Knowledge Integration between Urban Planning and Landscape Architecture in Contributing to a Better Neighbourhood Open Space: A Policy Review

S Yasmin Sofia HUSSAIN
Post-graduate Student, Department of Landscape Architecture, Faculty of Built Environment, Universiti Teknologi Malaysia, 81310, Skudai, Johor, Malaysia; yasminhuss6@yahoo.com

Ismail SAID
Associate Professor, Department of Landscape Architecture, Universiti Teknologi Malaysia.

This research investigates the process and matters concern in planning for open space, specifically in urban residential area. In Malaysia, for developing an area to become a residential neighbourhood, urban planner will prepare a layout plan that applies government policies, guidelines and other technical requirements. However, the roles of landscape architect only take places after the layout has been approved. This has resulted to inappropriate zoning for open space in neighbourhood and has caused less participation by the residents in outdoor activities. There were no knowledge integration occurred between urban planner and landscape architect during the planning of the residential area giving the situation that these two professions were involved in different stages of development planning. Therefore, this study explores connections or linkages between urban planner and landscape architect in planning for open space in residential neighbourhood. The results obtained by literature and policy review were analysed using content analysis method. The results suggest the desired criteria of open space by urban planner and landscape architect, and also their opinion regarding to our existing planning development process. Therefore, possible connections or linkages between urban planner and landscape architect in planning for a better open space were discussed.

Keywords: Urban Planning, Landscape Architecture, Knowledge Integration, Open Space

1.0 Introduction

Open green spaces usually function as corridors for fresh air supply and facilitate good air circulation in general. It enhances the recreational quality for the public and the overall image of a place. The amount of the provision, distribution, and the ease of access to green spaces are key contributors to social and ecological functions in urban environments (Barbosa, 2007). However, these key contributors, perhaps, can occur by the knowledge integration of urban planner and landscape architect. Good landscape planning came from the knowledge integration of these two professions (Antrop, 2001). A successful implementation of landscape demands careful thought on how landscape planning concepts and thoughts can be translated and communicated to people who have to consider much more aspects than just the one dealing with landscape. Concepts, theories and methods from planning also need to be given careful thought in order to contribute to a successful implementation of landscape. Therefore, this paper explains the area of knowledge on planning of open spaces in the perspectives of urban planner and landscape architect. This leads us on how to integrate urban planner and landscape architect in planning of open spaces in the urban neighbourhood.

As stated by Chiesura (2004) and Tsitsoni (2002), urban greenery is an important fundamental
for the quality of life in our increasingly urbanized societies. The enhancement of urban green spaces or urban forests is one of the ways, which has the potential to lighten the adverse effects of urbanization in an appropriate manner, and creating cities more attractive and comfortable to live in (Ridder et al, 2004). Urban greenery is better known for their non-market or intangible benefits than market or tangible benefits. For example, the annual output of forest ecosystem goods and services of Beijing, China has been estimated around US $ 6.3 billion. A study done in Beijing suggests the value of non-marketable product is 6 times more than the material goods (Wu, Hou & Yuan, 2010). Apart from Beijing, another study also are undertaken in Guangzhou, China, indicates that more than 50 % of its residents use urban greenery for recreational purpose and stress-relieving (Jim & Chen, 2006).

Bolund and Hunhammar (1999) also have stated that urban open spaces provide many services that are directly used by residents. In a residential neighbourhood, urban greenery such as parks, playground and recreational area are provided more for the purpose of relaxation, relief from urban stresses and to encourage the social contact. This is parallel with Volker & Flap (2011) that stated by providing meeting opportunities, they can raise the potential for developing social ties. As has been stated by Tsitsoni (1999), urban greenery refers to open spaces or green spaces such as parks, avenues of trees or any types of garden. In order to implement green spaces in the residential area, it has become the responsibility of planners and landscape architects. Figure 1 shows the integration part by landscape architect and planner field (Antrop, 2001). Figure 1 shows the integration area of landscape architecture and planning knowledge in order to have a good landscape planning. According to Antrop (2001), the similar areas that deal by both landscape architects and planners are land use, structure and change, in order to ensure the improvement of environmental condition. In this scenario, landscape architects offer the new insights about the processes acting in different spatial structures and scales. For example, the current situation in Malaysia in getting planning approval for housing development, planner will prepare a layout plan that take government policies, guidelines and other technical requirements into consideration. However, the planning layouts are prepared without involving the expertise of a landscape architect. This planning process should be reciprocity in understanding the criteria needed by landscape architect in planning for open space in order to achieve a successful implementation. This is useful for the planner in optimizing the use of space in order to improve the environmental conditions. Figure 2 shows the process of planning layout is being prepared.
According to Figure 2, the developer who is consist of few agencies, such as Department of Drainage and Irrigation and Water Supply Corporation, mentioned the requirements that they wanted to be put on the layout plan. After the layouts are prepared, as a consultant, the planner will have a focus group discussion with the agencies involved. After all agencies are satisfied, then the layout will be sent to the local authority for planning approval. However, the role of a landscape architect only involve after the layout has been approved (JPBD, 2007). This means that during this level, there are no stages that urban planner and landscape architect has the chance to work on the planning layout together.

Apart from Antrop (2001), Young (1974) suggests that most planning has been done without the awareness of the principles of human ecology. Both landscape architects and urban planners must appraise the area planned as a system to perceive the intended meaning of the people flow, energy, and materials into and out of the area. They also need to acquaint the design requirements based on the attributes or elements of the environment and human needs considering the connectedness and interrelatedness of the area.

Based on Table 1, it shows that Young (1974) expressed that planner and landscape architect must consider the area that they plan as a system and emphasized on its connectedness and interrelatedness. Meanwhile, Antrop (2001) stated that a good landscape planning is the knowledge integration of landscape and planning. Figure 4 shows how these two theories are interrelated to each other.

These two theories are supported by few other theories including Lyle (1985), Formon & Godron.
(1986), Hobbs (1997) and Hall (1990). Table 2 shows the summary of these theories.

Table 2: Summarized theories by Lyle (1985), Forman & Godron (1986), Hobbs (1997) and Hall (1990) (horizontal)

<table>
<thead>
<tr>
<th>Author</th>
<th>Year</th>
<th>Lyle</th>
<th>Forman &amp; Godron</th>
<th>Hall</th>
<th>Hobbs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Year</td>
<td>1985</td>
<td>For landscaping, emphasize location is an important component and the design must be like a system.</td>
<td>1986</td>
<td>Emphasize on temporal aspects which is change in the scheme of landscape characteristics.</td>
<td>1990</td>
</tr>
</tbody>
</table>

Based on Table 2, it shows that Lyle (1985) emphasized on location and the design must be as a system while Forman & Godron emphasize on temporal aspect-change. Hall (1990) stated that functionalism of the landscape planning is an important and motivating idea and Hobbs (1997) explains in details how structure, change and function interrelated to each other. These three components (structure, change and function) are taken as the parameters in this study in examining the functionalism of landscape planning. Figure 3 shows how all theories (underpinning and supporting theories) are interrelated to each other.

Landscape Planning = GOOD LANDSCAPE PLANNING

Good landscape planning:
- Both planner and landscape architect consider the area being planned as a system.
- Area design as a system: considering the connectedness and interrelatedness of the area.

The area must be design as a system by considering its structure and function (Lyle, 1985) and change (Hobbs 1997 & Forman and Godron, 1986). Functionalism of landscape is an important motivating idea for landscape planning. Functionalism of landscape is how the components fit together in part-whole relationships (Hall, 1990)

An area can be expressed as a system when it is functional to its surrounding. The suitable parameters used to examine the functionalism of the study area are chosen based on theories by Lyle (1985) and Hobbs (1997).

Figure 3: Theories and Underpinning interrelation
From the theories, few parameters are constructed for both urban planning and landscape architecture. Figures 4 and 5 show the parameters concern by urban planner and landscape architect. The parameters are explained in a few breakdowns to show what each parameters represent for.

Figure 4: Parameters for urban planning

Figure 5: Parameters for landscape architecture

Figure 7 shows the parameters by urban planning followed by few breakdowns. As shown in the figure, urban planner concerns on function, structure and land use in planning for open space. Meanwhile, landscape architect concerns on function and structure as shown in figure 8. The components of each parameter are taken out from the policies that related or being refer to by both professions. These policies are compiled in Planning Guidelines of Open Space and Recreation Areas (2013) and Landscape Planning Guideline: Second Edition (2008).

3.0 Results and Discussion: Policy review

3.1 Urban planning: Function

In an urban planning view, function in open space can cover a broad range of elements. According to policy that are currently used by Town and Country Planning Department in Malaysia, these are the elements that covered by ‘function’ in planning for open space.

1. Provision of open space
2. Gradient
3. Traffic system
4. Appropriate planning tools according to children’s age
5. Design and layout of play equipment
6. Cycling facilities
7. Facilities for disabled (OKU)

Provision of open space
Landed housing and multi-storey housing scheme has different way in determine the portion for open space. For landed housing scheme with the area more than 2 hectares, it requires 10% of its area to be open space. This required 7% to be functional open space and 3% can be reserved for facilities. Meanwhile for those area less than 2.0 hectares, it requires being in 10% absolute for open space. For multi-storey housing scheme (high-rise housing), the open space should be enough to accommodate 5 square meters per resident. The minimum size for field must be not less than 0.1 hectare. For development than more than 10 hectares, 20% of the total open space should be provided centrally.

Gradient
In designing parks, the suitable gradient is crucial in ensuring the comfort of the visitors. Table 3 shows the type of park and its maximum gradient.

<table>
<thead>
<tr>
<th>Type of parks</th>
<th>Maximum gradient</th>
</tr>
</thead>
<tbody>
<tr>
<td>Recreational site and playground</td>
<td>$7^\circ$</td>
</tr>
<tr>
<td>Neighbourhood parks and local parks</td>
<td>$11^\circ$</td>
</tr>
<tr>
<td>Urban park and regional park</td>
<td>Unlimited</td>
</tr>
</tbody>
</table>

Traffic system
For traffic system around the open space area, traffic calming has been emphasized more on the road near the field. There should be cul-de-sac at the recreational park that serves as a car park and the surface of the road should be rough for safety reasons.
Appropriate playing tools
In providing playing tools in open space, it has to be appropriate with the children’s age. Playing tools in recreation area should be diversified according to age 2-4 years, 5-8 years and 9-12 years.

Design and layout of play equipment
The playground equipment should be stable for children’s safety. The equipment’s design should follow the standards and requirements of SIRIM. It is also should be made of light materials such as plastic and rubber. The games provided should encourage the mental development of the children. The play equipment should be arranged in a clear visual range that can be seen by adults. The distance stacks of toys should have enough space for the user’s movement and the colours should be bright to enhance the attractiveness.

Cycling facilities
The provision of cycling routes is to encourage cycling activities. The gradient for cycling road should be suitable, that is no more than 7° and should be separated from the children’s play area.

Facilities for disabled
Accessibility to recreation areas by the disabled should be taken into account. The surface of the entrance to the recreational park should be suitable for a wheelchair and the pedestrian walkways connect all the play equipment.

3.2 Urban planning: Structure
Structure in urban planning refers to the ways of all components fit with each other. This includes the land use of the area and its surrounding. In structure, it has emphasized more on parameter planting. This means that it is important for recreational area to be separated by other land uses such as major roads, and electrical substations. Tree or crop trivial can be provided for separating the main street and the lot adjacent to the displacement of a building.

3.3 Urban planning: Land use
The location and site design of open space has to be strategic and accessible by visitors. Deserted place or incidental open space should be avoided. Open space must not close to the landfill of waste, oxidation, electrical sub-stations and drainage system that can cause harm and threaten the safety of users. The design of the site should also apply the principles of ‘Crime Prevention through Environmental Design’ such as natural surveillance, access control, and territorial reinforcement. When planning for open space, the element that contribute to the sense of welcoming should be involved. The appropriate distance of open space also crucial in ensuring the visitors’ safety especially children. In neighbourhood area, the appropriate distance of open space can encourage people to walk which is good for health. Figure 6 shows the type of parks with its suggested distance.

3.4 Landscape architecture: Function
In landscape architecture’s view, function refers to landscape characteristics that are more preferred by the residents. According to policy that are currently used by National Landscape Department, these are the elements that covered by function in planning for open space.

1. Space requirements
2. Type of plants
3. Planting distance
4. Car parks area
5. Soft landscape and landscape work
   (Method of plants selection materials)

Space requirements
For housing development, at least 10% of the total area should be preserved as an open space or park.

Type of plants
For residential areas, the use of tree planting palm prioritized and promoted only in a narrow planting space. These are the plants criteria together with the suitable place to plant.
i. One kind of tree in the main entrance and along the main road.

ii. Varieties of flowering plants in the main entrance and the main shade trees along the main road.

iii. Mixed cropping of many species, height and leaf size is recommended to be planted in the buffer zone.

iv. Crops in the children’s play area must be away from crops that are not easily broken, without thorns and flowers, fruit or leaves are poisonous.

v. Plant roots cord and shady recommended for along the walkway.

Planting distance
The spacing of landscape plants makes the difference between a well-groomed yard and an overgrown jungle. Appropriate design provides dimension, visual interest and curbs appeal. In housing, the distance is based on the type of home. For house terrace, the distance should not less than 5 meters and the planting location is in between two lots of home. For house twin, minimum two trees for each unit. Meanwhile for flat housing area, spacing based on the type of tree and the vastness of space but not less than 5 meters.

Car parks area
Every open space should have an area that allows a few numbers of cars to park. For the car park near open space, distance between trees should be 5 meters minimum. Free planting is recommended to create a natural effect and shrubs should be planted closely to produce the effect of enclosures and works as blocking the view. Figure 7 shows the space requirements for car parks area near open space.

Soft landscape and landscape work (Method of plants selection materials)
Selection of plants is based on the basis of crop planting material specifications set forth in the Plan Planting (Planting Plan) in the Tender Document / Contract. These are the criteria that have been set:

i. Ground cover polybag Size - 150mm crop size - 150mm high overall, with a minimum of 9 sections of trees.

ii. Shrubs Overall height - minimum 150mm, maximum 1000mm, minimum 300mm diameter canopy.

iii. Main tree:
   a. Trees standard size: 2100mm - 3000mm high overall diameter shaft: 25mm - 75mm polybag Size: 600mm x 600mm main trunk upright and have good branching system.
   b. Semi-mature trees (semi-mature / instant) Size: 3000mm - 5000mm high overall stem diameter: 75mm - 150mm polybag Size: 750mm x 750mm main trunk upright and have good branching system.

3.5 Landscape Architecture: Structure

Structure in landscape architecture’s view emphasized on the elements that connect the open space with the neighbourhood. Certain elements are bound with certain requirement of space in ensuring the open space connected to the neighbourhood. For example, the minimum of 3 meters width along the way must be prepared for planting and pedestrian space. Minimum 6 meters wide green belt (green linkages) should be provided to link residential areas with areas of public facilities such as public parks, schools and shops. This area shall be separated from vehicle routes, with only bicycle users and pedestrians are allowed to use it. While for buffer zone, minimum
of 20 meters to be provided for residential area overlooking the main street (30 meters) and an industrial area. Figure 8 shows the road and tree lane together with their suitable width.

Pedestrian path and bicycle lane should be provided with shade planting to improve comfort and safety of users. Pedestrian path is required to be 3 meters minimum width of the footway and 1.5m width for bike lanes. Both routes should be distinguished by surface finish or colour. For the intersection, should be built with material finishes and patterns to highlight the junction.

4.0 Conclusion

In order to achieve a good planning of open space in neighbourhood, it is crucial for urban planner and landscape architect to be familiar with each other’s roles. Urban planner are well known to be good in designing an area while landscape architect experts in filling a place with aesthetic value. However, in our planning development there is no stage for these professions to work together. Therefore, the least we can do is to be familiar with each other’s preferences to achieve mutual understanding in order to create a fully functioning open space in neighbourhood.
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