

05

JINJANG FLOWLAND: A MULTI PHASE DESIGN TOWARDS NATURE

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ABSTRACT

Malaysia has many ex-mining ponds which can be utilised through a sustainable integrated wetland. It can solve current issues of urban stormwater problems such as flash flood and pollution. Through design, the ponds have potential for an improved water quality while creating valuable wildlife habitat. There is a growing interest in the use of constructed wetlands for treating and recycling wastewater. The design proposal intends to make full utilisation of the benefits of ponds as a functional and ecological urban park.

INTRODUCTION

Batu Jinjang Pond is located in the upstream part of Sg. Klang river basin. It is one of the ex-mining areas in Selangor. The site encompasses of 3 connected ponds: Kolam Nanyang, Kolam Delima and Kolam Wahyu. Batu Jinjang ponds have flood diversion channels that begin from Sungai Gombak to Sungai Batu, and from Sungai Keroh to Sungai Jinjang. Water quality issue within the lower section of Sg. Jinjang is more prevalent than the flood problem. Leachate from abandoned landfill is the major source of pollution to the river and the three major ponds. Over the years the leachate has infiltrated the ground and transported by surface runoff to the nearest water bodies that is Sg. Jinjang. The ponds trapped some of these pollutants due to its vast storage that provide longer detention time. The water also polluted by construction, STP, legal factories and eateries. This scenario has reduced the ponds to be useless for any activity, especially for recreational purposes.

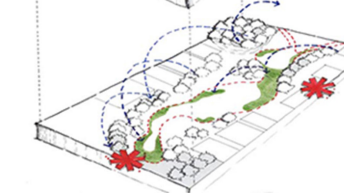
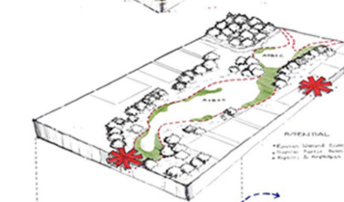
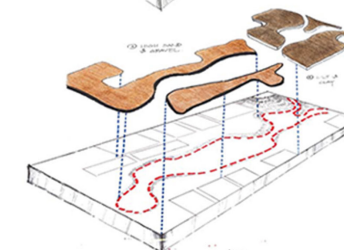
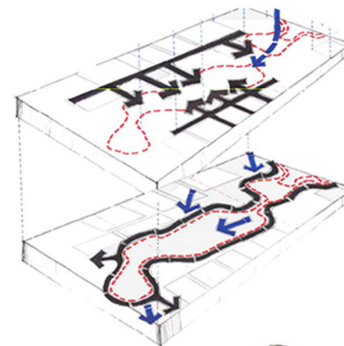
OBJECTIVES

The study aimed to re-awaken Batu Jinjang Pond as 'green sponge' by mimicking the natural wetland and make it as a living filter. The proposed landscape design integrates spaces through 3 phases of design.

Phase 1: Water network - improve water quality and ecological function through wetland construction

Phase 2: Create habitat - create eco-corridor enhancement for natural wander

Phase 3: Integrate space - integrate space for recreation.



HYDROLOGY ANALYSIS

Improved water quality from Class IV into Class IIb that suit for recreation

SOIL ANALYSIS

Variety soil types is potential to create variety plant species as can create specific habitat of animals

TOPOGRAPHY ANALYSIS

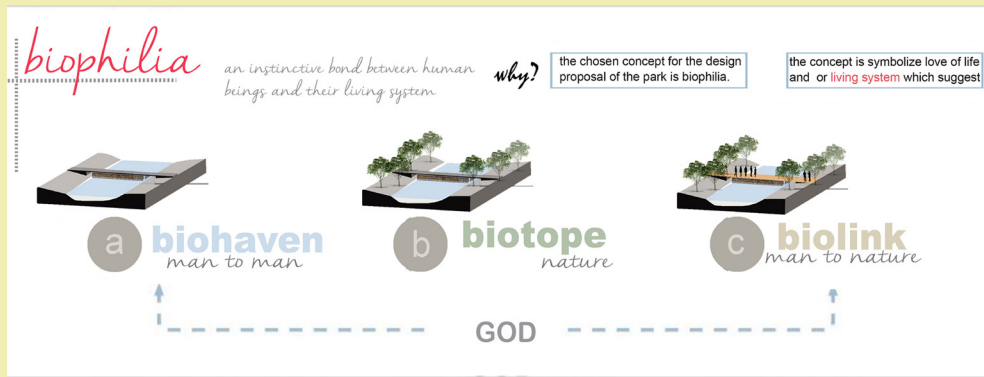
Different landform character at the site can be used as natural character to create different habitat

VEGETATION ANALYSIS

Character of the landform itself are potentially to create an ecosystem; submerged; emerge and floaters

WILDLIFE ANALYSIS

The niche of each community; bird, insects, aquatic ecosystem could be concerned



CONCEPTUAL IDEAS

The concept of Biophilia is used to create an instinctive bond between human beings and other living systems. The design includes a sequence of multi-phased planning that is derived from BIOHAVEN, BIOTOPE and BIOLINK. The solution seeks to reconnect the abandoned land and the area with a cleaner water by designing bay perimeter as an open space system.

BIOHAVEN: A new meandering watercourse to improve hydrological function

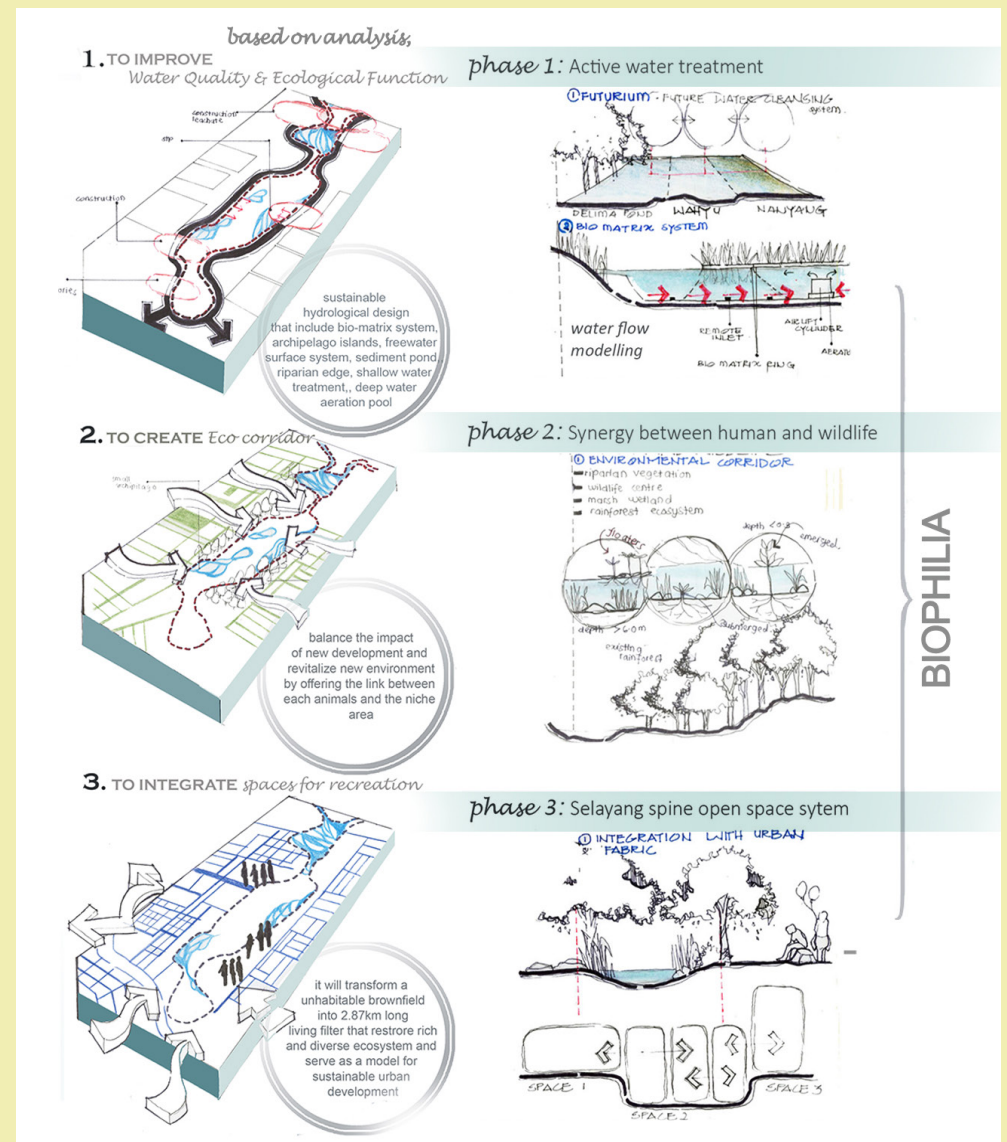
A sustainable hydrological design that includes bio-matrix system and involves in primary, secondary and tertiary wetlands, which differs in term of velocity and speed of water in the ponds. Through innovative bio-remediation technologies that mimic indigenous ecological processes, the newly constructed watercourse will improve the existing quality of the canal water from Class V (which is not fit for human habitation), to Class IIB, which is suitable for ecological restoration and recreational use.

BIOTOPE: Native plantings cleanse water and create habitat

An emphasis on native vegetation to support the re-establishment of diverse plant communities along the length of the corridor. It encourages colonisation by indigenous wildlife. Plantings along riparian edge, bio-swaales and rain gardens throughout the site will cleanse stormwater run-off from adjacent development. Plants selection creates a unique sense of place: topographical variety, differentiation of species into groupings based on height, texture and color creates distinct spatial patterns.

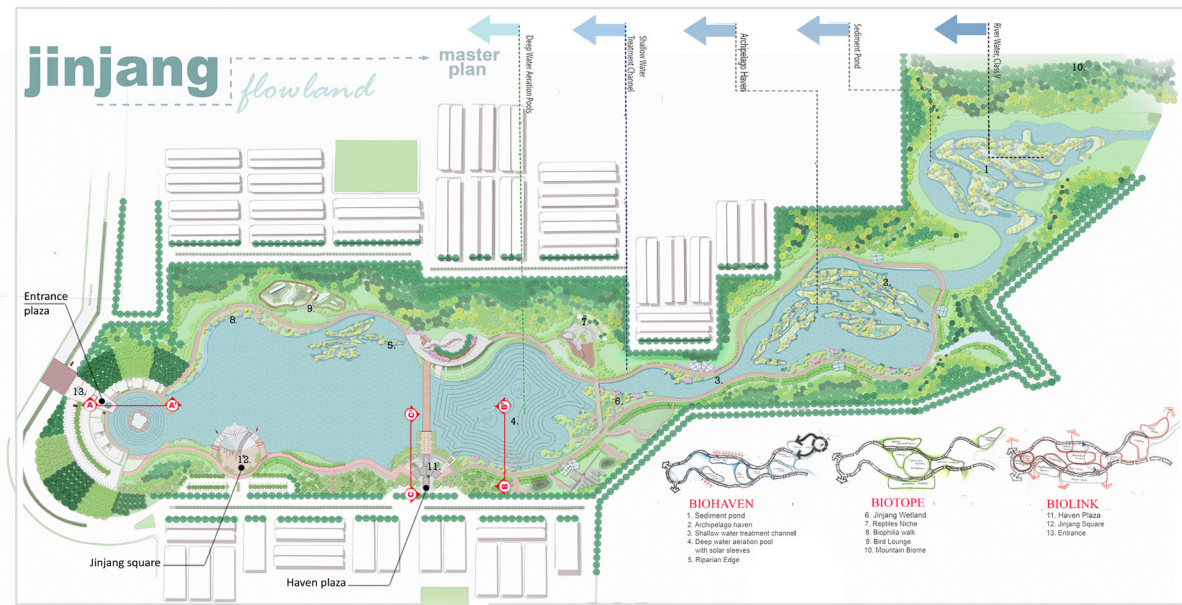
BIOLINK: Integrate for recreation

Restoring the ecological network, the Jinjang Flowland can integrate with the urban fabric through major and minor nodes. It creates fun and enjoyable public spaces for local and neighboring communities. After the water is purified, Jinjang Eco-Corridor will serve as the spine of Selayang New City's open space system. It will create vital habitat for native flora and fauna, enhances public health, creates fun and enjoyable public spaces for local and neighboring communities, and raises the bar for sustainable development in Malaysia.



REFERENCES

- Department of Irrigation and Drainage Ministry of Water, Land and Natural Resources. Batu Jinjang Ponds and Related Diversions. <https://www.water.gov.my/index.php/>
- Dordio, A., Palace, A. J., & Pinto, A. P. (2008). Wetlands: Water Living Filters? In Russo, Raymundo E. Wetlands: Ecology, Conservation and Restoration. New York: Nova Science Publishers
- Huang, Y., Ma, Y., Wu, W., & Lv, Q. (2017). Applying biotope concepts and approaches for sustainable environmental design. KSCE Journal of Civil Engineering, 21 (5), 1614-1622.
- Shattuck, S. O., & Fitzsimmons, N. (2000). BioLink, the biodiversity information management system.
- The Star Online (2009). Batu/Jinjang flood mitigation project nearly complete. 15 Oct.2009. <https://www.thestar.com.my/news/community/>
- Wilson, Edward O. (1984). Biophilia. Cambridge: Harvard University Press. ISBN 0-674-07442-4.



THE DESIGN PROPOSAL

The design starts from the water as it is from the viewpoint of nature, where nature will seek to coexist with man.

Jinjang flowlands proposes the strategies of two ecologies; BIOHAVEN + BIOTOPE that eventually give significant areas of open space, BIOLINK. The three systems allow the city of Selayang and its natural environment to sustainably develop together.

Plants selection is one of the approaches in landscape architecture, i.e. in designing an area of land. The site is divided into several zones with their very own planting concepts.

BIOPHILIA

Concept:

“An instinctive bond between human beings and their living system”

BIOHAVEN

Sustainable hydrological design that includes bio-matrix system and involves in every hierarchy of wetlands, which differs in term of their velocity and speed of water in the ponds.

Proposals:

1. Sediment Pond
2. Archipelago island
3. Shallow water treatment
4. Riparian Edge

BIOTOPE

The strategic planning has been implemented where it includes the re-establishment of diverse plant communities along the length of corridor to encourage habitat of flora and fauna.

Proposals:

1. Jinjang Wetland
2. Reptiles Niche
3. Biophilia Walk
4. Bird Lounge
5. Mountain Bime

BIOLINK

The Jinjang Flowland can integrate with the urban fabric by proposing major nodes and minor nodes, creates fun and enjoyable public spaces for local and neighbouring communities.

Proposals:

1. Haven Plaza
2. Jinjang Plaza
3. Entrance Plaza
4. Bamboo Plaza

Entrance

Concepts: Unique and special ambience, green tropical

Functions: Entrance statement and create wild tropic looks

Design Elements: Multi-layered vegetation of tall trees

Plant Species: *Samanea saman*, *Ficus religiosa*, *Barringtonia asiatica*



Riparian and Wetland Ecosystem

Concepts: Hygrophytes *Phytoremediation*

Functions: Attract wildlife by functioning as their habitat

Design Elements: Make use of existing natural feature

Plant Species: *Alocasia cucullata*, *Monocharia elata*, *Dillenia suffruticosa*, *Cyperus alternifolius*



Wildlife Centre: Reptiles and Amphibians

Concepts: Exotic tropical plants

Functions: Facultative plants communities at the stream edges

Design Elements: Lush and texture arrangement

Plant Species: *Samanea saman*, *Ficus religiosa*, *Barringtonia asiatica*



Aviary Ecosystem

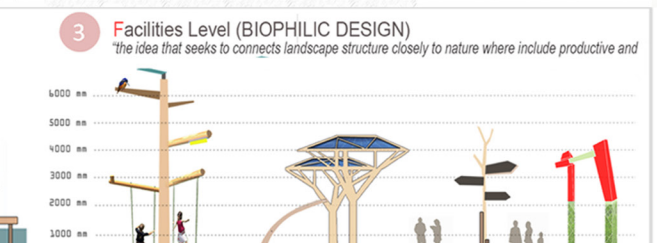
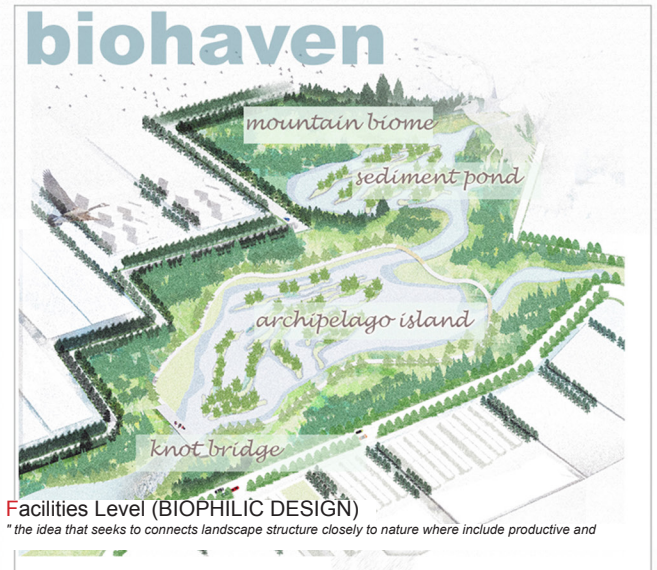
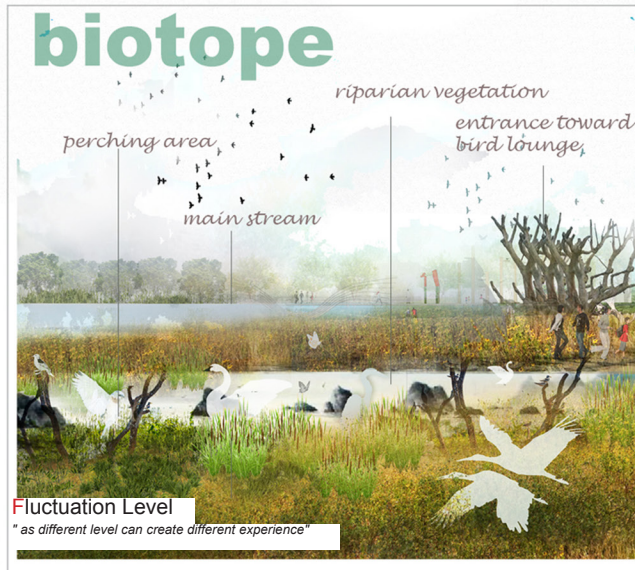
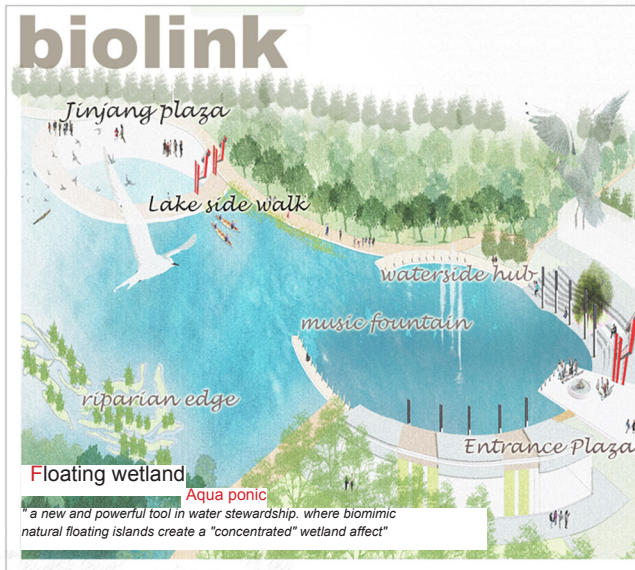
Concepts: Bird niche

Functions: Attract wildlife by functioning as their habitat = birds and insects

Design Elements: Perch tree as overlook location for birds, rooting wood becomes habitat for insects that eventually attract birds

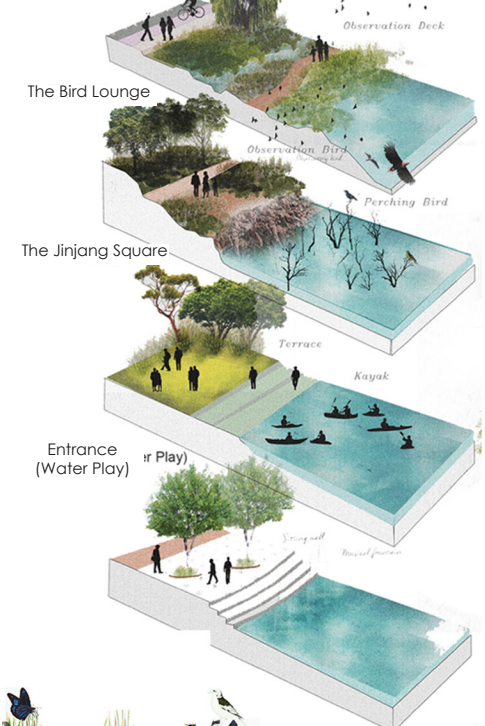
Plant Species: *Muntingia calabura*, *Carica papaya*, *Ptychosperma macarthurii*, *Erythrina*



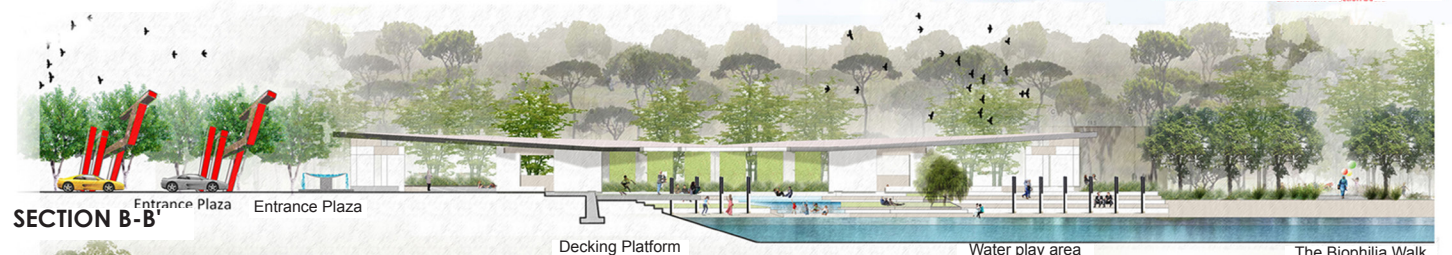


CONCLUSION

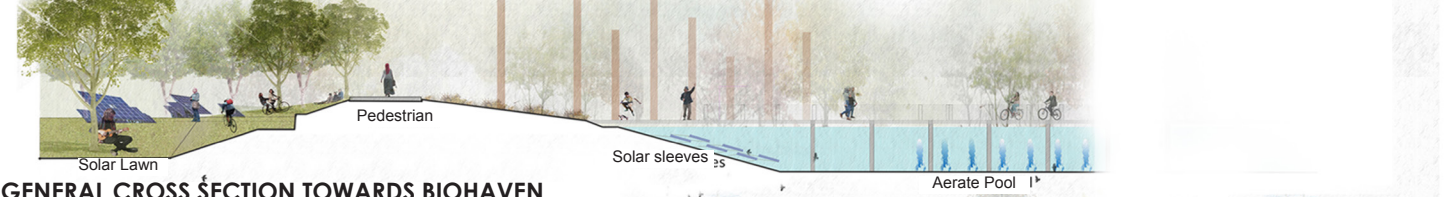
Jinjang Flowland provides future sustainable landscape where men, nature, advanced and coexist. The landscape infrastructure reconnects people to the water, increases future development values, and re-establishes Selayang's water-town identity, The Biophilia Walk



SECTION A-A'



SECTION B-B'



GENERAL CROSS SECTION TOWARDS BIOHAVEN



SECTION C-C'

