



# I | *introduction*



## “Modern Urbanism and Industrialization”

The world is seeing immense urbanisation and transformation in the 21st century. Modern urbanism, a multi-disciplinary topic embracing urban planning, architecture, and development, provides insights and techniques for navigating the difficulties of modern cities. Modern urbanism is a fluid and developing strategy that adapts to the unique requirements and goals of each area and community, rather than a set of fixed or strict principles. Modern urbanism is a group of connected movements that share certain similar aims and principles, such as New Urbanism, Smart Growth, Eco-Cities, Transit-Oriented Development, and others.

A country's economy shifts from being dependent on agriculture and handicrafts to industry and services as it undergoes industrialization. The expansion and concentration of people in urban areas, or urbanisation, typically follows industrialization. The social and physical structure of society is significantly impacted by industrialization and urbanisation because they give rise to new modes of culture, mobility, consumption, and communication.

Prompt: “seascape in rural areas with harbor, housings, and brownfields, in realistic and black and white”

Generated by: Copilot Bing



## “The Issue”

On the other hand, **a number of issues** and concerns are also brought about by industrialization and urbanisation, including *spatial fragmentation* and *social segregation*.

*Urban space* can become *fragmented and isolated* owing to several factors such as the growth of gated communities, low-density suburbs, commercialization of public areas, and inadequate integrated planning. This speaks to the strong spatial and social forces that “unmake” the city. The life and death of the urban are entwined in this context, where the city is made and unmade. This process frequently results in the creation of isolated pockets within the city where resources and opportunities may be distributed unevenly, which can exacerbate social inequality.

The idea of “fragmentation” frequently points out the distance, division, and mutual isolation that exist between various social classes and groups in the city. Due to possible unequal distribution of opportunities, resources, and services throughout the city, this may result in social inequality. Distinguishing and isolating various social groups on the basis of their income, education, ethnicity, religion, or other attributes is known as social segregation.

This phenomenon is frequently brought about by the unequal distribution of opportunities, resources, and services, the development of social networks and identities, and the persistence of discrimination and prejudice.

Prompt: “seascape in rural areas with harbor, housings, and brownfields, in realistic and black and white”

Generated by: Copilot Bing



## “Batam as Industrial City & Free Trade Zone”

In the 1970s, the Batam Authority Agency/Badan Otorita Batam (BOB), also known as the Batam Island Industrial Area Development Authority, designated Batam Island as an industrial area work environment with the initial goal of making Batam the Singapore of Indonesia. This was done in accordance with Presidential Decree number 41 of 1973. These days, BOB has become BP (Badan Pengusahaan) Batam is a concession agency.

After being designated as an industrial area, investors began to arrive and move Batam's economy slowly but surely. Republic of Indonesia Government Regulation Number 46 of 2007 concerning Free Trade Zones and Free Ports in Batam determines Batam City as one of the Free Trade Zones (FTZ). According to Charles W. Thurston in Harahap (2018), FTZs are basically designated state tax-free areas with rules that encourage investment. The general aim of the FTZ scheme is to increase economic growth. The establishment of the FTZ encouraged rapid growth in various socio-economic sectors of Batam City.

The most notable factor contributing to growth is the expanding built-up land area, which experiences significant annual increases. Two decades following the establishment of Batam Island as an administrative region, there was a marked surge in industrial activity, marking the onset of this extensive expansion (Saputra & Rachmawati, 2015). This expansion is driven by the growing demand for space for residential, commercial, and ancillary facilities, often leading to conflicts between land use requirements and adherence to allocation plans (Khadiyanto, 2005). This underscores the importance of effective spatial planning to maximize land utilization.

The built-up area expansion in FTZ Batam from 2000 to 2015 was increased from 5,523.6 hectares in 2000 to 7,925.2 hectares or by 43.48% in 2015. The built-up area sprawled increasingly toward the outskirts of FTZ Batam, as identified in Sekupang, Batam Kota, Sagulung, Batu Aji, and Nongsa Districts.

**Figures Source:** Future Prediction of The Expansion of Built-Up Area in Batam Free Trade Zone (FTZ) Using Land Change Modeler, 2021



*Land Cover Map in 2000*



*Land Cover Map in 2015*



## “The Expansion of Built-Up Area in Batam City”

The transformation of undeveloped land into developed areas extended from the west to the northwest and north, encompassing Batu Aji and Sagulung Districts, as well as Sekupang, Batam Kota Subdistrict, Nongsa Subdistrict, and the areas surrounding them. The distribution of previously existing built-up areas and the location of FTZ Batam's main activity centres are assumed to be the causes of this pattern and direction. The built-up area expansion in FTZ Batam from 2000 to 2015 was increased from 5,523.6 hectares in 2000 to 7,925.2 hectares or by 43.48% in 2015.

Significant growth has occurred in several socioeconomic sectors as a result of the FTZ designation's unique investment benefits. One specific illustration of this growth is the expansion of populated areas, which has increased significantly over time. It is anticipated that the built-up area will have increased by 31.8% over 2020 levels by 2035, bringing it closer to the FTZ Batam boundaries. It is expected that this growth will extend into existing open spaces and undeveloped forest regions.



Spatial Fragmentation in Batam City

Source: musnahterjinak/wikimedia  
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## “Idle Land Phenomenon in Batam City”

In urban areas, the distribution of rural residential land typically grows from the inner to the outer suburbs, then contracts in the outer suburbs and spreads to new locations. Growth as a result may become chaotic and inefficient. The conversion of green land into urban ecosystems in the form of housing, settlements, and industrial areas can lead to reduced water catchment areas, environmental degradation, including deforestation, air pollution, soil pollution, water pollution, and noise pollution. In addition, expansion can also lead to emergence of idle land, desertification and loss of habitat for certain species.

The issue of idle land remains a polemic for Batam City. The Batam Concession Agency (BP Batam) continues to work on resolving the issue of idle land in Batam. Idle land is land that has been allocated to a second party, but not utilised economically for a long time. There are several locations of idle land found, both in the city centre and in peripheral areas. In general, the locations found have several patterns in common, namely in areas that have become industrial and residential expansion areas.

BP Batam is aggressively managing idle land. According to BP Batam's records, the area of idle land reaches 7,777.01 hectares spread across 2,737 locations throughout Batam. The Head of the Batam Concession Agency (BP Batam) has also written to 580 owners of idle land in Batam City. The contents of the letter request that land owners immediately carry out development or at least land managers must submit a realistic business plan.

**Source:** Sultan, A. (2022, November 23). PT Batam Multimedia Korporindo. Metropolis. <https://metro.batampos.co.id/bp-batam-surati-580-pemilik-lahan-tidur-tidak-dibangun-bakal-langsung-diambil-alih/>







Source: Siregar, S. H. & Sutarno. (2018, March 19). 7.777 Hektar lahan tidur di batam dievaluasi. *Bisnis.Com*. <https://kabar24.bisnis.com/read/20180319/78/751625/7.777-hektar-lahan-tidur-di-batam-dievaluasi>

Source: Siregar, S. H. & Sutarno. (2018, March 19). 7.777 Hektar lahan tidur di batam dievaluasi. *Bisnis.Com*. <https://kabar24.bisnis.com/read/20180319/78/751625/7.777-hektar-lahan-tidur-di-batam-dievaluasi>



Source: <https://land8.com/pocket-parks-as-urban-acupuncture/>



## “Regenerate City through Urban Acupuncture”

In urban design and planning, the concept of “urban acupuncture” refers to the implementation of strategic interventions or small improvements within a city to catalyze positive change and address larger urban problems. Metaphorically, the term “acupuncture” suggests that these small actions can impact the overall health and vitality of a city in the same way that acupuncture needles target specific points to improve the body’s health. Similar to how an acupuncturist would target specific body points to treat particular disease, urban acupuncture would target specific areas, or “urban acupuncture points,” within a city. These points could be abandoned buildings, vacant lands, run-down neighbourhoods, or places with social or economic problems.

The goal of urban acupuncture is to make little, targeted adjustments to the urban landscape that can have a significant effect. These interventions can support the revitalization of abandoned areas, the progressive application of urban policies, or the consolidation of a city’s social infrastructure. For instance, a little park or community garden can be established in an abandoned area to enhance the surrounding area and serve as a hub for community activities. With the help of the Geographical Information System (GIS) method, it is easy to see the source points of disease spread across urban areas. This method also helps in diagnosing the character of the distribution pattern of buildings, greenfields, brownfields, and roads which play a major role in the city.



“R+B Embraces Role As Architect for  
the New Farm Collaborative Learning Center”

2024 | FADS | MicroPublicFarms

By ROWLAND+BROUGHTON ARCHITECTURE

Source: <https://www.rowlandbroughton.com/rb-embraces-role-as-architect-for-the-new-farm-collaborative-learning-center-at-cozy-point-ranch-in-aspen-colorado/>



## “Agriculture and Food Production for Improving Resource Sustainability”

The concept of recovery means rediscovering a good condition. Curing the disease of land vacancy which continues and will continue to occur in urban areas has its own challenges which are quite complex. Observant in seeing natural potential, regional conditions and the situation of local communities, able to provide views and ideas to be used as capital in preparing the formula. One way to heal empty land is by providing green space. Not just green space, but green space that is able to provide and fulfill basic human needs, food. Current conditions, prices of basic necessities continue to soar. Community independence in meeting these needs is an important goal in sustainability. So, without having to depend on certain parties, local communities are able to create their own food industry.

Encourage urban agriculture and food production projects to boost food production locally, enhance food security, and cut down on food miles from transit, such as community gardens, rooftop farms, and vertical gardens. To encourage access to fresh, locally farmed products, support neighbourhood farmers markets and community-supported agricultural initiatives. By integrating urban agriculture with permaculture design principles, self-sufficient and regenerative food systems can be established. The three main tenets of permaculture are resource efficiency, diversity of plant use, and emulation of natural ecosystems. In order to create resilient and fruitful food-producing landscapes within urban environments, permaculture urban farms incorporate elements like composting, rainwater harvesting, companion planting, and agroforestry.



# “Design Problem Study”

## Problem Statement

Based on the backgrounds and preliminary studies described previously, the following problem formulations are obtained:

### *General Problems*

How can idle land caused by spatial fragmentation and social segregation from industrialization in Batam City be regenerated by designing a Community-Based Facility as Urban Acupuncture through food production to form an independent, sustainable local community?

### *Specific Problems*

1. How to design a micro place so that it can heal an idle land that is spread across industrial and residential areas?
2. How can the micro-space design meet food needs through independent and sustainable agriculture and livestock farming?
3. How to organize the design so that it can survive and continue to be sustainable in order to improve the social, economic and welfare conditions of local communities?

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## Goals and Objectives

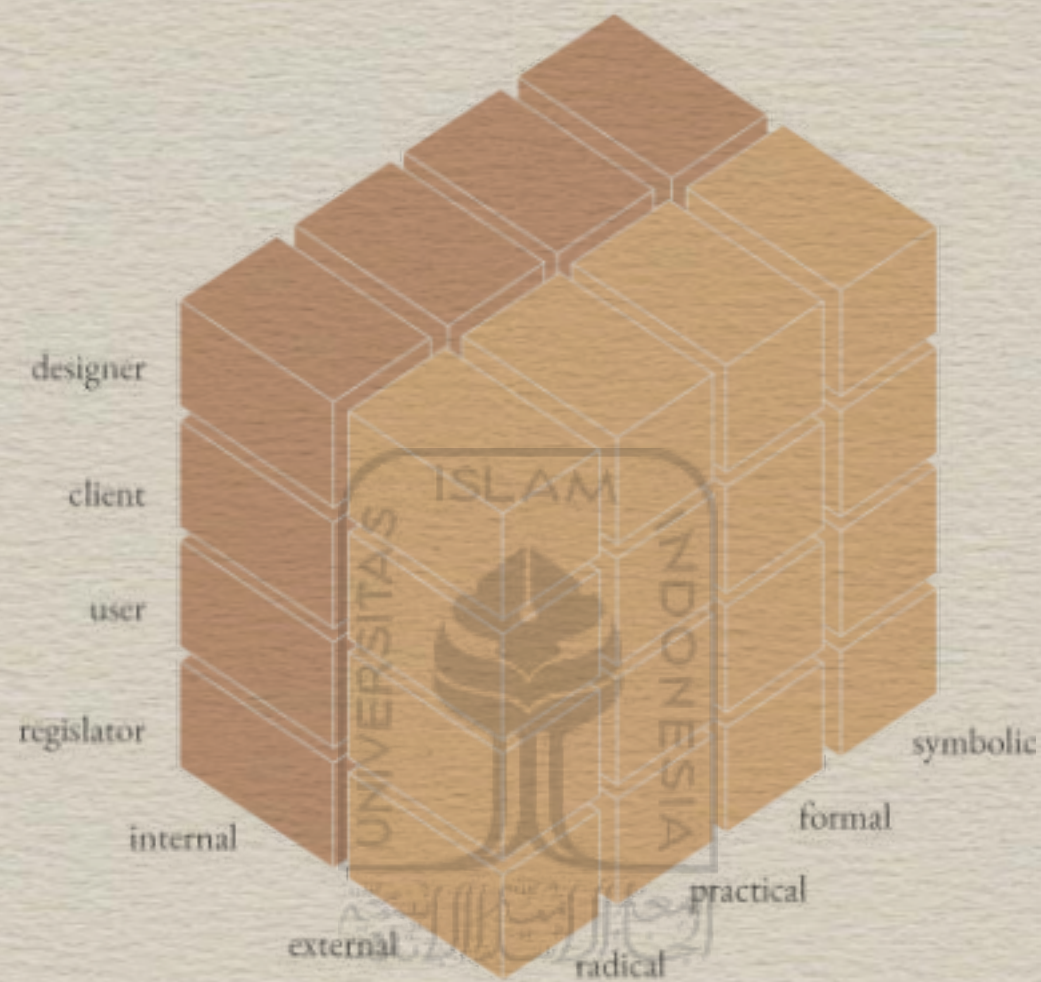
### *Goals*

The design of a micro public space aims to be a collaborative intervention medium between local community, industry and local government in utilizing and regenerating idle land through the production of food needs, in order to form an independent and sustainable local community. The design can also adapt to the temporary of time and natural conditions through the flexibility of design construction, so that it is able to grow and spread to points where the source of disease is located.

### *Objectives*

1. Mapping areas affected by idle land disease, especially those resulting from the expansion of industrial and residential areas
  2. Able to provide a micro public place for local communities in creating green spaces that meet sustainable food needs
  3. Designing a micro public place with integrated construction technologies such as modularity and fabrication method
-





“Design Problem Thinking Matrix”

Examples of design thinking include the integration of science and design, image design, and the traditional design thinking methodology, according to Lawson (2005). As per the thinking approach, the integration of design and science enhances the thoroughness of the creative process and enables a scientifically solid evaluation.



“Design Problem Thinking Matrix of Lawson”

|                                                                                                                                                                                                                                                 | Formal Problem                                                                                                                                                                                                                                                                                                                                   | Practical Problem                                                                                                                                                                                                                                                                                                                                                                                                                       | Symbolic Problem                                                                                                                                                                                    | Radical Problem                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Regulations</b><br><br>- Batam City Regional Regulation Number 7 of 2021: Regional Medium Term Development Plan 2021-2026<br><br>- United Nations   Department of Economic and Social Affairs: The Sustainable Development Goals Report 2023 | <b>BATAM CITY REGIONAL REGULATION NUMBER 7 OF 2021</b><br><b>Regional Medium Term Development Plan 2021-2026</b><br><i>Chapter IV</i><br><br>- Promote urban farming culture in the community, at least to meet household needs (subsistence);<br><br>- Empowering communities through new planting methods with a land optimization orientation | <b>BATAM CITY REGIONAL REGULATION NUMBER 7 OF 2021</b><br><b>Regional Medium Term Development Plan 2021-2026</b><br><i>Chapter IV</i><br><br>- Creating a technology-based urban farming pilot project that suits the conditions of Batam City through the use of idle land, aiming to disseminate agricultural technology in inviting people to farm on their own land with the support of cheap and effective agricultural technology | <b>BATAM CITY REGIONAL REGULATION NUMBER 7 OF 2021</b><br><b>Regional Medium Term Development Plan 2021-2026</b><br><i>Chapter IV</i><br><br>- Preparing an agricultural grand design in Batam City | <b>UNITED NATIONS DEPARTMENT OF ECONOMIC AND SOCIAL AFFAIRS</b><br><b>The Sustainable Development Goals Report 2023</b><br><i>2: Promote Sustainable Agriculture</i><br><br>- Urgent coordinated action and policy solutions are imperative to address entrenched inequalities, transform food systems, invest in sustainable agricultural practices, and reduce and mitigate the impact of conflict and the pandemic on global nutrition and food security |
| <b>Users</b><br><br>- Batam Local Community<br>- Batam City Government<br>- BP Batam                                                                                                                                                            | <b>Livestock farming</b><br><br>Providing a place to learn farming with the latest methods to fulfil household needs                                                                                                                                                                                                                             | <b>Sustainable Agri-Community</b><br><br>By utilising agricultural technology, the sustainability of food production will be more effective and maintained                                                                                                                                                                                                                                                                              | <b>Agriculture Area</b><br><br>A place of collaboration between communities who work together to grow crops, livestock, to fulfil their needs and green the environment                             | <b>Sustainable Food Security</b><br><br>Able to utilise micro public place as a medium to maintain self-reliance in fulfilling daily needs                                                                                                                                                                                                                                                                                                                  |
| <b>Clients</b><br><br>- Batam City Government<br>- BP Batam                                                                                                                                                                                     | <br><br>Developing agricultural infrastructure as a place to conduct outreach and cultivation for the community                                                                                                                                                                                                                                  | <br><br>Regenerate the spatial of the city with the agricultural technology                                                                                                                                                                                                                                                                                                                                                             | <br><br>Become an infrastructure, a place of learning for the community in creating a sustainable agricultural industry centre in Batam City                                                        | <br><br>The local government plays the role of initiator and regulator in realising new supportive infrastructure with the community.                                                                                                                                                                                                                                                                                                                       |
| <b>Designers</b><br><br>- The Architect                                                                                                                                                                                                         | <b>Refined-Agriculture Typology</b><br><br>Create a new typology of architecture for agriculture that can provide the food needs and regenerate the city spatial                                                                                                                                                                                 | <b>Regenerate of City Spatial</b><br><br>Regenerate vacant land into a micro place for farming using integrated technology to create a sustainable food cycle for community                                                                                                                                                                                                                                                             | <b>Urban Acupuncture for City</b><br><br>Puncturing micro-public places that regenerate vacant land and spread to disease hotspots across the city                                                  | <b>Sustainable &amp; Independent Fulfilment of Food</b><br><br>The community is able to create an independent agricultural industry that is sustainable and applied in its neighbourhood                                                                                                                                                                                                                                                                    |



“Table of Abductive Reasoning Based on Lawson’s Book”

| WHAT                                                                                                                                                                                                                                                                                                                                   | HOW                                                                                                                                                                                                                                                                                                                                                                                                                                                             | VALUE                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Describe “imaginative” building that fulfill the most important design problem in the matrix                                                                                                                                                                                                                                           | Describe the design strategies/ framework (pattern, force, and concept-based)                                                                                                                                                                                                                                                                                                                                                                                   | Describe expected value/additional value, goals with your design                                                                                                                                                                                                                                                                                                                                                                                                        |
| <div>Alternative 1</div> <div>A micro collaborative public place that grows gradually and then becomes whole in a vacant area according to the needs of the process of function and substance, by applying a horticulture plantation that grows throughoutly, and ends up being spread throughout the points of the vacant area.</div> | <div>- Mapping vacant areas scattered throughout the city with the elemental boundaries of industrial, residential, and open brownfield areas</div> <div>- Applying the concept of disassembly design through modular and fabrication by utilising industrial waste such as: containers, wooden pallets, and pipes</div> <div>- Injecting the design into the vacant area just like acupuncture needles are pricked into the source point of the disease.</div> | <div>- Become a collaborative intervention medium between local community, industry and local government in utilizing and regenerating idle land through the production of food needs, in order to form an independent and sustainable local community</div> <div>- Adapt to the temporary of time and natural conditions through the flexibility of design construction, so that it is able to grow and spread to points where the source of disease is located.</div> |
| <div>Alternative 2</div> <div>A structural design or micro public installation with dimensions and shapes that adapt to the conditions of the area, a structure that is easily removable but can still be used as a planting medium.</div>                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |



“Excellence, Originality and Novelty”

The design of MicroPublicFarms as Urban Acupuncture in Batam City has never been done by any party. Some themes that specifically or indirectly use urban acupuncture and modular design as an method or approach can be found. Issue and focus on the project differ from each other from the author proposed title. To avoid plagiarism in the process of preparing report and planning, these are some reference use:

Design of Flood Resistant Housing in Tambelan Sampit Riverfront with the Open Building Approach

Author : Muhammad Kemal Adro  
Institution : Universitas Islam Indonesia  
Publication : 2021  
Similarity : Typology  
Difference : Design Approach and Location

Perancangan Edu-Permaculture Sebagai Skenario Restorasi Bekas Tambang Emas di Gunung Tumpangpitu Banyuwangi

Author : Muhammad Naufal Al Fikri  
Institution : Universitas Islam Indonesia  
Publication : 2022  
Similarity : Permaculture System  
Difference : Typology and Location

Perancangan Pondok Pesantren dengan Pendekatan Permakultur di Petung Ulung, Nganjuk

Author : Yusril Muzakki  
Institution : Universitas Islam Indonesia  
Publication : 2021  
Similarity : Permaculture System  
Difference : Typology and Location





### “Design Limitation”

1. MicroPublicFarms as Urban Acupuncture aims as a new breakthrough in the agricultural industry in Batam City with a modular concept that is able to cure the disease of empty land.
2. The development of the design is intended as a medium of collaboration between the community, government, and industry that maintains the intention of survival and fulfilment of the needs of each party.
3. The agricultural and horticultural system that will be applied is expected to revive a healthy and sustainable green area on the basis of survival.









## II | *problems & study*





Batam Island

Source: Axel Drainville, Flickr  
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## “Site Location”

Batam is a city within the Riau Islands Province. Batam City has a land area of 715 km<sup>2</sup>, while the overall area reaches 1,575 km<sup>2</sup>. The landscape of Batam City has contours of hills and valleys. The soil in Batam is red soil or bauxite soil, making it unsuitable for agriculture.



“Design Framework”  
Pattern-Based



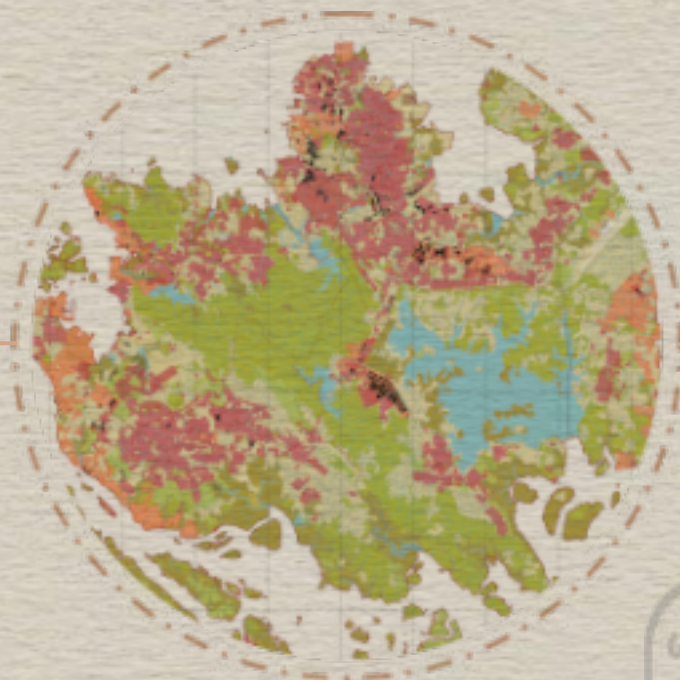
“Situation of Batam City”

In analysing the city situation, selection of the city centre as a macro area in determining the location of the site was done on the basis of the massive expansion of the built-up area in the city centre. Thus, it becomes a clear reference in analysing the pattern of areas scattered in every corner of the city.

“Reduction”

In looking at the potential and existing conditions in Batam City, the area pattern is reduced to 5 city elements: green land, brown land, water source and streams, residential area and industrial area. Later, these elements become the main benchmark in determining the exact location of the site.





*samples of cityspot*



*specific elements*



## “Samples”

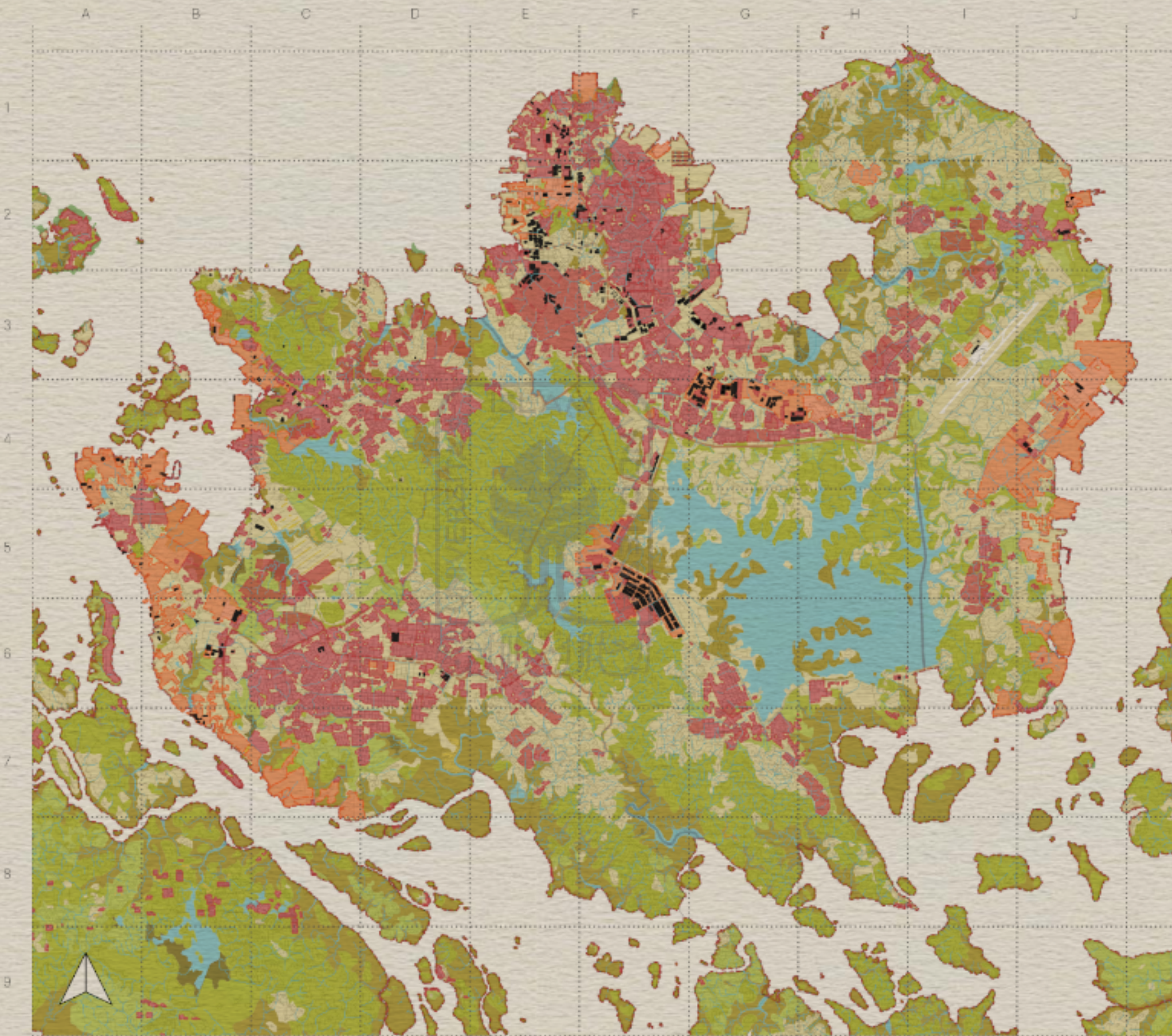
After obtaining the reduced city elements and applying them to the city map landscape, the next step is to create a sample location. Under the condition that the location fulfils the 5 elements that will be used as spots to be healed through "urban acupuncture"



## “Deployment”

Finally, one of the selected spots will be used as the project site location. The spot will be deployed into several elements. Each element will be identified and analysed for its strengths and weaknesses and become the basis for analysing the site context in accordance with the design needs



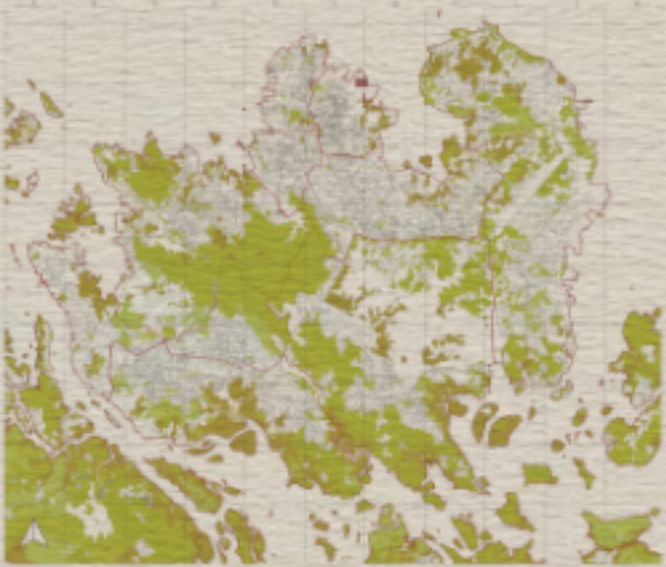


Map of Batam Island



LEGEND

- River Stream
- River
- Lake
- Industrial Building
- Houses
- Housing Zone
- Industrial Zone
- Coastal Area
- Swamp (Rawa)
- Sand (Pasir)
- Pond (Empang)
- Brownfield
- Greenfield - Semak Belukar
- Greenfield - Dry Forest
- Greenfield - Agrikebun
- Greenfield - Agri ladang
- Sub-District Administration
- District Administration
- Roadway
- Contour



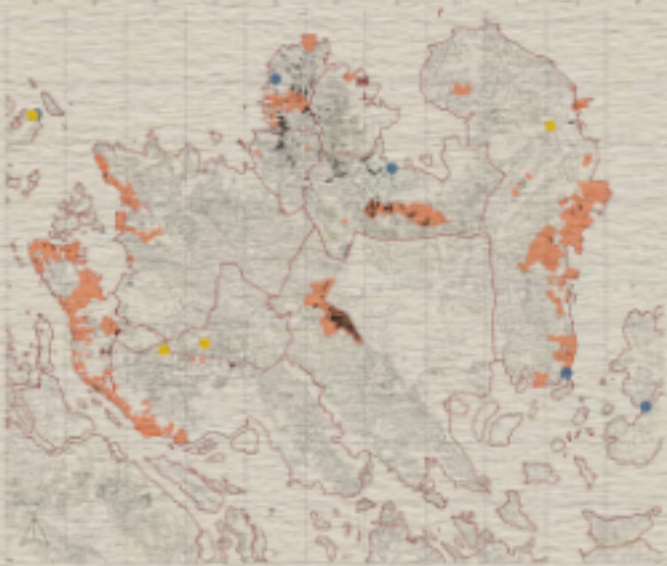
Greenfield in Batam City



Brownfield in Batam City



Housing Area in Batam City

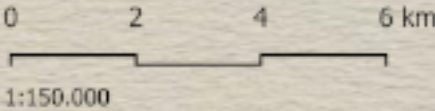


Industrial Area in Batam City



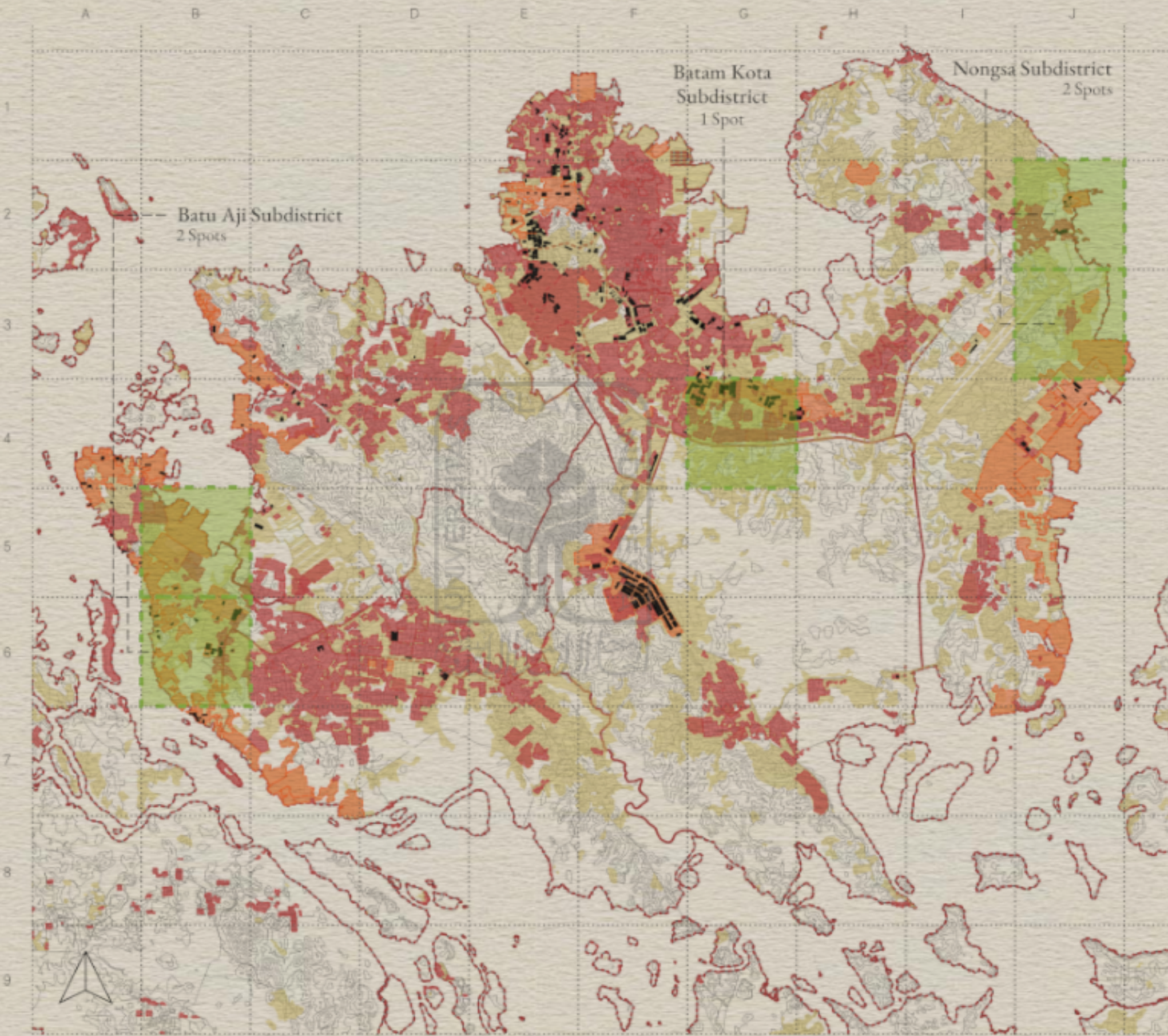
Waterway in Batam City

BATAM CITY



- In looking at the potential and existing conditions in Batam City, the area pattern is reduced to 5 city elements: green land, brown land, water source and streams, residential area and industrial area.
1. Greenfield, with an area of 221,400 hectares
  2. Brownfield, with an area of 45,900 hectares
  3. Housing Area, with an area of 21.540 hectares
  4. Industrial Area, with an area of 338.460 hectares
  5. Water Source, there are 9 reservoirs and 2 rivers





Discovery of Empty Open Space Spots as a Result of Industrial and Housing Expansion



LEGEND

- Industrial Building
- Houses
- Housing Zone
- Industrial Zone
- Brownfield
- Sub-District Administration
- District Administration
- Roadway
- Contour



Nongsa Subdistrict

“Site Samples”

By using the grid method in the base map, several spots were found that have vacant land with the characteristics of being around residential areas and industrial areas, and still have some natural resources such as: greenfields and water streams.

There are 5 points spread across several sub-districts:

- 1. Nongsa Subdistrict: 2 Spots
- 2. Batam Kota Subdistrict: 1 Spot
- 3. Batu Aji Subdistrict: 2 Spots



Batam Kota Subdistrict



Nongsa Subdistrict



Batu Aji Subdistrict



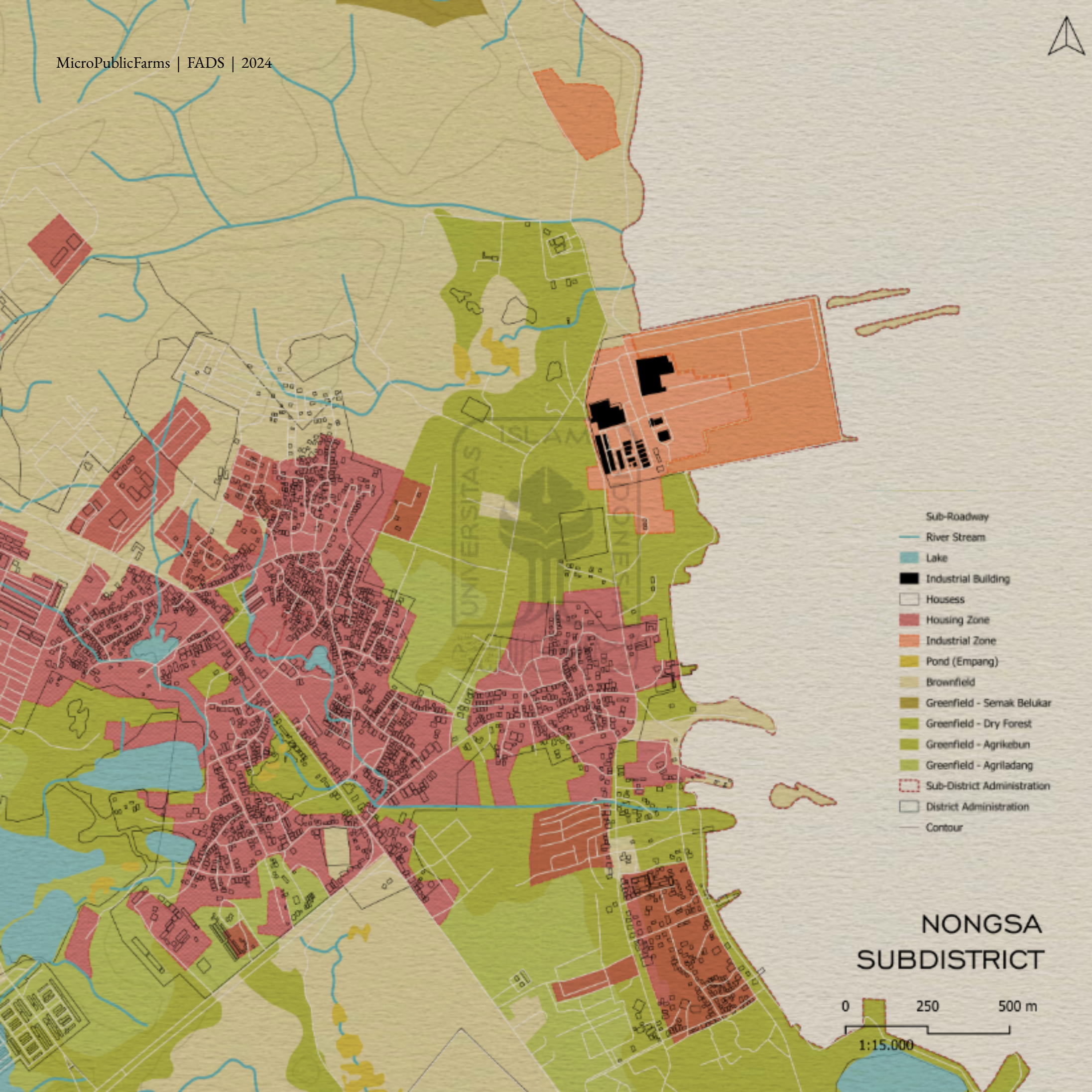
Batu Aji Subdistrict

BATAM CITY

0 2 4 6 km

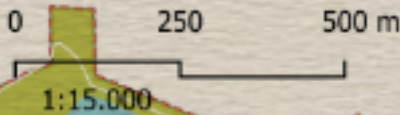
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- Sub-Roadway
- River Stream
- Lake
- Industrial Building
- Housess
- Housing Zone
- Industrial Zone
- Pond (Empang)
- Brownfield
- Greenfield - Semak Belukar
- Greenfield - Dry Forest
- Greenfield - Agrikabun
- Greenfield - Agriladang
- Sub-District Administration
- District Administration
- Contour

NONGSA  
SUBDISTRICT







Seen on the basis of real map images taken through Google Earth Pro, there are several open areas that have been plotted, some are neatly arranged and some are irregular. There are still some green areas and water sources (pond) that can be utilised as resources within the site.





“Greenfields”

The natural green spaces available today are being eroded by the development and expansion of residential areas. Vegetation is also a victim in this context. There are several types of vegetation available in the Nongsa sub-district. Ranging from short grasses, coconut trees dominate, there are some banana trees, ketapang trees, and also mangroves around the seafront.



Grasses and Coconut trees



Coconut Trees and Banana Trees



“Brownfields”

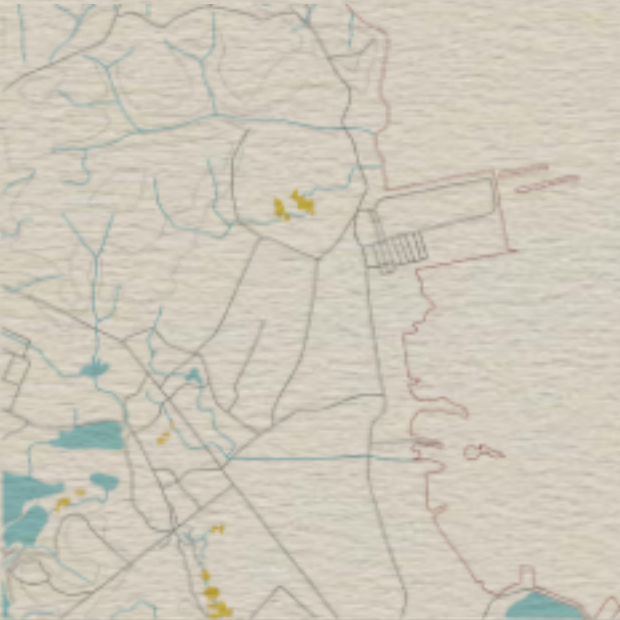
Brownfields are an important variable in site selection. Its development is quite alarming, where a lot of green land and vegetation has been eroded due to the expansion of built-up areas. For the Nongsa sub-district itself, the expansion of brownfields is dominated by the development of residential areas. Also, the expansion of industrial land that will be used as loading and production areas.



Brownfield 01



Brownfield 02



“Water Sources and Streams”

For water sources, it is quite difficult to find in Nongsa sub-district. Due to the expansion of the land, many water sources were filled with soil and used as residential land. Thus, water sources are reduced and only rely on water pipes from the government. However, due to its location on the edge of the city, there is a sea and ponds in the middle of the housing estate. Although the condition is also worrying.

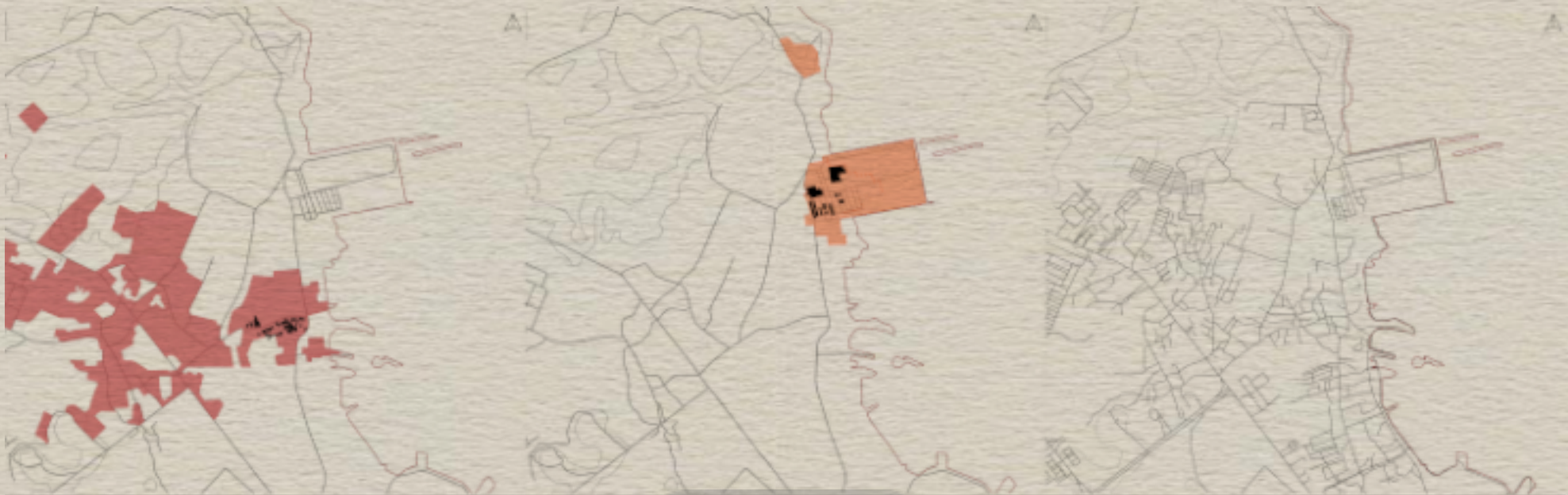


Seafront



Pond





### “Housing Area”

Housing areas are also one of the important parameters in determining the site. Its development is quite massive, triggering the birth of bare land which is not necessarily developed quickly. The residential area in Nongsa sub-district is one of the old areas where differences in spatial patterns can be seen today. The new area is more organised, while the old area is more organic and irregular.



*Perumahan Citra Mas*



*Perumahan Citra Mas Indah*

### “Industrial Area”

There is one Pre-Tensioned Spun Concrete Pile fabrication (manufacturing) company. The company has an area of 27 hectares. Prestressed rotary concrete pile products are one of the pile materials used for deep foundation construction used for various buildings such as buildings, ports, bridges, oil tanks and other buildings. Produce over 100, 000 tons of Pre-Tensioned Spun Concrete Piles Annually.



*Entrance of Company*



*PT Citra Lantan Teduh (WIKA CLT)*

### “Roadways”

Nongsa sub-district is one of the areas designated as a digital industrial area. To fulfil this dream, road infrastructure has been improved over the past four years. Initially, the road in Nongsa sub-district was only two lanes for two directions. Now, after development, each lane has 2-4 lanes. This road development also has the purpose of supporting industrial and residential development which carries heavy vehicles.



*Main Road*



*Local Road*



“Design Concept Study”

Micro Public Places (MPPs)  
proposed by Hans Frei and Marc Böhlen.

MPPs are a reaction to two major global trends: the increasing commercialization of public space and the spread of widespread information technologies. With technology influencing every aspect of our lives and private interests exerting a greater influence on public spaces, these trends have caused a change in the way we perceive public spaces.

In an effort to oppose these trends, the concept of MPPs suggests hybrid architectural programmes that integrate knowledge from a variety of disciplines, including human computing, ambient intelligence, architecture, social engineering, and urbanism. By providing access to resources that everyone should have access to, like books, medicine, water, air, and other necessities, the aim is to revitalise public life in modern societies.

The purpose of MPPs is to create inclusive environments that encourage social interaction and shared experiences. To create collaborative forms of seeing and knowing that neither system could accomplish alone, they fuse human intuition with machine processes. In other words, MPPs are informational and social spaces where technology and human intuition combine to produce a singular public experience, rather than just physical locations.

MPPs are essentially a novel type of public area that are intended to be flexible and responsive to community needs. These are places where, as opposed to displacing or isolating human interaction, technology is employed to improve interpersonal relationships and promote a feeling of community.

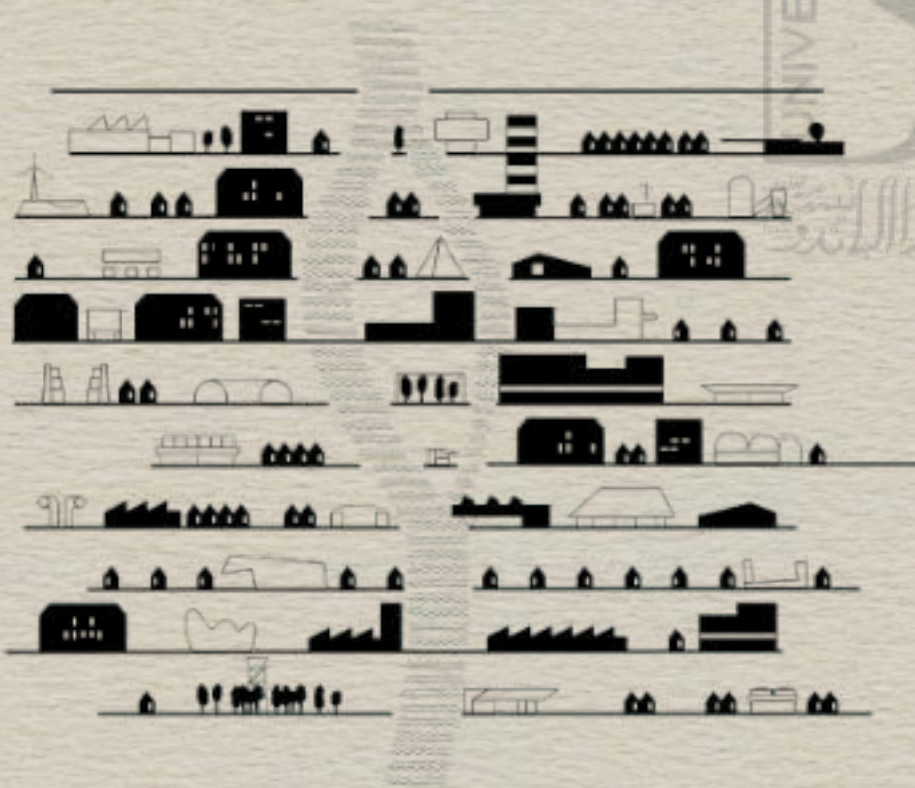
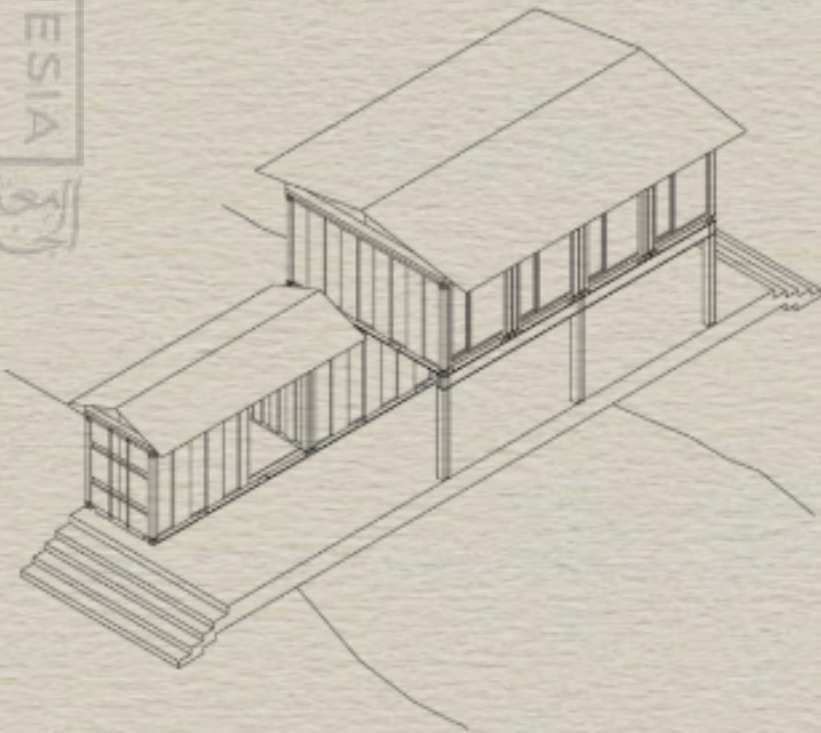


Figure 5: MPP perspective

Figures Source: Frei, H., Böhlen, M. (2009). *MicroPublicPlaces*.



## “Design Concept Study”

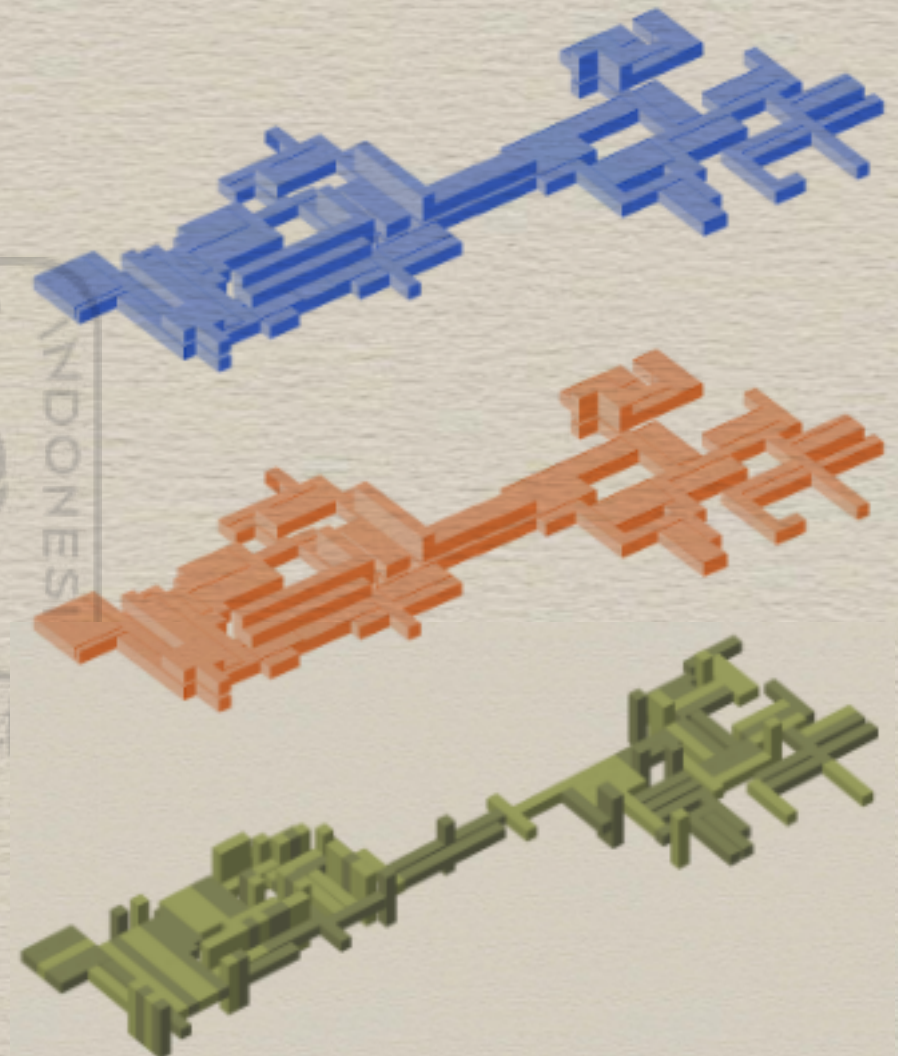
### Modular Design

generated by Computation and Parametricism

Modular architecture is used in the manufacturing and construction sectors to produce prefabricated parts that can be put together to form larger structures. For instance, standardised modules that are produced off-site and then transported to the construction site for assembly are used to construct modular buildings. Benefits of this strategy include shorter construction times, lower costs, and better quality control. Modular architecture is a design technique that divides a system into smaller, self-contained modules or components that may be designed, constructed, and upgraded separately. These modules are meant to be self-contained and flexibly related, which means they may function independently while communicating with one another via well-defined interfaces.

In farming, modular architecture involves designing agricultural systems with interchangeable components that can be easily customized and adapted to specific needs. This may include modular greenhouses, irrigation systems, hydroponic units, or livestock enclosures that can be configured based on factors like crop type, climate, and available space.

This modular design concept will be achieved by utilising computational processes and algorithmic grammar formulas summarised in a script that will be worked on Rhinoceros and Grasshopper software. The result to be achieved from the computational process is to find the configuration and arrangement of modules that will later become the building mass and landscape pattern on the site.





“Agriculture Study”

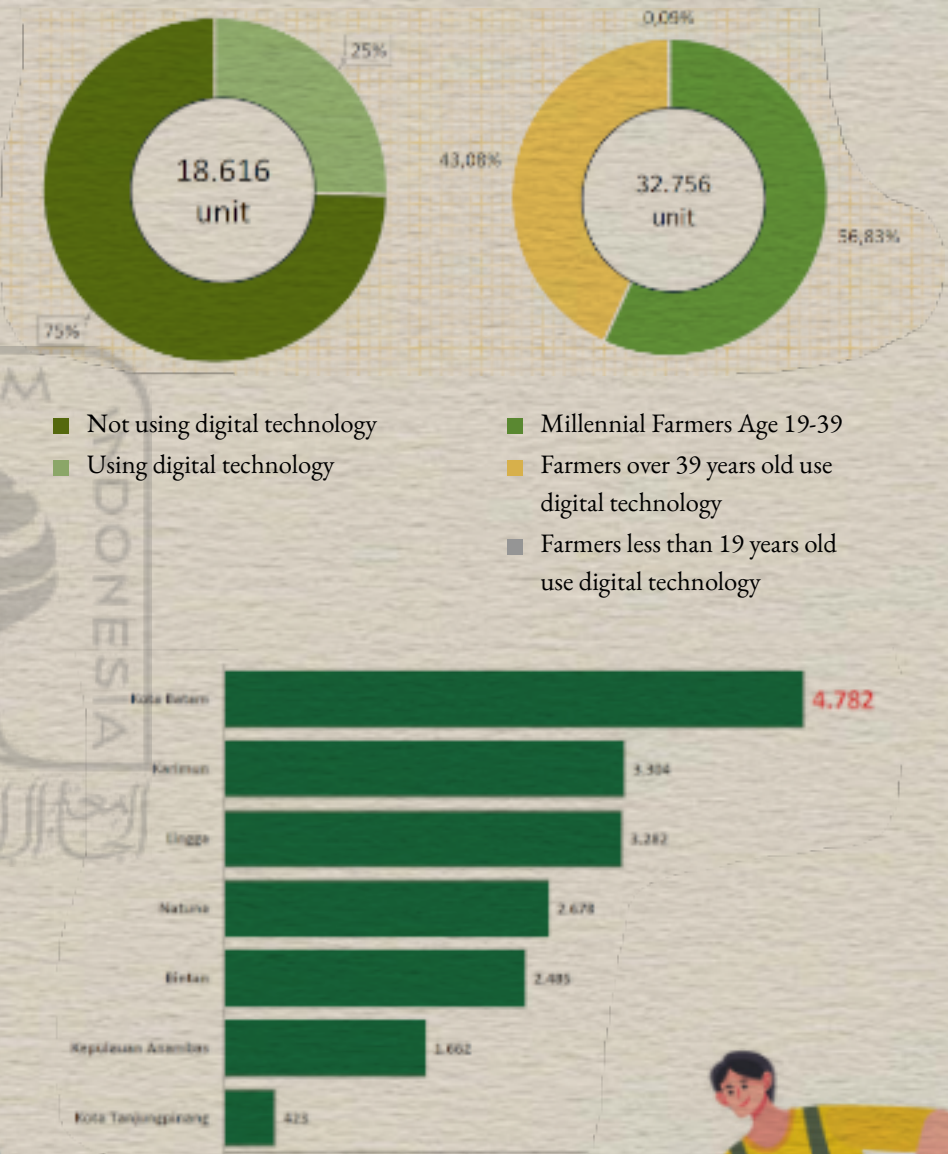
Millenial Farmers  
BPS Riau Islands Province 2023

Millennial farmers are farmers aged 19 years to 39 years, and/or farmers who are adaptive to digital technology. Modern technology includes the use of modern agricultural tools and machinery (alsintan) and modern technology, such as the use of the internet/smartphones/information technology, the use of drones, and/or artificial intelligence for agricultural cultivation.

In the phase I enumeration report, there were 18,616 millennial farmer units. The percentage shows that 75% of the 18,616 millennial farmer units still do not use digital technology thoroughly. Meanwhile, the other 25% have used digital technology with a good and thorough understanding. Other data also shows that in total there are 32,756 farming units recorded. Millennial farmers aged 19-39 years dominate at a percentage of 56.83%, farmers who are over 39 years old and use digital technology at 43.08%, and farmers who are less than 39 years old at 0.09%.

Of the total 18,616 units, the most millennial farmers aged 19-39 years in Riau Islands Province are in Batam City, with 4,782 people, followed by Karimun Regency and Lingga Regency which occupy the second and third positions. Seeing this potential that many millennial farmers are found in Batam City, millennial farmers can be targeted as users and managers of MicroPublicFarms. In the hope, MicroPublicFarm becomes a medium that can be utilised by millennial farmers and also has facilities designed to develop Urban Farming in Batam City.

Figures Source: BPS Provinsi Kepulauan Riau: Hasil Pencacahan Lengkap Tabap I, Sensus Pertanian 2023





“Agriculture Study”

Horticulture & Animal Farming  
Local Regulation & Needs

Pasal 34

(1) Kawasan pertanian sebagaimana dimaksud dalam Pasal 32 huruf b meliputi:

- a. kawasan perkebunan; dan
- b. kawasan peternakan.

(2) Kawasan perkebunan sebagaimana dimaksud pada ayat (1) huruf a dengan luas lebih kurang 1.622 (seribu enam ratus dua puluh dua) hektar yang berada di:

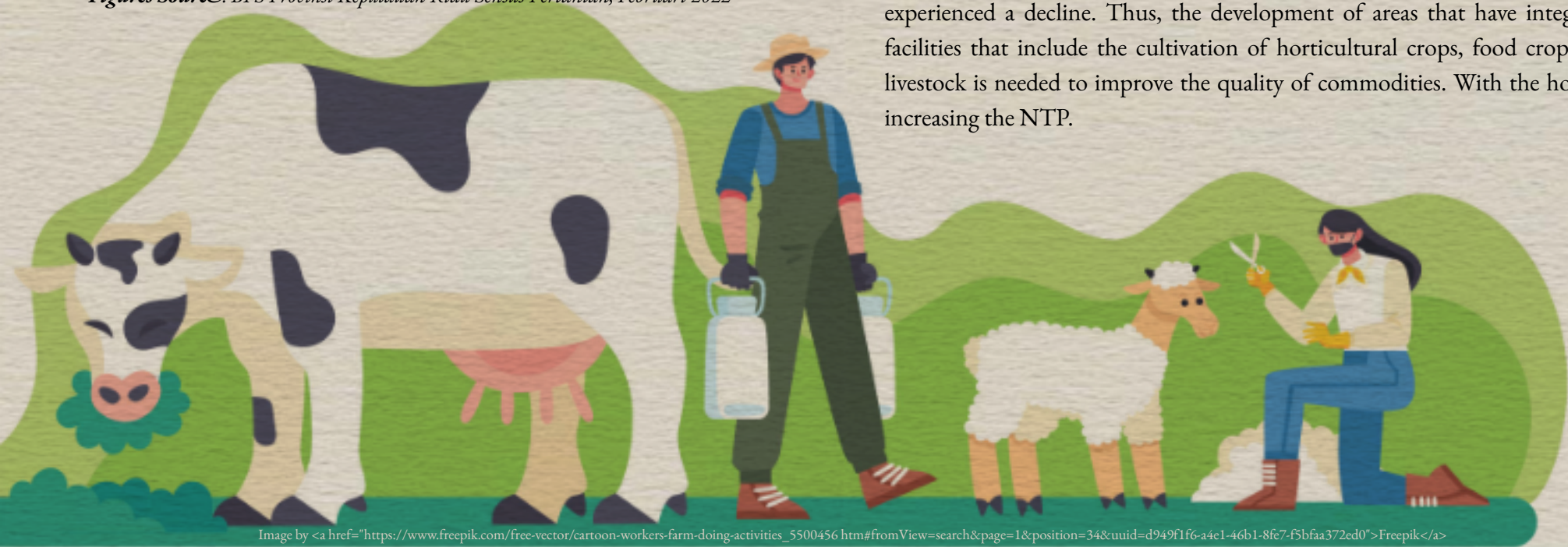
- a. Kecamatan Bulang;
- b. Kecamatan Galang;
- c. Kecamatan Batu Aji;
- d. Kecamatan Nongsa; dan
- e. Kecamatan Belakang Padang.

In the Local Regulation of Batam City No. 3 of 2021 on the Regional Spatial Plan of Batam City Year 2021 - 2041, Nongsa Sub-district is one of several areas in Batam City that has plantation area. Based on the regulation, the design of MicroPublicFarms located in Nongsa Sub-district is in line with the land designation.

Figures Source: BPS Provinsi Kepulauan Riau Sensus Pertanian, Februari 2022



Farmer Exchange Rate (NTP) is one of the useful indicators to measure the level of welfare of farmers because it measures the ability of products (commodities) produced/sold by farmers compared to the products needed by farmers both for the production process (business) and for consumption of farm households. Based on the 2022 Riau Islands Province Farmer Exchange Rate (NTP) report, *Food Crops, Horticulture and Animal Husbandry* experienced a decline. Thus, the development of areas that have integrated facilities that include the cultivation of horticultural crops, food crops and livestock is needed to improve the quality of commodities. With the hope of increasing the NTP.





## “Materiality”

Batam City has a lot of leftover or unused industrial waste, after the use of loading and unloading goods at the harbour and airport. The unused waste is recycled and reused as a way of reducing the carbon footprint.



### 1. Waste Container

The realization of container flow at Batam Port increased by 8 percent compared to 2022 at 577,161 TEUs. The realization of container flow of Batam Port in 2023 reached 624 thousand TEUs consisting of 167 thousand TEUs of domestic containers and 457 thousand TEUs of export-import container flow. Reusing containers and recycling them into the main body of micro public building materials. Arranging the containers into a unified form into a complete modular infrastructure using the stacking method with the help of grasshopper scripts.

### 2. Waste Wooden Pallets

Pallets are flat structures that serve as a basis for storing and moving items. They are made of various materials such as wood, metal, and plastic. Pallets are often flat and horizontal, making them easy to stack, transport, and load. In Batam City, there is a lot of accumulation of leftover wooden pallets, which are often resold to retailers. Wooden pallets can be reused as a structure and medium for planting vines. Also, they can be used as stair structures and flooring.



## “Agriculture Case Study in Riau Province”

The case study taken is one where a community can create farmland in red soil or bauxite conditions, such as those in Batam City. Looking at what was done to make agriculture possible.



### 1. Ady Indra Pawennari, Tanjungpinang City

Ady was challenged and wanted to prove that hard soil and rocks could also be used to grow rice. But with certain technological engineering. Ady used the innovation of coconut powder or cocopeat. The hard, red-coloured bauxite soil in his yard was treated with cocopeat, which absorbs and stores water for a long time.

During the dry season, cocopeat helps to moisturise the soil. That's why the rice he grows in his yard thrives, even though it's on hard bauxite and rocky soil.



### 2. Two farmer groups (Poktan) in Dompak Village

Two farmer groups (Poktan) in Dompak Village, Tanjungpinang, are cultivating plantations on former bauxite mining land. The two farmer groups, Harapan Jaya Group in Tanjung Moco and Bunga Mawar Group in Sungai Sudip, manage a number of horticultural crops, transforming the barren red soil into a green landscape producing plants such as chillies, melons, tomatoes, long beans, watermelons, various wet vegetables and a number of other horticultural crops. All types of horticulture can potentially be grown on bauxite land. Adequate fertiliser is said to give good results using manure mixed with MA-11 or Em4.



“Precedent Study”

# Tony's Farm

By Playze, Shanghai, China

Playze created a building complex that unites the main reception, a lobby (which also serves as a working space for future hotel rooms), and a VIP area with new offices and an existing warehouse where produce and fruits are packed in order to connect the activities of the working people with the farm's visitors. The structure offers transparency on the production process. As a result, it upholds the goal of integrating the visitor and fosters customer trust in the farm's offerings. In addition, the building's design conveys and advances Tony's Farm's central idea while being motivated by the idea of sustainability and having recognisable features.







Several techniques have been employed to lower the building's energy consumption in order to meet the client's high expectations for environmental protection. Despite the fact that the containers are shown in their unfinished state, the entire structure is well insulated. In order to reduce solar heat gain, the original container doors have been perforated and are now used as external shading blinds at sun-exposed facades. The energy for the floor heating and air conditioning systems is provided by a geothermal heat pump. By maximising air exchange rates, controlled ventilation reduces the amount of energy lost to uncontrolled aeration. The overall amount of electricity consumed is decreased by using LED lighting.



“Precedent Study”

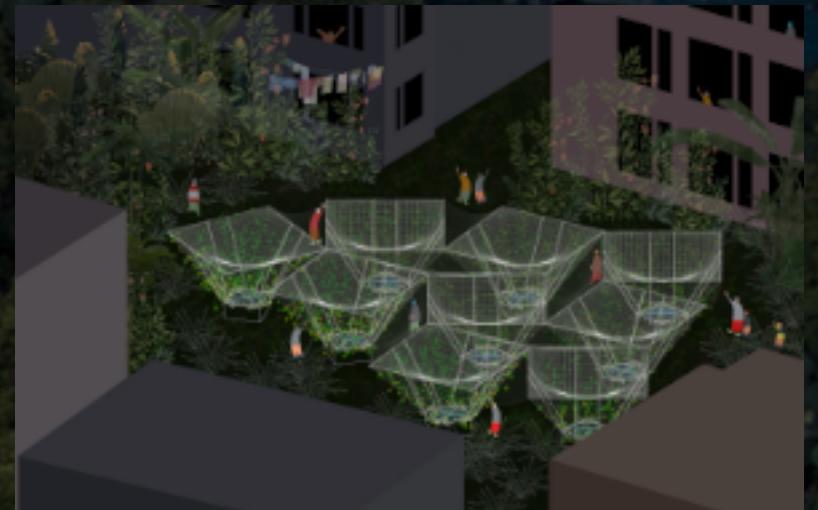
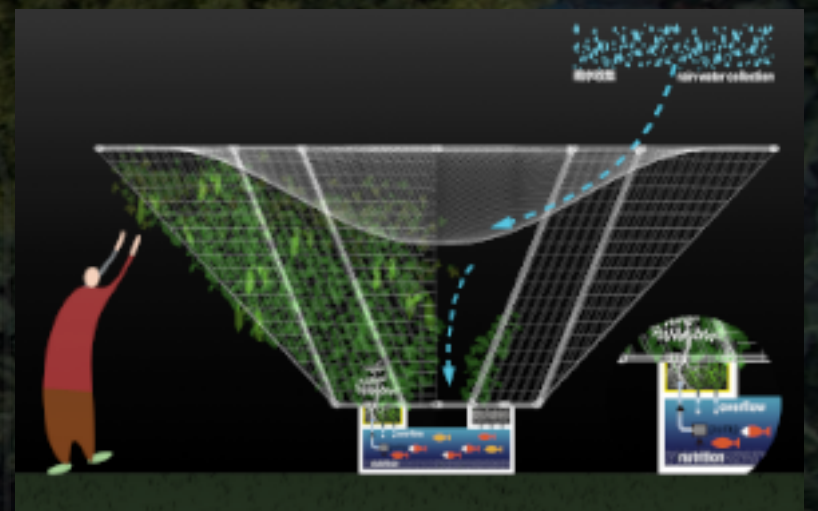
# Sky Farm

By VRAP, Shenzhen, China

About half of Shenzhen's population lives in urban villages, which occupy about 10% of the city's total land area. These urban villages are a unique type of urban area where small-scale industries coexist with small-scale peasant economies and where new construction is planned with the possibility of close integration with surrounding communities in mind. Sky Farm is an iterative product that can convert inexpensive residential space into efficient production space and distinctive consumer space for urban villages lacking public space. This is why Sky Farm is so well-suited for the new urban village economy.







Sky Farm can give a highly productive space at a reasonable cost, assisting in achieving the best potential promotional effect. The main material was chosen to be PVC, which is readily available in metropolitan villages. In addition, a standardised construction with simple dismantling and transportation methods has been used, allowing regular people to build the gadget. Farming nets for climbing vines with relatively big meshes on four sides of the device provide space for plants and fruits, while an anti-bird net on top protects the fruit and collects rainwater.



“Precedent Study - ”

# Folding Red

By Jike Zhincheng, Shanghai, China

The "Red" container Art Commercial modular buildings are located beneath the Oriental Pearl, on the east side of the Huangpu River. The function is highly adaptable and can be used for office, brand experience, high-end catering, and other purposes. Our initiative aims to become a significant part of the Huangpu River's recreational revetment system in the future. The most difficult element is figuring out how to meet the design goal, "it is a container, but far more than that." The goal is to preserve the container's symbolic parts and modulus while simultaneously breaking through the fundamental form and demonstrating the possibility of creation in container construction.

