



Park as a Green Infrastructure for Taman Mutiara, Kulim, Kedah

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Introduction

A recreational urban park is very important for urban areas because parks offer many benefits for urban dwellers. Traditionally, park is known as a green space for people to have recreation and social activities. In addition, a park is also known as a green lung for the city which is vital to improve environmental quality of a particular city especially the air and aesthetic quality. However, with urban open green spaces becoming scarcer, parks and green spaces have been planned to accommodate many more needs and city functions. Among the benefits supported by studies, urban trees can increase attractiveness of communities, reduce noise, improve wildlife habitat and provide recreational opportunities (Chen and Jim, 2008). Collectively, these benefits have been shown to foster psychological well-being (Ulrich, 1984) as well as increasing neighbourhood desirability (Millward and Sabir, 2011). Due to these facts, green spaces or parks have been designed to cater multiple functions such as flood mitigation areas and biodiversity enrichment areas. Therefore, the challenge for park design focuses on how a park can have all the functions intended but still be a place for people to enjoy its greenery and recreational activities.

Kulim, a city in Kedah, in the north of Malaysia, the experience very rapid urbanization due to development of Penang Island and Seberang Perai, Sungai Petani and Kulim High Tech Park. Many housing areas are developed to accommodate people working in this place. The development brings more people to Kulim as well as changing original landscaped

character of Kulim. Kulim become more urbanised and more landscape spaces are needed to meet people needs for greenery. Under the purview of Majlis Perbandaran Kulim (MP Kulim), Taman Mutiara is one of many housing areas developed in Kulim and within Taman Mutiara, 20 acres of land have been put aside to be a local urban park (Kulim Landscape Master Plan, 2010). Nevertheless, the site is also part and parcel of flood retention pond that is vital for the safety and health of Taman Mutiara residences. Based on the situation of future parks in Taman Mutiara, the objectives of the studio projects have been outlined as follows,

- i. Identifying and analysing issues related to park and open spaces development.
- ii. Planning and design of a park that can solve environmental problem and people needs.
- iii. Presenting and communicating clearly the planning and design ideas professionally, ethically and responsibly to stakeholders.

Site Issues and Design Problems

In the studio, 13 students were briefed about the problems of park design especially in relation to the conflicting situation between park for people and park for environmental problems. The project started with a site visit in which the students were able to see and feel the site for themselves via site inventory and analysis exercise. In addition, briefing by the officers from MP Kulim helped to further explain the problems are face by the site as well as MP Kulim problems in managing its green spaces.

Site Context

The site for the park is within Taman Mutiara, a residential areas which is located in Mukim Keladi, Kulim and within a 20 minutes driving distance from Kulim town. The site is about 8 hectares (20 acres), in size and currently serving only Phase 1 of Taman Mutiara but in the future, the site will be a central park of Taman Mutiara. Majority of the residents of Taman Mutiara are Malays and many of them are working at Kulim High-Tech Park and Sungai Petani. Interesting enough, Taman Mutiara is surrounded by many nature-based recreation areas such as Kawasan Rekreasi Ulu Paip, Kawasan Rekreasi Sungai Sedim and Kawasan Rekreasi Air Terjun Junjung. In addition, Taman Mutiara is also close to two forest reserves; Hutan Simpan Gunung Bongsu and Hutan Simpan Gunung Bintang (Figure 1).



Figure 1: View towards the site with Gunung Bongsu at a glimpse

Existing Site Structures and Usability

In term of land profile, the site has undulating land form with a lake (depression) in the

middle. The landform is sloping inward toward the lake and at some areas, they are seem to be quite dangerous for users. Presently, only a wakaf (shelter) and lawn exist at the site that can be considered as park amenities. Due to these very limited facilities, people who live in Taman Mutiara only use the site for relaxation and simple exercise. It is also noticeable that some people take the opportunities to enjoy recreational fishing. Nevertheless, the site has infrastructures constructed for flood mitigation purposes and that include monsoon drain and water control gate (Figure 2).





Figure 2: Land Profile of the site that steep and undulating

Soils and Hydrology

Three types of soil have been identified at the subject site. They are Holyrod, Renggam and Jerangau. The common characteristics of the soils are yellowish in color and their base material is clay. The situation shows that the soils water seepage or permeability capability is low thus allowing high quantity of water surface run-off. From the hydro-engineering perspective, the site is part of Sungai Kob watershed system and the site is designed to be a water retention area to mitigate flood in Taman Mutiara. Due to the facts that the site is a water retention area, all the drainage systems at Taman Mutiara are channelled to the site causing the site to have water pollution problems. The problem is further complicated by the facts that the drains channelled into the site's lake are not maintained. Thus, thrash and vegetation are left in the drain causing water clogging, bad odour and nuisance to eyes.



Figure 3: Visual of water condition at the site

Biodiversity

Vegetation analysis shows that only 14 species of vegetation (including grasses) exists on the site and the species include *Acacia mangium*, *Khaya senegalensis* and *Archidendron cypleria*. The plants appeared to be not well maintained and seemed to grow naturally. Nevertheless, the presence of these few vegetation attract faunas especially birds such as decu (*Saxicola caprata*) and storks (*Ciconiidae spp*). The lake is also found to be a habitat for aquatic life but due to low water quality only sucker fish (*Hypostomus plecostomus*) and tilapia (*Oreochromis spp*) are available.

Users' Needs

Taman Mutiara residents are also being helpful by providing information about what are the problems they are facing and what is their vision for the park. For the resident, they expressed their desire to see the site to be developed into a proper park that the community can enjoy for recreation and for communal activities is required.



Figure 4: Engagement with Stakeholders is vital for Development

The main issue is how to ensure that the site can be designed as a park that function as a water retention area as well as be used comfortably by residents. The solutions to solve these problems are further explored and developed by the students during 14 weeks of studio sessions.

Park as a Green Infrastructure?

It is become imminent at the beginning of the exercise that the idea of solving water quality is important for the students and many ideas have been presented regarding the needs to use green technologies or approaches to water quality issues. Among the ideas derived from the study are the use of wetlands and bio-filtration mechanism. Nevertheless, the question that needs to be explored is how the approaches can be a part and parcel of park design concept and programs. It was apparent to students to consolidate their park's programs not only to accommodate people recreational and social needs but also environmental needs by using green infrastructure approach. So, what is green infrastructure or GI?

GI is frequently referred to natural and engineered ecological systems which integrate with the built environment to provide the widest possible range of ecological, community and infrastructure services. According to Weber and Wolf (2000) and Weber et al (2006), in the earlier formation, GI was referred to as natural features in the landscape like forests, wetlands, and streams in the context of natural areas conservation efforts. After GI idea is getting more attention in the urban areas, according to Kloss et al (2006), GI has been defined as the trees, vegetation, wetlands, and open space preserved or created in developed and urban area. Meanwhile, US Environmental Protection Agency (2013) defined GI as an approach that communities can choose to maintain healthy waters, provide multiple environmental benefits and support sustainable communities. Based on the definition provided above, Green Infrastructure Workshop (2013) has further defined GI as both remnant natural areas as well as new, engineered green spaces and parks. The workshop acknowledges that whilst the original concept of GI was to manage storm water, the benefits of having GI in the urban settings can be bigger including controlling heat, wind, air and water pollution. GI can also help to increase urban biodiversity, food production, improve mental well-being and community cohesions well as mitigating impact of global warming.

In light of the definitions provided above, it is the approach taken by the studio to ensure that the proposal for Taman Mutiara Park would address the issues about ecological services namely biodiversity, storm water

management, water quality improvement and community well being. The idea of green infrastructures it seemed to be well suited with the issues for the studio which is to find design solutions that can blend traditional parks functions (recreation and socialization) with environmental or ecological functions. The examples of the solutions provided by the students that are in tandem with GI framework of ecosystem services can be derive from the students' proposal.

Mutiara Oasis

Mohammad Raafiq Saiful Anuar proposal is centred on the issues of water quality and lack of vegetation on site. To solve the problems, he envisioned that the park to be an oasis for Taman Mutiara, a place that people will dearly love and care. However, to enable the site to be an oasis, he acknowledged that the water that flows into the lake to be filtered for better water quality and appearance, so he proposed the use of bio-filtration by using wetlands as a filtration mechanism. Raafiq's wetlands filtration system is proposed to have three tiers of wetlands (Figure 5 & 7).



Figure 5. Overall Master Plan by Mohamad Raafiq

The first tier is to trap solid waste and the second tier is to have bio-physical cleansing process, meanwhile the third tier is to start bio-chemical process to purify the water. All the filtration process shall be done by selected wetlands plants. To increase people's comfort Raafiq suggested for the wetlands areas are to be planted with aromatic plants. Nevertheless, the interesting part of Raafiq's system is the wetlands filtration area accessible by parks users namely for educational and relaxation purposes.



Figure 6. Wetland System as Part of the Park.

Park elements such as a shelter, bridge and seating are provided to support the activities. It is again the conventional constructed wetlands design that usually are not allowing

people to interact with the system as it is fearful that the people will disturb the system thus making unfunctional. Having solved the water quality issues, Raafiq's further expand the ideas by blending the wetlands with other parks elements such as plazas, gardens and recreational areas.



Figure 7: Three tiers of Wetlands System

Park for Bird Paradise one of the ecosystem services that can be rendered by GI is biodiversity. Nor Amalina Fitriana Abdul Rahman Putra, looked forward to solve the problems of the site by increasing park biodiversity and she planned to do that by restoring back the nature to the site. She argued that the nature will provide clean air, help to clean water and support recreational activities.



Figure 8: Overall Master Plan by Nor Amalina Fitriana

However, nature without a assigned meaning will easily deemed worthless, therefore, Amalina proposed that the nature restored in the park should be a place or paradise for birds and place for people to learn about birds.

Understanding about nature bird's habitat and very important and the birds habitats are also found to be able to offer other ecosystem services (Figure 8 & 9).

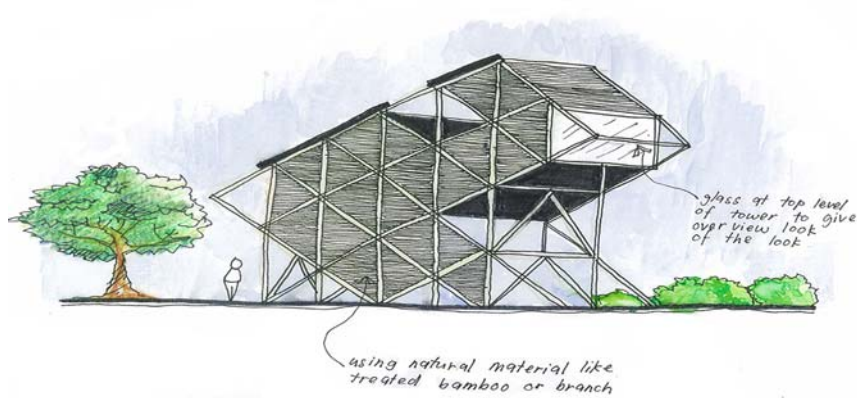


Figure 9: Birds Viewing Deck is one of the Park Elements

For example, wetlands and area for bird habitats are also valuable as the element to clean the polluted water. Amalinas simple idea of having a park as a bird paradise demonstrates the basic idea of GI that greenery can offer multiple benefits socially and environmentally.

Park for Healthier City by Syaza Mohd Ridzuan, green infrastructure, in addition to solving environmental problems, could also improve people's well-beings because she believed that nature or greenery is a major component for restorative environment. Taking advantage of the benefits that nature can provide for human well-being, Syaza proposed the site to be a park that users can enjoy for the benefits of their health.



Figure 10: Overall Master Plan by Syaza

She proposed landscape programs that can provide health benefits such as vegetation to improve air quality and nature system to comfort and relax human mind. In addition, the landscapes or greenery can also be a platform to create places for active activities such as bicycle lane, fitness decking and

kayaking, in which the activities can enhance or improve people's health. Further, Syaza also demonstrates that park as a GI project can solve environmental problems such as improving water, air and visual quality (Figure 10 & 11).



Figure 11: Meditation Garden is one of the park activities

Remarks

Generally, the students managed to come up with design solutions but the difficulty lies in producing a noble design concept that addresses both problems that have been outlined; community needs and environmental problems. It is suggested that, to overcome the problems of generating ideas and concept, critical analysis of past projects or precedent studies should be done extensively. In addition, understanding of parks as multi-functional spaces in the urban areas should be discussed thoroughly

in the studio. Conflicts about the major functions of the parks will always be debated among designers and landscape scholars. For this project, the conflict examined is in between parks for recreational needs or for environmental problem solutions. However, many interesting park design conflicts can be studied. For example, the question of park as art medium, the question that might be interesting to be explored is should the park be designed as an artwork or simply as a place to put artwork. By exploring all the possibility in the studio, the results can be well applied by landscape architects in practice to develop better park design.

References

- Boyle, C.A., G. Gamage, B. Burns, E. Fassman, S. Knight-Lenihan, L. Schwendenmann and W. Thresher (2012). Greening Cities: A review of Green Infrastructure. University of Auckland. Auckland p. 201.
- Kloss, C., C. Calarusse and N. Stoner (2006). Rooftops to Rivers: Green Strategies for Controlling Stormwater and Combined Sewer Overflows. Natural Resources Defense Council. New York. p.47.
- Jabatan Landskap Negara (2010). Kulim Landscape Master Plan. Kementerian Kesejahteraan Bandar, Perumahan dan Kerajaan Tempatan. Kuala Lumpur
- USEPA. (2013). Green Infrastructure. United States Environmental Protection Agency Retrieved from (<http://water.epa.gov/infrastructure/greeninfrastructure/>).
- Weber, T., A. Sloan, and J. Wolf (2006). Maryland's Green Infrastructure Assessment: Development of a comprehensive approach to land conservation, in Landscape and Urban Planning, 77(1), 94-110.
- Weber, T. and J. Wolf (2000). Maryland's Green Infrastructure: Using Landscape Assessment tools to Identify a Regional Conservation Strategy, in Environmental Monitoring and Assessment. 63: 265-277.