FARM THE GAPS!

POLITECNICO
MILANO 1863

“Tending an urban orchard should be about more than subsistence farming. Yes, you can grow food in the city, but farming within the public realm begs for art.”

- Richard Joseph Ingersoll

Architectural Dissertation
Politecnico di Milano, Piacenza Campus
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FARM THE GAPS!

REGENERATING RESIDUAL SPACES
IN BETWEEN INFRASTRUCTURE
FOR AGRO-CIVISM TO SUPPORT URBAN FOOD
SECURITY IN KUALA LUMPUR, MALAYSIA

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PROJECT FRAMEWORK

LOCATION
Kuala Lumpur, Selangor, Malaysia

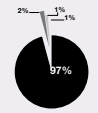
Selangor
State

REGIONAL ISSUE
Food security

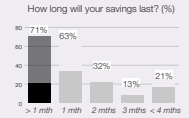
AVAILABILITY:
Import-dominated food commodity

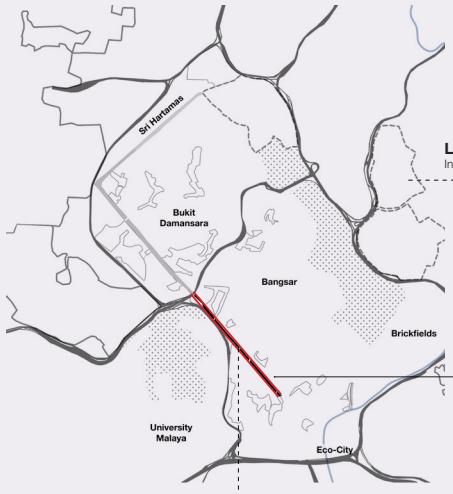
ACCESSIBILITY:
High household food expenditure

UTILISATION:
Difficulty in meeting nutritional needs

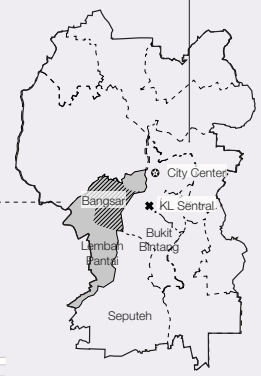


STABILITY:
Low preparedness to food shocks





LOCAL OPPORTUNITY
Infrastructural voids

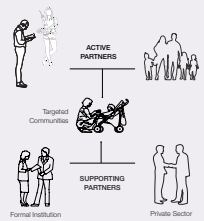


BANGSAR Sri Hartamas - TNBHq electrical transmission line 132 kV (low emission)
2 km, 12.3 ha

POTENTIAL SOLUTION
Agro-civism/ civic agriculture

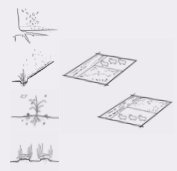
1. Farming on available land

2. Cooperation between various actors in the community

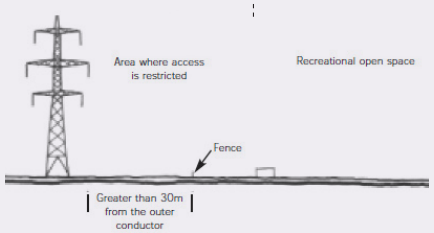


3. Preservation of local, ethnobotanical and vernacular character

4. Design considerations: Environmental conservation & aesthetic values



WORKING METHOD
Designing with clearances



1. Transmission buffers

2. Environmental buffers

3. Residential buffers

HOLISTIC OUTPUT

URBAN (XL) SCALE

Continuous Productive Urban Landscapes (CPULs) Potential Map

Accessibility, Physical Barriers, and Environmental Actors Network Strategy Map

NEIGHBOURHOOD (L) SCALE

Neighbourhood Scale Strategy Map
Strategic Infrastructural Layers
User & Activity Strategy Diagram
Landscape Aesthetics Diagram

LOCAL (S) SCALE

Masterplan Design
Masterplan Structure
Parcel Design
Landscape Programs
Agricultural System
Integrated Systems
Ethnobotanical Recommendations

ABSTRACT

Kuala Lumpur, Malaysia, is the second most urbanised city in South East Asia, due to a past of heavy tin-mining activity. While the city has been able to accommodate a great diversity of people and activities, it has also shaped the great sprawl over the urban fabric, creating gaps affecting living conditions in the city.

A great societal gap has been caused by rapid transformation from an agricultural to industrial society. This has contributed largely to factors of food security in the region. Another gap is the presence of infrastructural voids running through the gazetted urban fabric. Among one of them is the Bangsar TNB electrical transmission line which creates a *terrain vague* in the affluent Bangsar neighbourhood and strategic points of central Kuala Lumpur.

“Farm the Gaps!” is a proposal to bridge these apparent gaps through potentials of agro-civism (civic agriculture) in Malaysia. The rising interest of urban agriculture in the area, spearheaded by the non-profit community organization Kebun-Kebun Bangsar (KKB), is combined with contemporary landscape design strategies to transform underused land into a new contextual place for the urban community. The strategy takes into consideration urban conditions over a variety of scales, design clearances of transmission lines, actors and stakeholders, urban agriculture potentials, and landscape techniques over the contoured topography.

The result is a masterplan that covers an area of 12.3 ha, divided into 5 parcels, categorised over the themes of organised KKB activity, gathering spaces for the greater community, and a new nature reserve for the city. The 10 landscape programs proposed include dedicated functions to urban agriculture such as allotments, crop farming areas, livestock grazing, water reserves, and fish farming, ensuring a variety of opportunities to inspire productivity and self-sufficiency from within the city.

Keywords:
Food security, infrastructural voids, electrical transmission lines, urban farming, productive landscapes

Kuala Lumpur, Malaysia, è la seconda città più urbanizzata del Sud Est Asiatico, a causa di un passato caratterizzato da una pesante estrazione mineraria dello stagno. Se da un lato la città è stata in grado di ospitare una grande diversità di persone e attività, al tempo stesso ha originato una dispersione del tessuto urbano, generando vuoti che ne influenzano le condizioni di vita.

Una grande lacuna sociale è stata causata dalla rapida trasformazione da una società agricola a una industriale, che ha influenzato in maniera decisiva gli aspetti di sicurezza alimentare nella regione. Un’altra lacuna è data dalla presenza di vuoti infrastrutturali che corrono attraverso il terreno riconvertito a tessuto urbano. Una di queste linee è quella di trasmissione elettrica Bangsar TNB, la quale crea un vero e proprio *terrain vague*, nel ricco quartiere di Bangsar e nei punti nodali del centro di Kuala Lumpur.

“Farm the Gaps!” è una proposta volta a colmare queste mancanze attraverso le potenzialità dell’agro-civismo (agricoltura civica) in Malesia. La crescita d’interesse per l’agricoltura urbana nell’area, guidata dalla organizzazione comunitaria no-profit Kebun-Kebun Bangsar (KKB), viene combinata con strategie contemporanee per la progettazione paesaggistica al fine di trasformare territori sottoutilizzati in nuovi spazi destinati alla comunità urbana. La strategia prende in considerazione le condizioni urbane sotto molteplici aspetti: le distanze di progettazione dalle linee di trasmissione, la presenza di attori e promotori, i potenziali agricoli urbani e le tecniche paesaggistiche adatte alla specifica topografia del sito.

Il risultato è un masterplan che copre un’area di 12.3 ettari, suddiviso in cinque zone e strutturato in base ai temi della organizzazione KKB, in grado di generare spazi di aggregazione per la comunità e una nuova riserva naturale per la città. I dieci programmi paesaggistici proposti includono funzioni dedicate all’agricoltura urbana come la ripartizione dei terreni, le aree di coltivazione, il pascolo del bestiame, le riserve d’acqua e la itticoltura, al fine di assicurare varie opportunità, ispirando produttività e autosufficienza all’interno della città.

Parole chiave:
Sicurezza alimentare, vuoti infrastrutturali, linee di trasmissione elettrica, agricoltura urbana, paesaggi produttivi.

CONTENTS

01

INTRODUCTION

Cities and urban centers are increasingly under the microscope for their liveability and resiliency, especially in facing risks of climate change and its impending effects.

Kuala Lumpur, Malaysia, is one of the most urbanised cities in South East Asia. This condition is affected by multiple factors related to its colonial history and conception, rapid industrialisation, and ambitious push towards globalisation.

Radical environmental, societal and economical changes overtime has also created many impacts that shape up the context of the city today.

ISSUES & SCOPE OF STUDY

The City, The Food System, and Resiliency

The modern city, or cities formed since the nineteenth century onwards, is a product of economies prioritising market functions and industrialisation.

Typically, they are formed through **land displacement over crop lands,** thus greatly upsetting the previously established equilibrium between city and rural landscape. This conduct also creates **the phenomena of urban sprawl**: 'mutations' of not only the geography and morphology of the territory, but also of anthropological proportions.[1]

As a result, the landscape of the city faces issues of quality **degradation**. Its liveability is often questioned through capabilities to withstand ecological, social, and disaster losses.

These losses are often associated with **climate changes** and **climate-related disasters.** The risks are increasingly concentrated in urban areas, impacting not only the environment, but also **disrupting food systems**, inducing negative health impacts, and creating associated economic losses.

Consequently, many urban dwellers, especially in highly urbanised cities, are progressively **vulnerable** to these changes. Among them are the urban poor, or the people with the least access to resources within the city.

Today, cities are called upon to face two huge challenges: to address vulnerabilities within its structure in order to **adapt** to climatic change effects, while simultaneously **mitigating** the inevitable unamangeable climatic changes.[2]

Urban agriculture is a strategy that has been traditionally practiced by many groups of people all over the world and has been recognised to hold potentials in building **community resilience.**

At the same time, its presence as a controlled **open landscape** in the city can also be designed to address, adapt and mitigate the many faces of climate change and its impacts towards the city. [3]

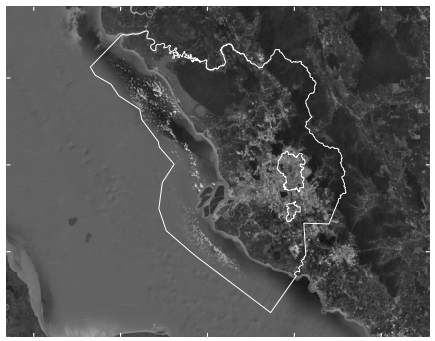
[1] Ingersoll, 2006.
[2] Herzog, 2015.
[3] Lwasa & Dubbeling, 2015.

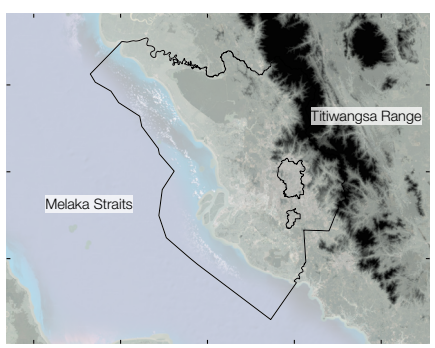
RESEARCH BACKGROUND

Kuala Lumpur, Malaysia

Between the mountains and the sea

The heavily urbanised capital of Malaysia, Kuala Lumpur, is administratively located in Peninsular Malaysia, or West Malaysia, which is the eastern region which holds 11 out of the 13 states of the country.

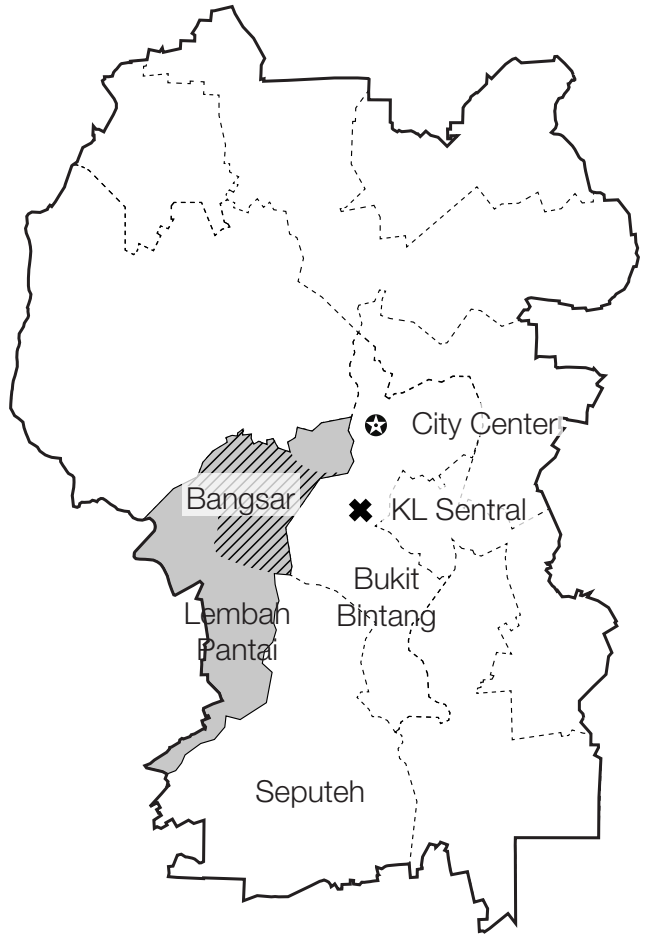




The state is bordered by the Titiwangsa Range, which expands from southern Thailand, in the east and the Melaka Straits in the west.

The Titiwangsa range is the chain of mountains acting as a natural divider, between Peninsular Malaysia and southernmost Thailand, into east and west coast regions.

Meanwhile, the Melaka Straits is a narrow stretch of 890 km water, between the Peninsular Malaysia and Sumatra. It is the main shipping channel between the Indian Ocean and the Pacific Ocean.



The metropolitan capital

Kuala Lumpur is the largest city in the country with estimated population of 1.808 million (2017).

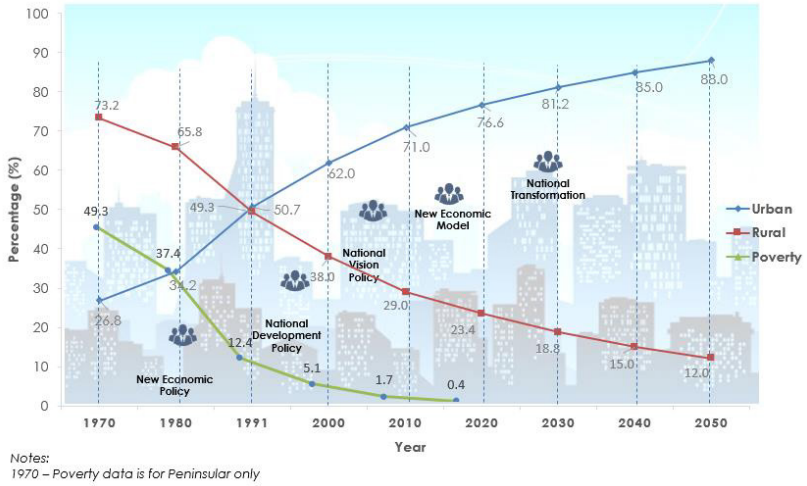
The city is marked by the latest development of KL Sentral, Malaysia's biggest transit oriented development hub.

Around 3 km away from the centre is the affluent neighbourhood of Bangsar, where the project will be situated.

URBAN DEVELOPMENT

Malaysia's urbanisation: 2nd Highest in South East Asia

As much as 2/3 of Malaysia's population live in urban areas.[4] Major urban areas have an average annual growth rate of over 2%, with significant contribution from rural to urban migration.



Recorded and predicted urbanisation trends in Malaysia 1970-2050.
Source: (Department of Statistics Malaysia, 2020).

The definition of 'urban' areas in Malaysia has persistently changed since 1970. A constant defining character is the original nature of the city as 'gazetted areas', or transformed agricultural land. Overtime, the redefinition has continuously moved further from its original agricultural activities.

Criteria of urban definition in Malaysia, according to 2010 and 2020 census:[5]

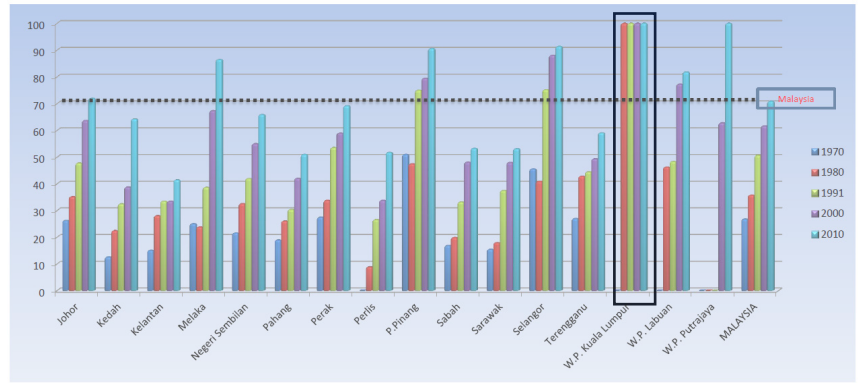
"Gazetted areas with their adjoining built-up areas, which had a combined population of 10,000 or more at the time of the Census 2010/2020 or the special development area that can be identified, which at least had a population of 10,000 with at least 60 percent of population (aged 15 years and above) were involved in non-agricultural activities."

[4] Yaakob et al., 2012.

Kuala Lumpur case: Over-Urbanisation

As the main uban center in Malaysia, Kuala Lumpur has been a primary destination for urbanisation over time, with main attraction being industrial, business and commercial activities present.

Percentage of urban population by states 1970, 1980, 1991, 2000 and 2010:



Kuala Lumpur's population continues to exceed Malaysia's national average.
Source: (Department of Statistics Malaysia, 2020).

Major causes for urbanization in Kuala Lumpur:[5,6]

1911-1921

Source: (TuckDB Postcards, 2012).

Tin mining during British colonialisation
with large foreign workers of mainly Chinese and Indian origin, creating legacy of urban segregation.

1947-1957

Source: (Aliran, 2020).

'The Emergency'
British initiative for creation of New Villages to relocate the rural Chinese towards new urbanised areas around the Urban Centers. Kuala Lumpur absorbed 3 of these New Village areas.

1970-1980

Source: (Bormann et al., 2010)

Highest internal migration from rural to urban areas, spurred by the New Economic Policy to expand manufacturing industries and economic activities.

[5] Department of Statistics Malaysia, 2020

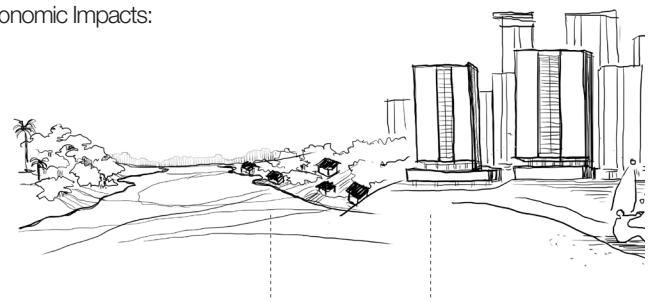
URBAN DEVELOPMENT

Impacts of Over-urbanization in Kuala Lumpur:[6]

The heavy transformation performed in Kuala Lumpur since the 1970's brought about radical transformation and changes to the city. It succesfully placed Malaysia in the thriving global market as a country committed to industrialisation.

However, all these changes also took a toll on Kuala Lumpur's environmental, social and economical conditions. Changes occur in living styles and traditions of the citizens, while significant degradation of the environment is marked by a number of ecological disasters.

Socio-Economic Impacts:



Spontaneous Settlements
(squatter areas) lacking basic necessities

Urban Poor Settlements
with poor living qualities

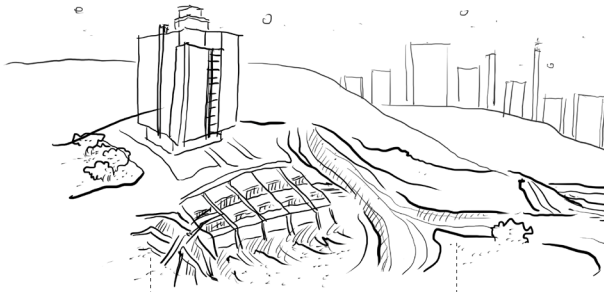
Disguised Unemployment

Involuted Informal Sector
of the urban economy marked by income inequality and racial conflicts

Increase in Non-communicable Diseases
due to reduced environmental quality

Cultural Shifts
the influence of Western culture, loss of locality, changing morals, also related to increasing trends of youth crime and drug abuse

Environmental Impacts:



Landslides, Land Subsidence and Sinkholes
due to the poor soil quality of Kuala Lumpur, over-construction, and climatic influences

Erosion and Siltation
very high erosion on untreated slopes bring in sediments to river run-offs, sometimes affecting infrastructures

Water Pollution & Groundwater Contamination
mainly from untreated/ partially treated industrial waste

Urban & Industrial Pollution, Improper Waste Disposal
unhealthy practices of open dumping, intermittent littering, and improper industrial waste treatment

Concrete Jungle
increase of built landscape and lack of recreational and open spaces

Air & Noise Pollution
increased motor vehicles and urban infrastructures

[6] Mazlan et al., 1998

VEGETATION CHANGES

Transformed Village Orchards

Kuala Lumpur was typically structured by villages surrounded by traditional orchards, which also became part of the residents' food supply.

Rapid urbanisation has abolished the presence of such orchards, and replaced the common vegetation with plants for urban beautification instead.[6]

The following list of plants have been noted as species commonly found in Village Orchards in Kuala Lumpur. They consist of native tropical fruit trees, trademarks of societies in South-East Asia.

Their various types and size, as well as fruiting season, can be incorporated into a renewed type of urban gardens in Malaysia.

Garcinia mangostama

Durio zibethinus

Traditional Village Orchard plants in Kuala Lumpur:

Lansium domesticum

Nephelium lappaceum

Nephelium ramboutan-ake

Musa spp.

Carica papaya

Phyllanthus acidus

Artocarpus heterophyllus

Cocos nucifera

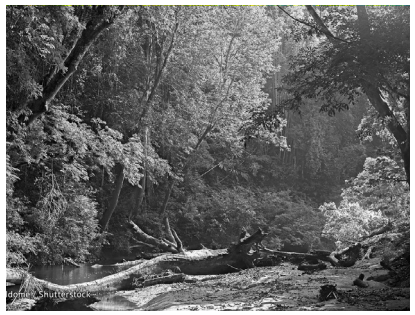
Punica granatum

Citrus grandis

[6] Mazlan et al., 1998

ECOLOGICAL CHANGES IN MALAYSIA

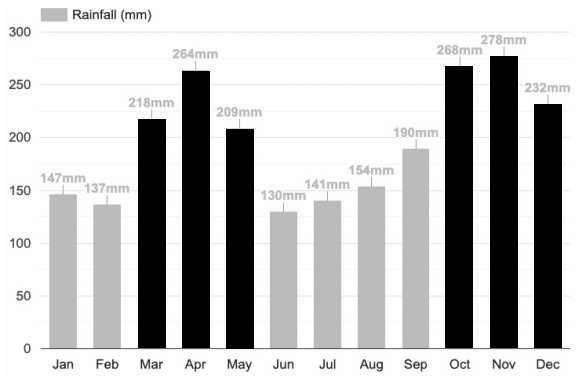
Tropical Monsoon, Heavy Rainfall, Flash Floods



Malaysia lies along the area of equatorial doldrum and experiences a tropical rainforest climate. (uniform temperature between 32 to 35 °C, high humidity and heavy rainfall throughout the year.

It is influenced by two dominant monsoon season, North-East Monsoon (NEM) between November-March and South-West Monsoon (SEM) between May - October.[7]

Kuala Lumpur receives an annual rainfall of 2600mm while experiencing maximum rainfall from Oct-Nov and from Apr-May and minimum rainfall from Jun-Jul and Feb.[8]



Average Rainfall, Kuala Lumpur, Malaysia.
Source: Malaysian Meteorological Department (MET)

[7] Wan Mohtara et al., 2020
[8] Malaysia Meteorological Department (MET), n.d.
[9] Mohd Nasir & Othman, 2015
[10] Muhammad et al., 2016

Urban Flash Flood Potential

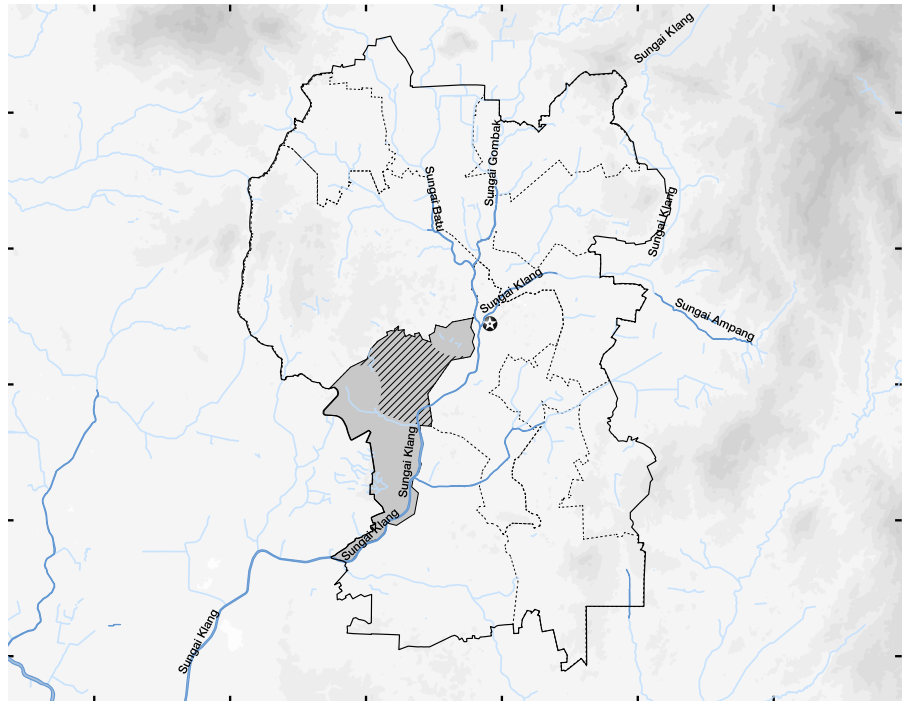
Malaysia is mainly affected by man-made disasters such as flood, landslide and haze.

The increasing incidents of flash flood occurrences in the metropolitan capital of Malaysia are due to several reasons:

- urbanised area induced high surface runoff and poorly maintained and designed drainages [9]
- high frequency of extreme rainfall events with shorter duration and higher intensity [10]

Green shaded areas indicate the flood prone areas in Peninsular Malaysia.
Source: Department of Irrigation and Drainage Malaysia (DID)

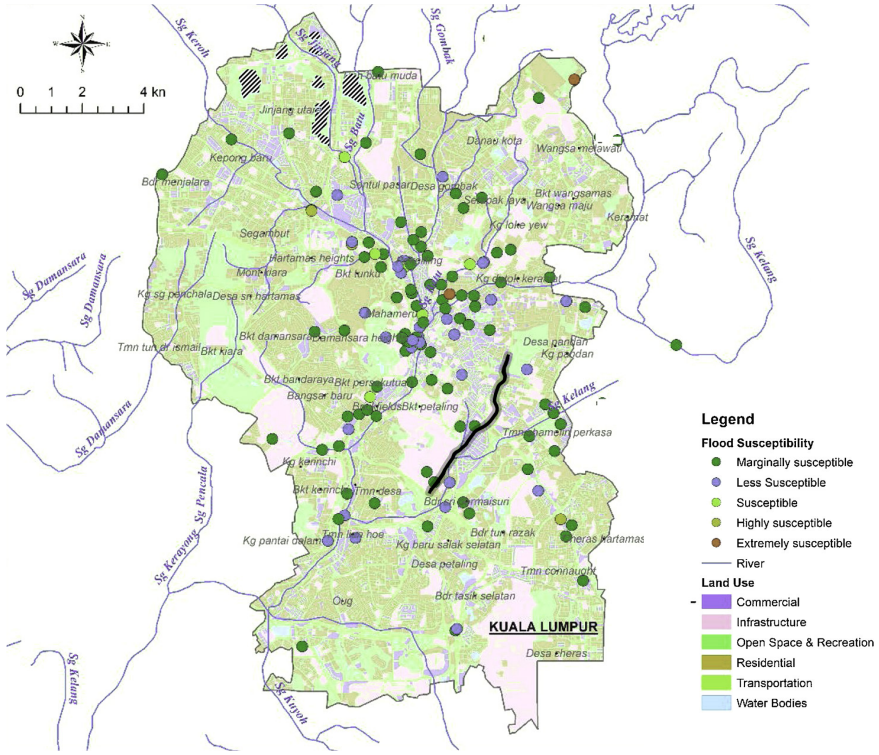
Kuala Lumpur as Watershed Area



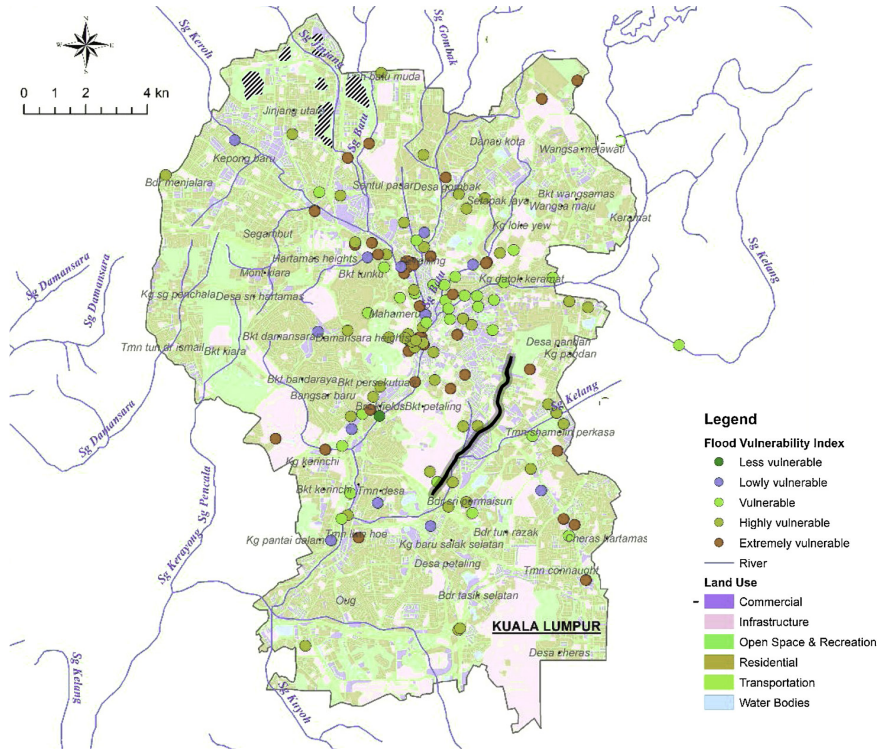
Kuala Lumpur lies in the middle of the Klang River basin, one of the major river basins in Malaysia with a watershed of 1288 km^2. Batu, Gombak and Ampang are the tributaries to the main stem of Klang River.[7]

GEOHAZARDS- FLASH FLOODS

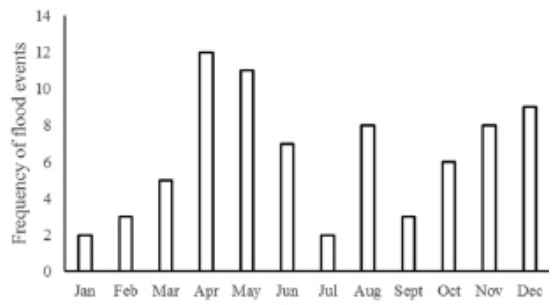
Flood Susceptibility Map



Flood Vulnerability Map



Flash flood in Kuala Lumpur on September 10, 2020 following a 2 hours torrential downpour Source: (The Star, 2020).



Frequency of UFF events in Kuala Lumpur from the year 2005 to 2015.

Source: (Mohtara et al., 2020)

As depicted in the Flood Susceptibility and Vulnerability Map, the confluence between Batu, Gombak and Klang river is usually prone to urban flash floods.

The Stormwater Management And Road Tunnel (SMART) and Batu Jinjang Ponds diverted the flow from the upper catchment of Gombak and Batu Rivers, and upper Klang River (including Ampang River), respectively, minimising overflow discharge into the city centre from both North-West and North-East. [7]

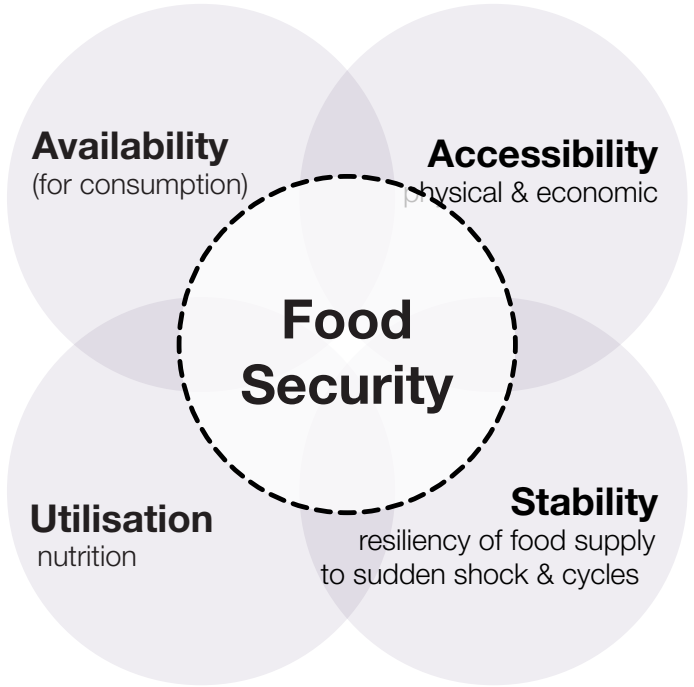
[7] Mohtara et al., 2020
[8] Malaysia Meteorological Department (MET), n.d.
[9] Nasir & Othman, 2015
[10] Muhammad et al., 2016

FOOD SECURITY IN MALAYSIA

Is the country being properly fed?

Malaysia's urbanisation has greatly affected its urban dynamic with food.

This condition can be analysed using the Food Security Framework,[11] which investigates four components tied to food distribution and supply. The findings will potentially show the main food vulnerabilities to be addressed.



Framework for Food Security
Source: Gibson, 2012

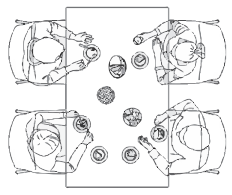
[11] Gibson, 2012.

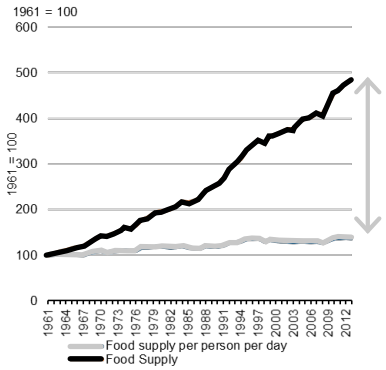
FOOD SECURITY IN MALAYSIA

Food Availability (Consumption)

The first criteria is the physical presence of domestic produce and/or imported food at farms and in local markets through adequate infrastructures.[11]

In Malaysia, increases in food supply (through domestic food production & imports) in the country since 1961 has provided more than sufficient dietary energy for every person in the country.[12]



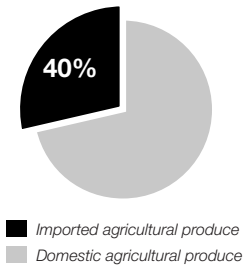


Net per capita food supply, 1961–2013
Source: (FAO, various years)

This indicates that Malaysia does not seem to have issues with food availability for consumption.

However, of the total food supply in Malaysia is imported. In 2018, it exceeded RM52 billion (equivalent to USD 13 billion).[13]

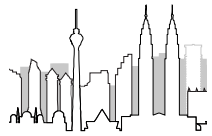
This high number of imports may impact the affordability of food.



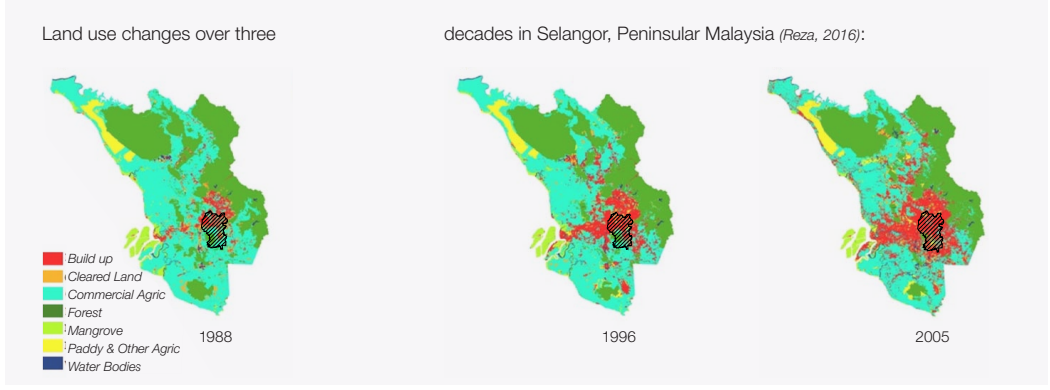
Percentage of imported food in Malaysia.
Source: (Seng, 2020).

Food Accessibility (Physical)

The second criteria analyses the ease of accessibility of citizens towards food supply/ food sources, especially in urban areas.

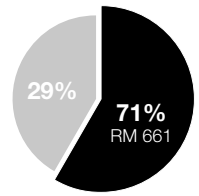


Physically, the shrinking gap between rural and urban areas implies that geographical location is no longer a major factor influencing food availability and consumption.[12]



Food Accessibility (Economical)

Economically, Malaysia's food accessibility index can be seen through the spending habits of its lowest-income citizens.



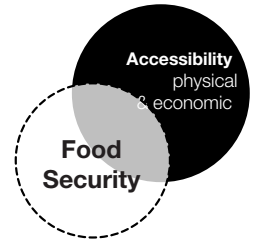
Household monthly expenditure in 2016.
Source: (Sundaram et al., 2019).

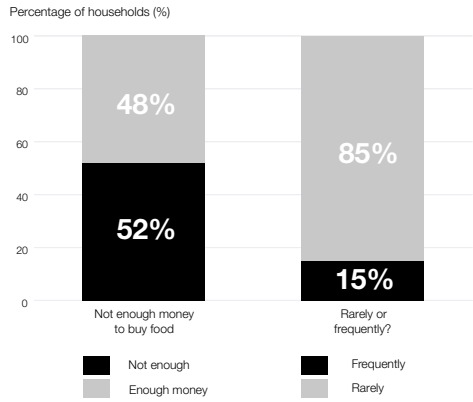
According to the 2014 HIS, the average poverty line incomes for Peninsular Malaysia is equivalent to RM 930 (USD 230).

Households in Malaysia spend a minimum of RM 661, or 71% of their total monthly expenditure to purchase various ingredients for nutritious meals in 2016.

[11] Gibson, 2012.
[12] Sundaram et al., 2019
[13] Seng, 2020.
[14] United Nations' Childrens' Fund et al., 2020

FOOD SECURITY IN MALAYSIA



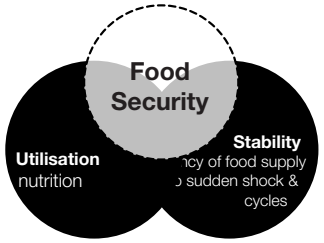


Sufficiency to purchase food and frequency of the incident. *Source: (United Nations Childrens' Fund (UNICEF) et al., 2020).*

Adversely, this implies that poor households would need to spend almost their entire monthly income on food expenditure.

Additionally, 1 in 2 in low-cost households, in and around KL do not have enough money to buy food in recent months and 15% of them experience this frequently. [12]

FOOD SECURITY IN MALAYSIA



Stability

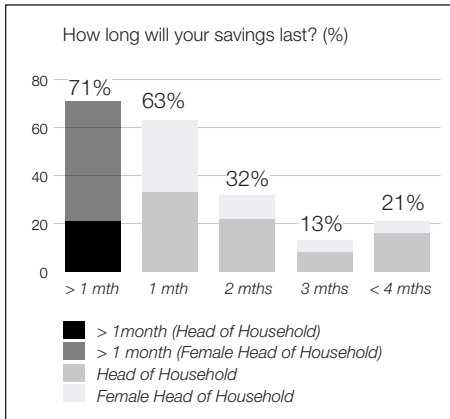
The third criteria used to asses food security is the stability and vulnerability of food supply influenced by the social and physical environment, political and economic instability.[12]

In this case, particular attention has focused on the COVID-19 case in Malaysia, in which during the first outbreak of 2020, the government had ordered strict limitations under the name Movement Control Order (MCO) .

The results indicate that 57% head of households (HoH) experienced worsening earnings during the MCO, with total monthly median earnings dropping by 1/3, while average monthly expenditure on food decrease by mere 4%.

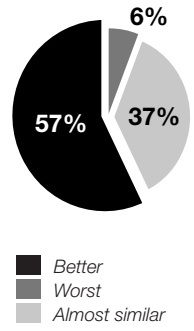
Worse, among those who were able to save during the MCO, only 1 in 6 of them has enough savings to last more than three months. Among female HoHs, only 5 in 100 have enough savings to last more than 3 months.

How long will your savings last? (%)



Source: United Nations Childrens' Fund (UNICEF) et al., 2020

How is your earnings level at present (during MCO) compared to the end of 2019? (%)



Source: United Nations Childrens' Fund (UNICEF) et al., 2020

COVID-19 Pandemic: Food Shock

During the first phase of the Movement Control Order (MCO) in Malaysia, some stockpiled food in panic, causing food inflation and food waste. Since then, the prices of essential food items have surged upwards.

The most vulnerable group has been the B40, or the lowest-earning group. as they are forced to bear the burden of higher food prices.[13]

price of a cucumber rose by **300%** during MCO

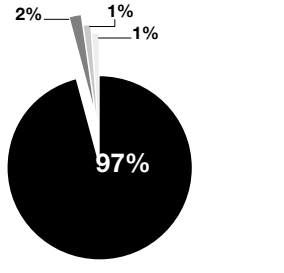
On top of that, most of the B40 are struggling to survive due to limited savings and no income during the MCO period. This implies that a marginal increase in food prices and the extended enforcement can make them food insecure.[3]

[11] Gibson, 2012.
[12] Sundaram et al., 2019
[13] Seng, 2020.
[14] United Nations' Childrens' Fund et al., 2020

Utilisation

The last criteria deals with how food is utilised, measured by the ability to access to adequate nutritious food supply.[2]

Challenges to prepare healthy food for children



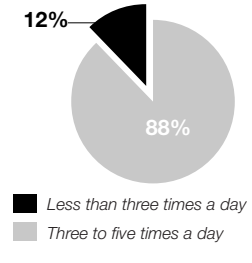
Source: United Nations Childrens' Fund (UNICEF) et al., 2020

The findings show that providing healthy meals is especially challenging for the low-income in Kuala Lumpur.

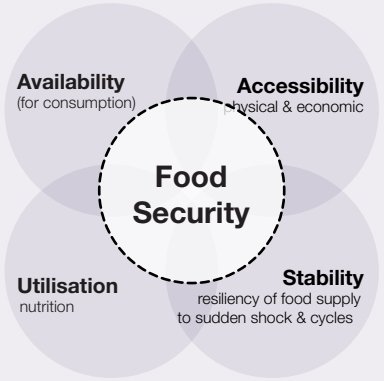
As much as 97% of households in low-cost flats in and around KL say that high food prices prevent them from preparing healthy meals for their children.

As a result, 12% of children in low-cost flats in and around KL had less than 3 meals a day.[14]

Average number of meals consumed per day, for children 5-17 years old (%)



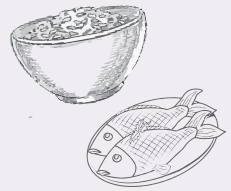
Source: United Nations Childrens' Fund (UNICEF) et al., 2020



CONCLUSIONS

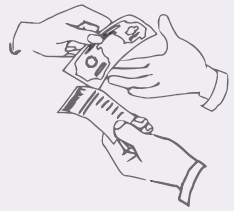
At a glance, Malaysia's food supply show high availability, with ease of physical accessibility to its citizens. However, this is mostly possible also due to a high number of food imports, which finds its way into the local markets through a chain of processes, driving high food prices.

This condition greatly limits the people's economical accessibility, rendering them towards insecurity during periods of instability, as well as being unable to provide the right nutrition for their daily needs.

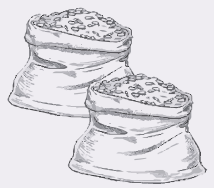


1 **Insufficient diversity in local food supply and need to lessen imports.**

2 **Lack of accessibility to food supply for urban poor communities.**



3 **Import-driven model causing ineffective food chains, rife with unhealthy practices, including monopoly & oligopoly, food wastage etc.**



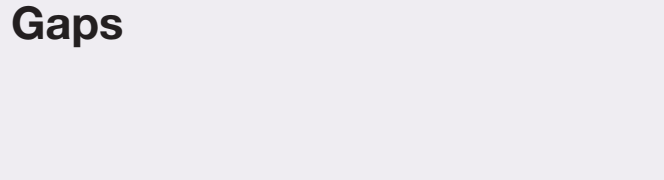
4 **The need to strengthen adequate emergency food supply to prepare for emergency and shocks.**

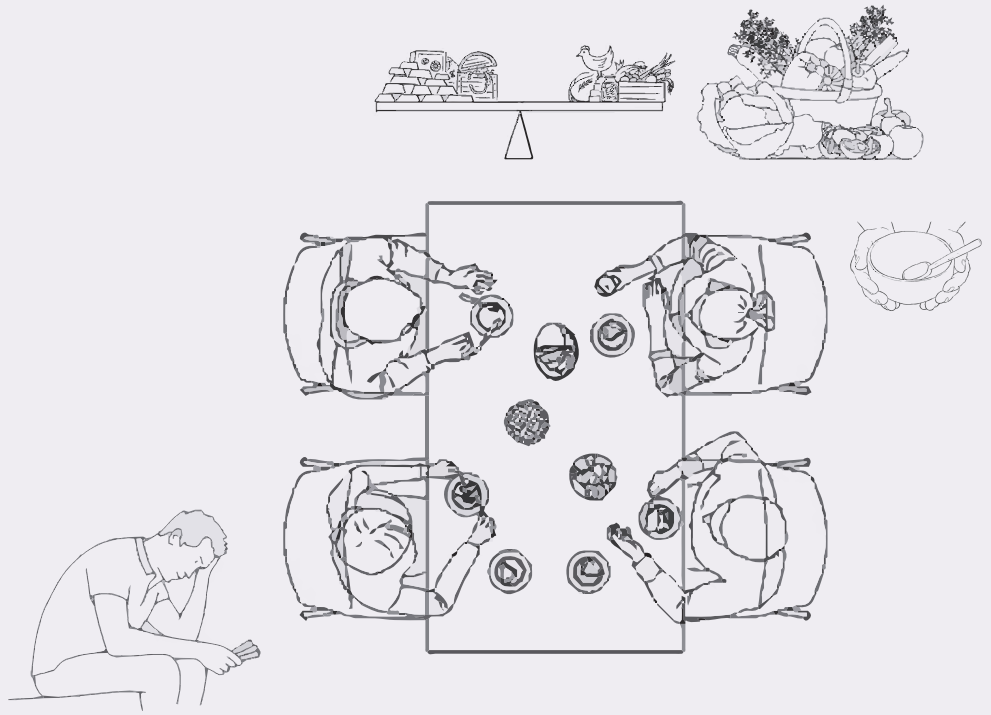
The Two Gaps

Overurbanisation in Kuala Lumpur has enabled the city to accomodate various people, activities, and functions.

However, it has also brought many changes to its original city environment, leaving **societal and environmental gaps** that affect the living conditions of the city.

These living conditions have become highly tested in extraordinary times, such as the food crises brought by the pandemic situation of 2020.





Treating, or 'closing' these two gaps are crucial in ensuring future resilience of the city.

02

LITERATURE REVIEW

Due to its heavy industrialisation, traditional food-growing agriculture in Malaysia continued to be a declining trend.

Related local knowledge, such as its unique ethnobotanic plant culture, has also been affected.

However, in recent years, there has been growing interest in small-scale agriculture practiced by its urban communities, which can potentially support the revival of the food-growing culture in the country.

AGRICULTURE IN MALAYSIA

Local tradition vs. industrialisation

Malaysia is a traditionally agrarian society, with rice paddies shaping the typical landscape.[15]

Rice paddies are part of the food crop agriculture, as opposed to industrial crops.

Due to heavy industrialisation since the late 1980's, industrial crops have taken over food crop production.[16]

Agriculture sector in Malaysia has declined from contributing 30.8% to the national GDP in 1970 to only 7.3% in 2019, [17] and therefore requires strengthening and revival.

Malaysian paddy rice field, painting by A.B. Ibrahim. Source: WorthPoint, n.d.

FOOD CROPS	INDUSTRIAL CROPS
Native plants that have been typically grown for consumption by local Malaysian smallholders, or independent farmers.	Non-food plants that are grown for specific productions, grown in large estates, managed by corporations.
 vegetables  fruits  grain crops  root crops	 palm oil  tea  coffee  rubber

[15] Alam et al., 2010.
[16] Hassan et al., 2018.
[17] Mahidin, 2019.

Problems affecting agriculture in Malaysia

As much as 37.9% of the sector is dominated by oil palm, indicating a heavy reliance on non-food/ industrial crops.

This domination greatly affects the production of important food crops, with low-sufficiency ratios for crucial herbs and spices used in everyday life.

Meanwhile, the remaining smallholder and independent farmers who strive in growing food crops, are increasingly decreasing in number, as well as size of their land (average of less than 2 ha).

This is coupled with a high average aging farmers and a shortage of domestic skilled labors, with many farmworkers living below standard national wages (B40 income group).

As a result, there has been a great lack of incentives and technology in the farming sector.[18]

Integrated planting

Traditional Malaysian agriculture, as dominated by rice cultivation, focuses heavily on working over the terrain. Rice paddies often employ intensively irrigated large bodies of land.

A common practice is the integrated planting method which utilises this watery landscape to be coupled with fish cultivation. As a result, the land is able to sustain two types of production efficiently.[19]

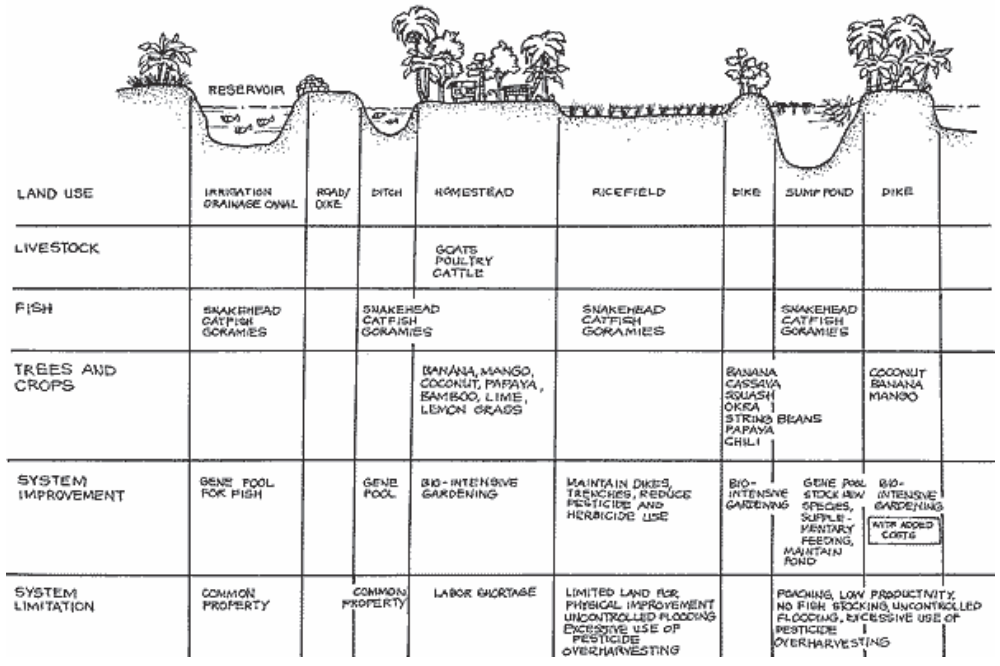
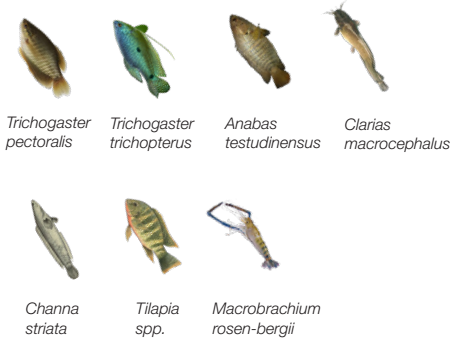


Diagram of traditional integrated planting system. Source: Ali, n.d.

Suitable fish species:



Trichogaster pectoralis *Trichogaster trichopterus* *Anabas testudinensus* *Clarias macrocephalus*

Channa striata *Tilapia spp.* *Macrobrachium rosen-bergii*

[18] Lee & Surendran, 2020.
[19] Ali, n.d.

AGRICULTURE IN MALAYSIA

Lost Culture:

Relationship between plants & locals

Malaysia's local geographical region is home to around 30,000 species of plants,[20] making it one of the most species-rich countries in the world.

As a result, traditional communities in Malaysia have a very intimate relationship with plants.

However, this culture is lost during the heavy urbanisation periods of the 19th century, yet the relevance of plants is still cultivated by few. [21]

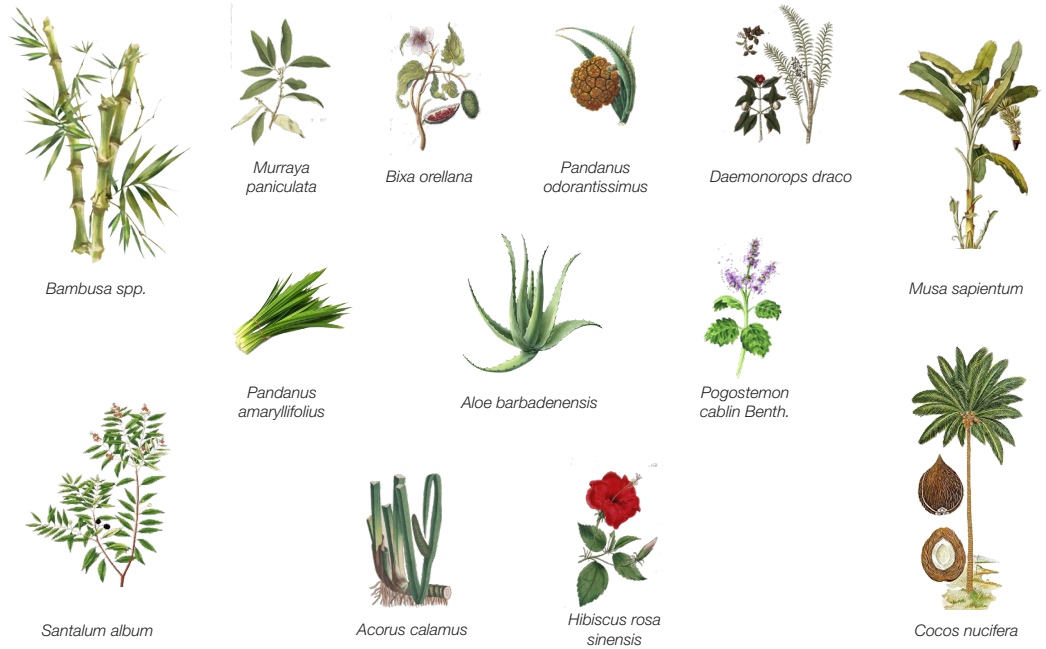
Ethnobotany: plants of value in Malaysian culture

Ethnobotany is a rising discipline that studies the relationship between indigenous communities and their local plants. The discipline is deemed to help preserve the integrity of the cultures, while protecting the natural heritage and its knowledge.

Malaysian ethno botany is a composite of the plant knowledge of the three main ethnicities present: Malay, Chinese, Indian, and indigenous communities (Orang Asli), for the following purposes.[21]

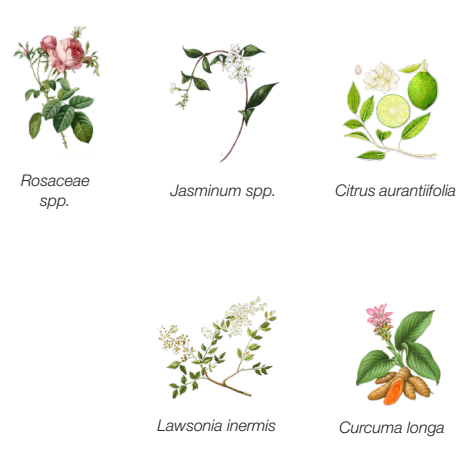
1. Healing and consumption

2. Utilities (multi-functional) plants



3. Ritual plants

4. Beauty treatments



[20] Foster, 2009.
[21] Adnan & Othman, 2012.

AGRICULTURE IN MALAYSIA

Contemporary Urban Agriculture

Generating renewed interest

With 75% of Malaysia's population living in cities, food demands are constantly increasing. Around 40-45% of these are of low-income category, with lack of accessibility to good quality food, despite spending up to 50-70% of their income on food.

The need for new methods of obtaining food has generated interest for urban agriculture, which could potentially reduce household expenses of food to 40-60% of total earnings. [22]

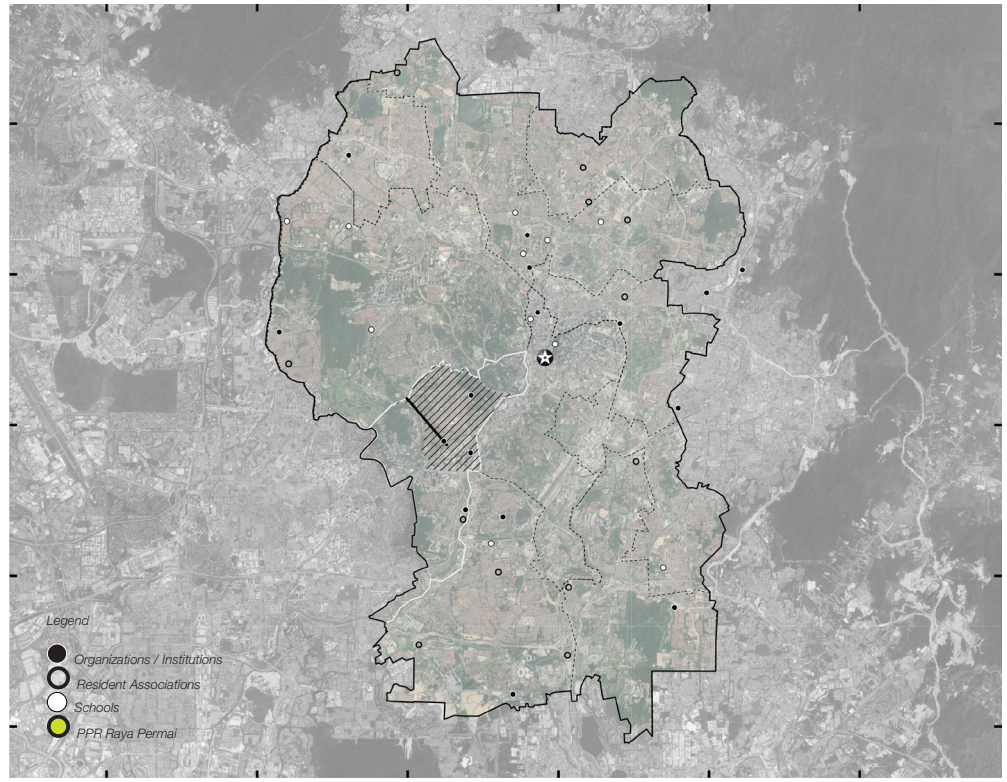
Agricultural and Food Sector Support by local government. Source: Kebun-Kebun Bangsar, 2020

Poster for LA21 event, KL. Source: Local Agenda 21 Kuala Lumpur, 2013

Rise of Urban Agriculture in Malaysia

An initiative for community gardening in Malaysia was first established in 2006 under the theme "Clean & Beautiful City" in UN Local Agenda 21 (LA21). 8 years later, in 2014, a community gardening project under the agenda began with partnership between Kuala Lumpur City Hall (DBKL) and the local community at a low-cost housing flat, PPR Raya Permai flats. [23]

However, in 2015, there has been queries raised over the relevancy of the agenda due to the lack of attentivity and 'bottom up' initiative from the local councilors. [24]



Location of local urban agriculture spots in housing areas around Kuala Lumpur.

First community gardening project under LA21 in a low-cost housing flat, PPR Raya Permai flats. Source: The Star, 2020

Fortunately, the initiative has improved over the recent years as food security has become an increasingly hot topic in the country following the continuous growth of food imports. The pandemic has also brought the country's inability to fully feed itself even on basic grains such as rice into the limelight. According to Bernama, 2020 home gardening and community farming projects has been gaining momentum in Malaysia in the recent years and peaked during the nationwide lockdown. [25]

Several policies such as the Agriculture and Food Support initiative has been drawn up during the recent months to bridge the gap between agriculture and food security and as an assistance to the lower income communities.

[22] Rahman, 2018
[23] C40 Cities, 2019
[24] Sri Priya, 2015
[25] Bernama, 2020

AGRICULTURE IN MALAYSIA

Contemporary Urban Agriculture

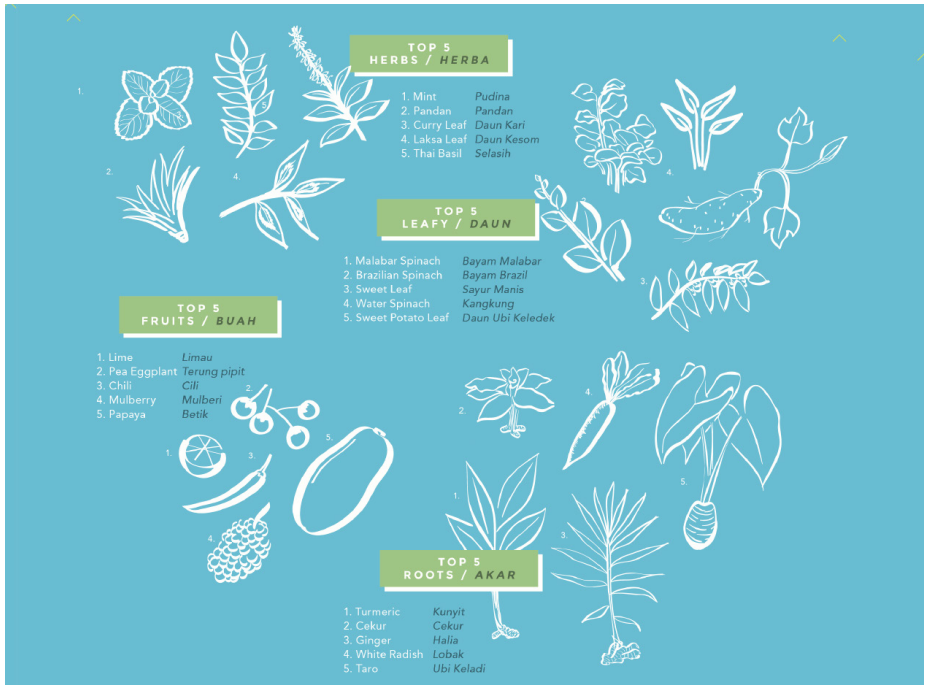
From Plot to Table

Urban agriculture may not solve larger scale problems regarding food supply and accessibility, but it can reduce household expenses for food. It can also ensure healthier produce for the family due to the controlled conditions of the plants.[22]

Therefore, the character of crops grown must not only be suited to the needs of the people, but also ensure a diversity of nutrient supply.

1. Type of suitable crops

Crops suitable for planting in Kuala Lumpur, typical of lowlands in Malaysia, are common household staples including herbs, leaf plants, fruits and root plants.



Typical household plants commonly used in Malaysian kitchens. Source: Sayur In The City, n.d.

Hydroponics in public housing, Malaysia. Source: Urban food growing in MARDI Kuala Lumpur Malaysia, 2014

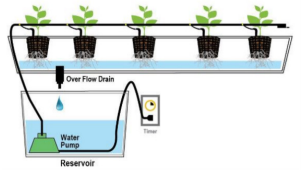
Land-Efficient Practices

Contemporary urban agriculture set-ups are designed to fit the typical Malaysian urban home, which are largely (70%) apartment or condominiums.

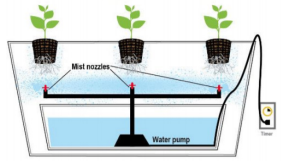
In lower income housings, these apartments often have limited space for gardening, lack of sunlight, and burdened by regulations. [26]

These existing conditions have driven many urban agriculture design innovations based on contemporary planting methods.

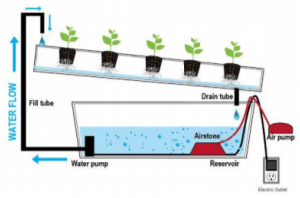
2. Popular contemporary planting methods [25, 26]



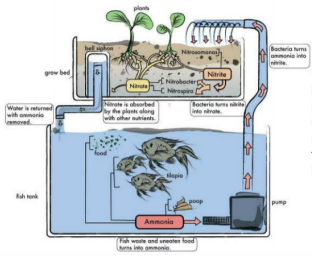
Drip system hydroponics
Basic set-up. Consists of a reservoir tank containing water and nutrients, and a separate tank for plants. Water is generated to each individual plant through a system of pipes. Recommended for fruit and vegetables.



Aeroponics
Most technologically advanced hydroponic system. Plants are suspended in the air, being sprayed at the roots by pumps in the reservoir tank. Recommended for leafy plants.



Nutrient Film Technique
The plant growth tank is set at an angle of decline, enabling nutrients to trickle back into the reservoir tank. Recommended for short harvest crops, such as lettuce, chinese kale, bell peppers, tomato.



Aquaponics
Based on a symbiotic system between fish and plants. Ammonia from fish waste is processed as nutrients for plants, creating a natural filtration system for the water before flowing back to the fish tank.

[26] Rahman & Talib, n.d.

AGRICULTURE IN MALAYSIA

Contemporary Urban Agriculture

Case Study- K²B (Kebun-Kebun Bangsar)

Perhaps Kuala Lumpur's biggest urban agriculture movement, encompassing an area of 35,000 m2 within the TNB transmission line area in Bangsar.

Lead by Malaysian landscape architect Ng Seksan, starting in 2015, through the Local Agenda 21 (LA21) program.

Kebun-Kebun Bangsar (K2B) provides land for civic agriculture volunteers, whose harvest are to be donated to soup kitchen and humanitarian organizations. On weekends, the garden holds 'gotong-royong' sessions for the public to work on the garden.

Kebun-Kebun Bangsar logo. Source: Journalism Shah Alam, 2020.

Humanitarian Model

Principles

To Tread lightly on the land

Respecting the neighbors & civic consciousness

To Inspire children

To promote inclusion

To give back

To be Self-reliant

To be a joint community effort

To Encourage Participation

Immediacy

Small actions, big changes

Activities

KKB is very active and has activities that extends to more than just planting activities.

Besides food trainings and workshops, KKB also has a petting zoo with animals that also contribute to the farm and the harvest. KKB also applies participatory planning in their extended development.[27]

Activities held by KKB, from top left, bamboo appreciation and model making workshop; small animal petting; fundraising concert; monthly gotong royong; satay picnic. Source: Kebun Kebun Bangsar, n.d.

Monthly gotong royong in KKB. Source: Journalism Shah Alam, 2020.

Expansion- KKK (Kebun-kebun Kerinchi)

The KKB association has extended their efforts to a new plot by the Klang River, called Kebun-Kebun Kerinchi (KKK). The area is in proximity to housing for lower-income communities, and is targeted as productive land for these communities.[28]

Learnings from K²B Movement

KKB and KKK is encouraging proof of Kuala Lumpur's uprising urban agriculture movement.

KKB proves to be a strong learning model to promote and transmit civic agriculture ideas.
However, KKB still performs as a humanitarian act, rather than a food sovereignty model for communities in need.

Therefore, further planning with food justice considerations, as well as added design to better integrate with surrounding neighborhoods, could improve urban agriculture settings in metropolitan Kuala Lumpur.

[27] Kebun-Kebun Bangsar, n.d.
[28] Khoo, n.d.

INFRASTRUCTURAL VOIDS

Form & utilization

Large-scale infrastructural networks are part of the sprawling urban fabric of Kuala Lumpur, necessary to support the high energy needs of the city.

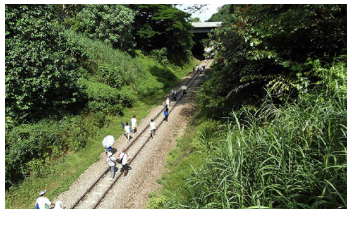
However, these networks have also created gaps within the urban terrain, dividing parcels with inaccessible, terrain vague areas within strategic parts of the city.

Rather than being left untreated, these void spaces can be designed to better support the ecology and the aesthetic of the city.

Types of Infrastructural Voids

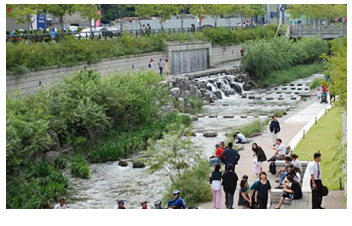
Infrastructural voids are present in many forms, related to different types of functions. Often they are linear, occupy large areas of space, and left untreated.

Many recent interventions have attempted to work with these different forms, proving that transformation of such voids can create new social and ecological benefits.



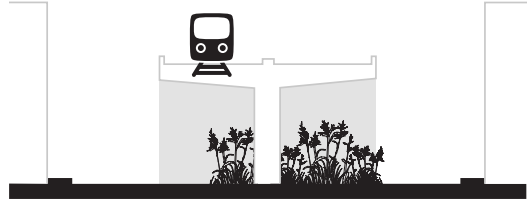
On ground railway voids

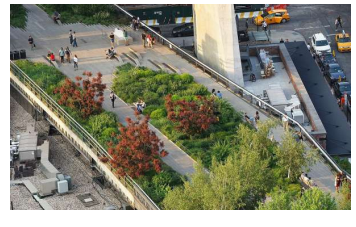
The Rail Corridor
Singapore



Open drain

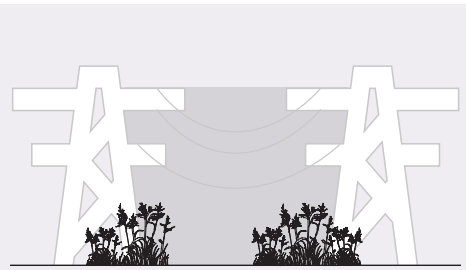
Cheonggyecheon River
South Korea





Elevated structural voids

The Highline
New York



Spaces under electric transmission line

Fairford Leys, Aylesbury
United Kingdom

INFRASTRUCTURAL VOIDS

Residual space under transmission line

Historically, where development took place close to these high voltage overhead lines, little attention was paid to the design and layout of development and its relationship to the electricity equipment.

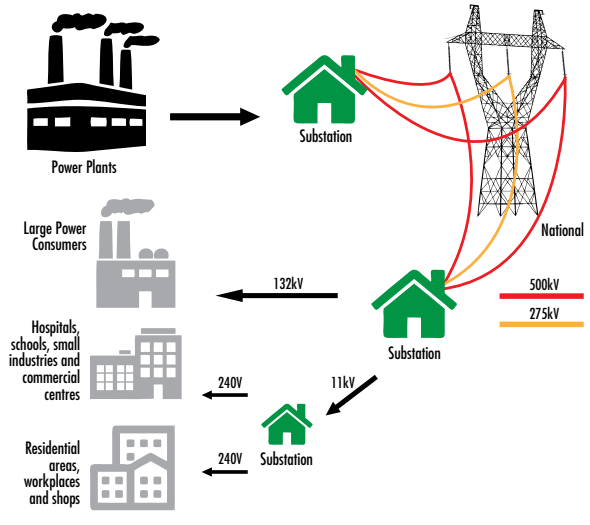
Whilst the pylons and overhead lines are often the most distinct and memorable part of the transmission route, the quality of the land through which it passes contributes to its distinctiveness,visual impact and overall perception.[29]

Cutting across the neighborhood of Bangsar is the 132kv Sri Hartamas - TNB Headquarters power transmission system. Beneath it is a 12.3 hectares of untapped urban oasis.

Tenaga Nasional Berhad (TNB) is the only electric utility company in Peninsular Malaysia

500 kV transmission system is the single largest surface transmission system to be ever developed in Malaysia followed by 275 kV, 132 kV & 33 kV

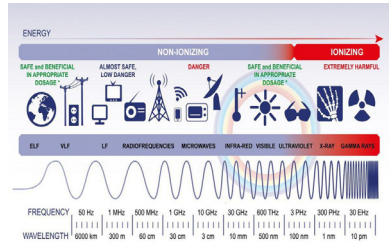
The network of high voltage power lines (500kV, 275kV, 132kV, and 11kV) in the National Grid transports power from power plants to load centres (substations) or directly to large power consumers.
Source: Tenaga National Berhad



Debunking the Myth

Constraints

Besides restrictions on certain activities such as kite flying and standard clearance requirement near transmission tower, a commonly raised public concern is the health implication caused by Extremely-low frequency (ELF) electric and magnetic fields (EMF) of high voltage transmission line.



Electromagnetic fields (EMF) around transmission lines

In 2010, the International Commission on Non-Ionizing Radiation Protection concluded that the evidence that living near power lines increases the risk of the deadly blood cancer "is too weak to form the basis for exposure guidelines." [30]

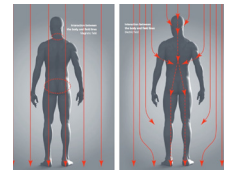
The current recommended reference level for public exposure to magnetic fields (at 50 Hz) is 100 µT. [31]

Measurable effects of EMF on humans

EMFs definitely have some effects on us as humans – but at high field levels, bigger than we usually meet in the environment. These established effects include:

- Induced currents in the body
- Microshocks
- They also have effects on equipment such as VDUs, pacemakers and on some other implanted medical devices

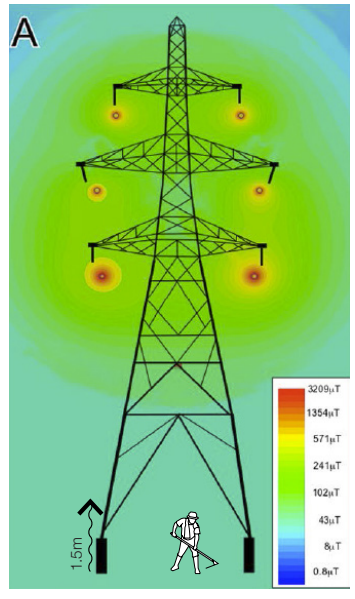
- These effects are well understood and there are exposure guidelines in place to protect against these effects
- Other suggested health effects of EMFs such as cancer are not regarded as "established" effects



Typical EMF: 5–10 µT
Max. EMF: 100 µT
Rec.Ref.lvl: 100 µT

50 Hz EMF distribution around a 400 kV Large L6 pylon. The field at 1 cm to be 3 mT, at 10 cm to be 2.7 mT and at 1 m below the lowest conductor to be 1.2.mT.[3]

1 Millitesla mT] = 1 000 Microtesla [µT]



Typical Ground-level UK Field Levels from Overhead Power Lines — EMF *(microteslas µT)*

The largest steel pylons (275 & 400 kV)	Maximum field *(under line)* Typical field *(under line)* Typical field *(50 m to side)*	100 5 - 10 0.4 - 0.6
Smaller steel pylons & largest wooden pole *(132 kV)*	Maximum field *(under line)* Typical field *(under line)* Typical field *(50 m to side)*	40 5 - 2 0.03 - 0.2

Typical Magnetic Field Levels from Some Common Mains Appliances in the Home

TV, Washing Machine, Microwave	**close to appliances 1m away**	50 0.2

Source: Energy Association Network, 2017

According to the table, the typical magnetic field 1.5 m above ground under a Pylon is 5–10 µT, and the maximum is 100 µT, which is within the reference level stated above.

[29] National Grid, David Lock Associates, n.d.
[30] Tennenhouse , 2018
[31] Council of the European Union, 1999

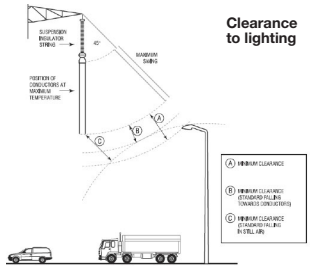
INFRASTRUCTURAL VOIDS

Design Guidelines

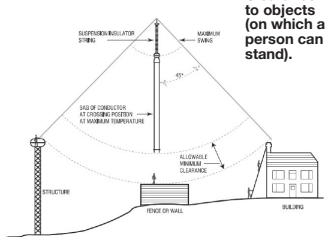
Safety Measures

Contact by people or objects with high voltage equipment must be avoided. For overhead power lines a statutory minimum clearance must be maintained between conductors and the ground.[32]

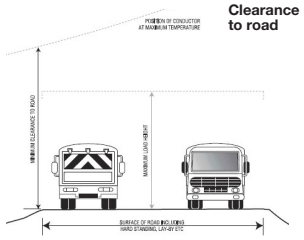
However, for overhead power lines a statutory safety clearance must be maintained under or adjacent to overhead power lines to avoid contact between people and high voltage equipment.



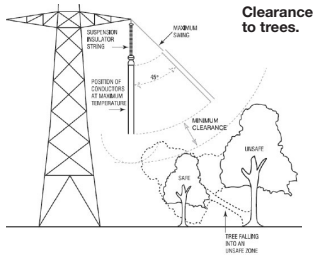
Clearance to lighting



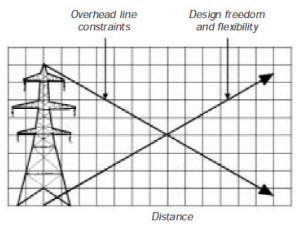
Clearance to objects (on which a person can stand).



Clearance to road



Clearance to trees.

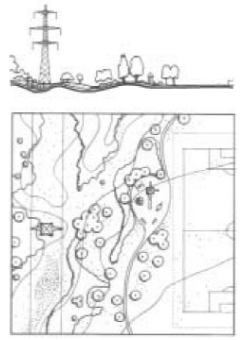


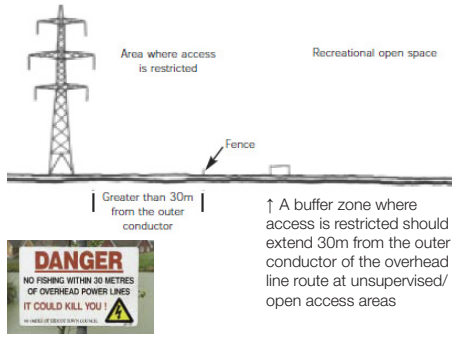
Design opportunity and freedom diminishes closer to the transmission route. Source: National Grid, David Lock Associates (n.d.).

Item	Description of Clearance	Minimum Clearance (metres) at 400,000 volts	Minimum Clearance (metres) at 275,000 volts
1	To ground	7.6	7.0
2	To normal road surface	8.1	7.4
3	To road surface designated "6.1 metres high load" routes	9.2	8.5
4	To motorway or other road surface where "Skycradle" can be used	10.5	9.8
5	To motorway or road surface where scaffolding is to be used on:		
	(i) Normal 3 lane motorways	16.3	15.6
	(ii) Elevated 2 lane motorways	13.3	12.6
6	To any object on which a person may stand including ladders, access platform, etc	5.3	4.6
7	To any object to which access is not required AND on which a person cannot stand or lean a ladder	3.1	2.4
8	To trees under or adjacent to line and:		
	(i) Unable to support ladder/climber	3.1	2.4
	(ii) Capable of supporting ladder/climber	5.3	4.6
	(iii) Trees falling towards line with line conductors hanging vertically only	3.1	2.4
9	To trees in orchards and hop gardens	5.3	4.6
10	To irrigators, slurry guns and high pressure hoses	30.0	30.0
11	To street lighting standards with:		
	(i) Standard in normal upright position	4.0	3.3
	(ii) Standard falling towards line with line conductors hanging vertically only	4.0	3.3
	(iii) Standard falling towards line	1.9	1.4

Overhead line conductor clearances Source: National Grid, David Lock Associates (n.d.).

[32] Energy Association Network, 2017



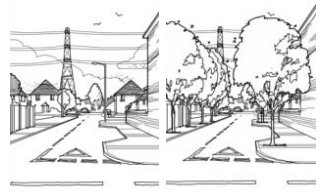


↑ A buffer zone where access is restricted should extend 30m from the outer conductor of the overhead line route at unsupervised/ open access areas

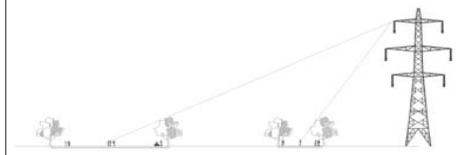
The effective use of pictorial signage and creation of buffer zones with vegetations, ground modeling, shallow water can be implemented to inhibit the certain activities and also to restrict passerby through the vicinity of overhead power line. Source: National Grid, David Lock Associates (n.d.).

Clearance- Recreational Activity

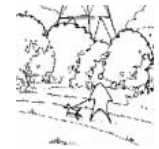
With appropriate safeguard measures It is possible to utilize the land reserve below overhead transmission line for recreational purposes except for kite flying and fishing. [29]



Street planting can also be 'retro-fitted' to existing environments to soften the visual impact of pylons and overhead power lines. Source: National Grid, David Lock Associates



Narrow avenues of trees create intimate and enclosed paths where the pylon's impact is reduced relatively close to the transmission route.



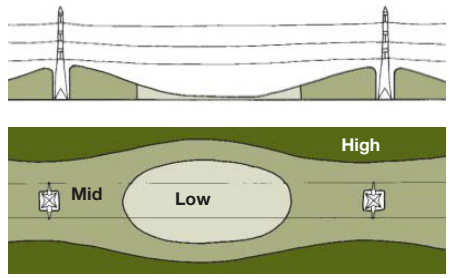
Planting at the base of pylons can reduce the impact at the pedestrian level.

Carefully placed groups of trees can reduce the impact from a distance.

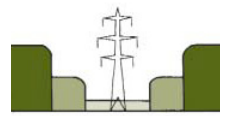
Screening by Landscape Design

Planting, along with development intensity, can play an effective role in screening views of pylons and overhead power lines. Such screening can partially or completely obscure views of pylons and overhead power lines from within developments, and can be highly effective at differing distances from pylons. [29]

Typical vegetation form along transmission route



However, there are constraints on the size of planting in close proximity to the pylons and lines for public safety and to prevent electrical flashover of transmission line resulting in power failure.



03

DESIGN QUESTION, AIMS & OBJECTIVES

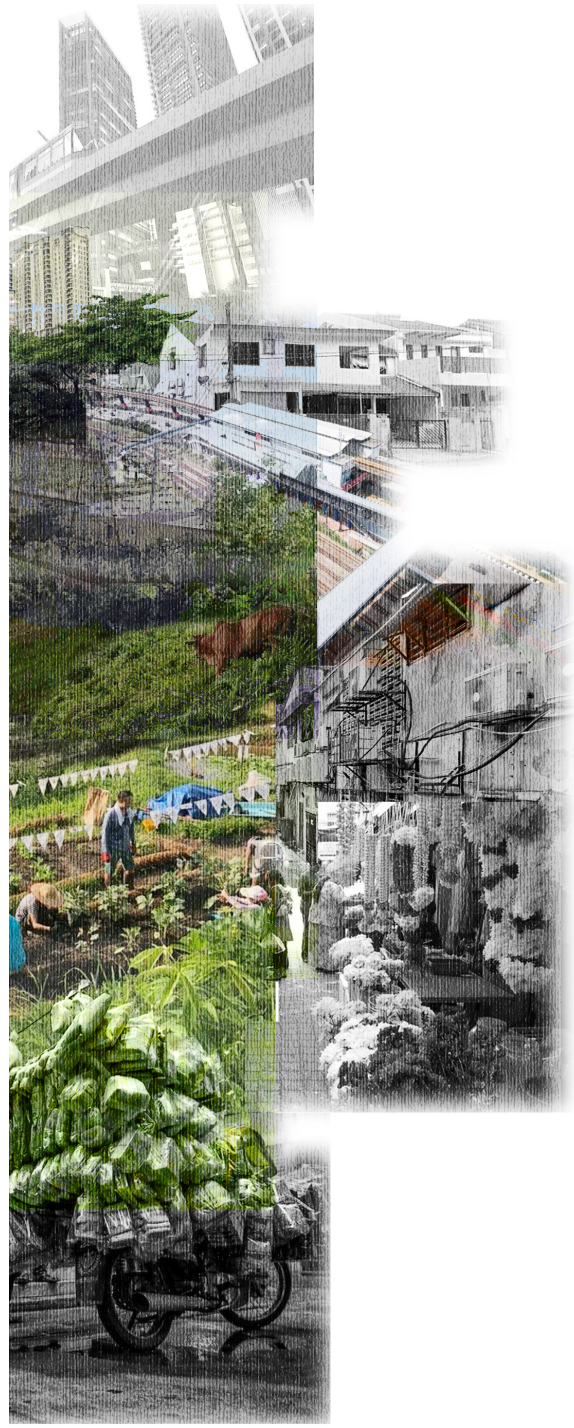
Design Question

What are the ways in which urban food security can be strengthened through residual space regeneration to close the development gaps of Kuala Lumpur?

Design Aim

to close the gap...

between large-scale urbanization and fringe areas



...while securing a food safety net

for the local community in Bangsar and nearby neighbourhood areas

Design Objectives

To build land resiliency:
transform residual area into ecologically sound and productive landscapes

To build socio-economic resiliency:
enable access and involvement of various stakeholders in surrounding neigbourhoods

To strengthen food supply:
enable ecological agricultural practices along terrain and existing infrastructure

04

METHODOLOGY

Urban agriculture is a strategy that not only creates new types of open landscapes, but also potentially holds a range of ecological, social, and recreational benefits.

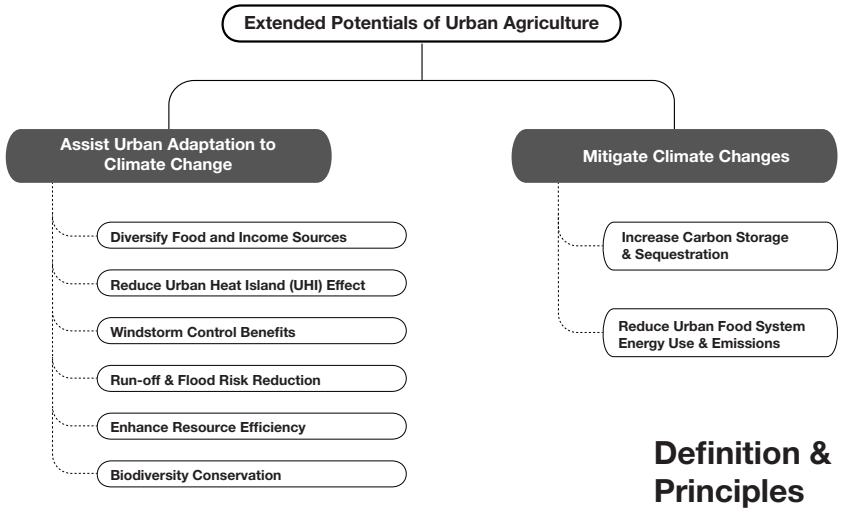
Extended urban agricultural practices within the city can create a new network of productive spaces. Meanwhile, at the site scale, micro design treatments can induce new experiences within the city.

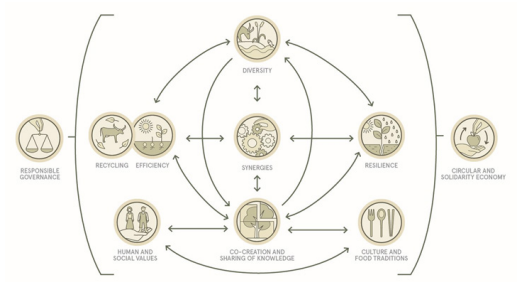
Urban agriculture has also been proven to help communities become more just, equal, healthy, and connected.

CLIMATE ADAPTABILITY

Not just a farm in the city

Recent trends in climate changes and its impacts call for smarter methods and practices in everyday life. Urban agriculture, as a historically common strategy for many urban residents, can be practiced with added considerations to tackling climate change issues and impending effects.[33]





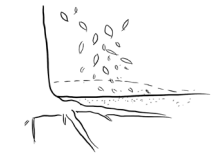
Interaction between the 10 elements of Agroecology. Source: FAO (n.d.).

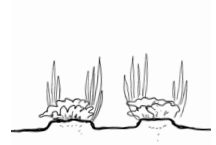
Definition & Principles

Agroecology is deemed as an alternative to current environmentally-depleting conventional agricultural practices. It combines the science of environmental ecology to better support a whole food system (including the practice of agriculture and all other related systems) within a certain location and community.[33]

Agroecological farming practices

Since agroecology is a highly localized concept, the framework has been translated into various types of practices. Often, these are based from extensive local farmer knowledge and best practices. However, there are several commonalities between them:



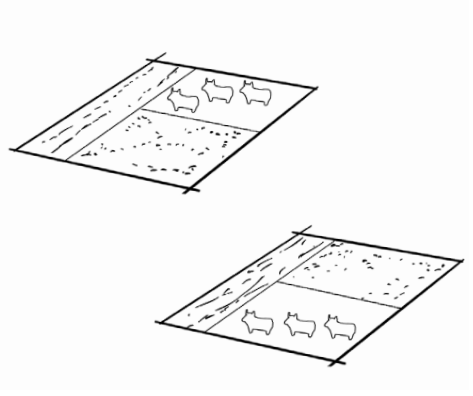


- **Recycling nutrients from organic matter to enhance the biotic activity and fertility of soil**
- **Minimizing losses of water, energy, and soil nutrients**
- **Promoting beneficial biological synergies and interactions to enhance ecological services**
- **Increasing genetic diversity and using mutually beneficial planting and antagonists to create inter-cropped polycultures that better resist plagues and sustain soil**
- **Integrating livestock and crops into a holistic system** [35]

The framework manages interactions between plants, animals, humans, and the environment to build long-term sustainability.

As defined by Food and Agriculture Organization (FAO), Agroecology is built through 10 basic elements:

1. Diversity
2. Co-creation and sharing of knowledge
3. Synergies
4. Efficiency
5. Recycling
6. Resilience
7. Human and social values
8. Culture and food tradition
9. Responsible governance
10. Circular and solidarity economy [34]



[33] Wezel et al., 2020
[34] Food and Agriculture Organization of the United Nations (FAO), n.d.
[35] Hathaway, 2015

The nature of void spaces:

‘a smiling face with a lot of teeth missing’

- Phillip Lopate

‘Third landscapes, areas of refuge for biodiversity’

- Gilles Clement

The Nærum Allotment Gardens of 1948. The varied layouts of the individual gardens inside the oval hedges, as well as the spaces between the ovals, are apparent when seen from above. Source: Schurmann, 2020.

Urban Agriculture: Primal activity inserted in dynamic modernity

“Tending an urban orchard should be about more than subsistence farming. Yes, you can grow food in the city, but farming within the public realm begs for art.”

- Richard Ingersoll

[36] Ingersoll, Eat the City, 2013

DESIGN THE GAPS

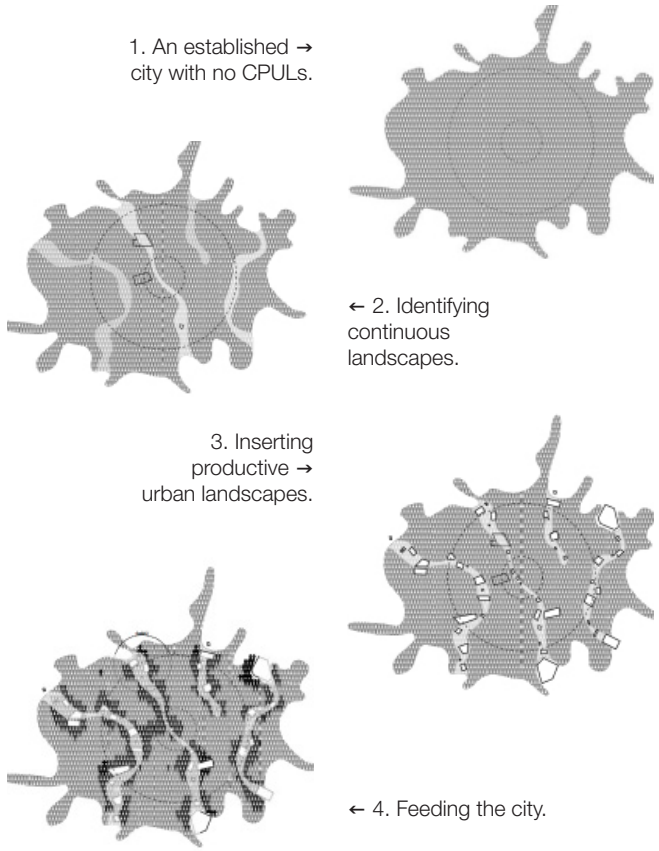
Farming the gaps with assistance of design

Recent trends in climate changes and its impacts call for smarter methods and practices in everyday life. Urban agriculture, as a historically common strategy in sustaining the life of residents in the city, continue to gain importance from time to time.[36]

MACRO STRATEGIES

Continuous Productive Urban Landscapes (CPULs)

Continuous Productive Urban Landscapes (CPULs) are open landscapes productive in economical, social, and ecological terms, interlinked together in the urban system through urban patches and corridors.[37]



The formation process of a CPUL. Source: Vijoen, Bohn, & Howe (2005).

[37] Viljoen, Bohn, & Howe, 2005

MICRO STRATEGIES

Landscape Design Considerations[37]

(a) isolated patches

(b) small fields

(c) large individual fields

1. Size & spaciousness

Working with dimensions and distances to create different senses of space.

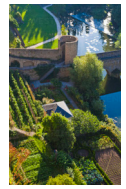
2. Sense of openness

A play between height and size of boundaries to guide the eye and body

(d) disconnected & isolated areas

(e) expansive views

(f) modest linear paths



(g) elevated passages

3. Local interactions

Adjusting access and continuity between spaces to promote different interactions.

(h) wild, natural environments

(i) controlled, architectural environments

4. Urban nature

Control between various environments to promote possibilities for nature to establish / expand.

(j) continuity

(k) branching, forking

(l) repetition

(m) variation

5. Persistent visual stimulation

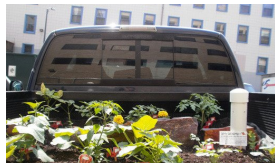
Exploring a variety of various design languages using natural elements to create a legible urban ornament.

(a) AG&P Greenscape, 2016
(b) Pop Up City, 2020
(c) American Society of Landscape Architects, 2008
(d) AKG-Images, 2017
(e) The Guardian, 2020
(f) The American Society of Landscape Architects Fund, 2019
(g) Westend 61, n.d.
(h) Aloise, 2012
(i) VTN Architects, 2013
(j) Metropole de Lyon, 2017
(k) World Landscape Architect, 2017
(l) Archdaily, 2012
(m) Clausen, 2011

CIVIC AGRICULTURE

How modern communities grow their own food

In general, civic agriculture means the act of farming within municipal boundaries, creating a resistance to industrial agriculture and inciting a new engagement of citizens with their first source of energy: food.[36]



Truck Farm Bed, DC Central Kitchen, Washington, DC. Source: Ingersoll, 2014.

As a system, civic agriculture is a form of alternative food movement based on the contention that local food systems:

1. are environmentally sustainable
2. rebuilds the independent middle class
3. creates community
4. reconnects people to place [38]

Logo of alternative food movement. Source: STROLOVITCH, 2017.

Town with alternative food movement. Source: Raguit, 2018.

Alternative Food Movements

Growing & networked group of farmers, environmentalists, consumers, who oppose industrial agriculture on the basis of environmental sustainability.

The movement takes on many names and forms, however, they are bound over the common theme of ecological, economical, political and physiological critiques of the corporate food regime.

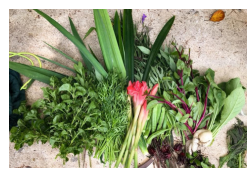
[38] Myers, 2012.

Food Justice as an Added Dimension [1]

Part of the alternative food movement that emerged from civil rights and various social justice consciousness to address race and class-based inequities within the food system.

Combining food justice as an added dimension to other alternative food movements can help address problems of poverty of sustainability, and ensures not only food security but also food sovereignty for lower income classes.[38]

Community barter of local produce. Source: SFGate, 2011.

	from		to	
Ecological	 (a) Industrial agriculture	→	 (b) Community gardening	Local, multi - product farms with sustainable and holistic management of soil structure and organic matter
Mono-culture, industrial-standard agriculture dependent on pesticides and farm machinery				
Economical	 (c) Mass produce	→	 (d) Farmer's market.	Community-scale direct retails that minimizes the food system within local structures, generating 'civic capital'
Large chains of production expanded to trans-national networks controlled by private corporations				
Social	 (e) worker exploitation	→	 (f) sovereign urban farmers	empowered communities becoming their own producers of food, micro-farmers
Large industrial agricultural structures comprised of main farmer and many minimally-paid workers				
Physiological	 (g) processed food	→	 (h) direct fresh produce	food straight from the ground, minimally processed, low in added salts, sugars, fats, and oils
Low-quality produce turned into unhealthy processed foods				

(a) Empson, 2020
(b) Cambell-Preston, 2020
(c) Richner, 2019
(d) Wood, 2020
(e) Todini, 2018
(f) Sapari, 2018
(g) Gault, 2020
(h) Jayne, 2020

CIVIC AGRICULTURE

Case study: East New York Farms! (ENYF!)

ENYF! is the oldest food justice organization in Brooklyn, East New York

Background & Settings

ENYF! is established in Brooklyn Community District #5, an area of 5.6 sq mile with 180,000 inhabitants, predominantly (around 86%) African-American & Hispanic.

As much as 30% of them are under 18, while another 30% live below the poverty line. The area was subject to 'ghettoization', or deemed high with crime (neighbourhood homicide). [39]

ENYF! Farmers' Market
Source: UCC (2020).

ENYF Youth Interns at a community garden. Source: Community Food Funders (2018).

Food Redlining, Food Deserts, Food Swamps:

Pratt Institute Planning Studio 1996:

Retail, food and commercial area only captures 50% of residents' expenditures.

Residents often shop outside East New York for groceries because of lack of healthy produce and lack of affordability. Residents also resort to unhealthy processed foods as cheaper alternatives. [38]

White Flight and Disinvestment

1996 Pratt Institute Study: 25% loss of building stock between 1970s to 1980s

[39] Sonti et al., 2016.
[40] East New York Farms!, n.d.

Combination of programs organised by ENYF![40]

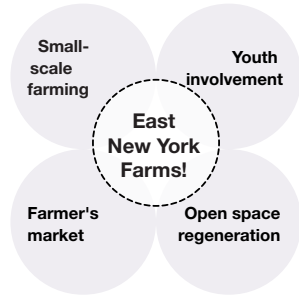
Urban Farms
Distribution of fresh food to local citizens from a series of micro farms in the neighbourhood.

Community Gardens
Intergenerational community garden with a focus on market production

ENY Farmer's Market
community-run market including local gardeners, vendors, and regional farmers

the only place in East New York to find local and organic produce and Caribbean specialty crops

July – October
Wednesdays, 1:30 PM – 6:30 PM
June – November
Saturdays, 9:00 AM – 3:00 PM



Youth Internships Program
Young members of the community managing the community gardens and harvest for the market.

Youth Food Justice Network
Platform for youth education and involvement on food justice issues and practices.

Youth CRAFT (Collaborative Regional Alliance for Farmer Training)
Provides on-farm learning experiences and leadership events.

Planting in abandoned locales
The urban and community farms occupy spaces left untouched by development, transforming them into interesting neighbourhood spaces.

Contribution to Food Justice [39]

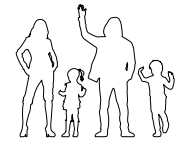
A large part of ENYF!'s success has been in its implementation of food justice towards the marginal community of East New York.

'from the community to the community'

Producers contribute a percentage of their allotment to farmers' market as a way of contributing to the food needs of the community.

Wortman Avenue Community Garden. Source: UCC (2020).

Youth Programs



Empowers youth in the community, not only through increased gardening and food skills and knowledge, but also in interpersonal skills (communication, responsibility, confidence, money management, career).[1]

Farmers' Market & Farm Stands

50%

check-based revenue
brings affordable and fresh produce through partnership with various foodstamp programs.

ENYF! Farming principles

- promotes companion planting rather than monoculture, keeps uncultivated weeds and cultural food as food source, e.g. Caribbean-based callaloo (Amaranthus spp.)

- provides economic alterity, e.g. barter through different produce or dedicated labor

- provides new public spaces with strong sense of belonging to the community

Resource Management

Compost
created internally & donated by city council

Woodchips
donated by local tree pruning companies

Land & Water
public land developed under land trust for GreenThumb organization

05

SITE STUDIES

The electrical transmission line in Bangsar occupies a highly strategic neighbourhood, containing a number of heterogenous actors, facilities, and resources.

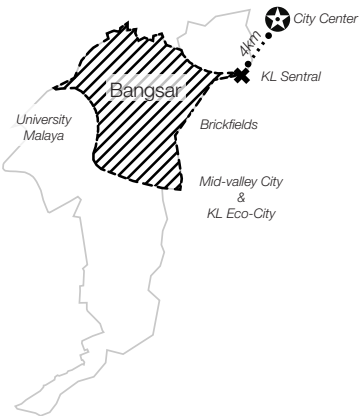
The site can also be considered part of the urban green network of central Kuala Lumpur.

Further development requires highly strategic and sensitive planning to satisfy the various elements in the context.

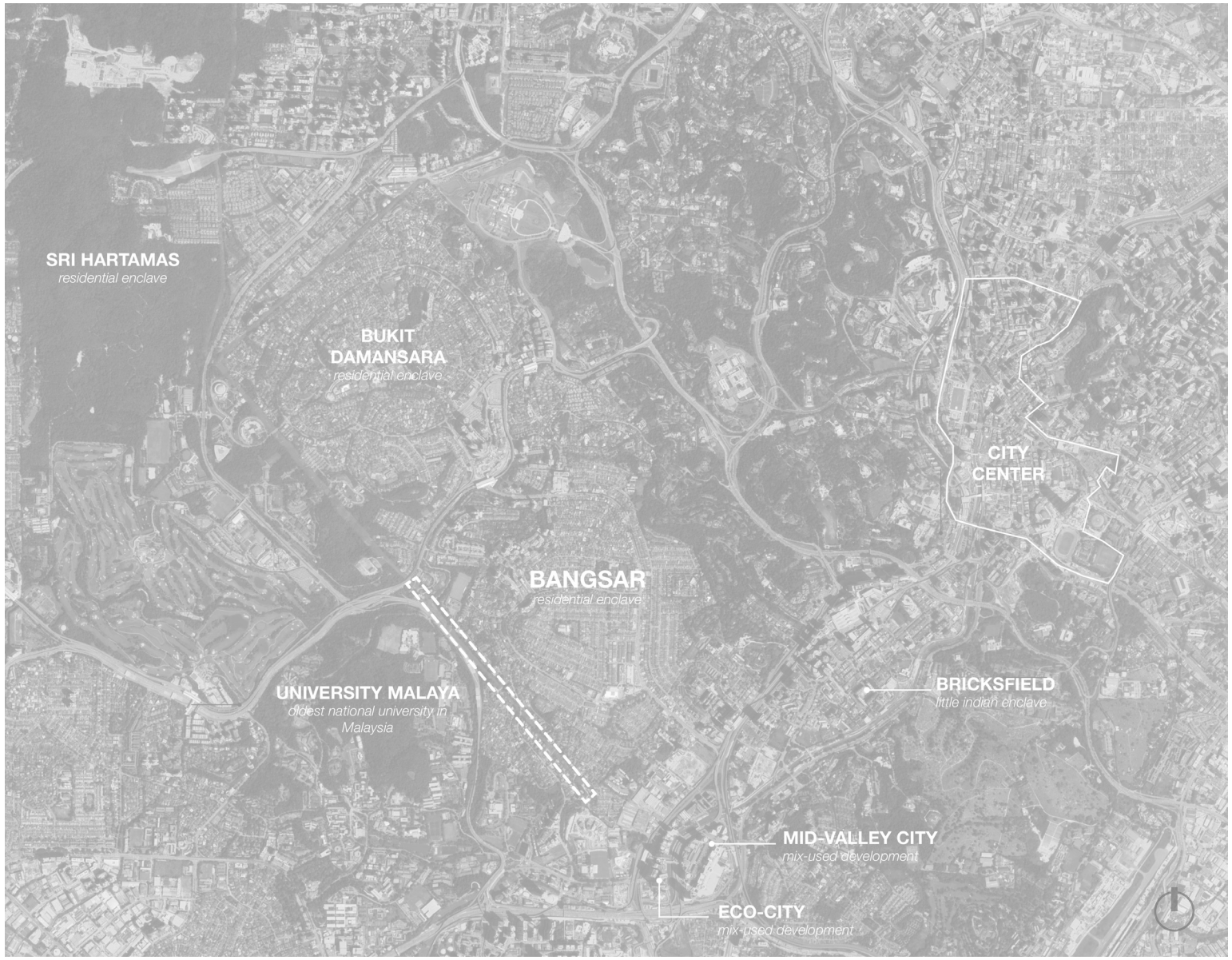
URBAN (XL) SCALE ANALYSIS- SITE LOCATION

Bangsar Neighbourhood

One of the more popular areas which come under Lembah Pantai constituency. It is an affluent urban enclave at the peri-urban of Kuala Lumpur, lying about 4 kilometres south-west of the city centre.



URBAN (XL) SCALE ANALYSIS- SITE NEIGHBOURS



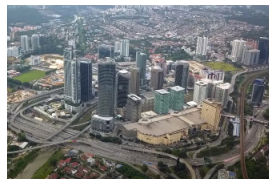
Strategic Neighbours

KL Sentral
an inter-modal transportation hub that houses the main railway station

Brickfields
known as the Little India of Kuala Lumpur due to the high percentage of Indian residents and businesses, also notable for being home to KL Sentral, Kuala Lumpur's main public transportation hub.

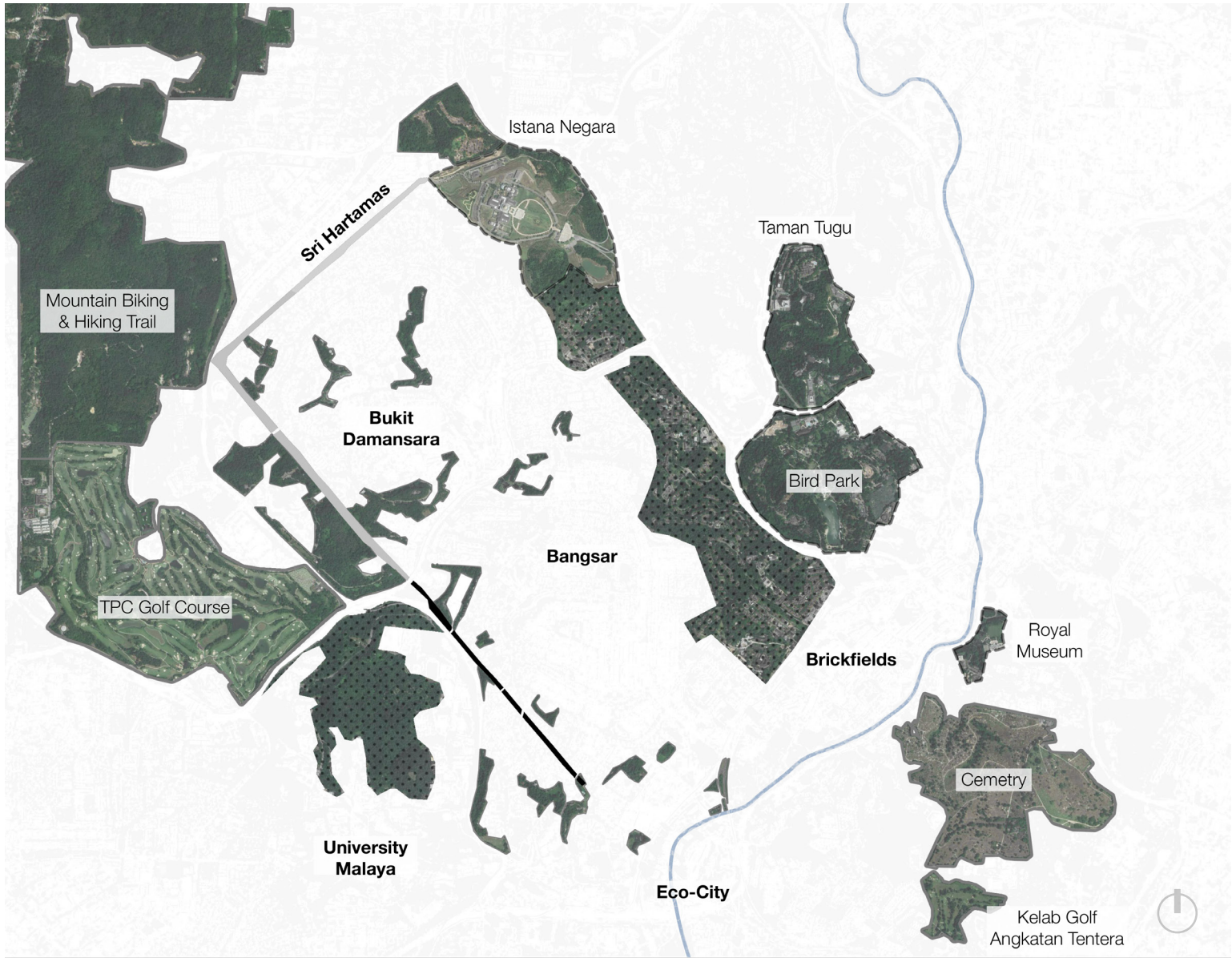
University Malaya
the oldest and highest ranking public research university in Malaysia.

Mid Valley City
a large mix development which consists of shopping malls, office tower and 3 hotel blocks



KL Eco-City
a 25-acre integrated mixed-use development, is situated along the periphery of Bangsar, next to Mid Valley City and surrounded by established commercial precincts.

URBAN (XL) SCALE ANALYSIS - GREEN INFRASTRUCTURE

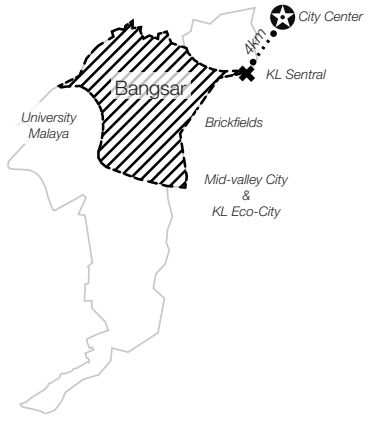


KL Green Network

Even though Kuala Lumpur is built over a sprawling urban fabric, the city still holds large patches of green areas.

The existing Bangsar TNB line is part of this network, connecting several other patches with varying functions:

- riverside
- formal parks
- national monuments
- residential patches
- activity parks



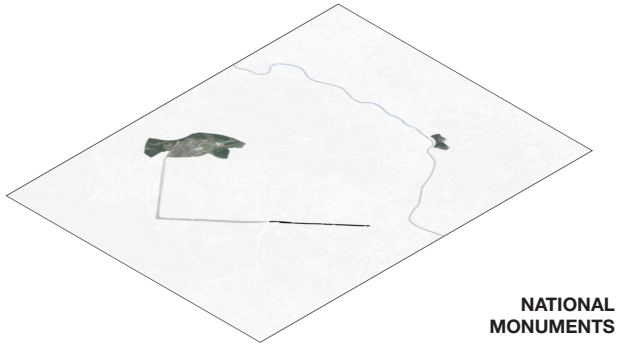
Layers of Green Patches

The layers of green patches around Bangsar are greatly varied, due to topography, function, and management, creating a distinct character for each type.

The varying characters contribute to the micro environment of the Bangsar TNB patch.

istana negara

royal museum



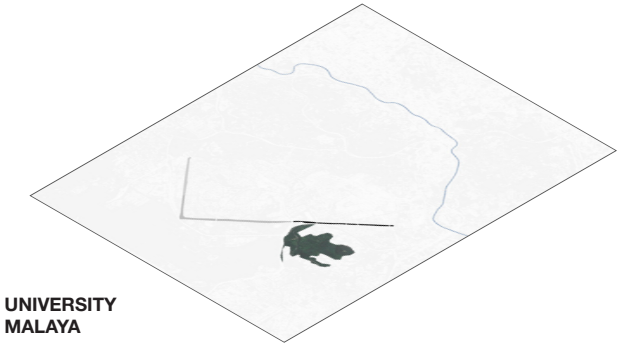
NATIONAL MONUMENTS

ACTIVITY PARKS

hokkien cemetery

bukit kiara mountain biking

tpc golf course



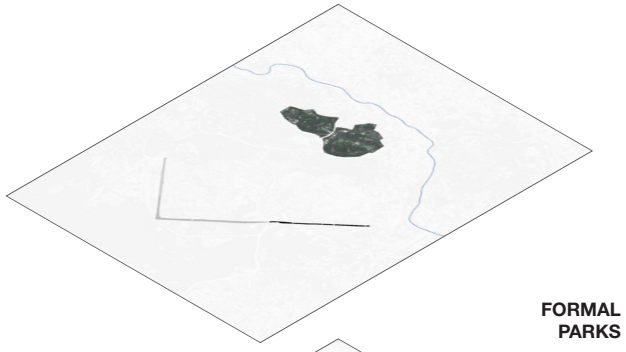
UNIVERSITY MALAYA

forested covering

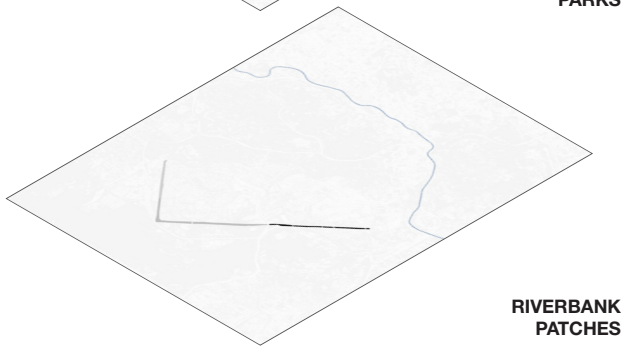
perdana botanical garden

bird park

taman tugu

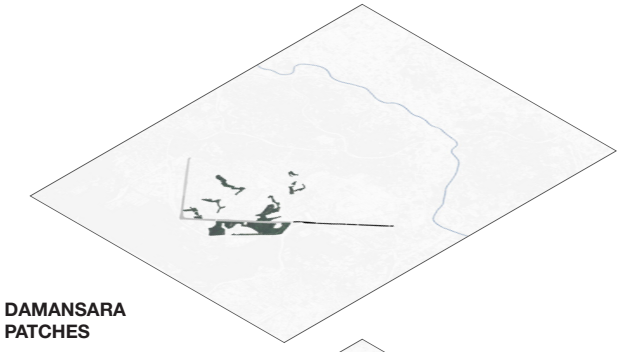


FORMAL PARKS



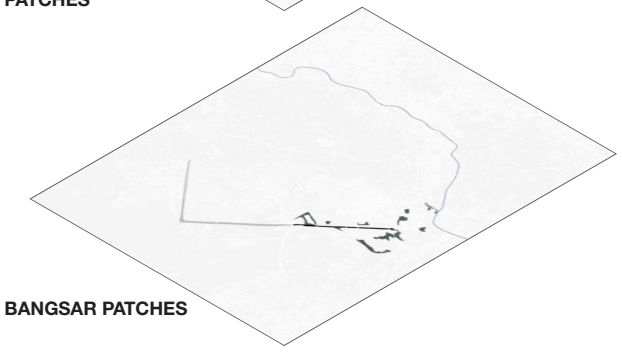
RIVERBANK PATCHES

ruderal & disconnected



DAMANSARA PATCHES

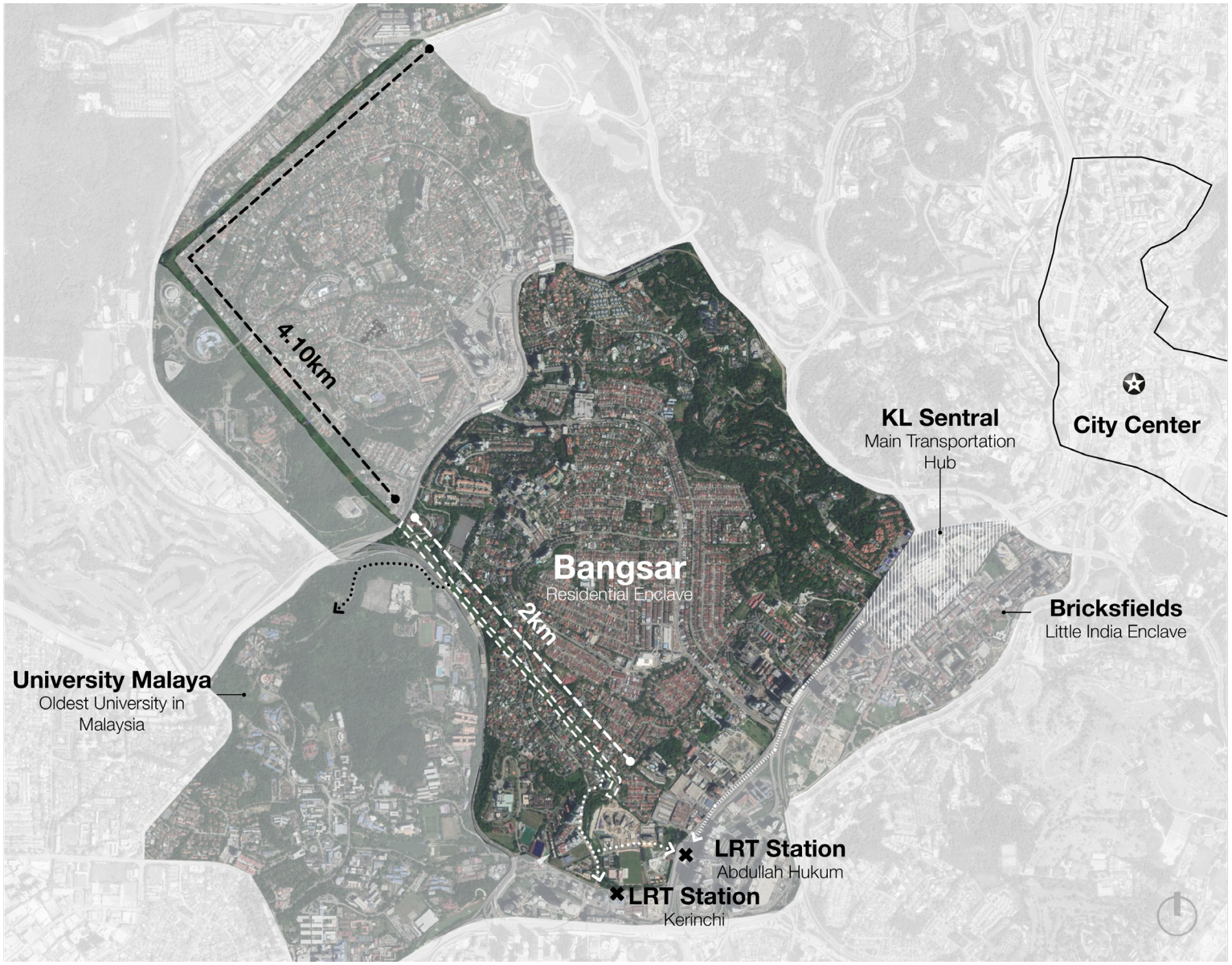
relatively flat in comparison to Bangsar neighborhood with ruderals and forested coverings



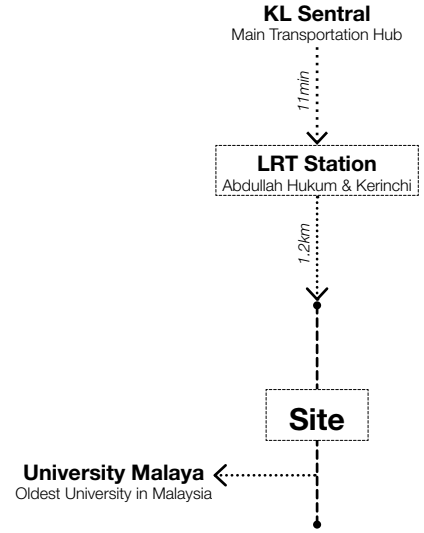
BANGSAR PATCHES

huge topographical difference between ground levels

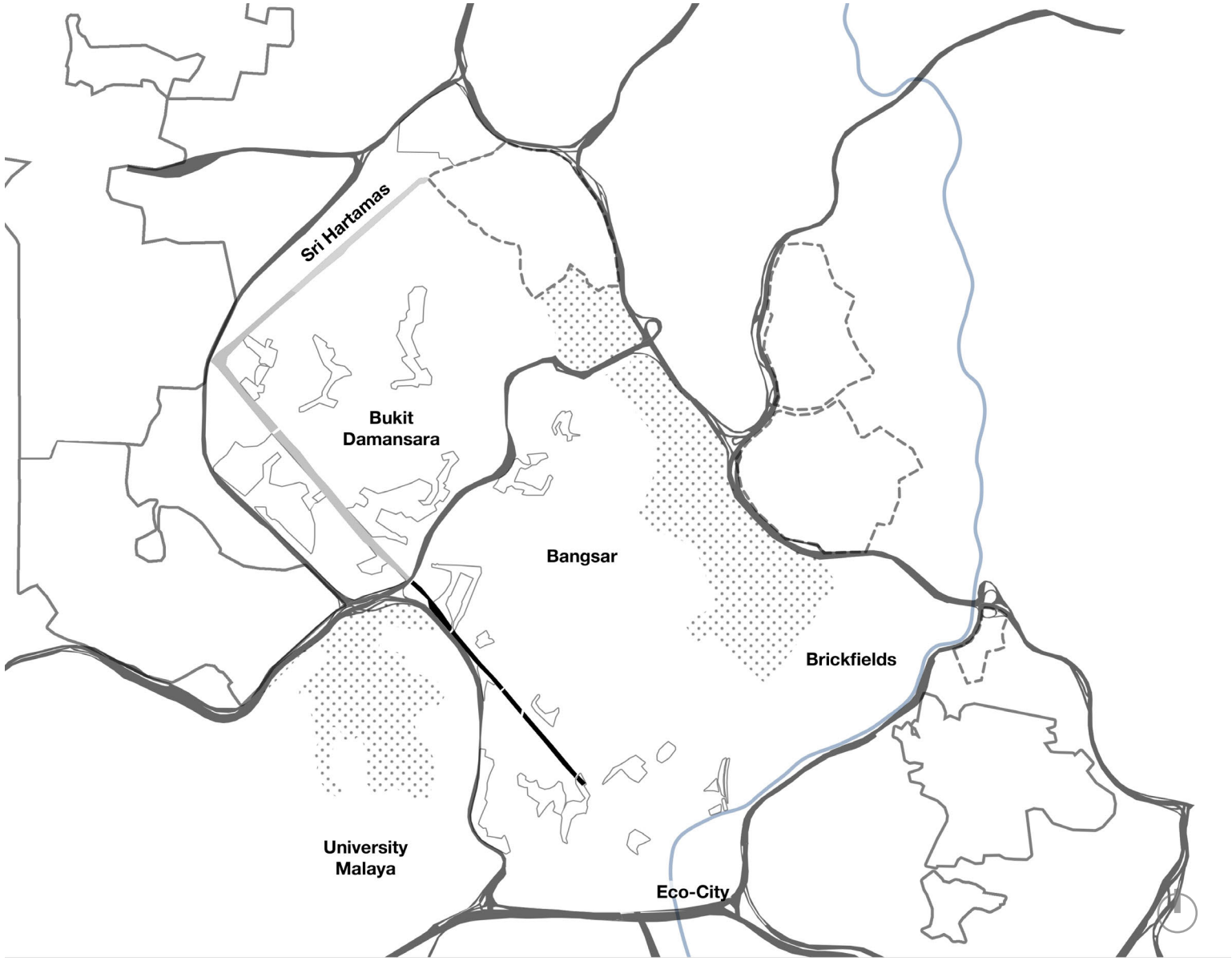
URBAN (XL) SCALE ANALYSIS - AREA ACCESSIBILITY



Public transport route



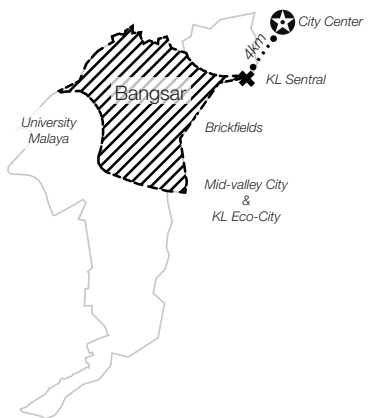
URBAN (XL) SCALE ANALYSIS - PHYSICAL BARRIERS



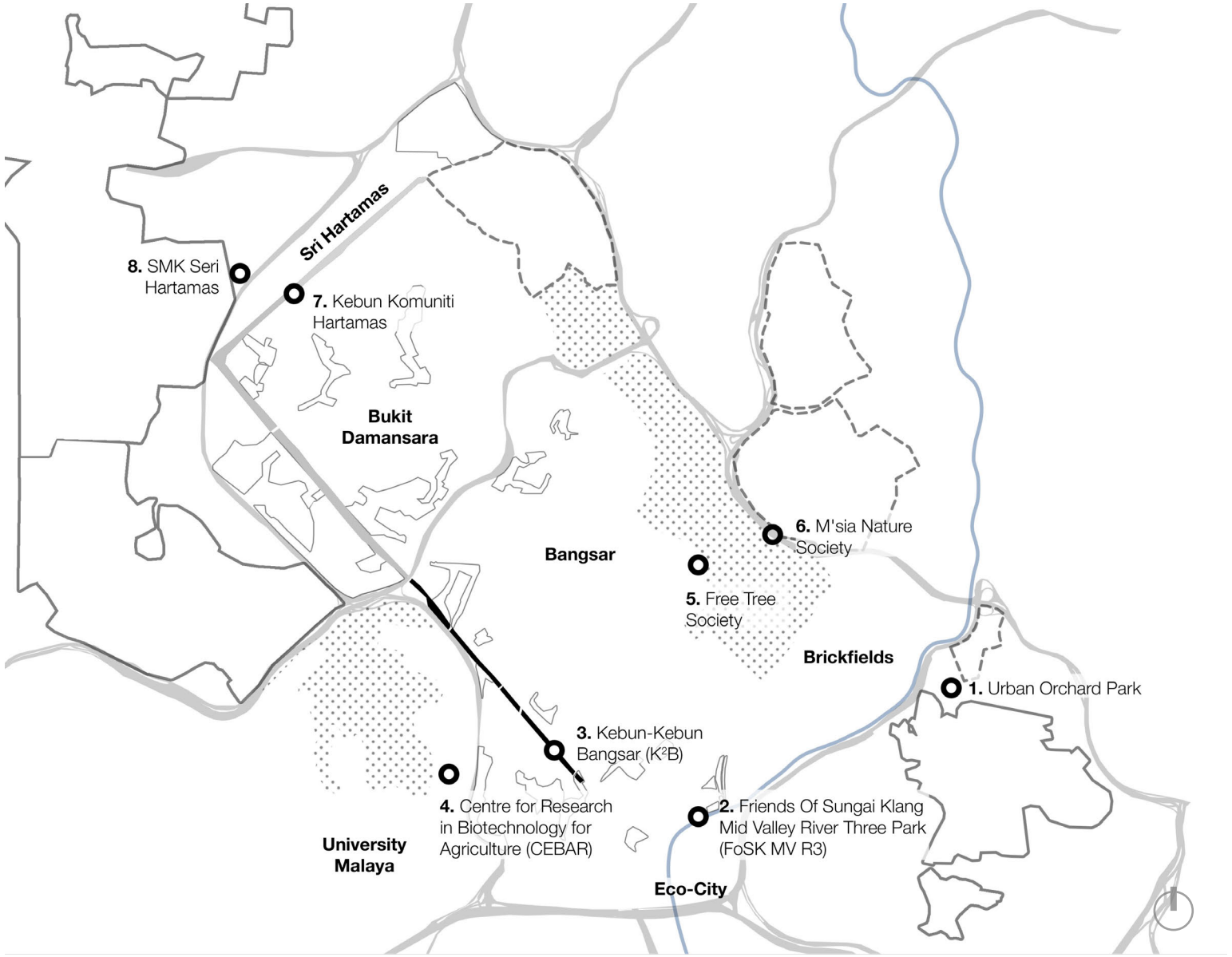
The Highway Limit

Evident of its condition as a sprawling town, the area of Kuala Lumpur is broken up through series of highways and road networks.

In particular, the TNB line in Bangsar, running through the north-west direction, is broken up by the highway that divides the neighbourhoods of Bangsar and Bukit Damansara.



URBAN (XL) SCALE ANALYSIS - NETWORK OF ENVIRONMENTAL ACTORS



Local Actors' Network

The neighbourhood of Bangsar is subject to stewardship by a number of environmental actors. Each actor concentrates on different aspects of the environment, all possibly relating to the Bangsar TNB patch.

Main actors in the neighbourhood

1

Urban Orchard Park
NGO concentrating on community programs to conserve, protect and rejuvenate the Klang river.

2

Kebun-Kebun Bangsar
Community initiative to transform the TNB reserve into a physical garden through various activities and cooperation with members of the society.

3

Free Tree Society
Environmental group promoting environmental stewardship and awareness.

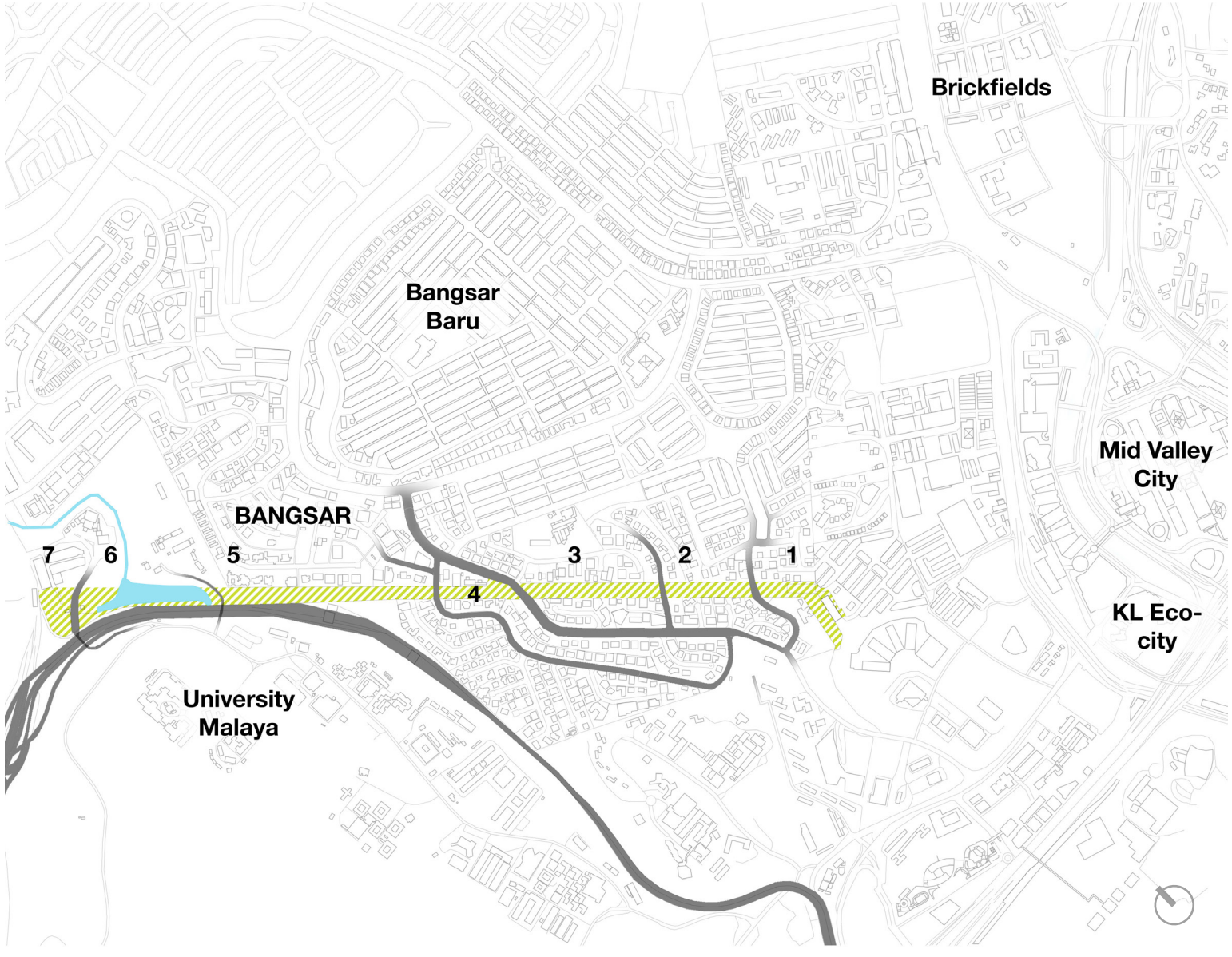
URBAN (XL) SCALE ANALYSIS - NETWORK OF LOCAL ACTORS

How local actors can work together

Even with homogeneous residents, the Bangsar neighborhood offers many potentials for development. Local creative and entrepreneur communities are thriving in the area, creating a slew of active hubs.

Together with the Bangsar residents, they can be activated to regenerate the urban poor communities living in affordable housings nearby. Meanwhile, the presence of formal institutions and private sectors can indirectly support the growth.

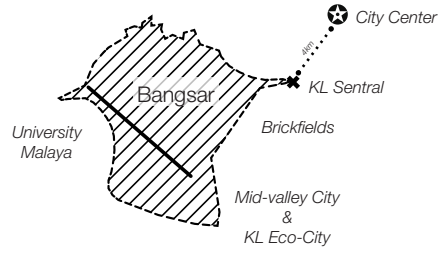
NEIGHBOURHOOD (L) SCALE ANALYSIS- SITE ACCESS



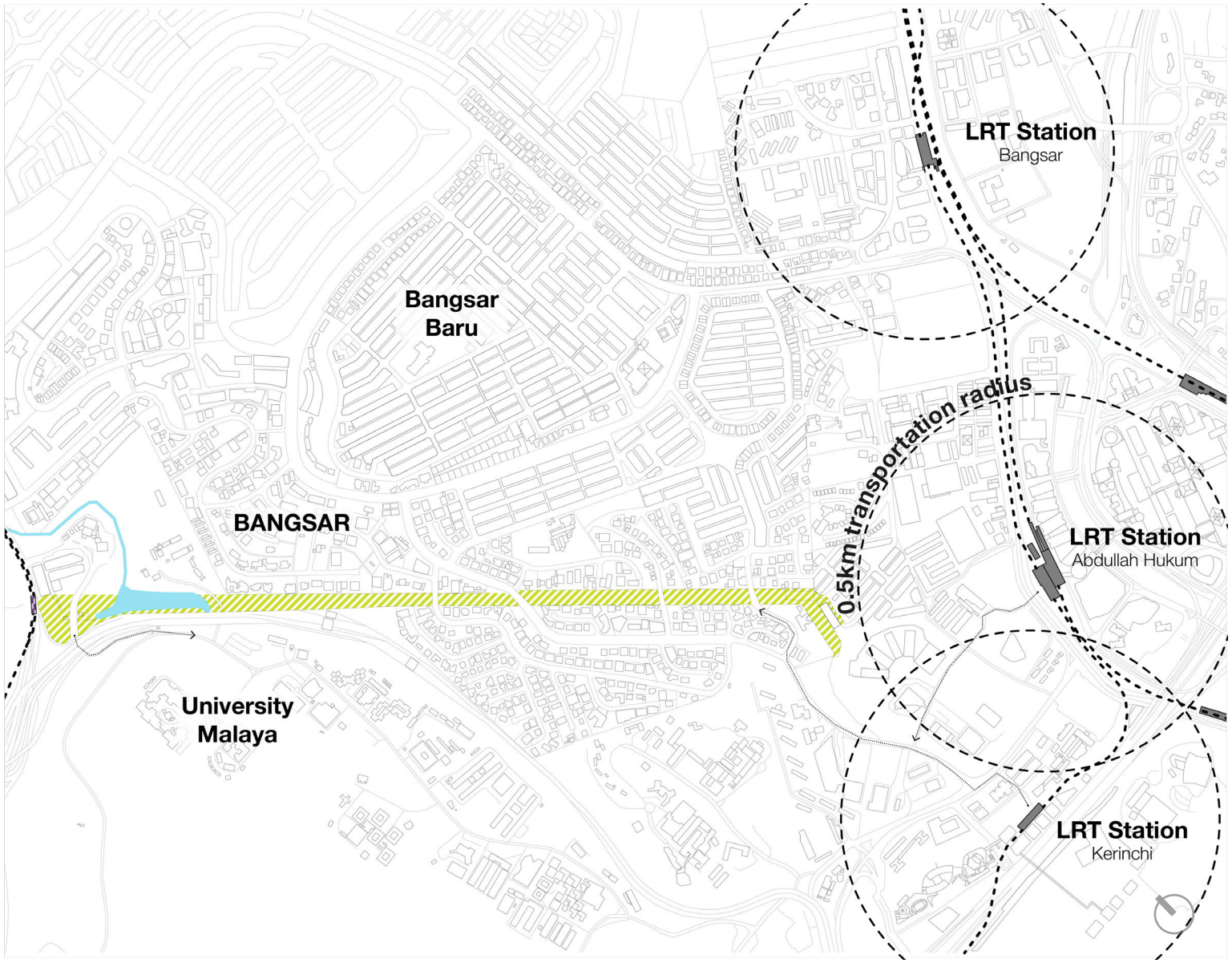
Site Accessibility

On the North-South direction, the corridor is set apart from the adjacent neighbourhood (University Malaya) by an elevated highway. One can access the university through point 6 & 7.

Whereas on the East West direction, the corridor is divided into 7 parcels by various residential roads.



NEIGHBOURHOOD (L) SCALE ANALYSIS- SITE ACCESS



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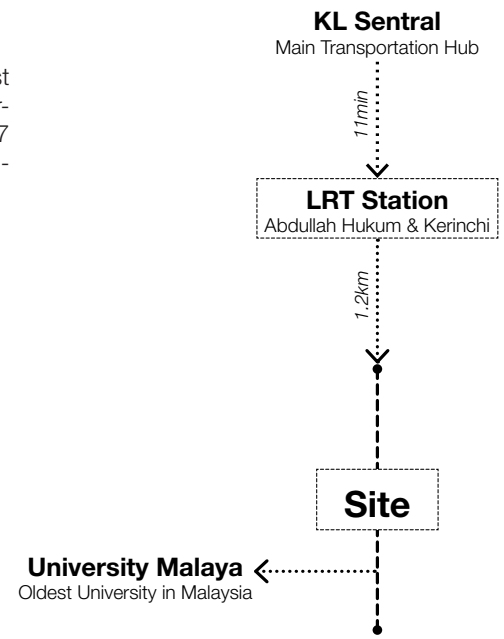
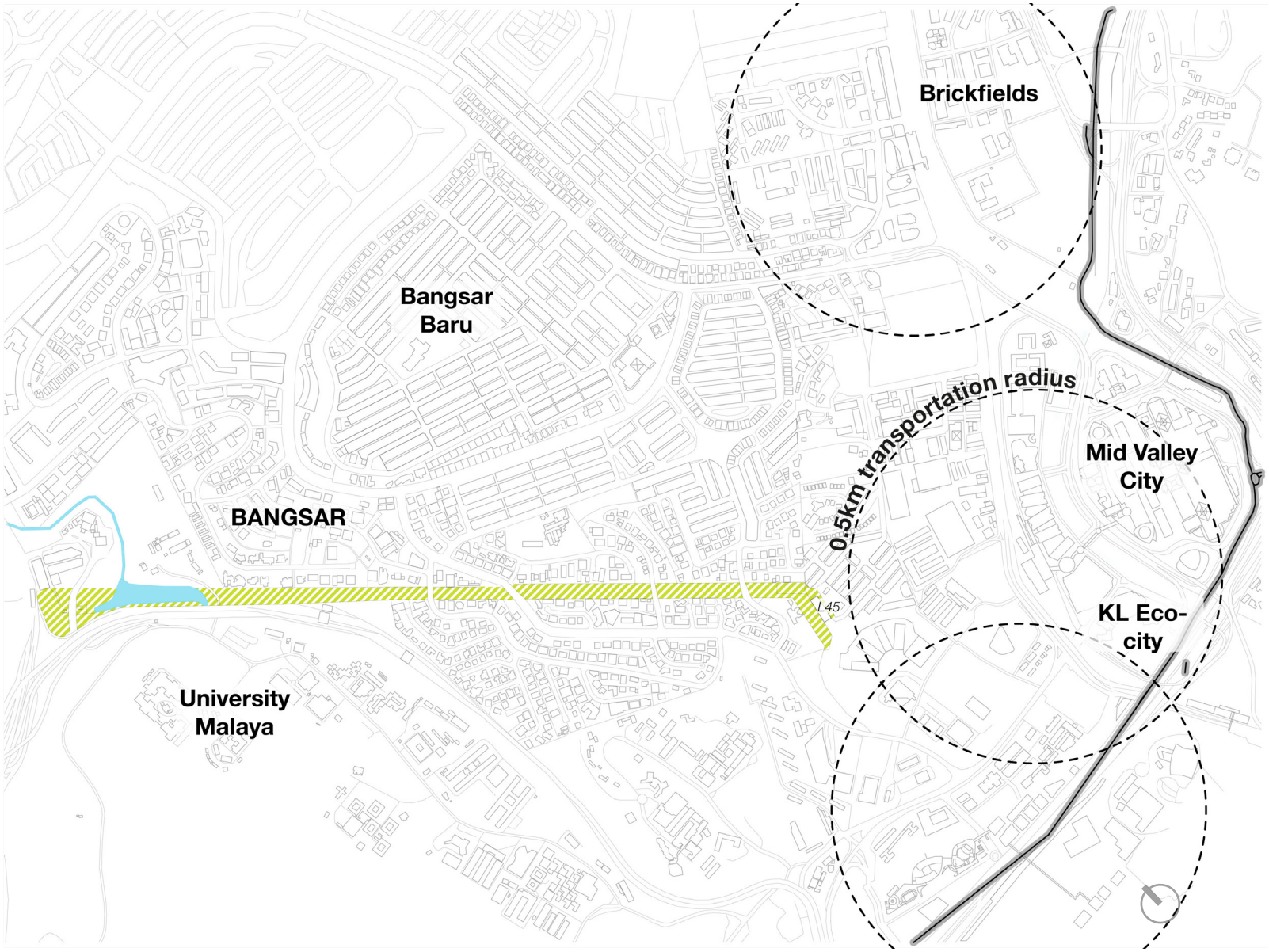


NEIGHBOURHOOD (L) SCALE ANALYSIS- SITE ACCESS

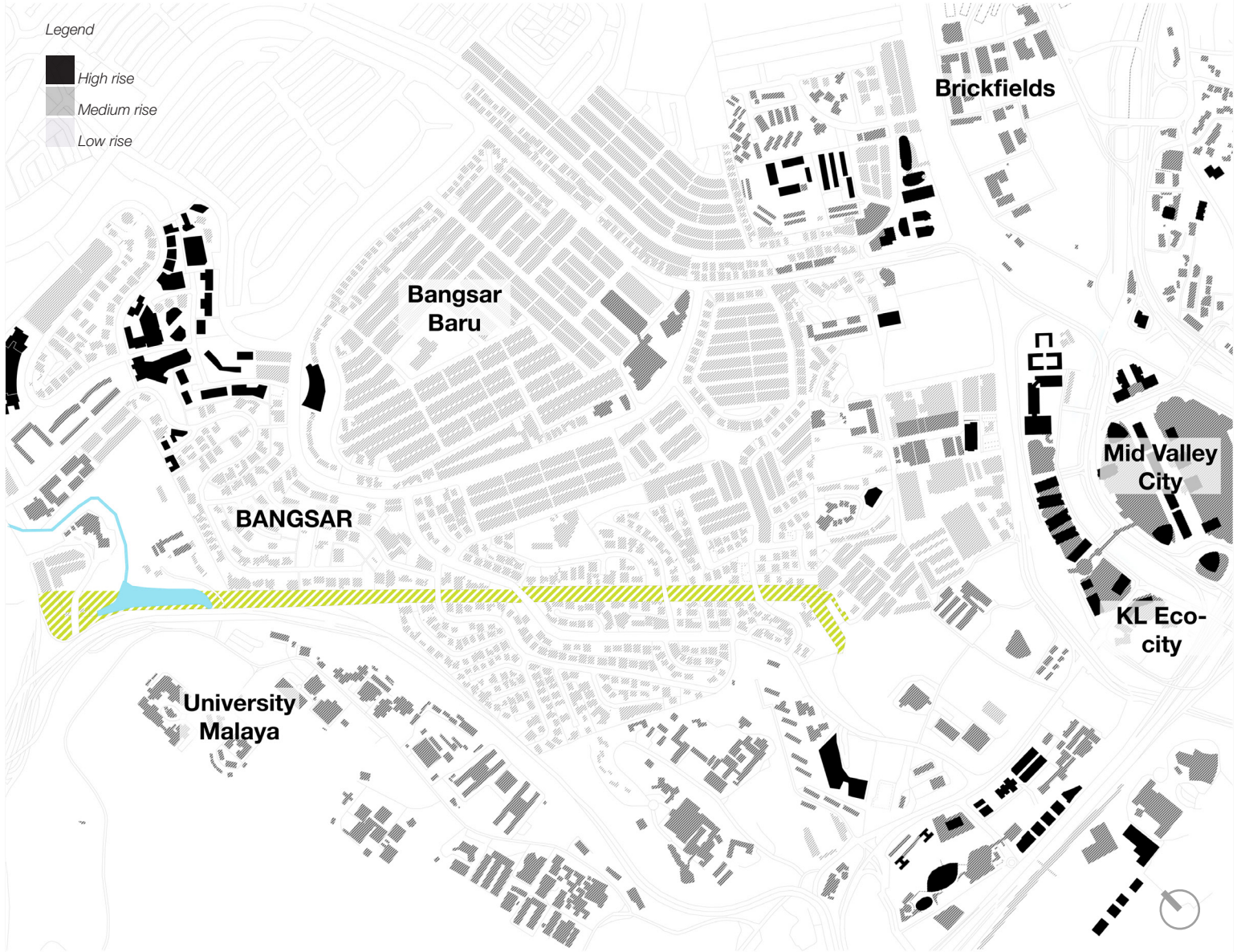


Alternative cycleway

A cycleway is present along the riverfront area. However, it is disconnected from the site by the main Jalan Bangsar roadway.

Potentially, direct access can be achieved during KL Car Free Morning Days in which the roadway is freed from motorway vehicles.

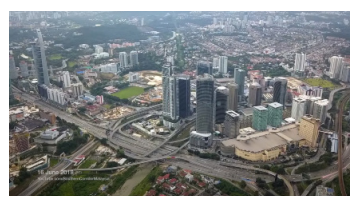
NEIGHBOURHOOD (L) SCALE ANALYSIS- URBAN GRAIN



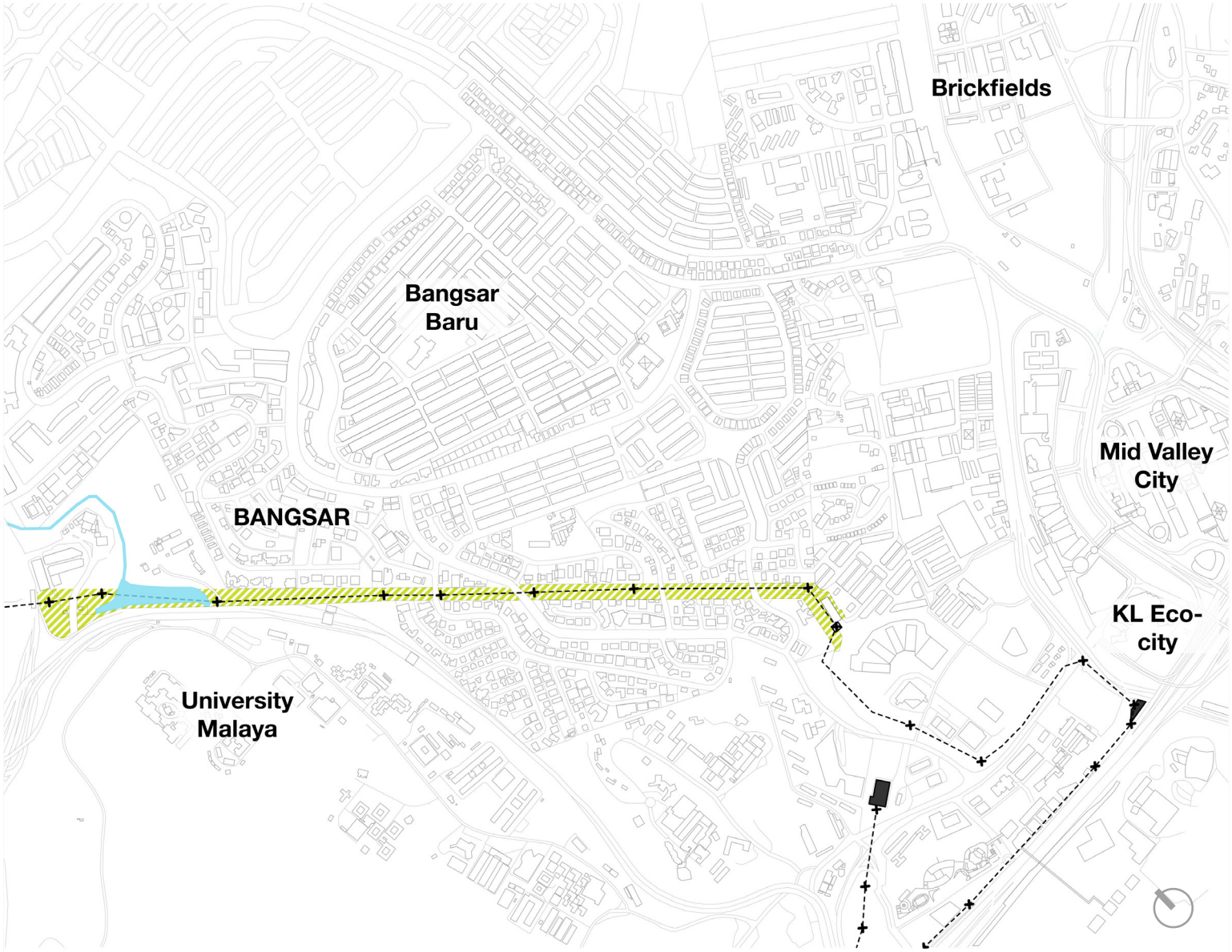
Urban Grain

The urban grain corresponds to the general land use of the area. The residential area of Bangsar and Bangsar Baru is characterised by low-density, low-rise housing.

Meanwhile, the surrounding commercial metropolitan occupies higher density, high-rise buildings.



NEIGHBOURHOOD (L) SCALE ANALYSIS- EXISTING INFRASTRUCTURE

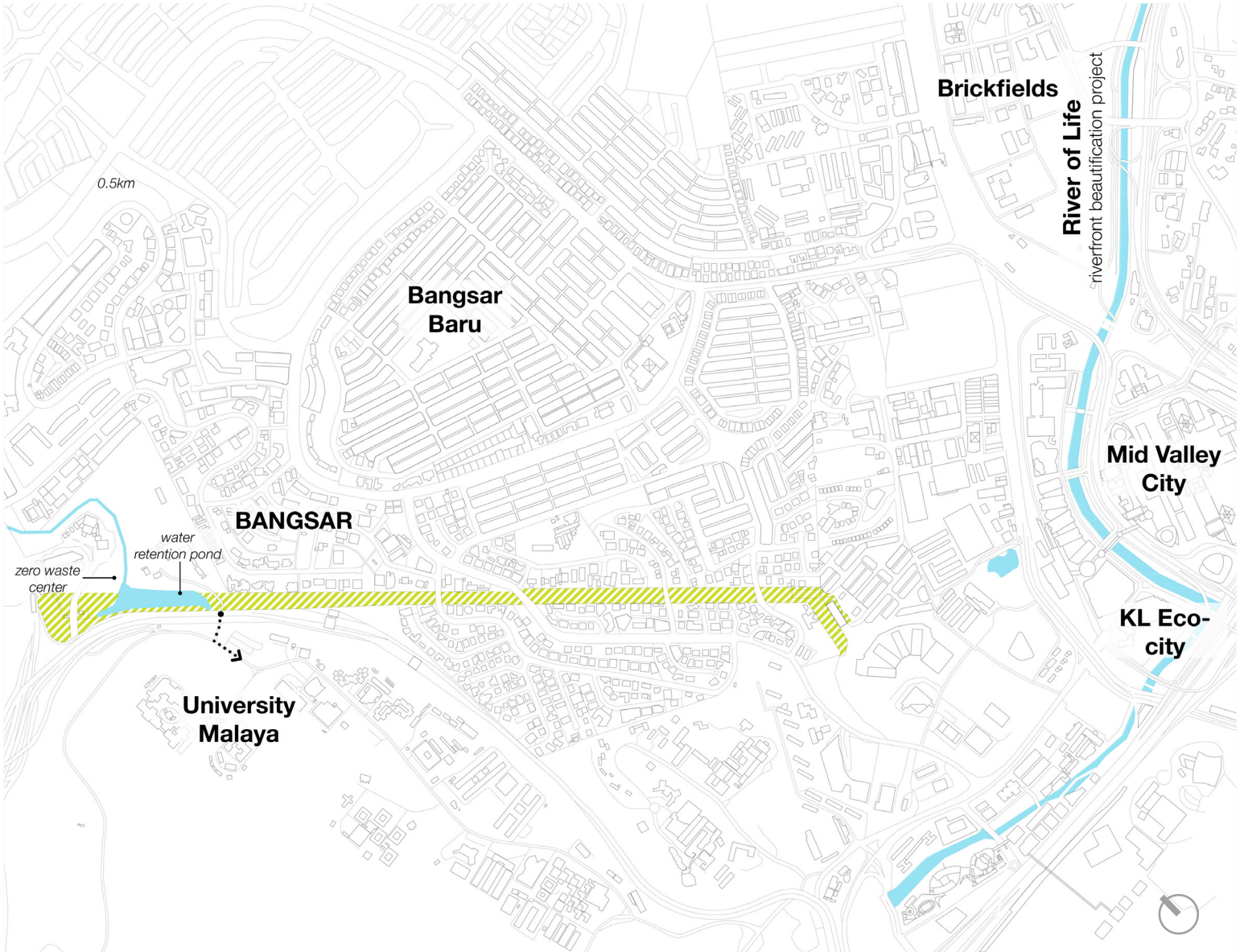


Power Transmission Line

As part of the national electricity network, the plot is characterized by large-scale infrastructures standing over a long linear stretch of ground.

The immensity of the infrastructure is visibly magnified next to the low-lying residential area.higher density, high-rise buildings.

NEIGHBOURHOOD (L) SCALE ANALYSIS- EXISTING INFRASTRUCTURE

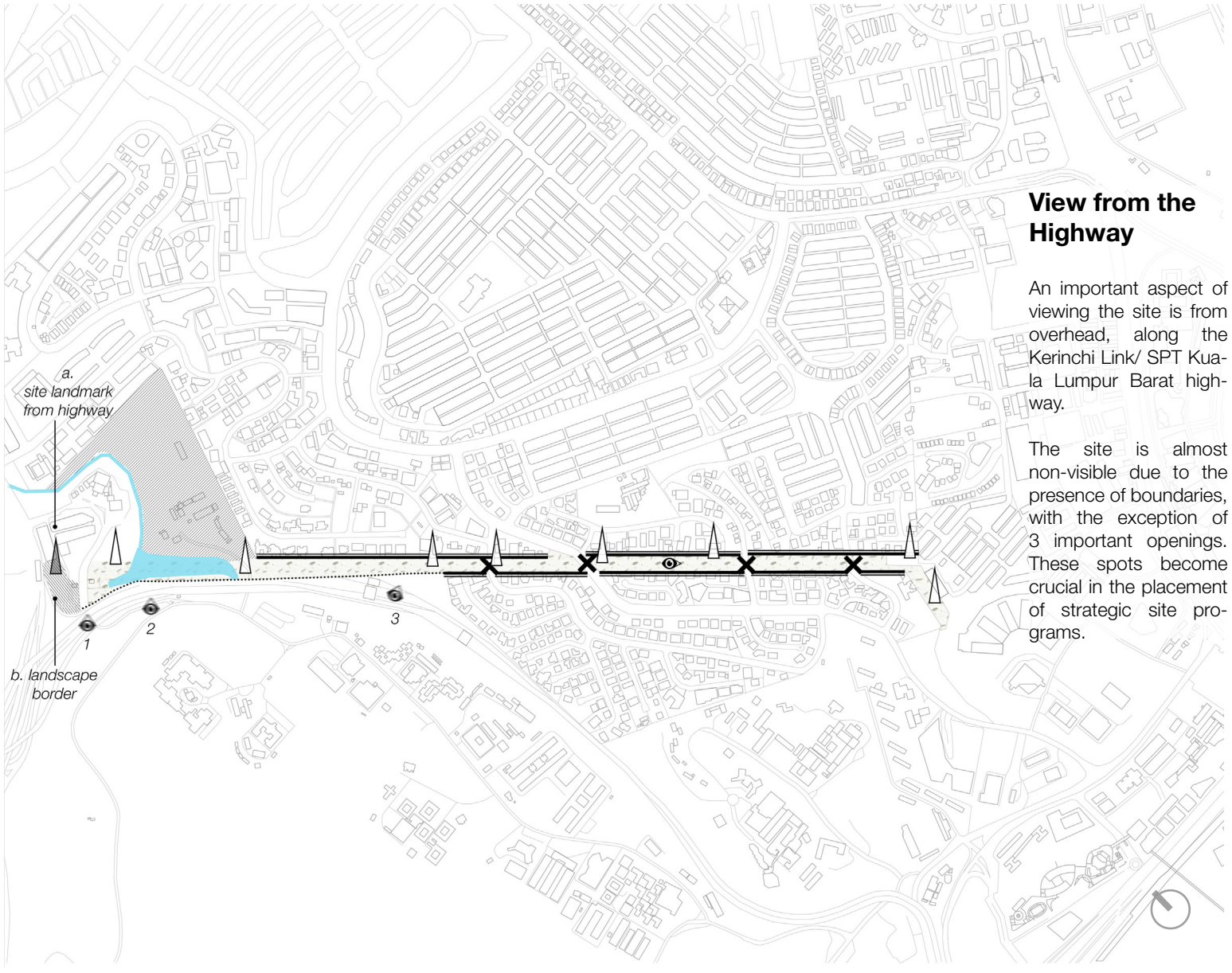


Blue Infrastructure

The two main surrounding water bodies are subjected to different projects. The Klang River has been beautified as part of the city's main waterfront area.

Meanwhile, a water retention pond at the end of the site is utilised by University Malaya's Zero Waste Center.

NEIGHBOURHOOD (L) SCALE ANALYSIS- POTENTIAL VIEWPOINTS



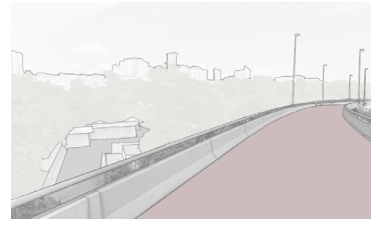
View from the Highway

An important aspect of viewing the site is from overhead, along the Kerinchi Link/ SPT Kuala Lumpur Barat highway.

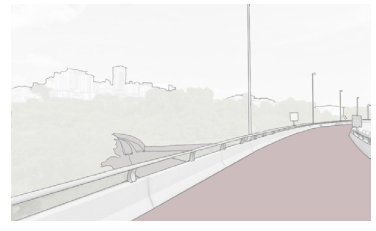
The site is almost non-visible due to the presence of boundaries, with the exception of 3 important openings. These spots become crucial in the placement of strategic site programs.

a.
site landmark
from highway

b.
landscape
border



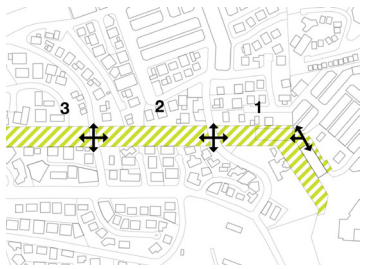
1.
visual
opening



2.
visual
opening

3.
visual
opening

NEIGHBOURHOOD (L) SCALE ANALYSIS- DRIFT MAP



Site Drive-Through 1-3

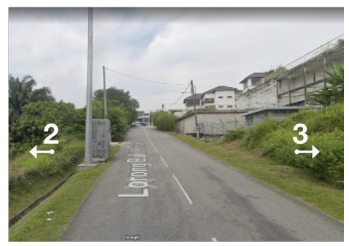
While moving along the intersections between the corridor and the residential roads, one can notice the huge difference in landform between the transition of each parcel.

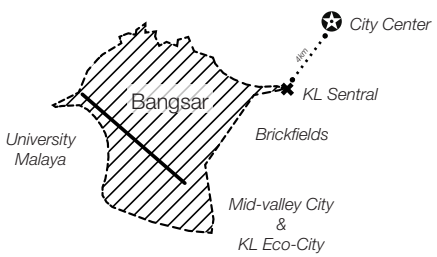
As the neighborhood is situated on a hill, from the drift map, we gradually move uphill from parcel 1 before reaching the peak at parcel 2 and gradually descending at parcel 3 to 5 and finally reaching flatland at parcel 6 to 7.

1

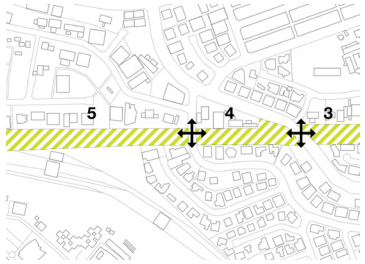
1 - 2

2 - 3





NEIGHBOURHOOD (L) SCALE ANALYSIS- DRIFT MAP



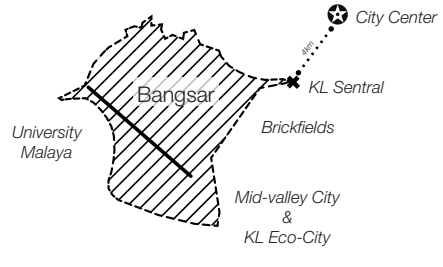
Site Drive-Through 3-5

While moving along the intersections between the corridor and the residential roads, one can notice the huge difference in landform between the transition of each parcel.

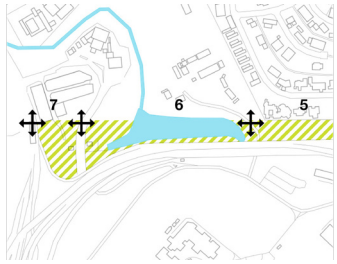
As the neighborhood is situated on a hill, from the drift map, we gradually move uphill from parcel 1 before reaching the peak at parcel 2 and gradually descending at parcel 3 to 5 and finally reaching flatland at parcel 6 to 7.

3 - 4

4 - 5



NEIGHBOURHOOD (L) SCALE ANALYSIS- DRIFT MAP

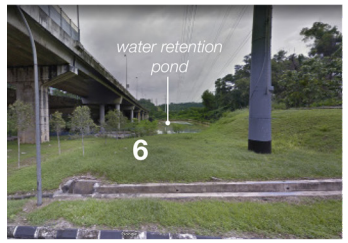


Site Drive-Through 5-7

While moving along the intersections between the corridor and the residential roads, one can notice the huge difference in landform between the transition of each parcel.

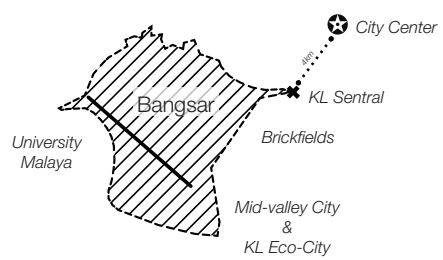
As the neighborhood is situated on a hill, from the drift map, we gradually move uphill from parcel 1 before reaching the peak at parcel 2 and gradually descending at parcel 3 to 5 and finally reaching flatland at parcel 6 to 7.

5 - 6

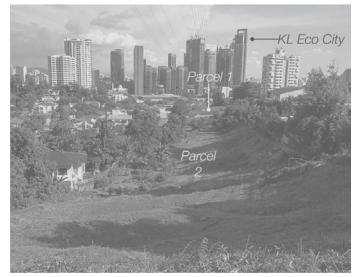


6 - 7

7



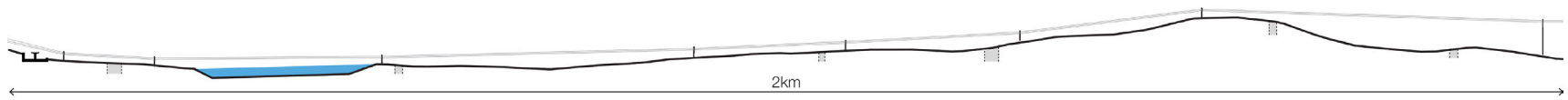
NEIGHBOURHOOD (L) SCALE ANALYSIS- TOPOGRAPHY



Topography

The terrain of the site runs over varying topography that rises from the south-east to a point on parcel no. 2, before falling towards the north-west area.

Due to the type of slope s and soil on the site, enhancements on the ground is deemed to be necessary for various types of uses.

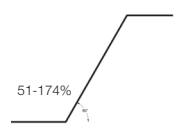


Soil quality

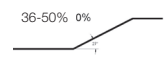
Type of soil on the site is typical of the Kenny Hill formation found in Kuala Lumpur, made up of thick layer of sandstone and shale, and very thin (almost negligible) layer of siltstone.

This type of soil is prone to weathering overtime and therefore needs enhancement, especially in extreme contour areas.

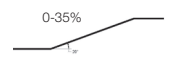
Site slopes



1. Extreme slope
- not suited to farming practice
- needs soil enhancement/ terracing



2. Median slope
- general slope in the area
- satisfactory for farming practice, with slope treatment



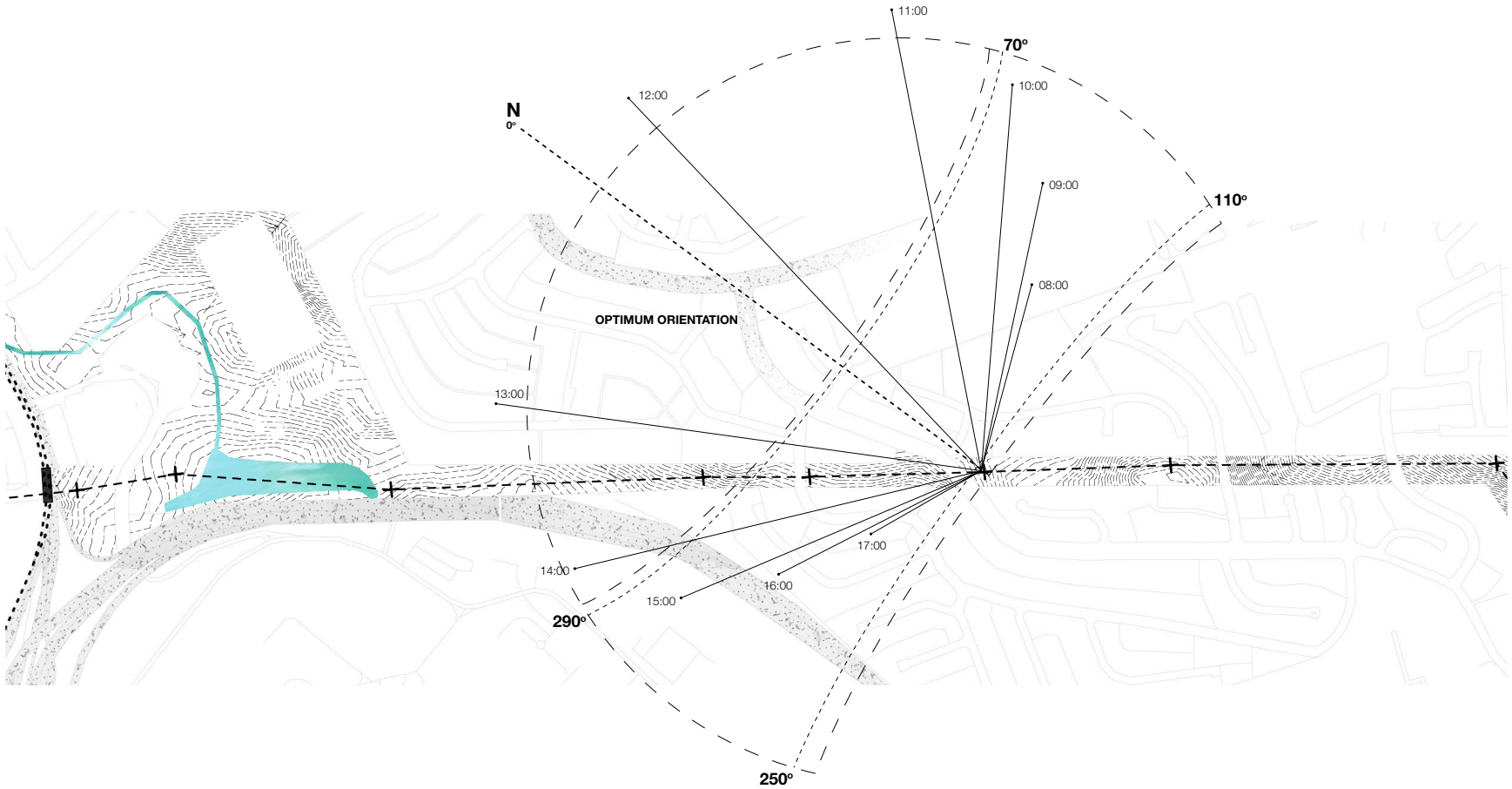
3. Lesser slopes
- satisfactory for farming practice
- added slope treatment to benefit in soil conservation

NEIGHBOURHOOD (L) SCALE ANALYSIS- SUN ORIENTATION

Sunlight Quality

The amount of sunlight guides the types of plant suitable along the terrain.

The central spine of the area remains the most strategic area for planting, and thus care should be given to produce the right amount of shade on the land.



Sunlight Character	Orientation	Vegetation
Optimum	310°-50°	Crop plants
Less sun	250°-310° 50°-110°	Ornamental, hedges
Full shade	110°-250°	Shrubs, groundcover, creepers, aquatic plants

NEIGHBOURHOOD (L) SCALE ANALYSIS- POTENTIAL CONFLICTS

Tensions & Conflicts

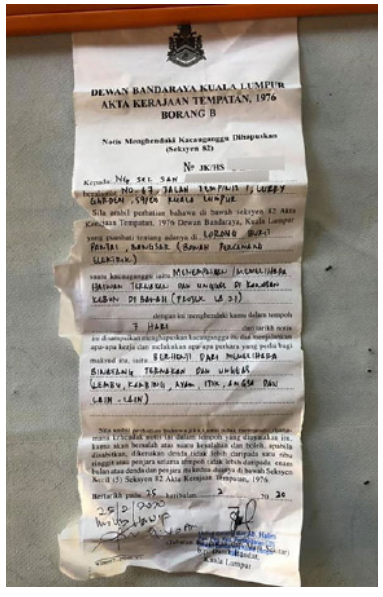
The development of KKB has been through several conflicts and controversies, especially with authorities and neighbouring communities.

In early 2020, KKB has been reported for failing to renew their Temporary Occupation Licence (TOL) through the Kuala Lumpur City Hall (DBKL).

Around the same time, KKB has received complaints from the nearby residents concerning noise from animals in the garden and has been threatened to vacate the premises.[41]

[41] Journalism Shah Alam, 2020.

Political



DBKL (Local authority) notice to K2B to remove its animals. Source: Journalism Shah Alam, 2020.

Residential concerns

Issues raised by residents of Bangsar:

- Gentrification
- Landslide
- Soil Erosion
- Drainage problem especially during monsoon season

To transform the area into a fully-functioning productive land, the applied interventions will need to tackle these concerns.

Fearful of landslides, Bangsar residents launch petition against hillslope community park

Friday, 22 Jul 2016 01:46 PM MYT
By Ida Lim

Architect Kevin Mark Low said the hill slope on TNB reserve land is already a beautiful green lung and would be a bad location to develop the proposed community park. — Pictures by Choo Choy May

KUALA LUMPUR, July 22 — Caught by surprise and worried about potential landslides, residents of Bangsar's Taman Weng Lock came together yesterday to launch a petition drive against a proposed community park on a hillslope above their neighbourhood.

At a briefing to residents last night, architect Kevin Mark Low spoke of the numerous problems that the project named Kebun-Kebun Bangsar could cause the Taman Weng Lock community. This includes drainage concerns, and increased traffic in the already-congested area.

"Contrary to what the park proposal says, 'lightly touching the land', no hillside slope development especially a park can do that, simply because in order to grow crops, vegetables or nice flowers, you need to remove all that lallang to expose all that topsoil," said the Jalan Riong Rukun Tetangga committee member, adding that the project would likely require the use of machinery to cut and terrace the slopes.

"This is the worst possible thing because lallang is the best form of surface water control, it's very thick so it slows the water down and because lallang roots lift the soil up, it creates very permeable conditions for surface drainage.

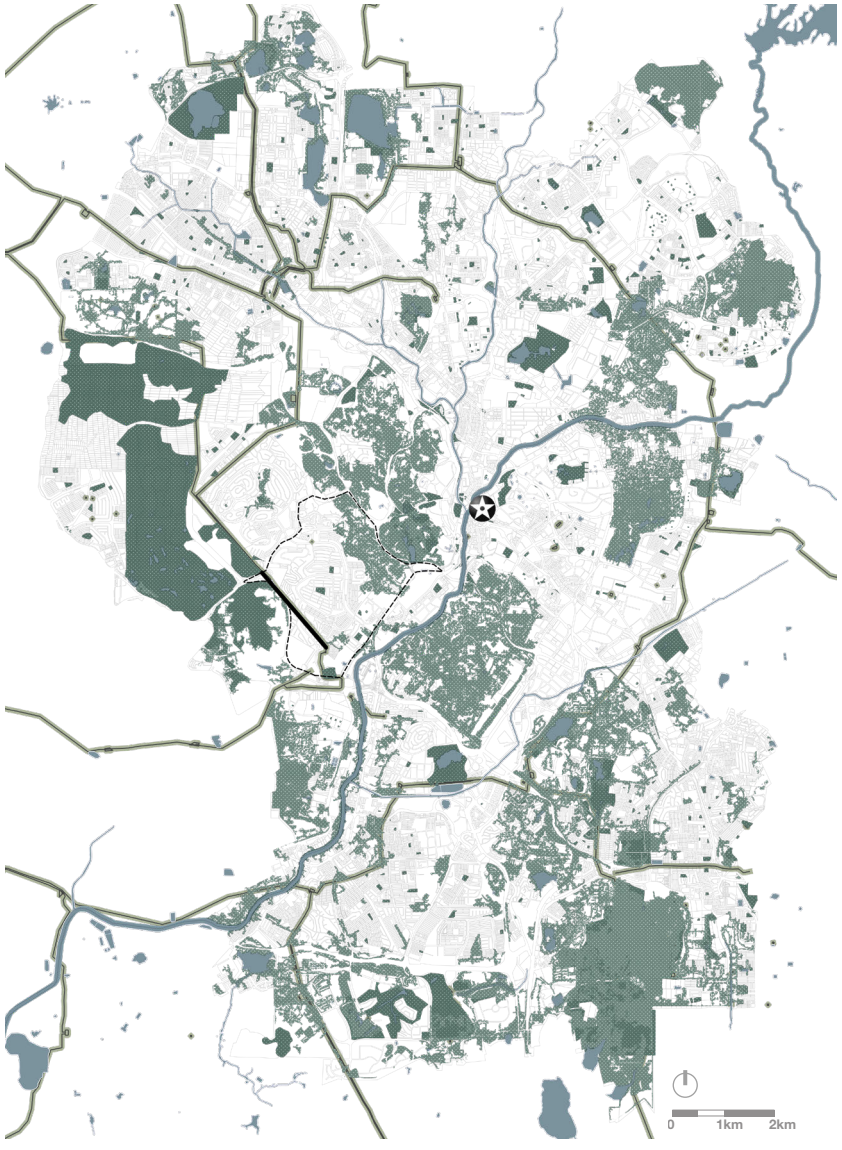
06

DESIGN STRATEGIES

The planning of the new urban agricultural space in Bangsar is carried out on three levels: urban, neighbourhood, and site scale.

Design on each level corresponds to different needs and issues. The urban scale shows potential urban connectivity within Kuala Lumpur. The neighbourhood scale promotes the involvement of different actors. Meanwhile, the site scale shows the treatment on different parcels of the land.

URBAN (XL) SCALE STRATEGY - CPUL POTENTIAL MAP



Green Infrastructure Connection

Kuala Lumpur is not a city without its spare of green areas.

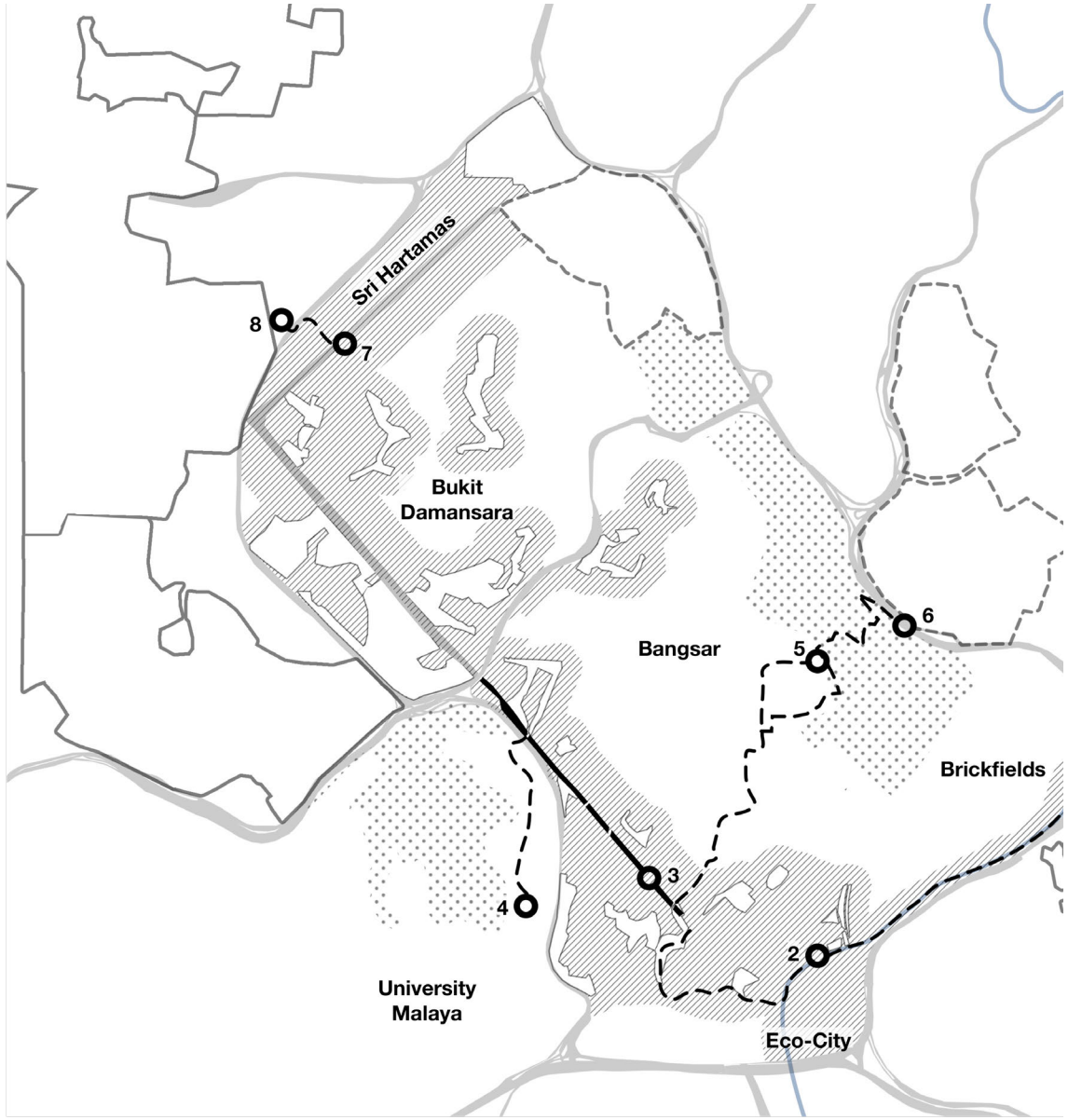
With proper planning, the green networks can be part of an interconnected system in the city.

The infrastructural lines (marked in yellow), especially, run through several strategic areas.

Seeing the potentials of the Bangsar TNB line, other infrastructure-related green areas can be treated with the same considerations, contributing to a new kind of green network, and creating a continuous productive urban landscapes (CPULs) throughout the city.

Power transmission network < > green infrastructure

URBAN (XL) SCALE STRATEGY - ENVIRONMENTAL ACTORS NETWORK MAP



Building a network of social enterprise

Different actors can have different roles in regenerating different parts of the park together with the surrounding residence.

Closing the gaps

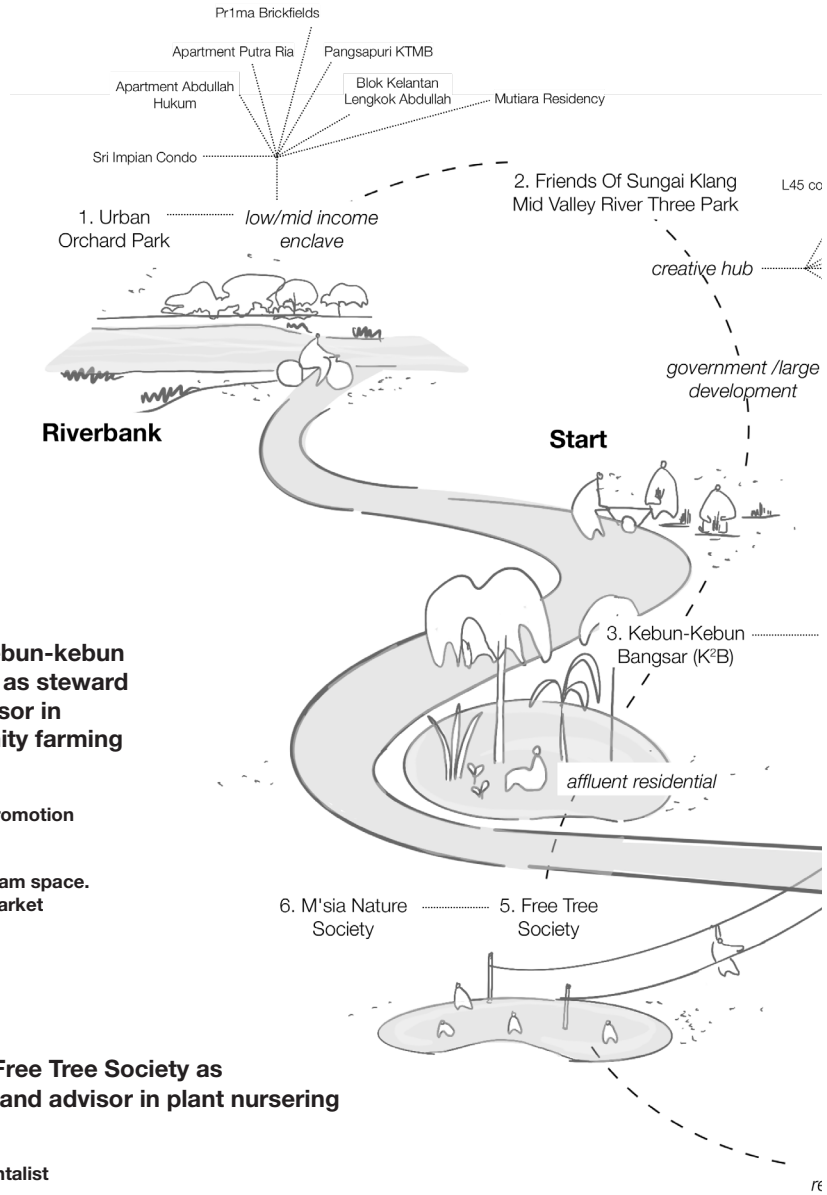
Social enterprise acting stewards in activating the residual space. Thus closing the gaps between neighborhood and open space in the city.

NEIGHBOURHOOD (L) SCALE STRATEGY - USER & ACTIVITY DIAGRAM

Riverbank: Gateway

Role:
crowd collector

Output:
pleasant riverfront, connection to existing bike lane



Start: Kebun-kebun Bangsar as steward and advisor in community farming

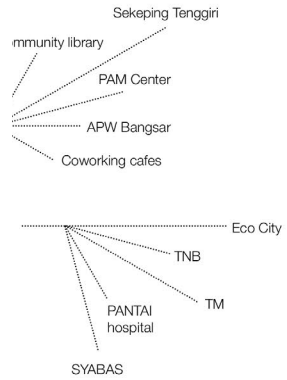
Role:
program promotion

Output:
main program space. farmer's market

Middle: Free Tree Society as steward and advisor in plant nursering

Role:
environmentalist

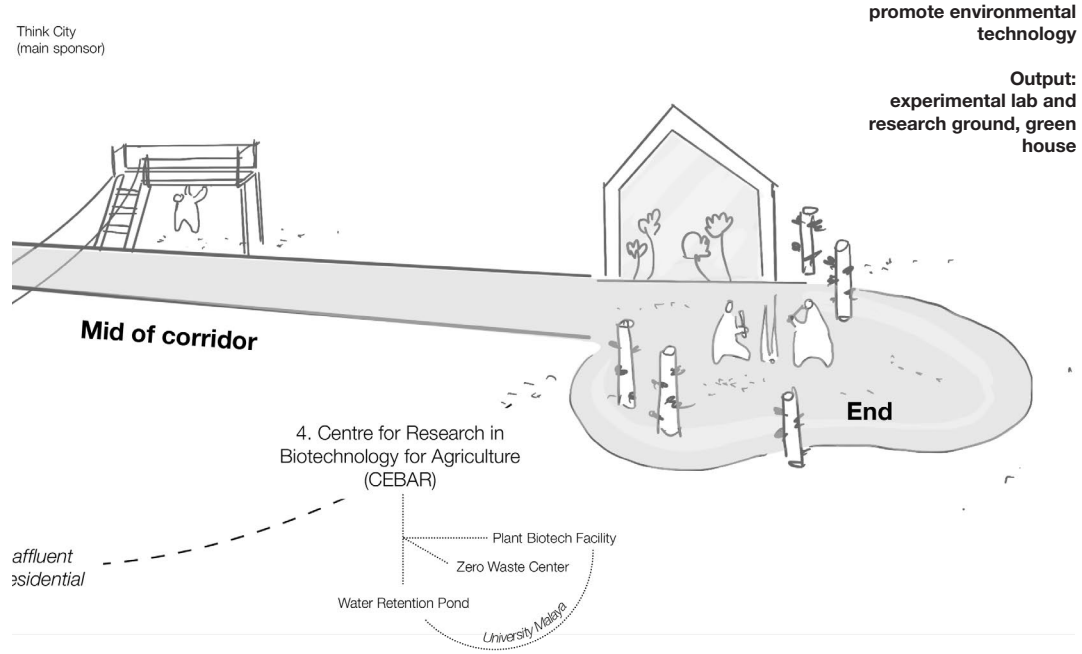
Output:
patches of various intensive vegetation to contribute towards environmental protection and to prevent soil erosion along the green transmission corridor.



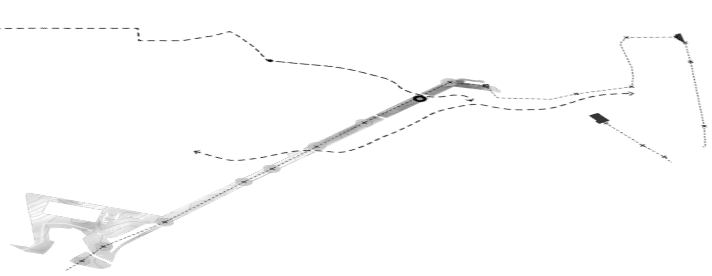
End: University Malaya as steward

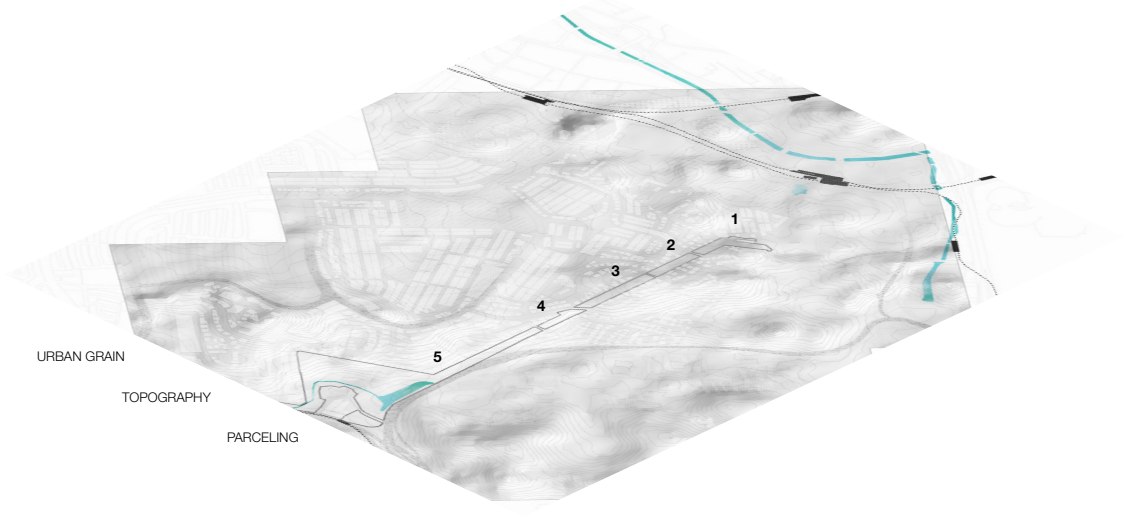
Role:
promote environmental technology

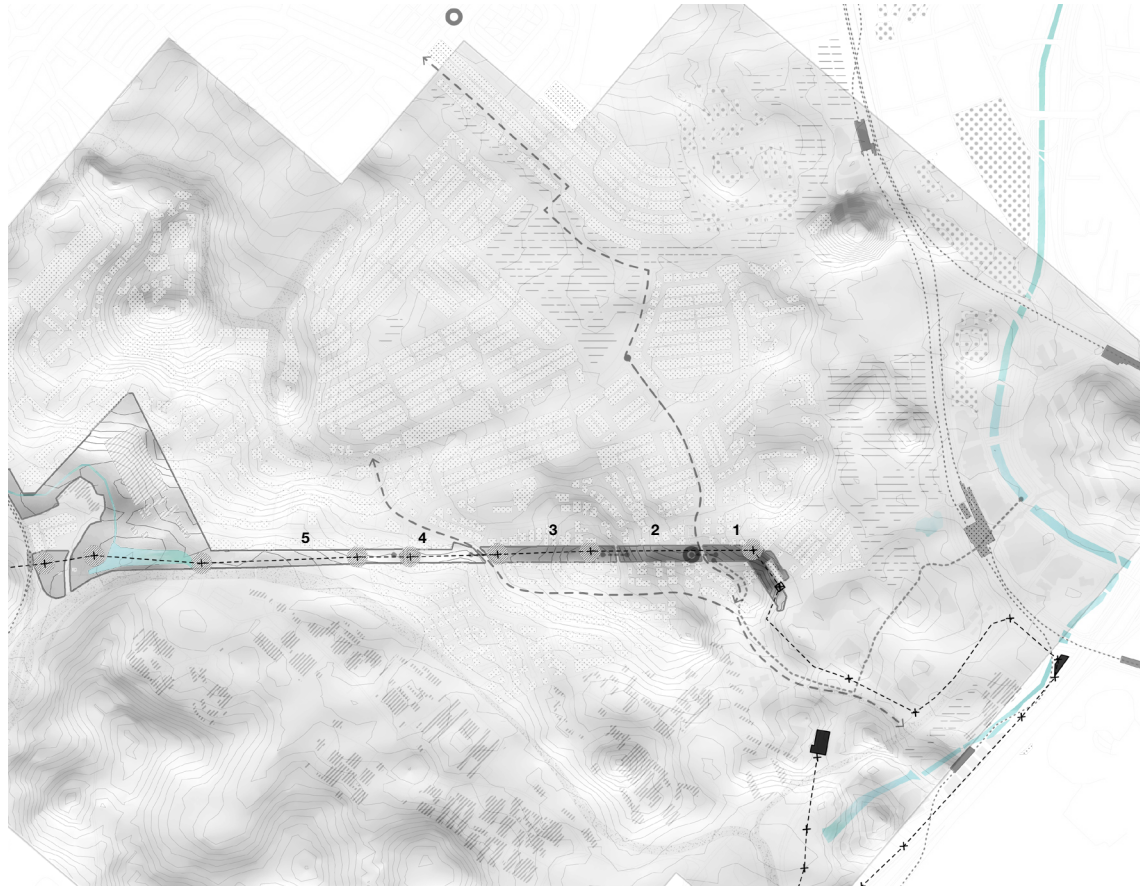
Output:
experimental lab and research ground, green house



NEIGHBOURHOOD (L) SCALE STRATEGY - INFRASTRUCTURAL LAYERS





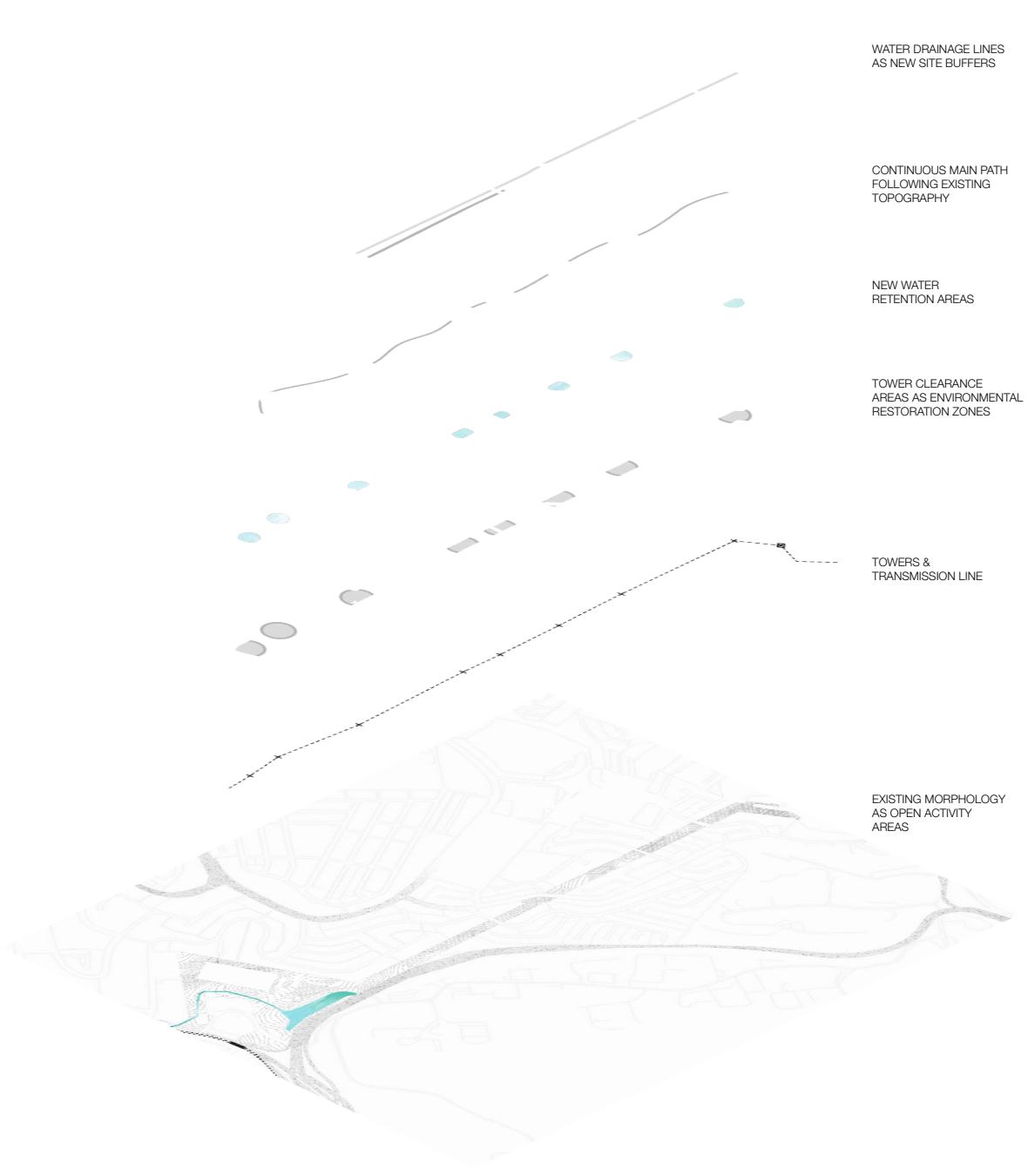


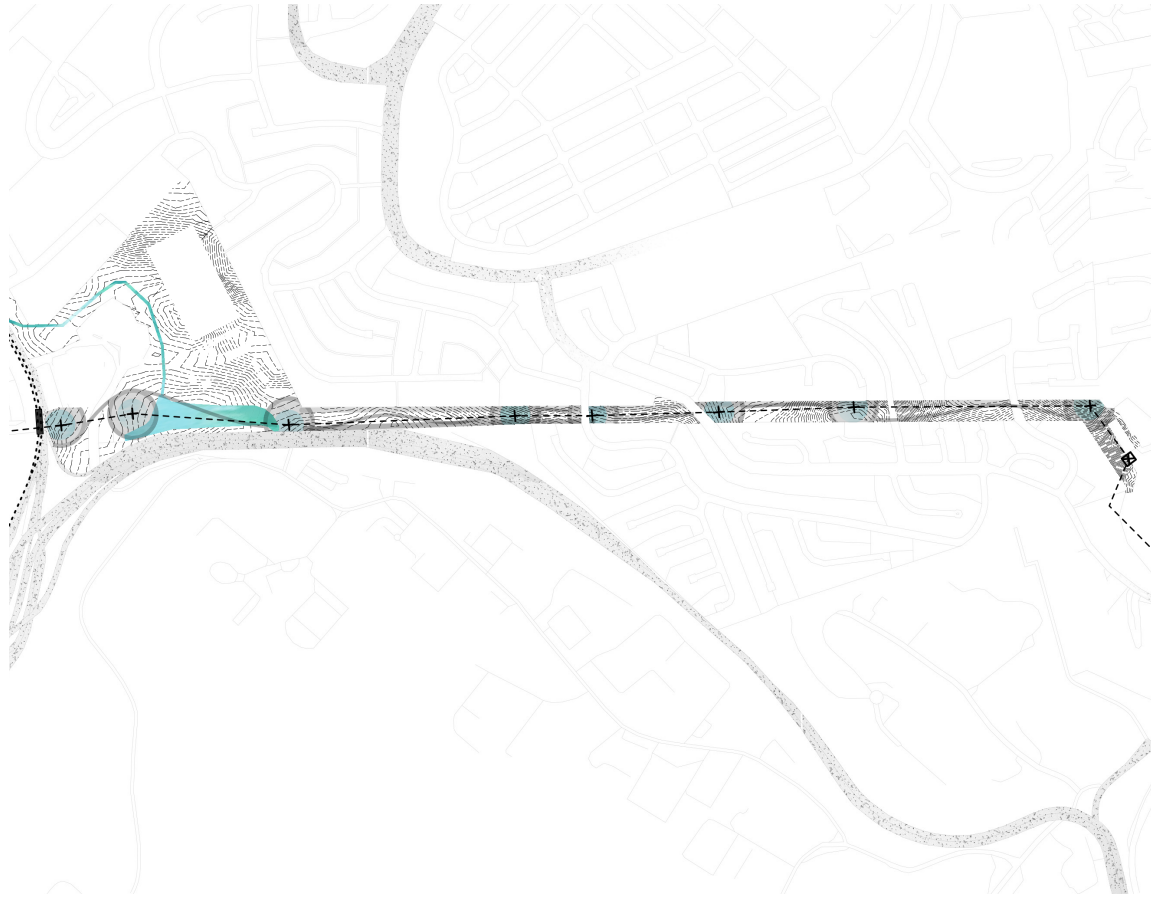
Neighborhood Scale Strategy Map

The strategy map at neighborhood level accomodates the accessibility and involvement of users at the middle scale.

The map takes into account morphologies of existing topography, urban fabric, and transmission line clearances.

LOCAL (S) SCALE STRATEGY - INFRASTRUCTURAL LAYERS





Local Scale Strategy Map

The strategy map at local scale attempts to work with the local morphology as guiding potentials.

Topography are programmed as open activity areas. Meanwhile, tower clearance areas are reserved as water retention spaces, supported by drainage lines at the two sides of the site.

OVERALL STRATEGY MAP

Legend

permanent structure

30m safety clearance

water buffer

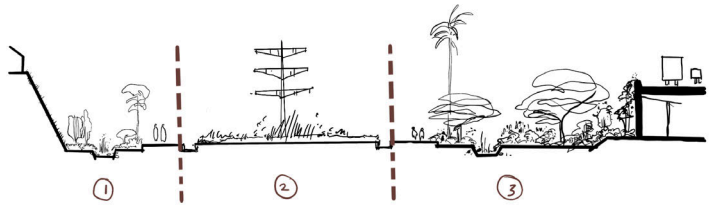
vegetation soft buffer

transmission tower & electric lines

pedestrian access

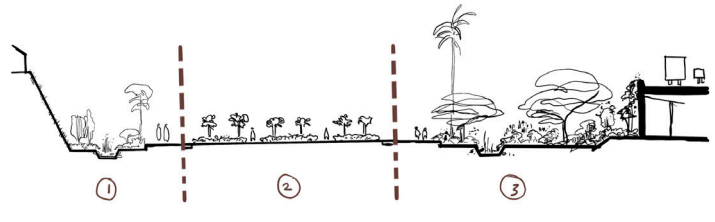
drive-by areas

LOCAL (S) SCALE STRATEGY - POTENTIAL BUFFERS



Scenario 1

1. Residential biocorridor
2. Uncultivated nodes
3. Pollution buffer and highway biocorridor



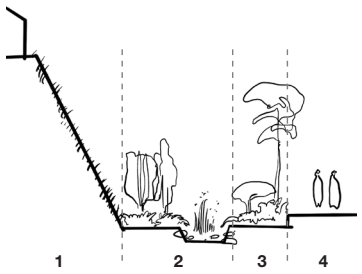
Scenario 2

1. Residential biocorridor
2. Agroecological allotments
3. Pollution buffer and highway biocorridor

Strategic Sections

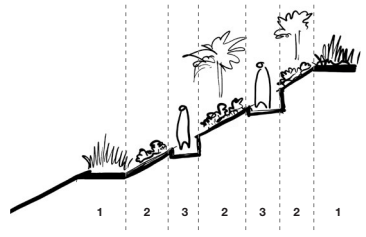
The morphology of the site determines the allocation of various activities, as well as the necessary buffers.

The strategic sections act as guides for the different landscape treatment and their placements.



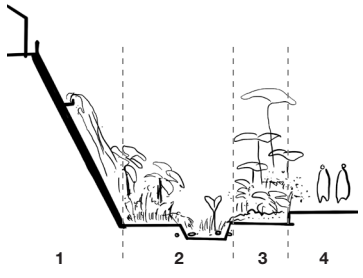
Scenario 1- Grassy slope

1. Grassy slope
2. Bioswale
3. Ornamental edge
4. Path



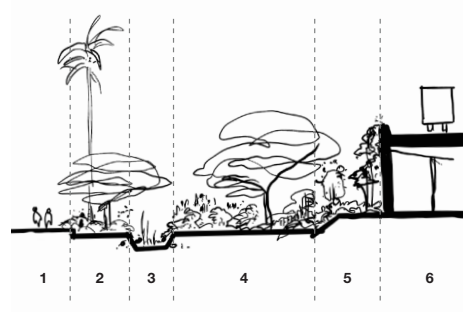
Contoured area with grass edging

1. Contour edge with vetiver grass
2. Allotment plot
3. Dead furrows



Scenario 2- Retaining wall

1. Concrete wall
2. Bioswale
3. Ornamental edge
4. Path



Extended buffer area

1. Path
2. Ornamental edge
3. Bioswale
4. Extended pollution buffer
5. Improved original higway edge
6. Highway

LOCAL (S) SCALE STRATEGY - SPECIFIC TECHNIQUES

Edging

Creating visible limits between two different areas.

Different edge treatments create diffrent senses of transition and privacy.

Two main types of borders:
1. Hard borders: Walls, mesh
2. Soft borders: plants, vegetation, water

1. WEATHERED WALL

Walls made of stone or concrete, made to be weathered, grown over by moss and vegetation.

2. GRASS SLOPE

Sloping land covered with cellulose mulching material, grown with grass through hydroseeding process.

3. EDGE PONDS

Ponds located at edges of the site, can be combined with retaining walls and landscape paths.

4. BIOSWALE

Vegetated ponds with added functions of assisting filtration and water retention.

Filling

Treatments over dominant areas of the landscape to facilitate certain ecologies and for designated purposes.

FORESTED PATCHES

Create more shaded open areas, direct views and paths.

ALLOTMENT GARDENS

Measureable divisions of land for cultivation purposes, which can run in perpendicular to the main landscape paths.

Farming on Sloping Terrain

The farming practices need to be suited over the sloping terrain, which can be done in four main ways[x].

1. TERRACED FARMING

Basic structure of the land that utilises the naturally sloping form as land parcel divisions.

2. CONTOURED FARMING

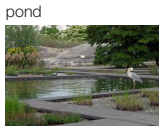
A cropping technique which places the planting ridges following along the contour, with border plants along the edges.

3. BLIND/ FRENCH DRAIN

Drainage structure hidden under the soil which also allows water retention along the layered surface.

4. MULCHING

A cropping technique which places organic matter over the soil to help prevent water run-off and also to protect from excess evaporation.



pond

CONTROLLED

NATURAL

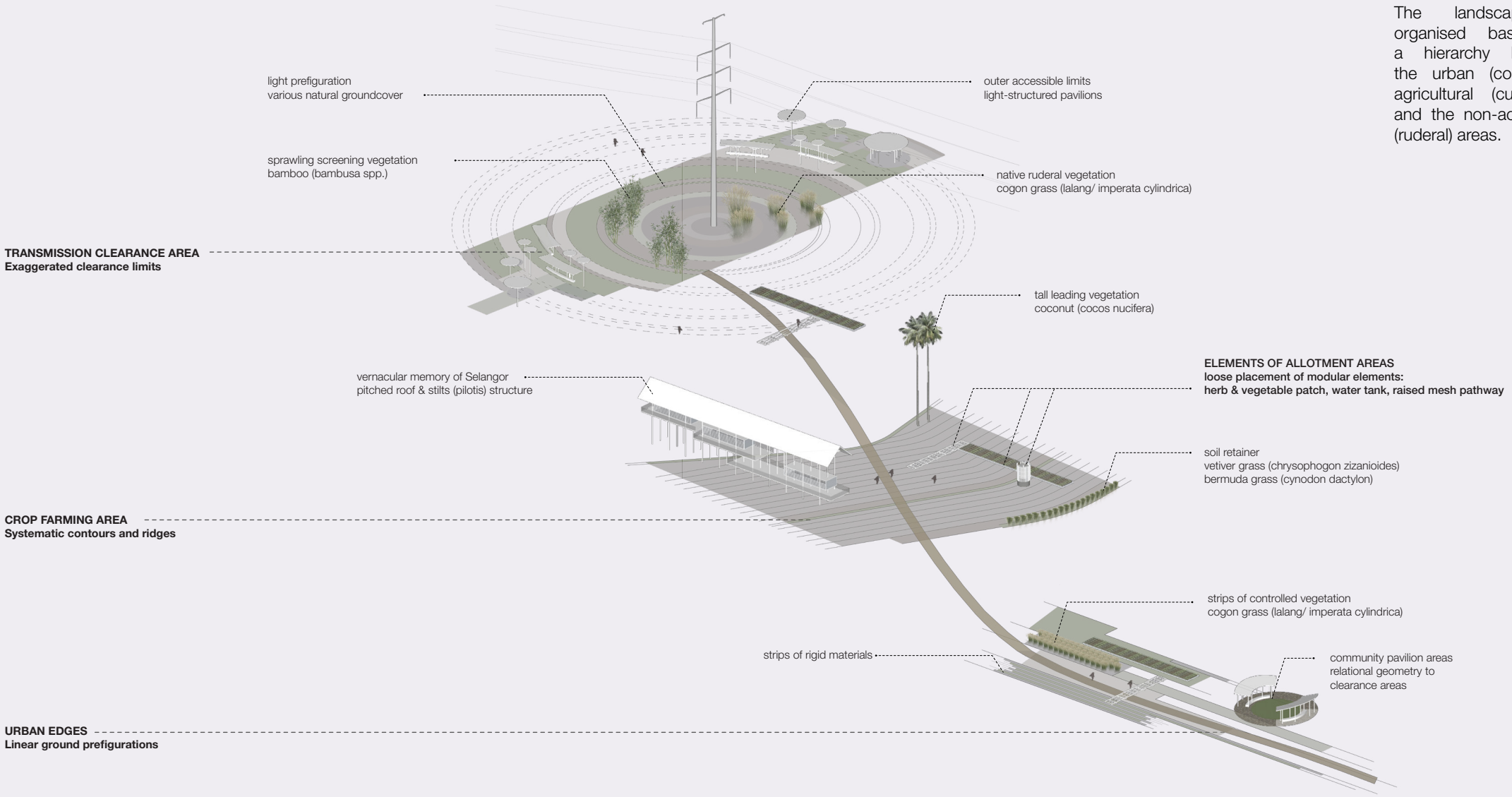
wetland

bog

Water Treatment & Retention

Areas can be designed to promote the flow of water through different types of environment.

LOCAL (S) SCALE STRATEGY - LANDSCAPE AESTHETICS



Three Hierarchies

The landscape is organised based on a hierarchy between the urban (controlled), agricultural (cultivated), and the non-accessible (ruderal) areas.

07

DESIGN IMPLEMENTATION

The design implementation stage simulates the whole approach over a variety of scales and representation. Starting with the masterplan design and its structural layers, parcel plans, before continuing to more detail landscape programs, systems, and ethnobotanical recommendations.

The whole package is intended as a testament to all the viable possibilities of landscape treatment that can be applied on the site in order to produce a new, active and productive urban landscape.

MASTERPLAN DESIGN

Interconnected parcels

Continuity between parcels is needed to counter the fragmented urban morphology. It is formularised in two forms: the landscape character of the parcels and the dedicated theme of each area.

The landscape character is defined by its agricultural structure both in allotments as well as open area crop farming.

The themes of the first four parcels, due to their vicinity and size, are designed to potentially support each other.

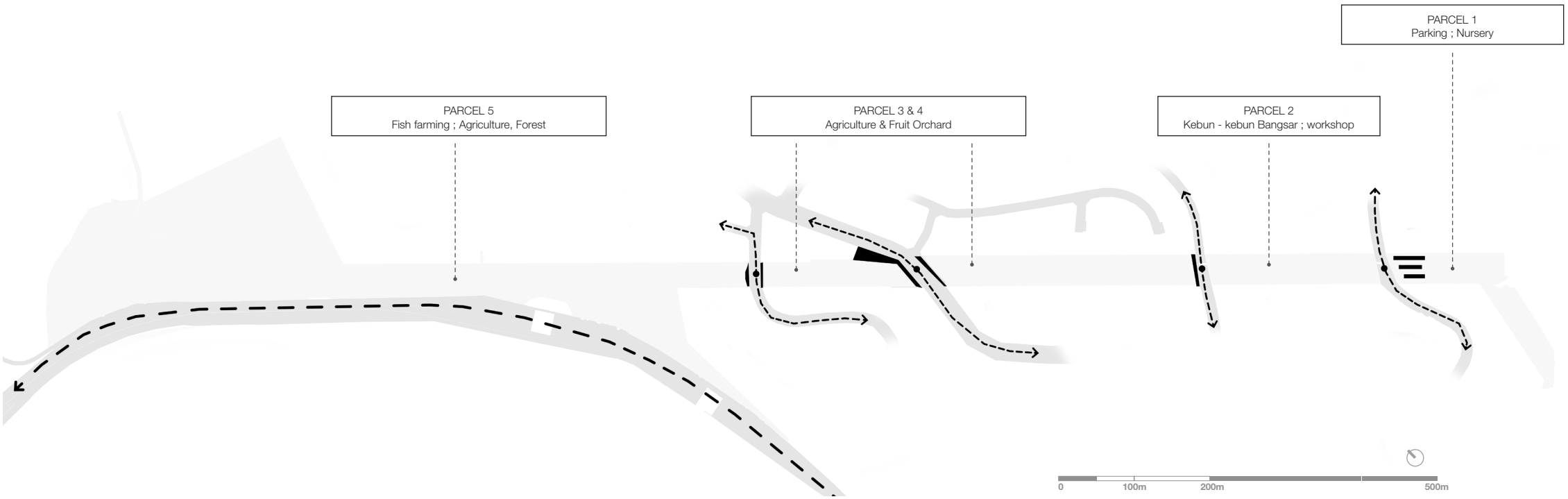
Parcel 1-2 are organised for Kebun-Kebun Bangsar (KKB)- affiiated functions.

Parcel 3-4 is dedicated for more intensive agriculture techniques.

Meanwhile, Parcel 5 corresponds to functions for the greater public within a natural reserve setting.

MASTERPLAN STRUCTURE

Vehicular circulation



Legend

parkway

vehicular access through aterial road

parking bosque

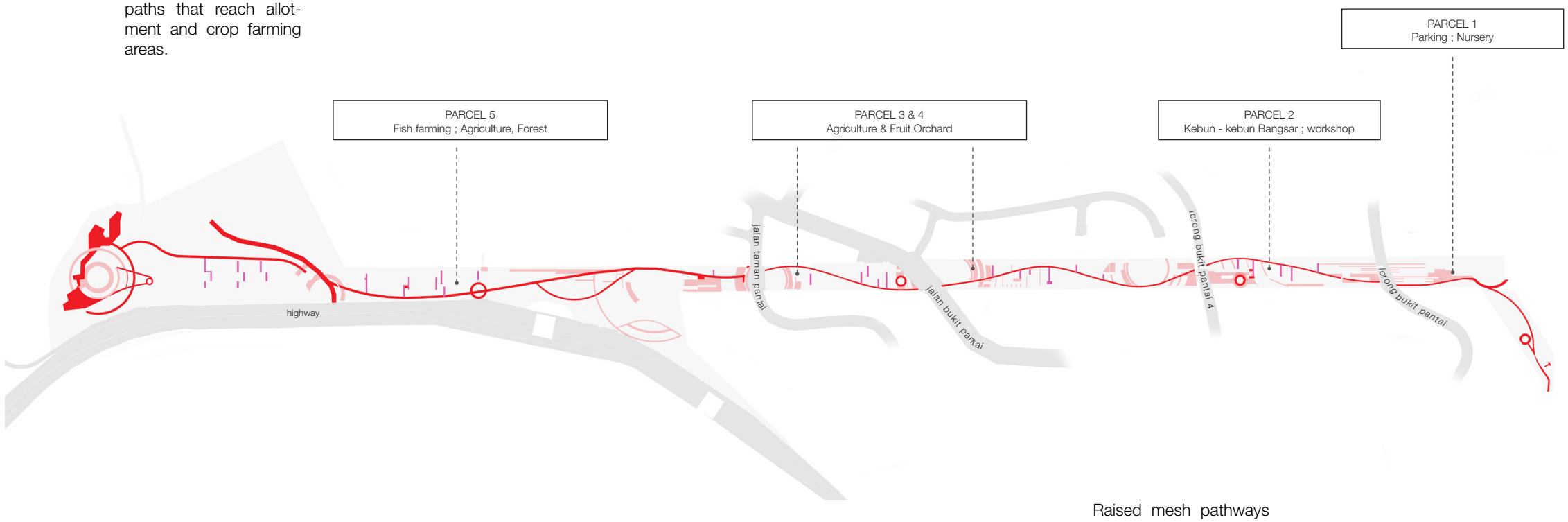
Due to reasons of extreme topography, intended user character and activity, as well as privacy considerations, the overall new masterplan is predominantly non-vehicular.

However, pockets of spaces are reserved for parking and drive-through to enable accessibility towards certain activities in the site.

MASTERPLAN STRUCTURE

Pedestrian circulation

A main path runs continuously along the whole site. Over the course, it branches into secondary paths that reach allotment and crop farming areas.



Legend

primary multi-use recreational path

secondary paths

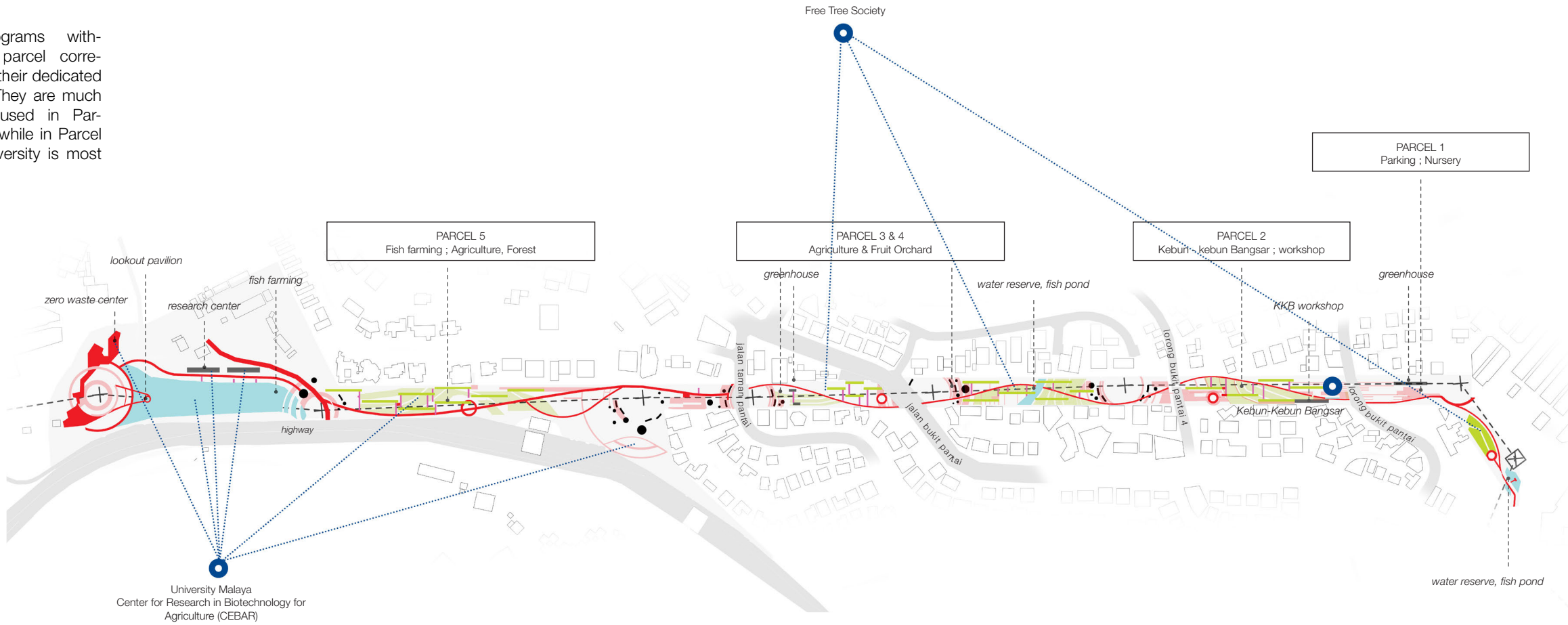
raised mesh pathway

Raised mesh pathways are a variation used in open areas where the ground is dominated by soil for farming as a non-invasive method of passing through the land.

MASTERPLAN STRUCTURE

Program Plan

The programs within each parcel correspond to their dedicated themes. They are much more focused in Parcels 1-4, while in Parcel 5 their diversity is most apparent.

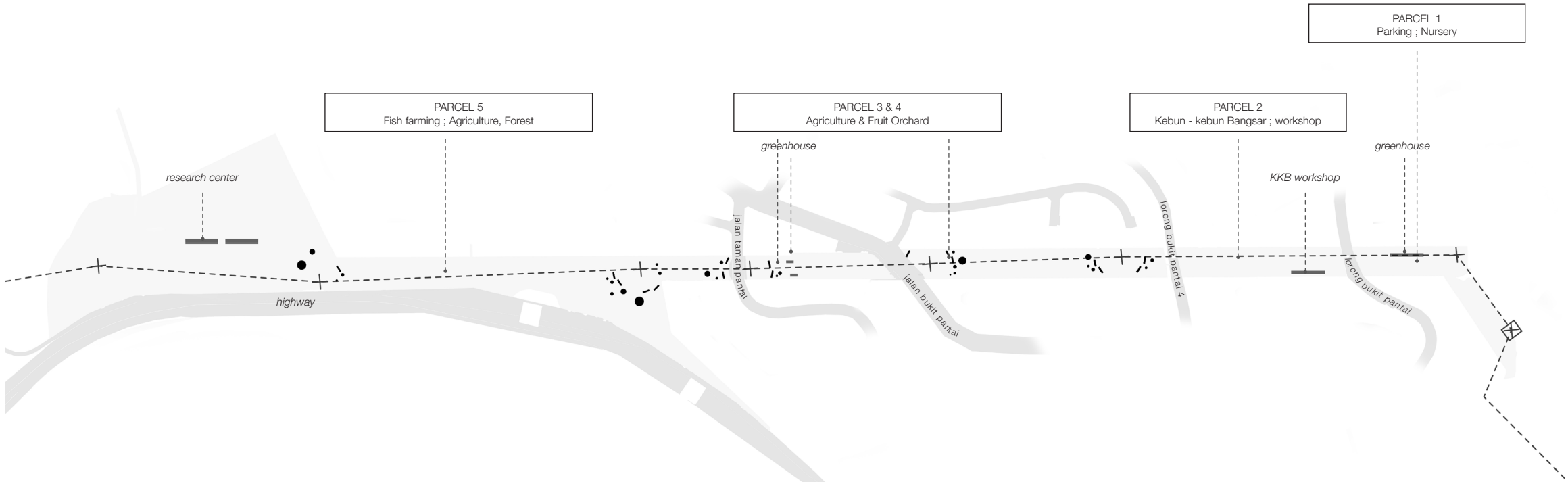


Legend

- blue infrastructure
- agricultural patch (with deeper root system)
- greenhouse, research center, workshop
- allotments (herb & vegetable patch)
- community pavillion

MASTERPLAN STRUCTURE

Structures plan



Legend

greenhouse, research center, workshop

community pavillion

exisiting transmission tower and electric cables

MASTERPLAN STRUCTURE

Landscape Plan

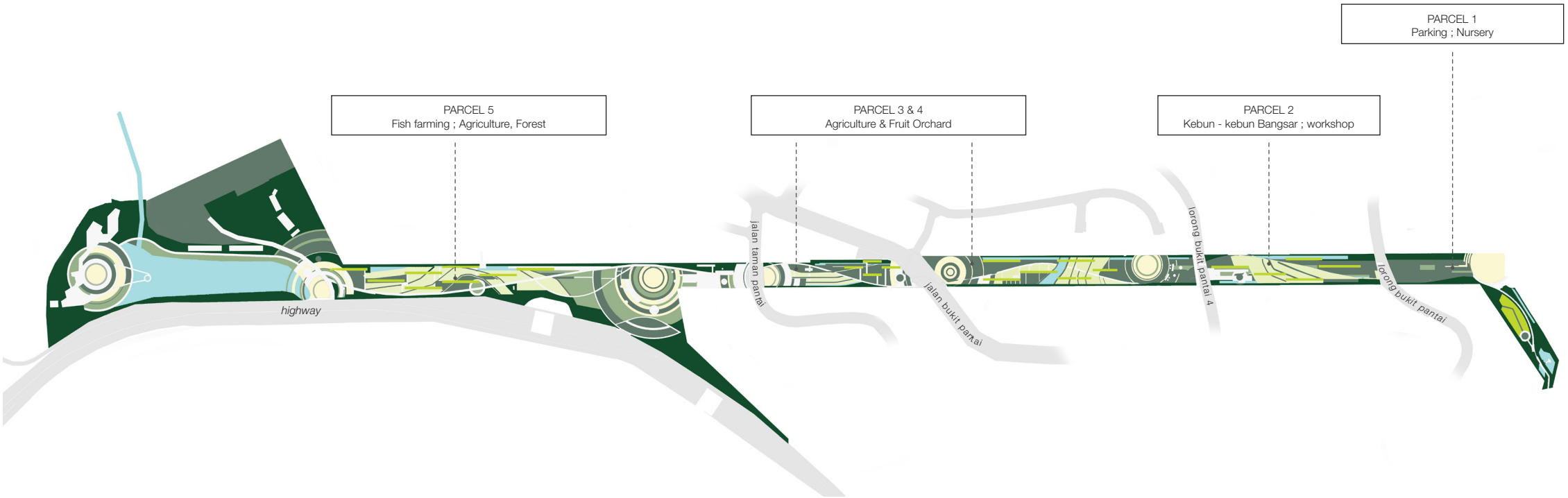
The landscape plan is formulated according to atmospheric and environmental qualities, as well as relevant buffer considerations for each site.

High-density planting marks more specialised territory around natural areas, as well as in buffer zones along the Bangsar neighbourhood.

The center spine of the site, being the most exposed towards the elements, are reserved for planting in both forms; allotment patches and crop farming.

These areas are then lined by village orchards and blue infrastructures to complement their agriculture uses.

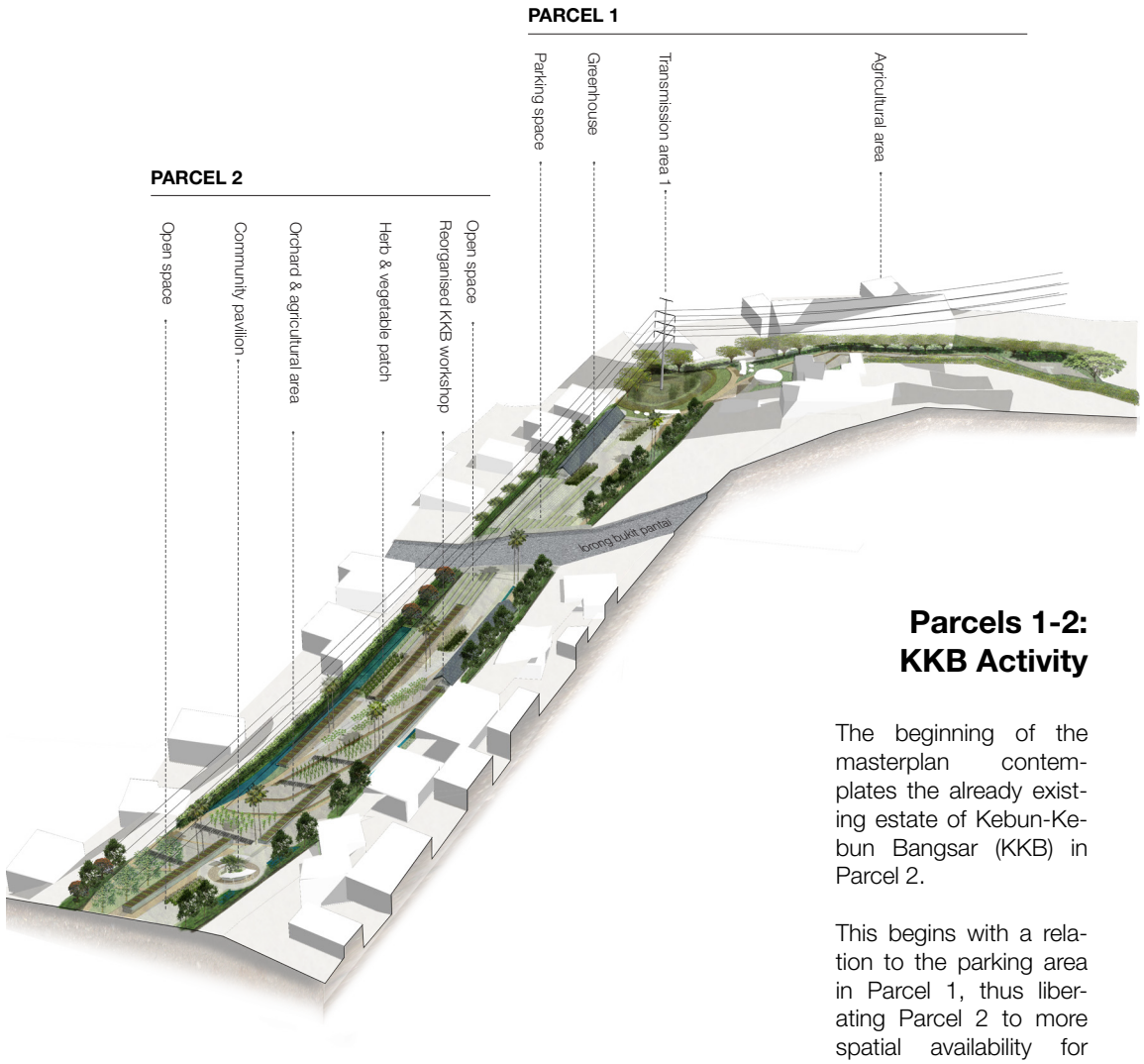
Areas least controlled around the transmission towers, are left as natural marsh areas as natural environmental restoration points.



Legend

- high density planting (green buffer)
- medium density planting
- low density planting
- blue infrastructure
- marsh
- agricultural patch (with deeper root system)
- herb & vegetable patch

PARCEL PLANS



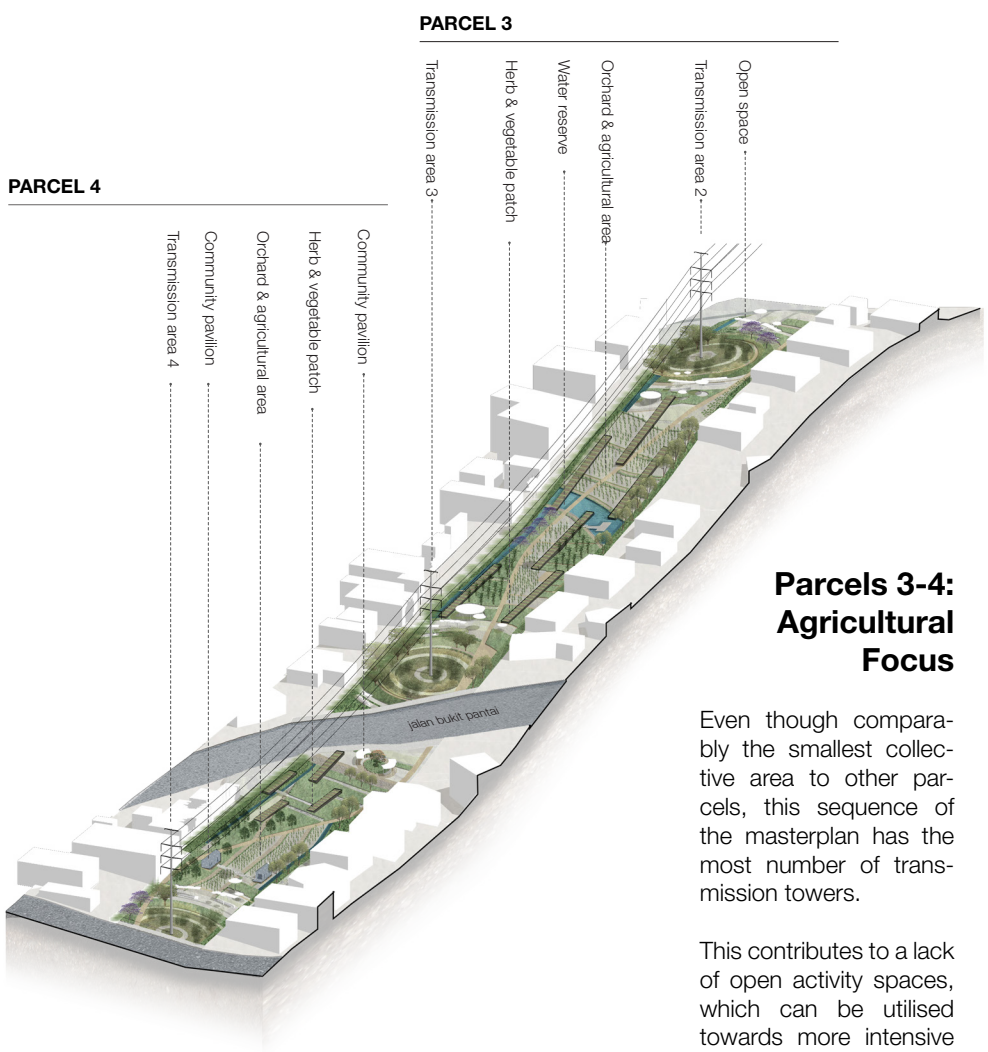
Parcels 1-2: KKB Activity

The beginning of the masterplan contemplates the already existing estate of Kebun-Kebun Bangsar (KKB) in Parcel 2.

This begins with a relation to the parking area in Parcel 1, thus liberating Parcel 2 to more spatial availability for teaching and organising purposes.

PARCEL PLANS

PARCEL 3

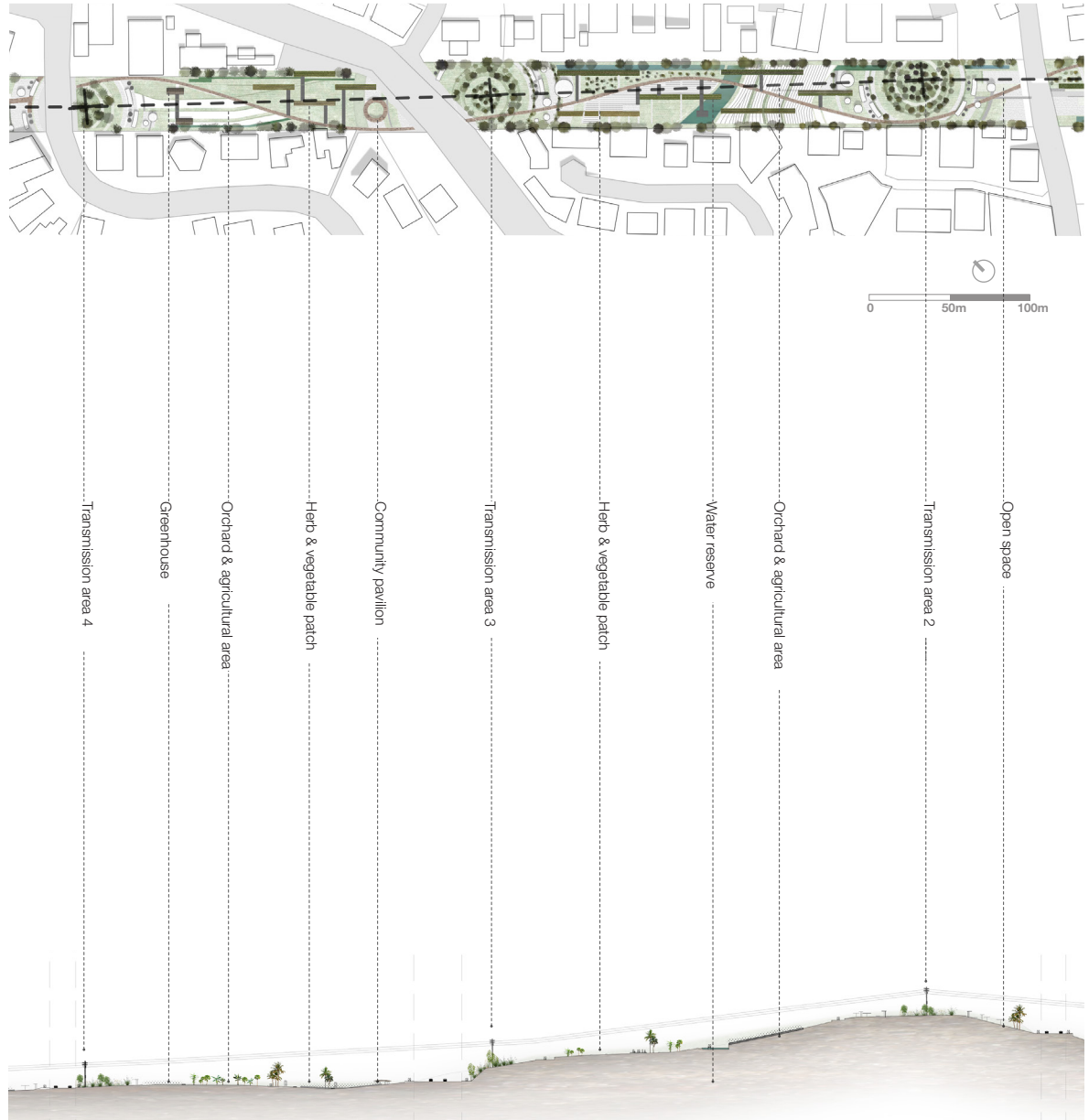


PARCEL 4

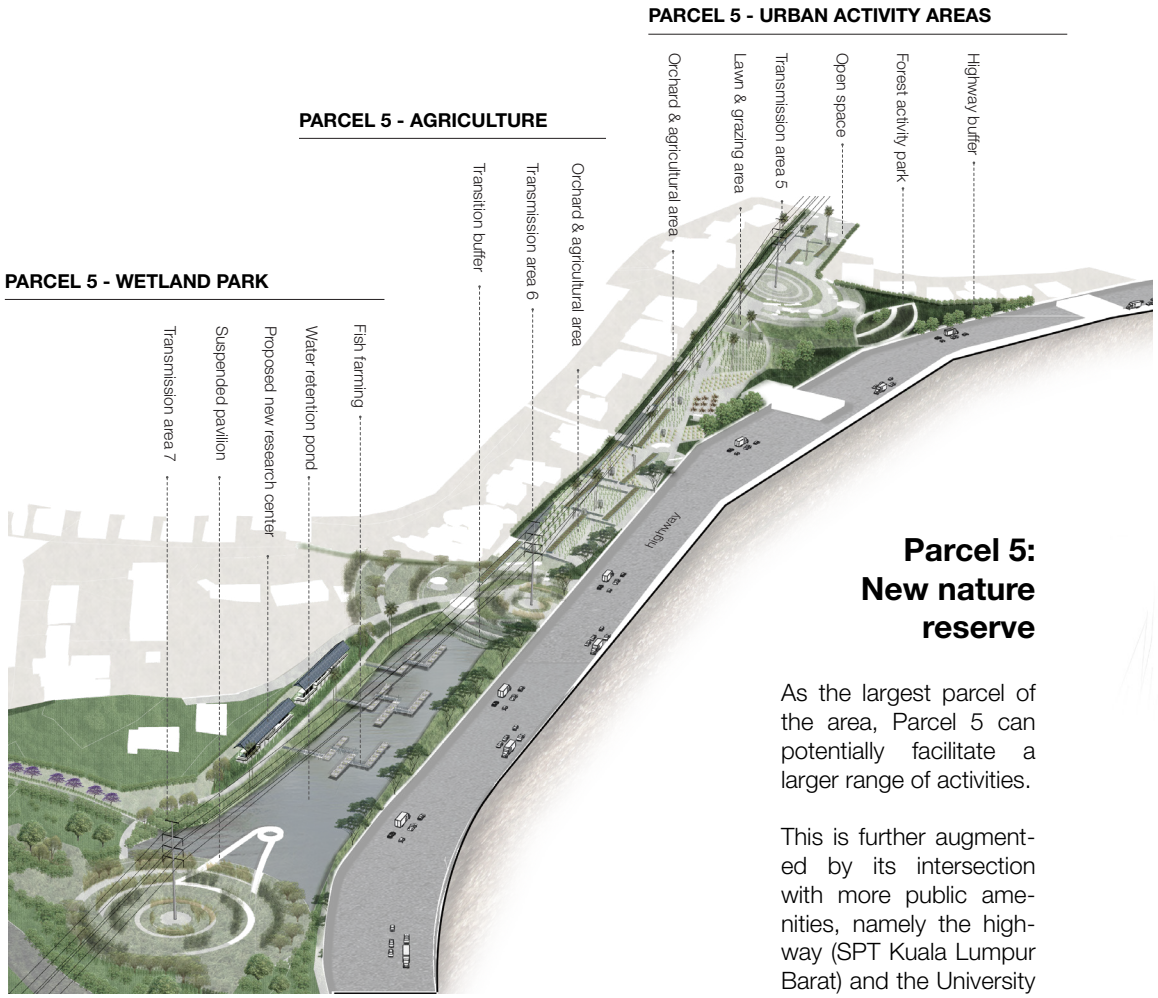
Parcels 3-4: Agricultural Focus

Even though comparably the smallest collective area to other parcels, this sequence of the masterplan has the most number of transmission towers.

This contributes to a lack of open activity spaces, which can be utilised towards more intensive farming practices, with added variety of a water reserve for fish farming.



PARCEL PLANS



Parcel 5: New nature reserve

As the largest parcel of the area, Parcel 5 can potentially facilitate a larger range of activities.

This is further augmented by its intersection with more public amenities, namely the highway (SPT Kuala Lumpur Barat) and the University Malaya.

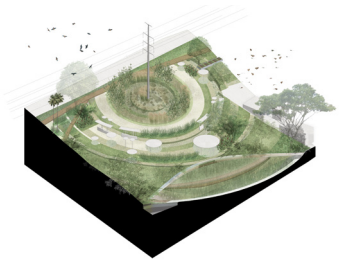
On the other hand, this Parcel holds more unique natural morphology, which is incorporated into the programming of an improved and utilised wetland area.

LANDSCAPE PROGRAMS

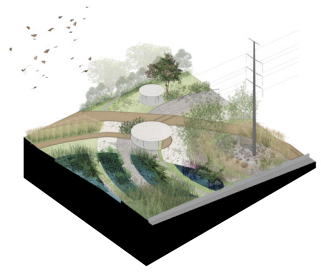
Environmental typologies

The landscape programs are specific typologies of space that are mapped along the whole area.

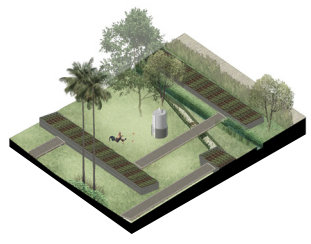
They symbolise the various characters of the land, in relation to their potential for specific users and activities.



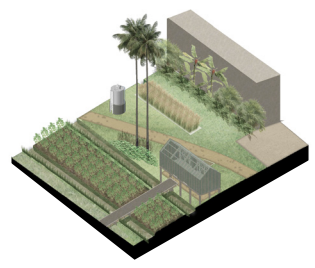
Transmission buffer



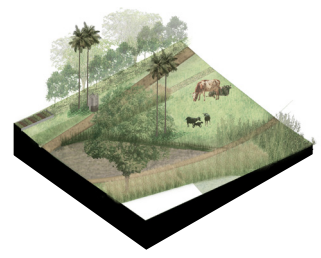
Transition buffer



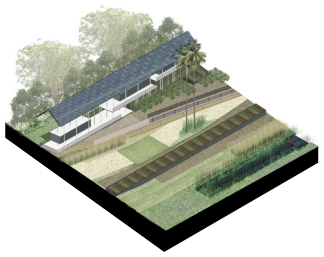
Herb & vegetable patch



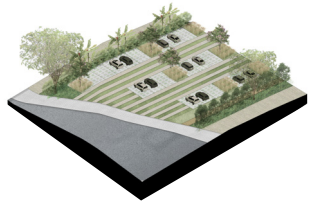
Crop farming



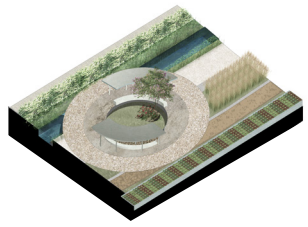
Livestock grazing



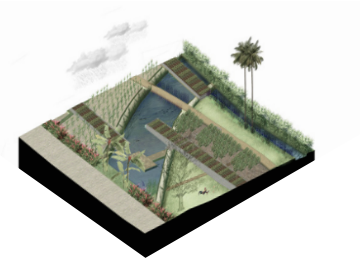
Workshop



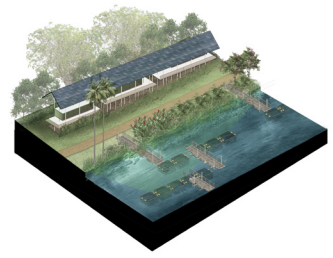
Parking



Community pavilion

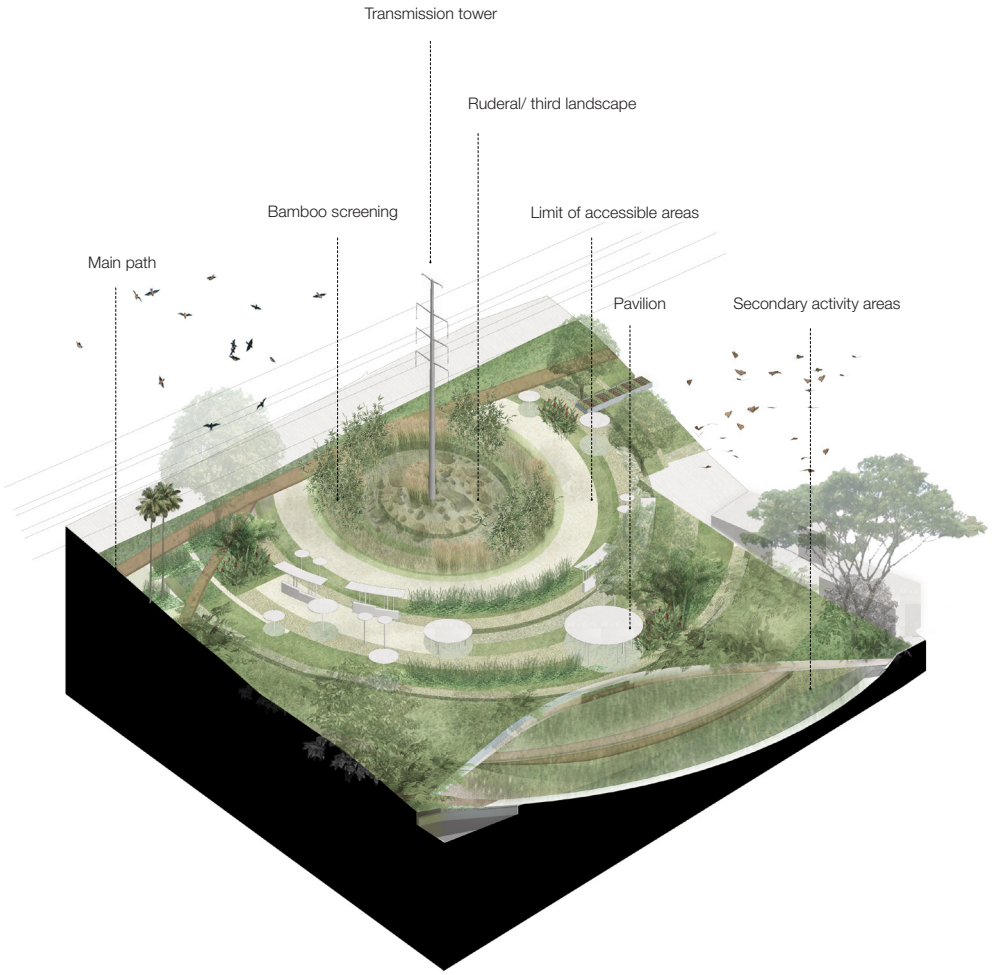


Water reserve



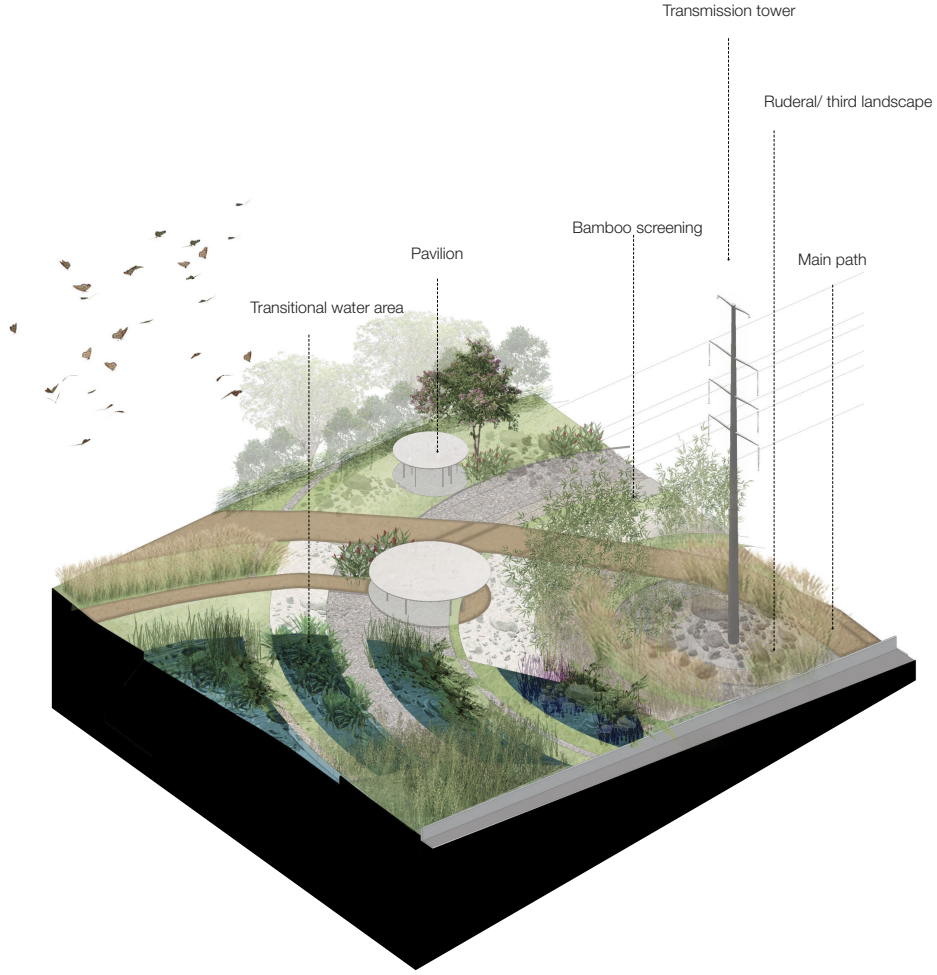
Fish farming

LANDSCAPE PROGRAMS



Transmission buffer

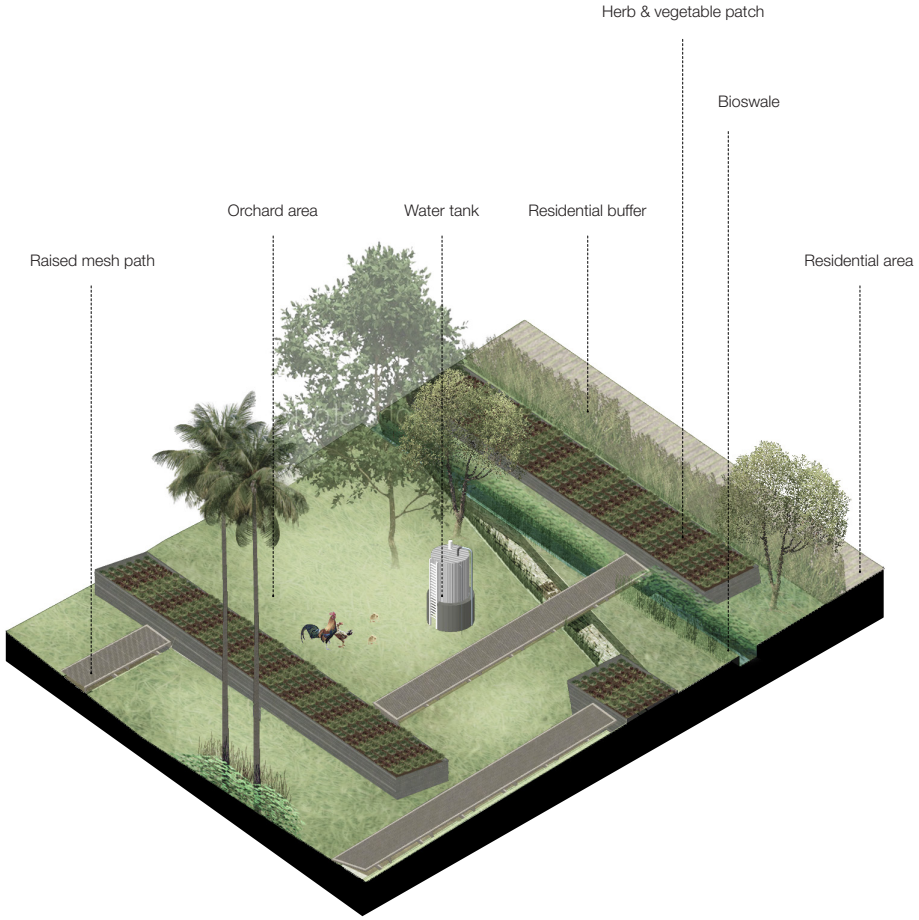
Light prefiguration using different types of natural groundcover, combined with screening vegetation and pavilions around the outer accessible limits of the clearance area.



Transition buffer

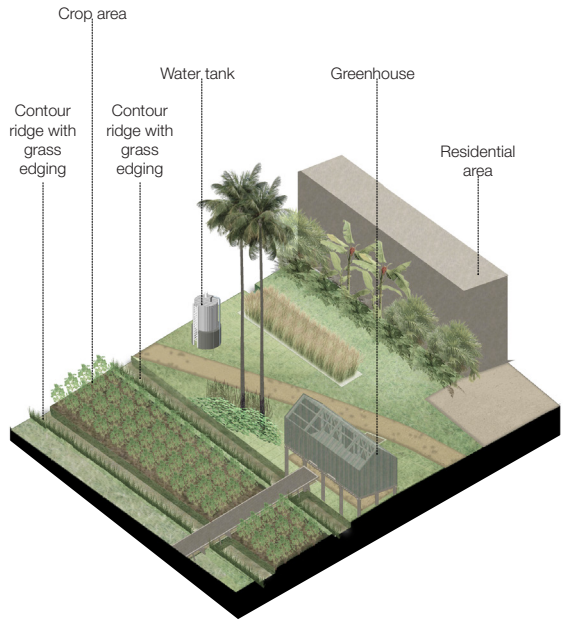
Meeting point between dry transmission buffers and intensive wetland area. Water is slowly introduced in between the clearance pattern.

LANDSCAPE PROGRAMS



Herb & vegetable patch

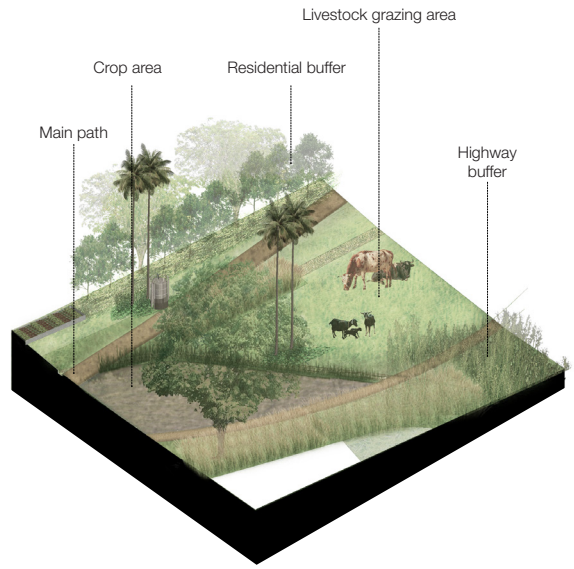
Loose linear configuration of measured allotments, water tanks and raised mesh pathway made of corrugated metal. Can be combined with orchard area to initiate vegetative cover and produce shaded spots for rearing livestock.



Crop farming area

Open ground planting managed with agroecology techniques for crops requiring deeper soil and climatic requirements.

Organised over slopes using contour ridging methods.

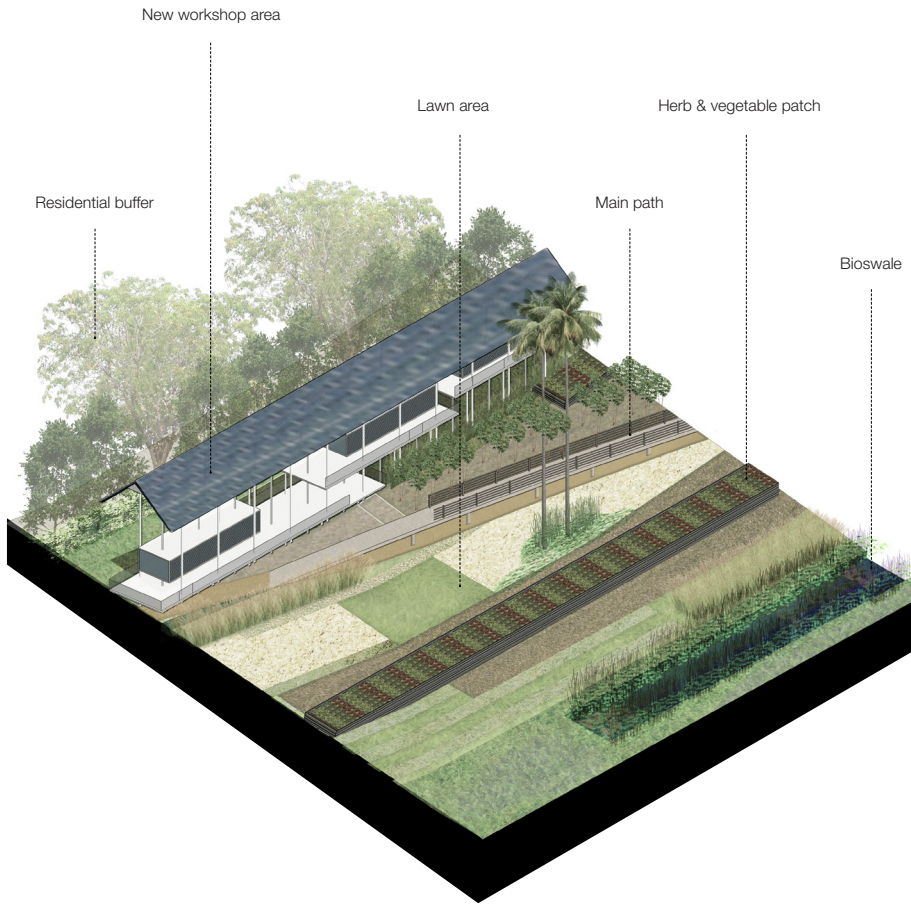


Livestock grazing

Land unused for agriculture, or in between planting periods, intensively cultivated with grass for animal feed.

Recommended placement around more open/ public areas for larger animals.

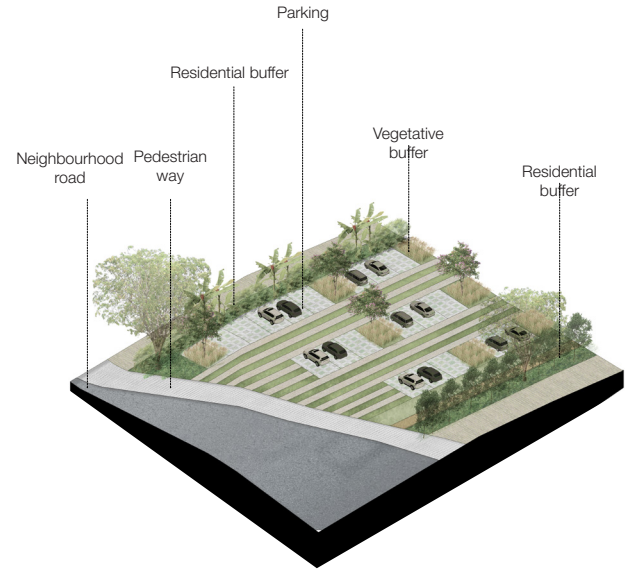
LANDSCAPE PROGRAMS



Workshop

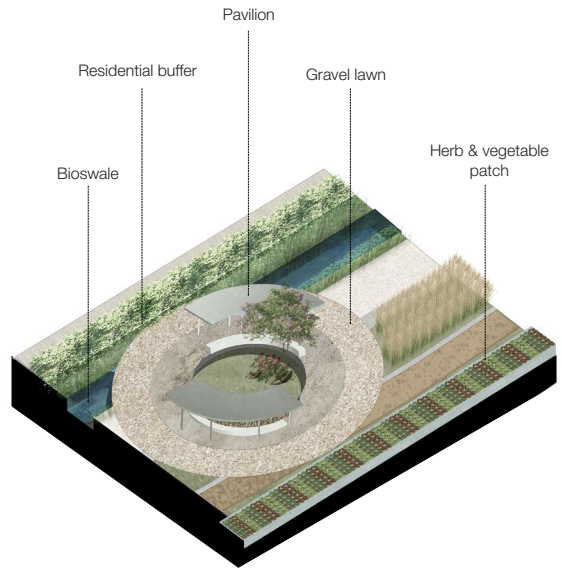
The main area for large numbers of human activity, intended for coaching and training to users of the site.

The building complements the linear configuration of the allotments, and is located along the main different environments of the landscape.



Parking

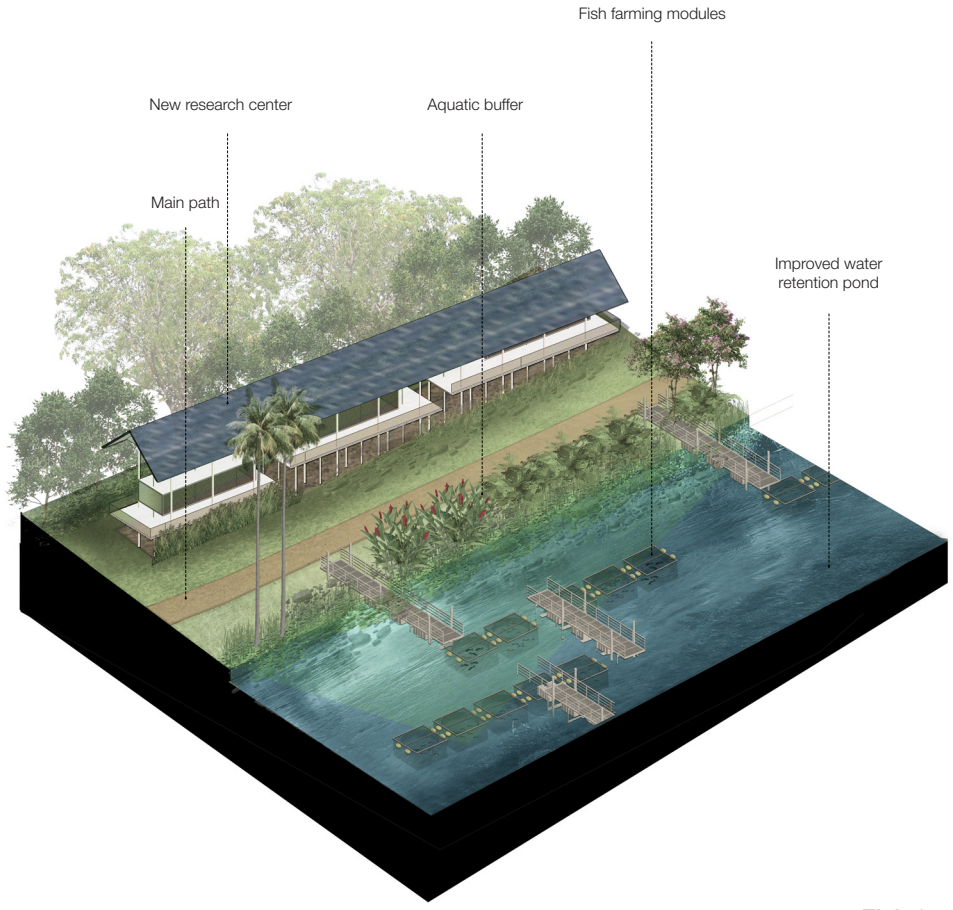
Most specifically programmed in Parcel 1, the parking ground uses permeable materials to ensure good water run-off while maintaining stable ground for vehicles.



Community pavilion

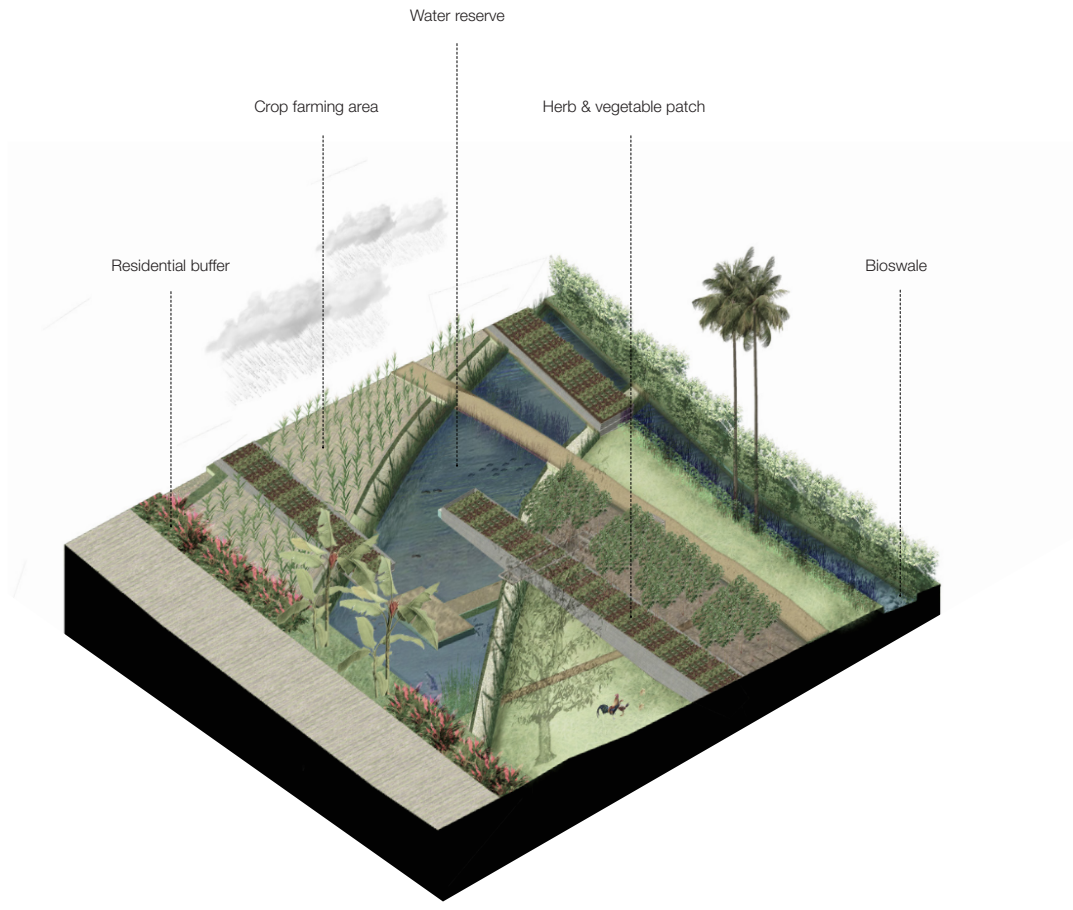
Circular form mimics the main clearance theme, located in the urban edges of the site, complementary to the various environments in the area.

LANDSCAPE PROGRAMS



Fish farming

Located in the improved water retention area at the end of the site. Its proximity to the University Malaya Center for Research in Biotechnology for Agriculture (CEBAR) and a zero waste center can be utilised to host a dedicated center to improve the quality of agriculture across the landscape.



Water reserve

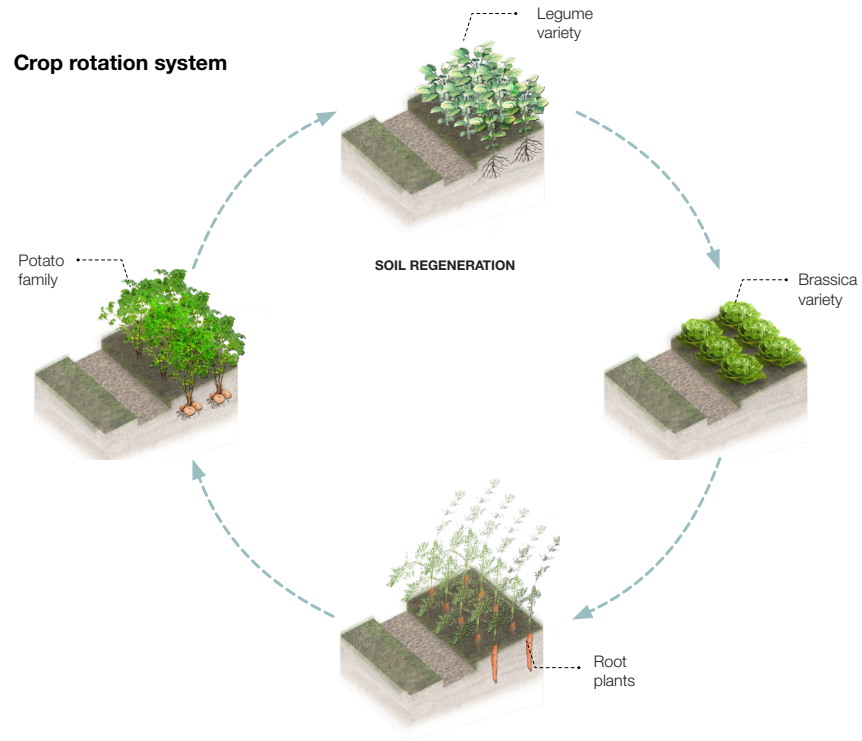
Smaller pocket of water intended to hold water run-off over sloping ground. Located next to crop farming area, the watery area can hold smaller fish farming activities.

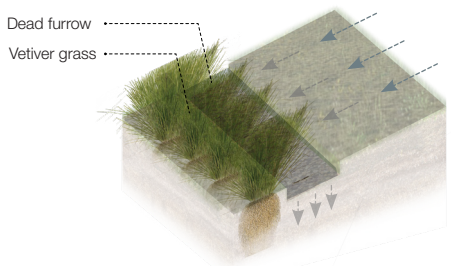
AGRICULTURAL SYSTEM

The areas destined for agriculture is designed with consideration for agroecological practice.

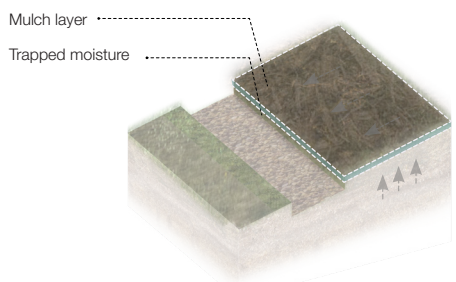
This ensures that while the land is cultivated, the soil is also duly conserved, thus ensuring its sustainability over longer periods of time.

Promoting good practices

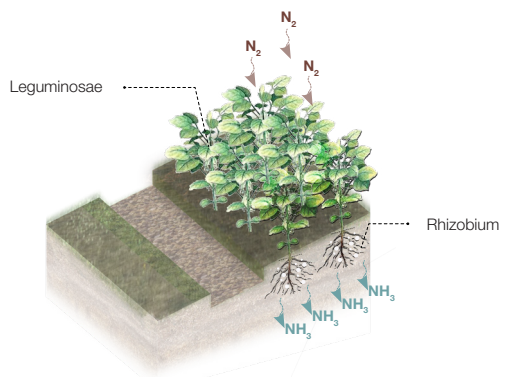




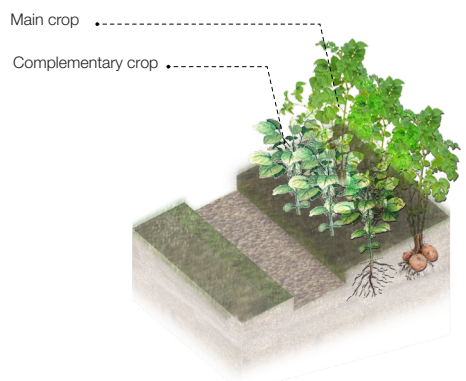
Run-off prevention



Moisture retention



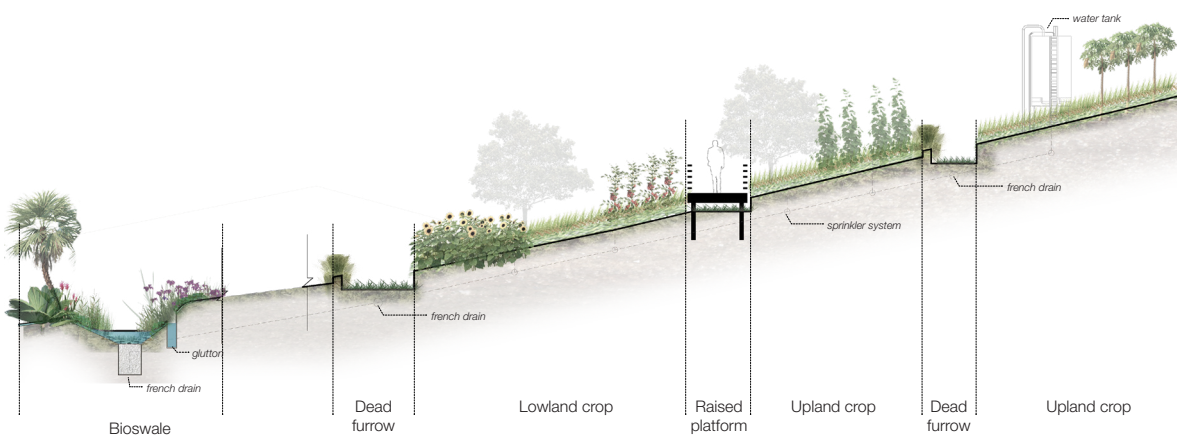
Soil remediation



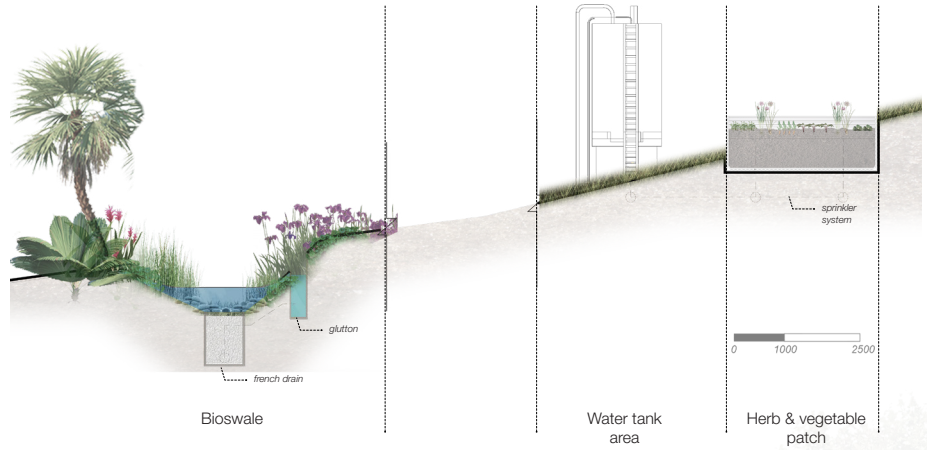
Companion planting

AGRICULTURAL SYSTEM

AGRICULTURAL DRAINAGE SYSTEM



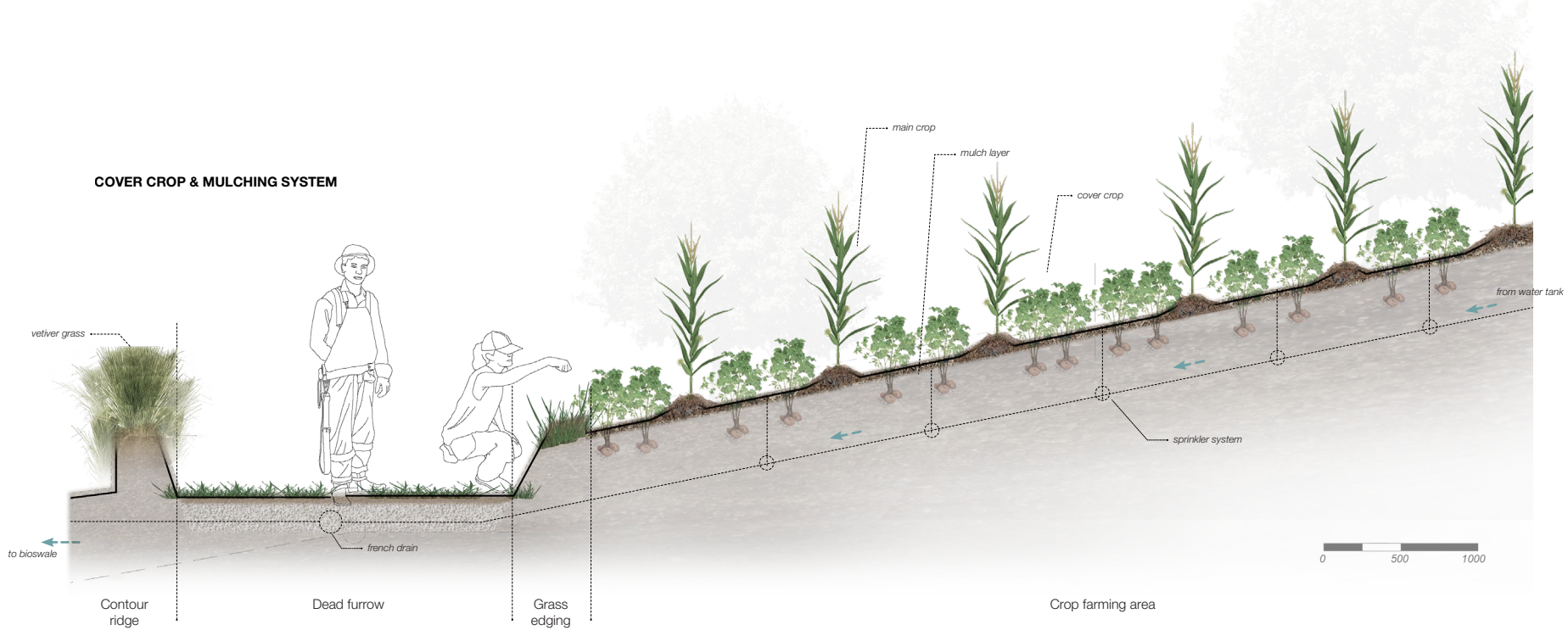
ALLOTMENT DRAINAGE SYSTEM



Hidden drainage

To ensure a controlled water supply, a drainage network that works together with water tanks, water reserves, and bioswale, is necessary. The network can be hidden to optimise on-ground landscape uses.

COVER CROP & MULCHING SYSTEM



INTEGRATED SYSTEMS

Combined landscapes

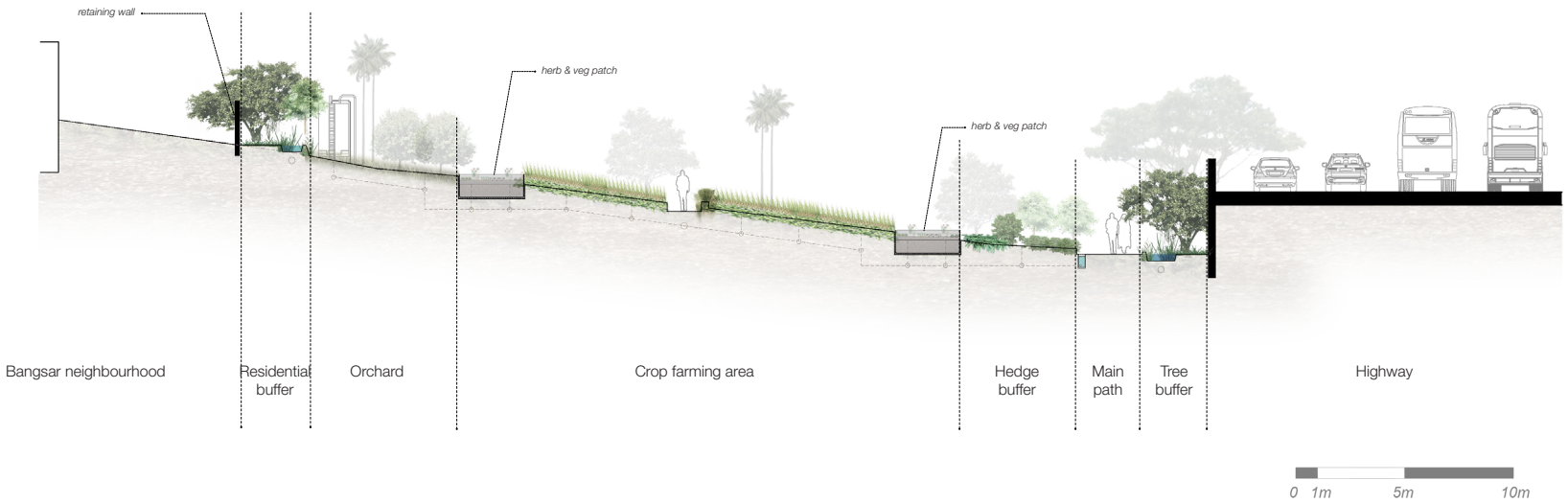
The agricultural system is then incorporated with the other different environments in the landscape. The result is several types of systems that creates a variety of landscape expressions along the site.

RESIDENTIAL - AGRICULTURAL - RESIDENTIAL SYSTEM

CONTOURED AGRICULTURAL SYSTEM

INTEGRATED SYSTEMS

RESIDENTIAL - AGRICULTURAL - HIGHWAY SYSTEM



Environmental buffers

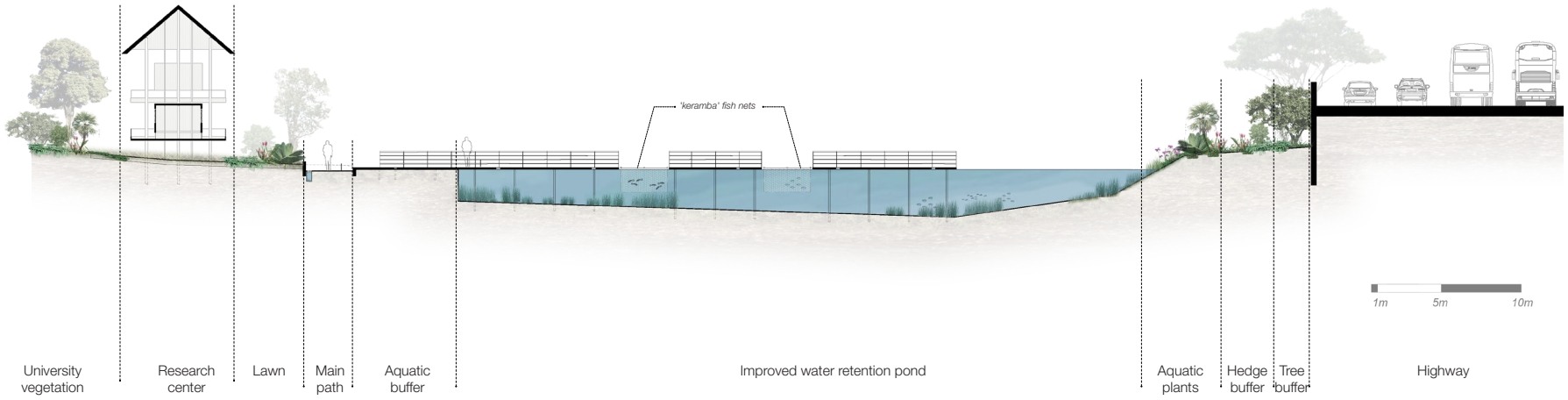
Special consideration is given towards areas near the highway, where stronger environmental buffers are required.

Existing street trees need to be paired with hedges and groundcover vegetation to counter the direct impact of pollution from the roadway.

Aquatic environments

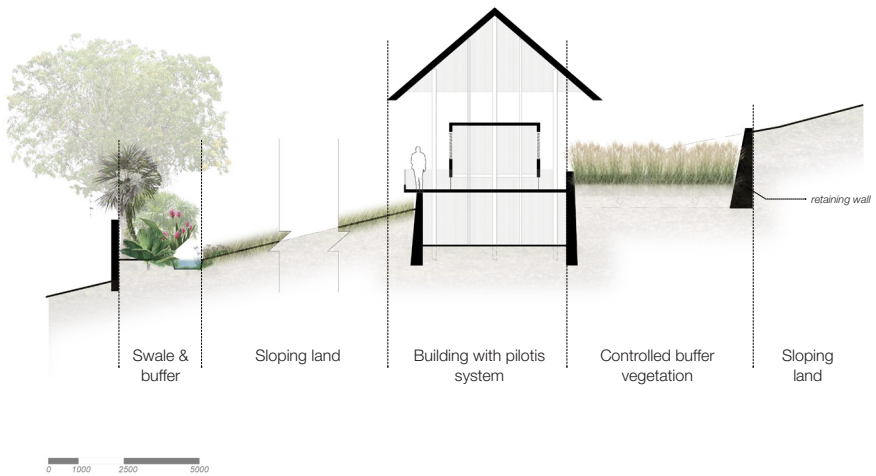
In aquatic environments (including bioswales, water reserves and water retention ponds, the presence of aquatic plants can help to naturally conserve the environmental health of the water bodies.

RESEARCH CENTER - FISH FARMING - HIGHWAY SYSTEM

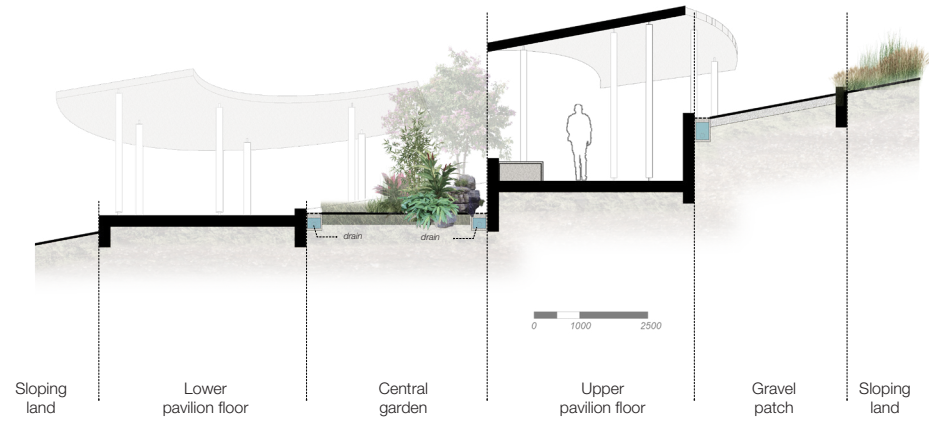


INTEGRATED SYSTEMS

LAND- BUILDING RELATIONSHIP



PAVILION STRUCTURE SYSTEM

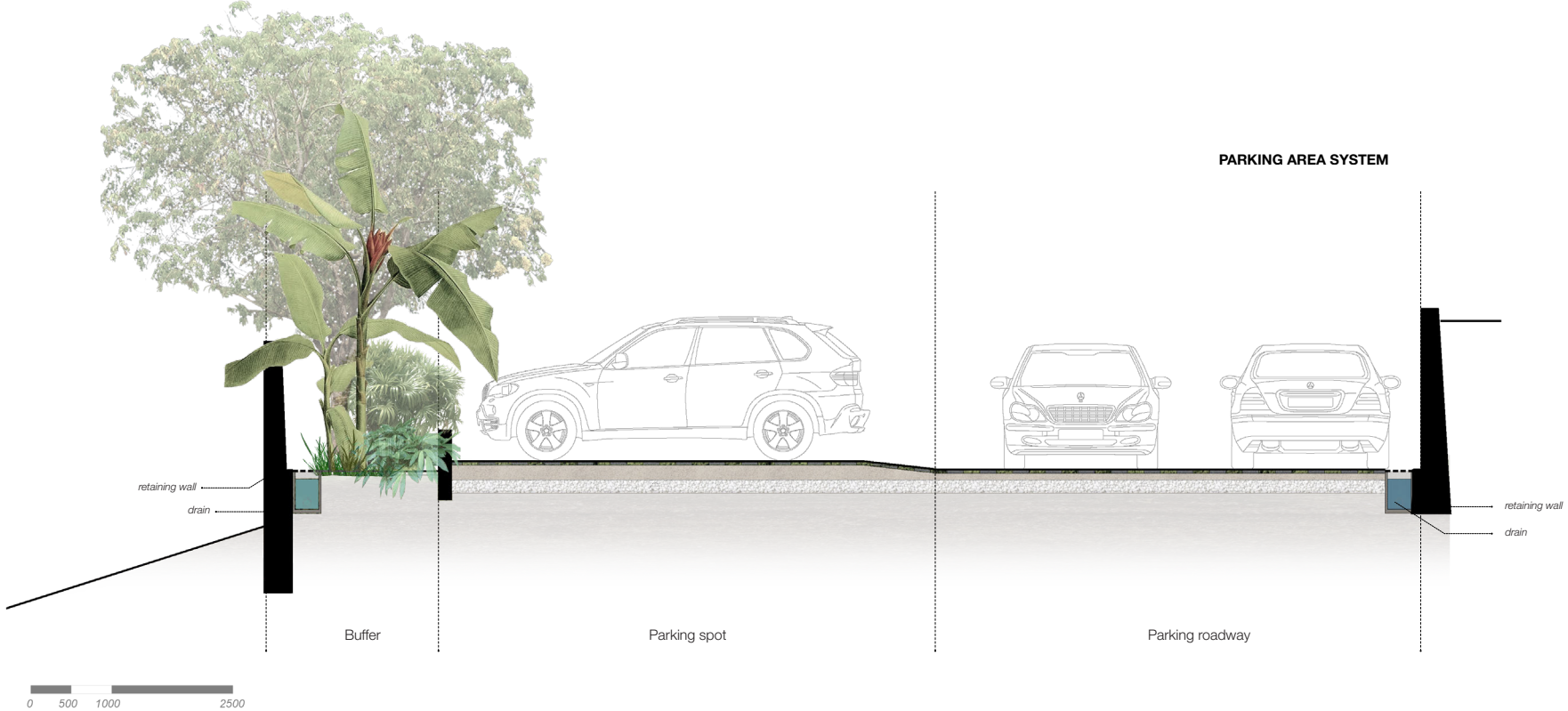


Retaining walls

Within areas of human activity, retaining walls are required to further secure the environment for human activitiy.

These walls can be in the form of rough concrete walls made to age and weather over time.

PARKING AREA SYSTEM

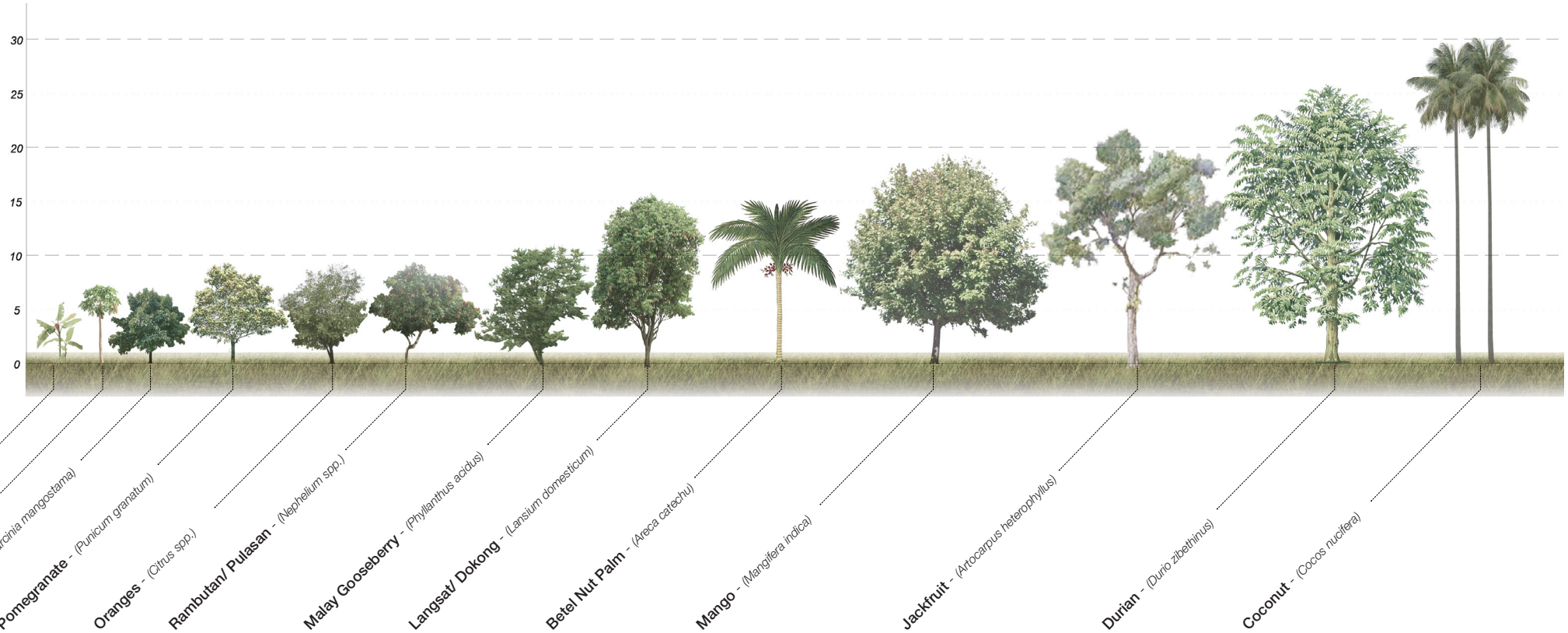


ETHNOBOTANICAL RECOMMENDATIONS

Village orchard areas

The formation of village orchard patches in between the open agricultural area not only functions as natural shade cover for crops, but also as a testament to local vegetation traditions of old Selangor.

The selection is predominated by fruit trees, which can also contribute towards the variety of nutrition produced within the site.

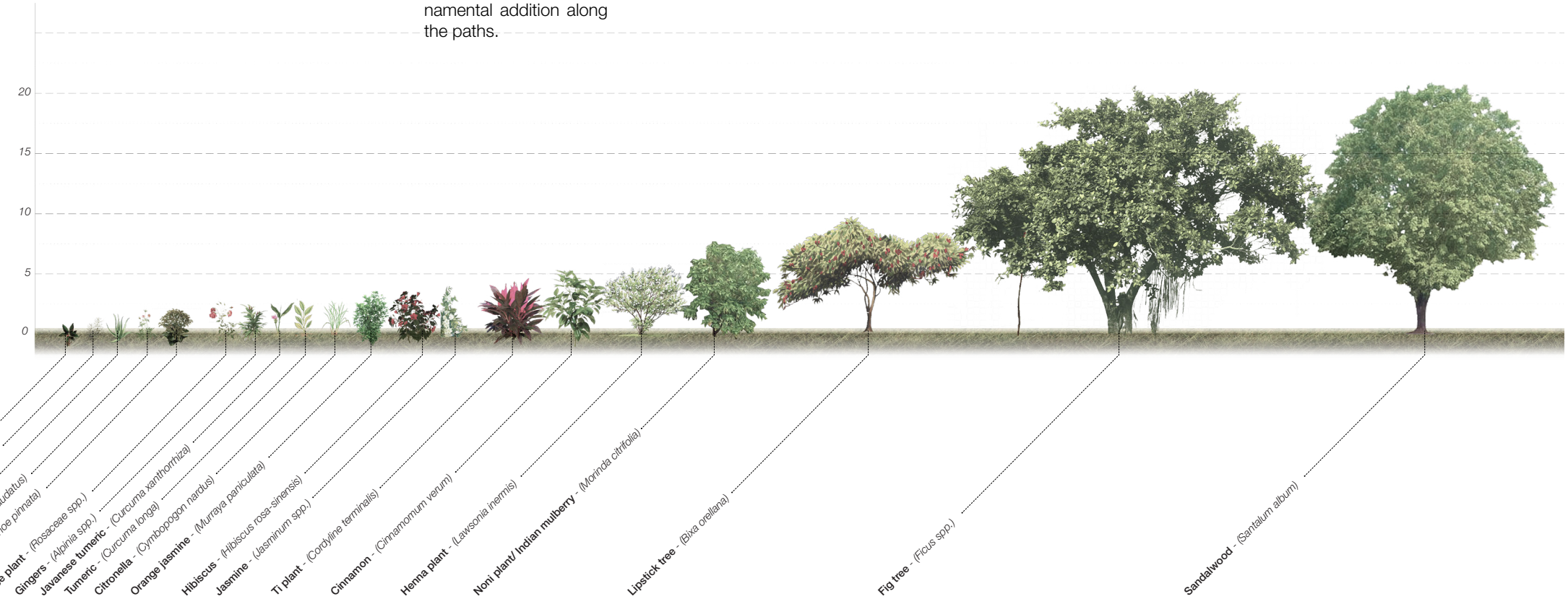


ETHNOBOTANICAL RECOMMENDATIONS

Buffer areas

With the variety of local available, buffer areas can also be another opportunity to introduce ethnobotanical plants.

Leafy shrubs can be placed along the site edges, while more flowery shrubs can be ornamental addition along the paths.

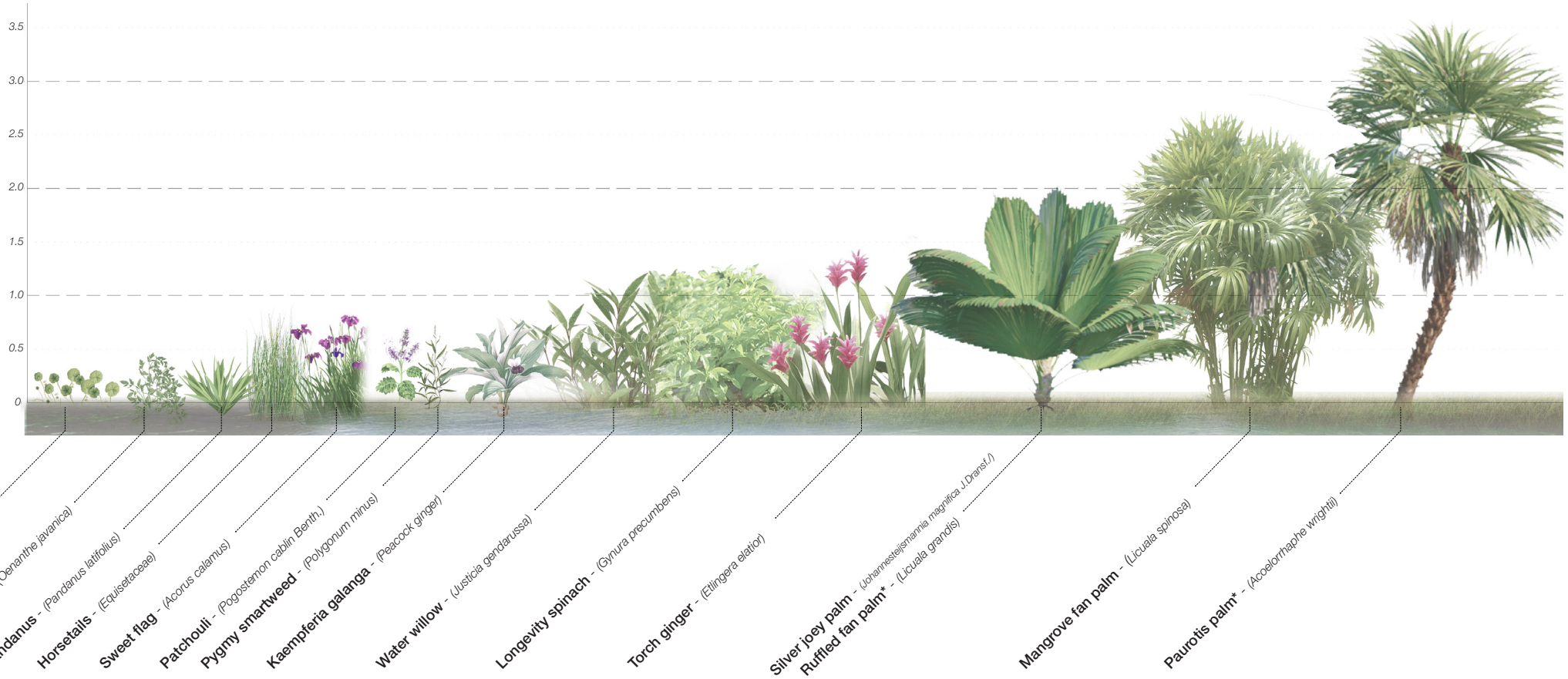


ETHNOBOTANICAL RECOMMENDATIONS

Aquatic environments

Plants around aquatic environment can range from species growing in water to muddy and marshy areas.

Water plants can help assist purification, while the other shrubs chosen could be more ornamental.



*Additional decorative species

Future of cities, future of farming

As cities face burgeoning post-industrial challenges, new questions are being called everyday upon its nature, form, and purpose.

Cities have become more permanent and ever more important at facilitating standards of living; it is highly inescapable that they will play a more central role in the provision and sustenance of food for its citizens.

The most sustainable cities will strive to prepare the right space, facilities and resources to support the resiliency of their residents in the future.

08

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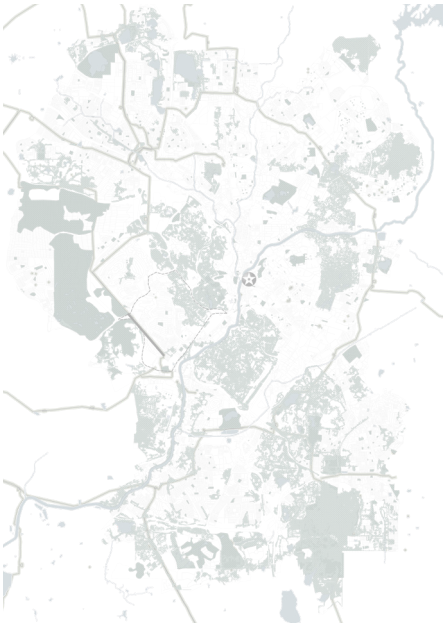

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