
<tr>
<td>Green spaces is a meaningful place for me</td>
<td>53%</td>
</tr>
</tbody>
</table>

Reasons of favourite place:

- For physical activity | 53%
- To relax and relief stress | 52%
- To interact with family and friends | 46%
- Safe and secure | 25%
- To interact with neighbour/other residents | 14%
RESULTS

Satisfaction and concern on green spaces

- A substantial percentage of residents satisfied with green infrastructure (68%).
- Residents voted that they are satisfied with the green spaces due to their physical properties and attributes (72%).
- This means properties and attributes of green infrastructure including diversity, naturalness and coherence contributes to satisfaction of residents towards the green infrastructure.

Table 6: Satisfaction and residents’ concern on green infrastructure

<table>
<thead>
<tr>
<th>Survey item</th>
<th>Per cent on agreement n=335 maximum=5, min=1</th>
</tr>
</thead>
<tbody>
<tr>
<td>I am satisfied with green infrastructure in Taiping</td>
<td>68%</td>
</tr>
<tr>
<td>I am satisfied with green infrastructure because of their physical properties and attributes.</td>
<td>72%</td>
</tr>
<tr>
<td>Green infrastructure offers suitable activity for residents' lifestyle</td>
<td>65%</td>
</tr>
<tr>
<td>I care and concern about the green spaces</td>
<td>75%</td>
</tr>
<tr>
<td>I feel the green spaces should be protected and conserve</td>
<td>82%</td>
</tr>
</tbody>
</table>
RESULT

Feelings on properties and attributes of green infrastructure

Thirteen adjectives on physical attributes of the green infrastructure were selected from literatures to identify emotional feeling of residents towards the green spaces.

The responses would interpret their sense of attachment to the spaces.

Most of the attributes measured obtained high mean ratings except for item on ‘facilities’ (mean 3.69)

Table 6: Perceptions and feelings towards green infrastructure

<table>
<thead>
<tr>
<th>Bipolar adjective rating scale</th>
<th>Mean of agreement</th>
</tr>
</thead>
<tbody>
<tr>
<td>PROPERTIES AND ATTRIBUTES</td>
<td>n=335 max=5; min=1</td>
</tr>
<tr>
<td>1) Spacious - crowded</td>
<td>4.34</td>
</tr>
<tr>
<td>2) Beautiful - ugly</td>
<td>4.30</td>
</tr>
<tr>
<td>3) Variety - monotonous</td>
<td>4.05</td>
</tr>
<tr>
<td>4) Clean - dirty</td>
<td>3.87</td>
</tr>
<tr>
<td>5) Good facility – vandalism/graftiti</td>
<td>3.69</td>
</tr>
<tr>
<td>6) Calm - stressful</td>
<td>4.41</td>
</tr>
<tr>
<td>7) Fond of it-dislike it</td>
<td>4.40</td>
</tr>
<tr>
<td>8) Exciting - boring</td>
<td>4.30</td>
</tr>
<tr>
<td>9) Lively - abandoned</td>
<td>4.04</td>
</tr>
<tr>
<td>10) Comfortable - uncomfortable</td>
<td>4.04</td>
</tr>
<tr>
<td>11) Safe - fear /anxiety</td>
<td>4.00</td>
</tr>
<tr>
<td>12) Familiar - strange</td>
<td>3.97</td>
</tr>
<tr>
<td>13) Inspiring - unimaginative</td>
<td>3.94</td>
</tr>
</tbody>
</table>
RESULTS
Comparative perceptions towards different green infrastructure

Four specific green infrastructure land uses were chosen to evaluate the difference in attachment towards different types of green spaces. They are the Lake Gardens, hill sites, pocket spaces in town and open space and home gardens of neighbourhood. Findings are in favour of the Lake Gardens as compared to other green infrastructure land uses. The lowest score is for pocket spaces in town as can be seen in low mean score in Figure 3.

Figure 3: Comparative mean of residents’ feelings towards specific places
Most of residents regularly used the spaces regardless of whether they are new to the town or they have been in Taiping for most of their lives. The familiarity is contributed by the diversity of green infrastructure in the Lake Gardens.

Diversity of spaces and activities in the pocket spaces is minimal and affect uses and regular contact of residents with the spaces. The lack of coherence in terms of the existence of noticeable landmarks discourages legibility to the places. Connectivity of the spaces with another may not be physically and visually easy and diminishes accessibility and affecting residents’ usage of the spaces, thus, reducing familiarity.

The result on familiarity found to be in contrast with the literatures. The reasons for this difference lie in the context of the town itself. Taiping town is an old colonial town and is relatively a small place - Attach to Taiping because of its own identity.

Residents of Taiping perceived the green spaces as their favourite place that afford residents relaxation and relief from stress and as places for them to perform physical activity.

Result also shows that there is no significant association between age group and favourite place. Finding in the study are in accord with many researches that demonstrate that there are many aspects of outdoor environments and green spaces that are attractive to people, regardless of age (Ward Thompson, 2007).
LIMITATION OF STUDY

- Data from the study has several limitations:
- The study is far from conclusive and primarily useful for guiding future research - analyzed using descriptive statistics such as percentage and cross tabulation due to the exploratory nature of the study.
- Further research should evaluate these findings - the questions of ‘how’ and ‘why’.
- Future investigation on the topic should include open-ended questions - the study did not elicit deeper feelings of residents towards types of green infrastructure.
THANK YOU FOR YOUR ATTENTION