2020 ISOCARP AWARD FOR EXCELLENCE

Merit Award

RECTREEFYING BOGOR CITY 2030

Prepared by: Nusantara Urban Advisory, Indonesia

RECTREEFYING BOGOR CITY 2030

“Let us make Bogor as a better place for the peoples and families. **Let us create Bogor greener and cooler** with an abundance of trees, parks, and shades. We, of course, long to see again Walnut Trees everywhere as in our childhood time.”

Bima Arya
Mayor of Bogor City

This project is a revitalization of Bogor City Center through master plan preparation. By applying a **cooling city strategy**, this project seeks to make Bogor cooler, more pleasant, also to solve its socio-economic problems, to restore Bogor as a livable place for its people. "Rectreefying" is to rectify the city through an urban tree strategy.

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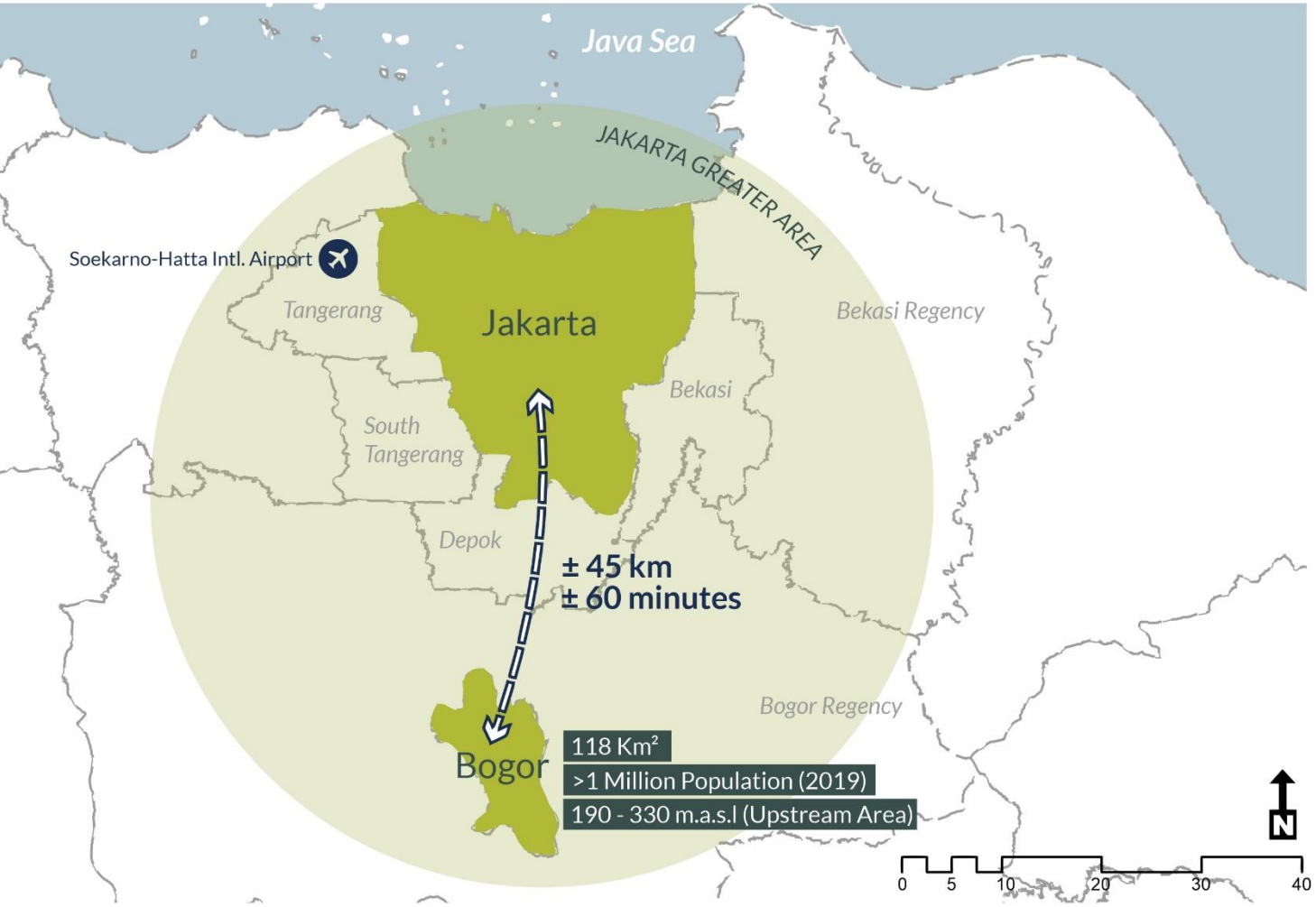
CONTENT AND CONTEXT OF THE PROJECT

BOGOR POSITIONING AND CONTEXT



THE SETTLEMENT AND WEEKEND GETAWAY FOR JAKARTA GREATER AREA

- Bogor is a tourism destination or a weekend getaway from "hustle-bustle" in Jakarta
- Bogor has unique characters such as beautiful scenery and less crowded compared to the other satellite cities like Tangerang, Bekasi, and Depok.

WAS KNOWN AS BUITENZORG "A CITY WITHOUT ANY WORRIES"

- In the Dutch Colonial Period, Bogor still had fresh air and cold temperature
- Bogor was built as the city for rest, with several parks, big trees, a huge Botanical Garden in the middle of the city, and a vast presidential palace

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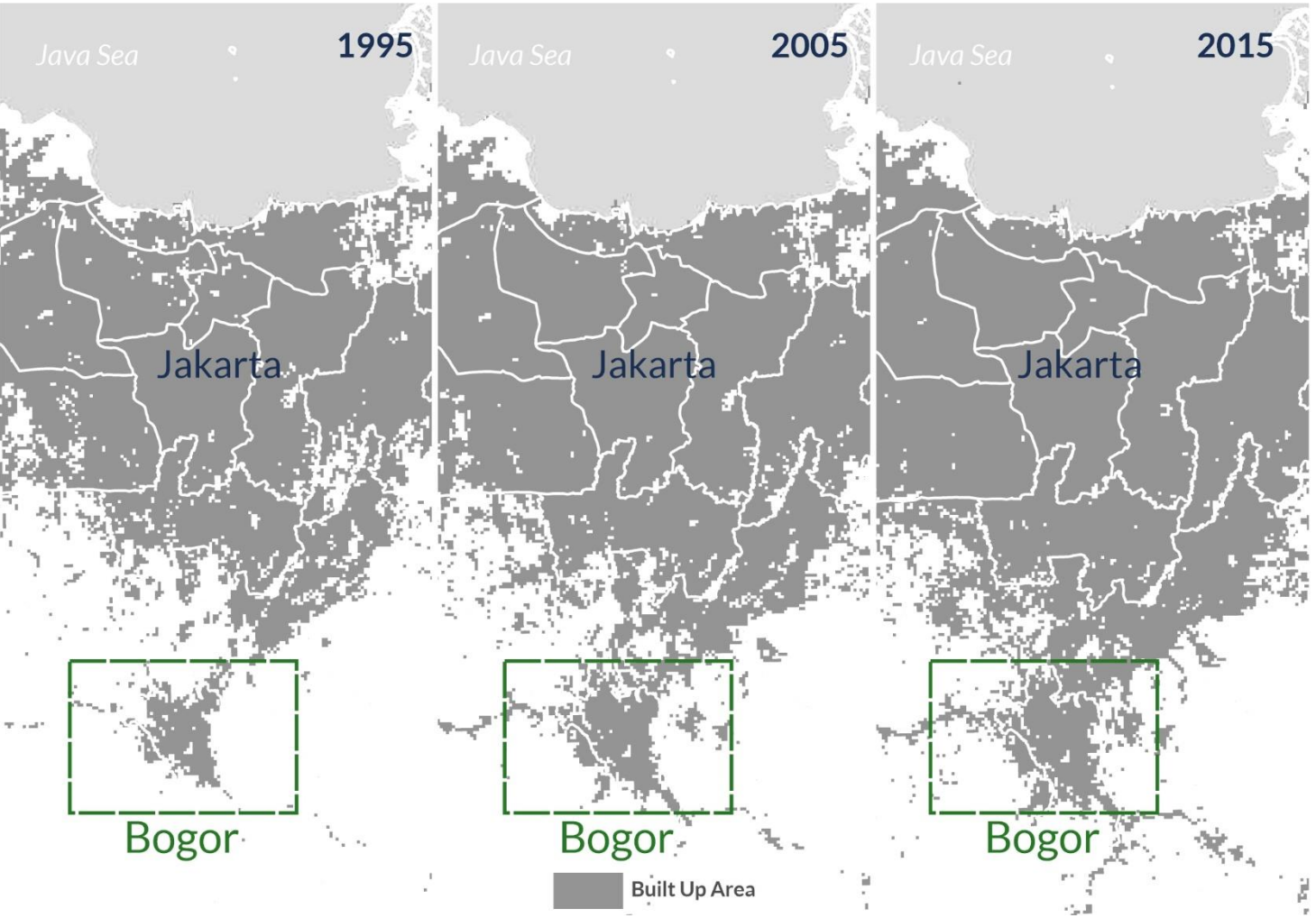
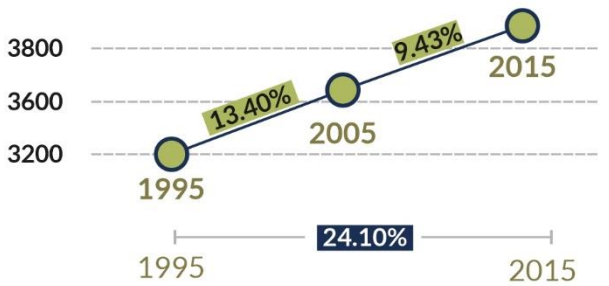
CONTENT AND CONTEXT OF THE PROJECT

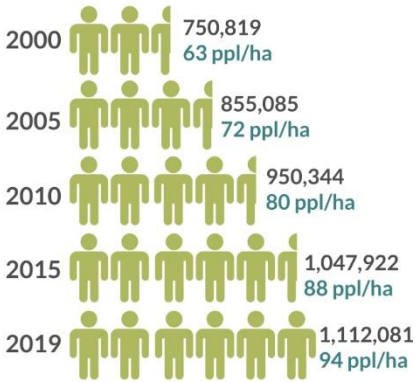
BOGOR CARRIED OUT THE PRESSURE OF RAPID URBANIZATION



Growth of Built-Up Area



Population Grows Fast



Source: Statistics Indonesia, 2020

- The built-up area in Jabodetabek increased by around 24% within 20 years, as Bogor is one of the settlement areas for Jakarta workers
- The growth percentage of the built-up area in the past five years is increasing to 1,89 % per year
- Within the past 5 years, the population in Bogor increased by around 6%.
- It's two times higher than the National and Jakarta population growth, which only increased by 3% in the past five years

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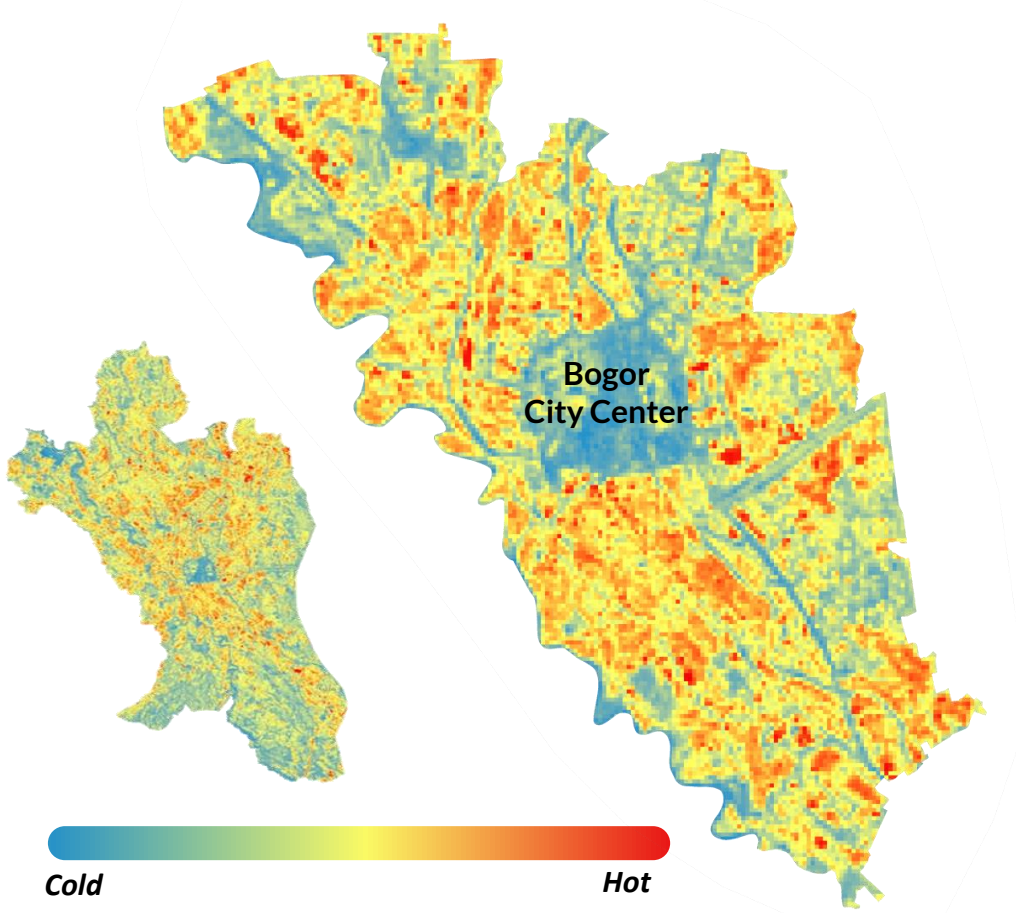
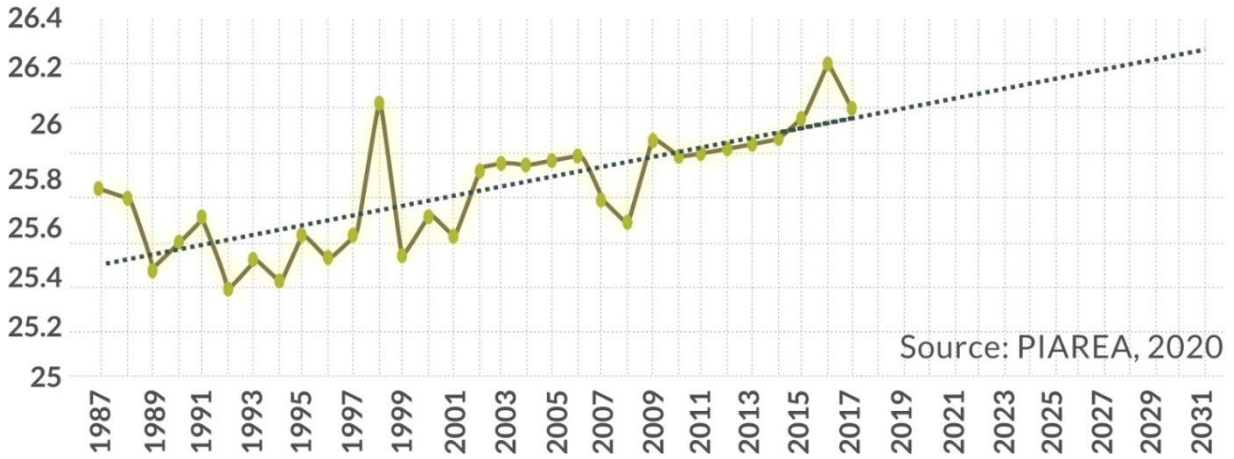
CONTENT AND CONTEXT OF THE PROJECT

CITY CENTER IS HOTTER



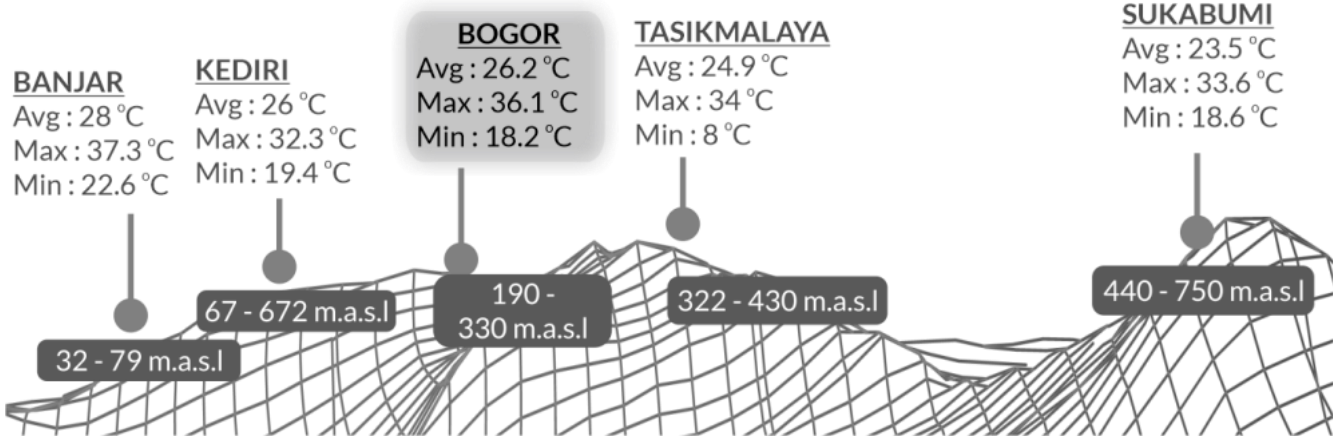
The Map showed that Urban Heat Island (UHI) in Bogor City. Some areas in the City Center appear as a hot spot compared to the surrounding area

Bogor will be Hotter in the Next 10 Years



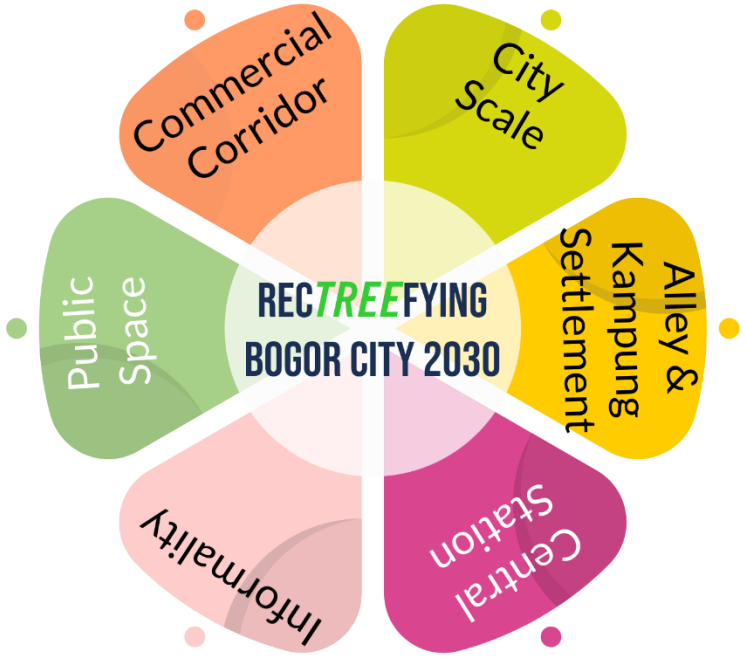
- Temperature trends in Bogor increase around ± 0,5° C within 30 years (1987 – 2017).
- It predicted that the average temperature in Bogor would increase within range of 0,47° C to 0,91° C in the future.
- The temperature in Bogor is also warmer compared to other cities with similar elevations and characters.

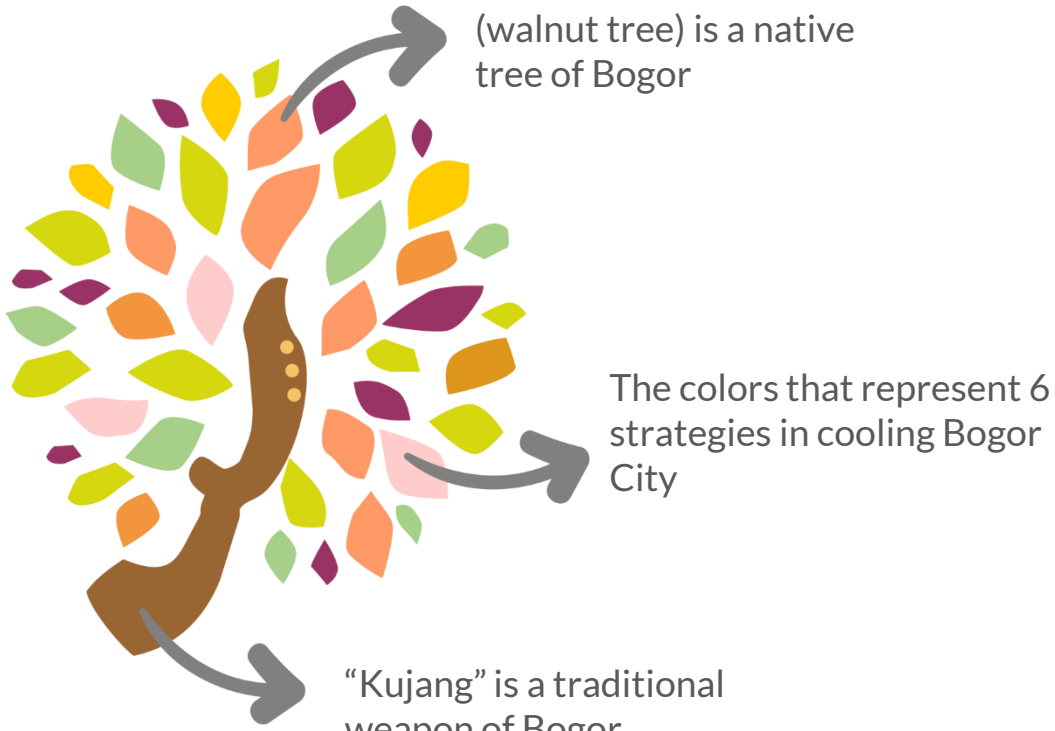
Bogor is Warmer Compared to Other Similar Cities in Central Java



MAIN FEATURES OF THE PROJECT

COOLING BOGOR CITY





Urban tree strategy is known as the most mainstream yet the most effective way to tackle urban heat. This project divided six types of area intervention: **city scale**, **commercial district (Bogor Central Station)**, **commercial corridor/streets**, **public spaces**, **informal street vendors organizing**, and **'kampung' settlements and alley**.

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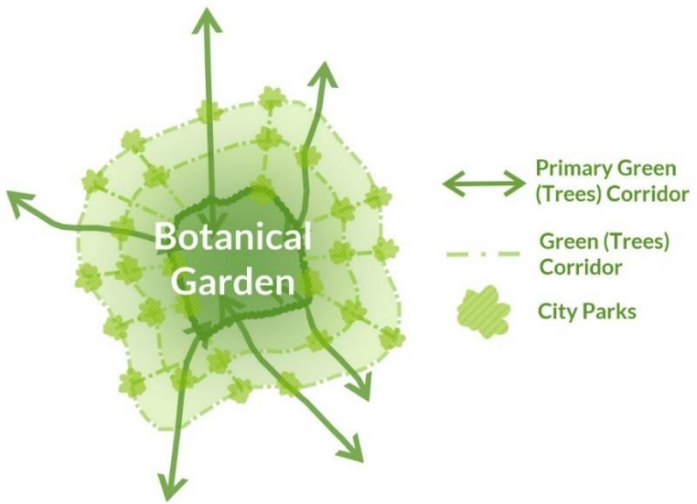
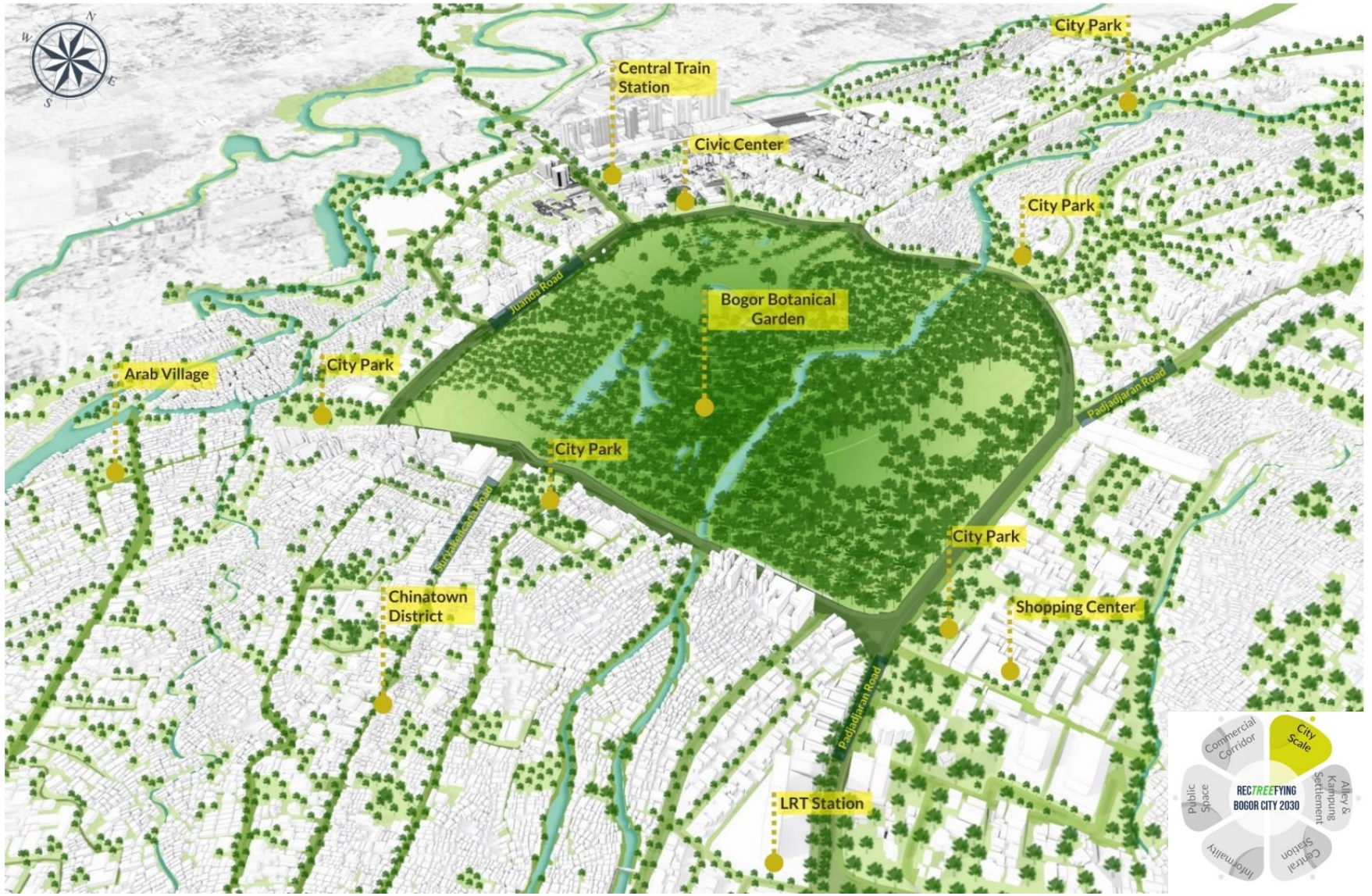
MAIN FEATURES OF THE PROJECT

CREATING URBAN VENTILATION CORRIDORS



- The basic concept to make Bogor cooler is to spread the energy of Botanical Garden to all parts of the city by creating continuous green and blue network
- It will be developed by connecting parks, street trees and vegetation, urban forest, river, and lake.
- Ventilation corridors will result in wind flow enhancement in the city and help more cooling in the city.
- It could also improve the air quality, provide habitat for plants and animals, protect biodiversity, and improve urban storm-water management
- In total, the green network will be at least 55 km around the city center



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MAIN FEATURES OF THE PROJECT

COOLING COMMERCIAL AND BUSINESS DISTRICT

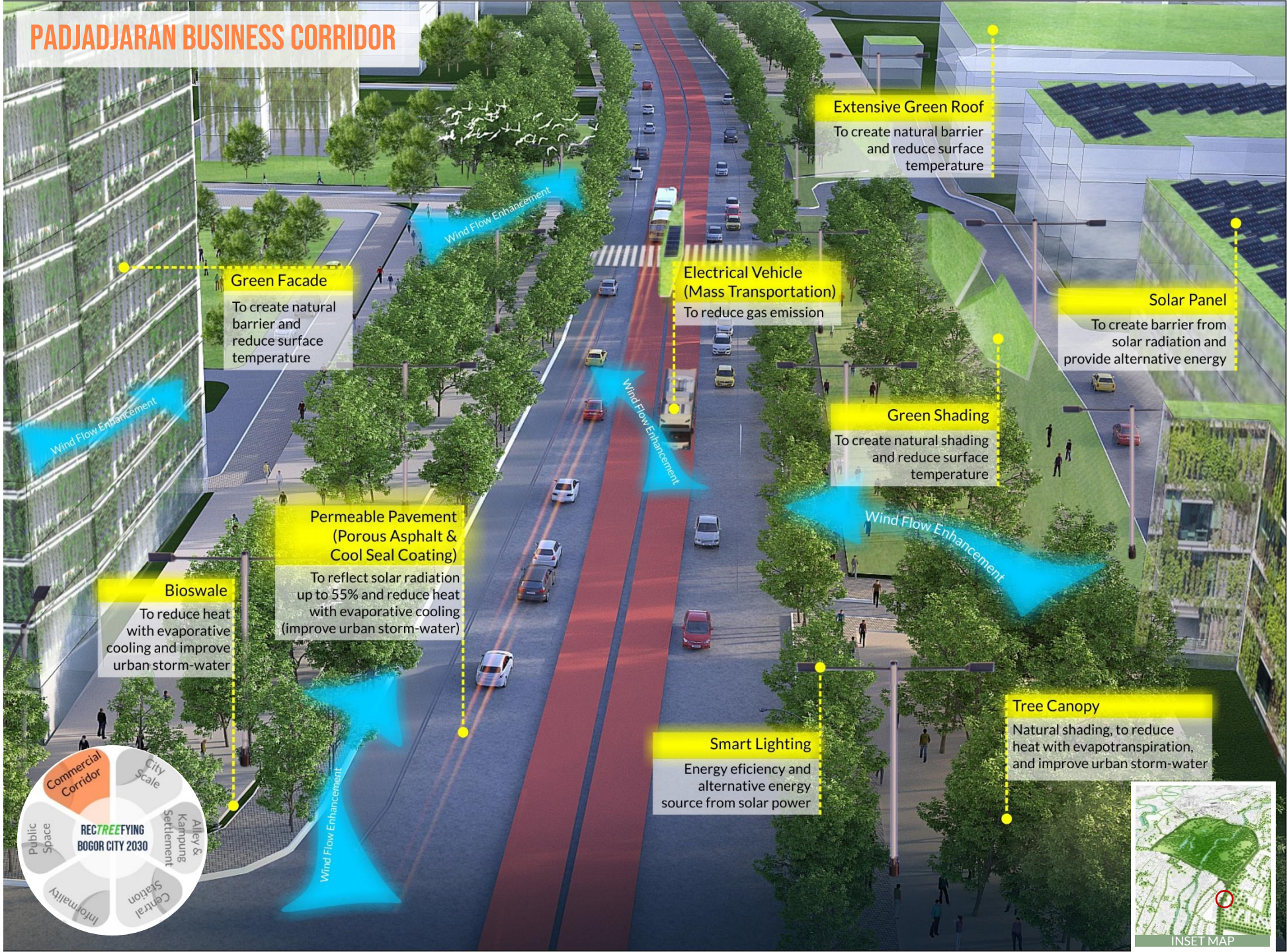
- This project is a revitalization of Bogor Central Station Area, to create a mixed-use, compact, walkable, and green TOD within **68 ha area**.
- The cooling strategy is exercised by adding **3 km street and pedestrian way tree canopy, 3 km porous asphalt, greening 15 high rise buildings, building 1.7 ha city park, and permeable pavement for the plazas**.

MAIN FEATURES OF THE PROJECT

COOLING COMMERCIAL AND BUSINESS DISTRICT

- The corridor revitalization aims to achieve a **more walkable and people-oriented business corridor**
- Strategies: adding **1.2 km extended tree canopy, high reflective-permeable color pavement, bioswale, and green facades**

Existing Condition

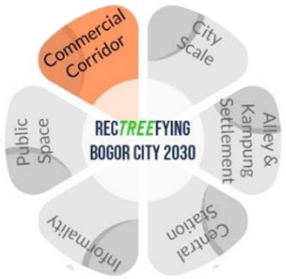


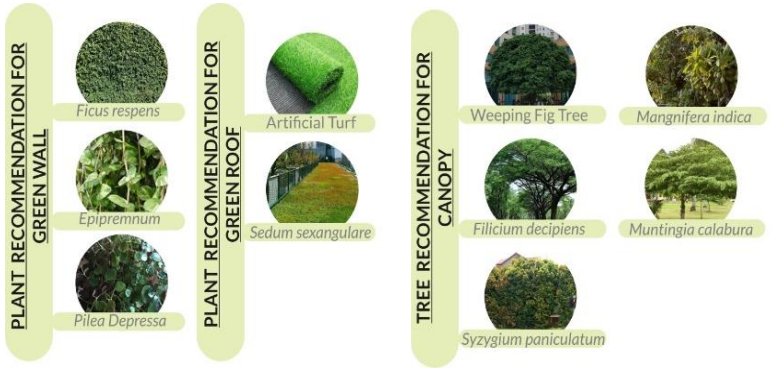
MAIN FEATURES OF THE PROJECT

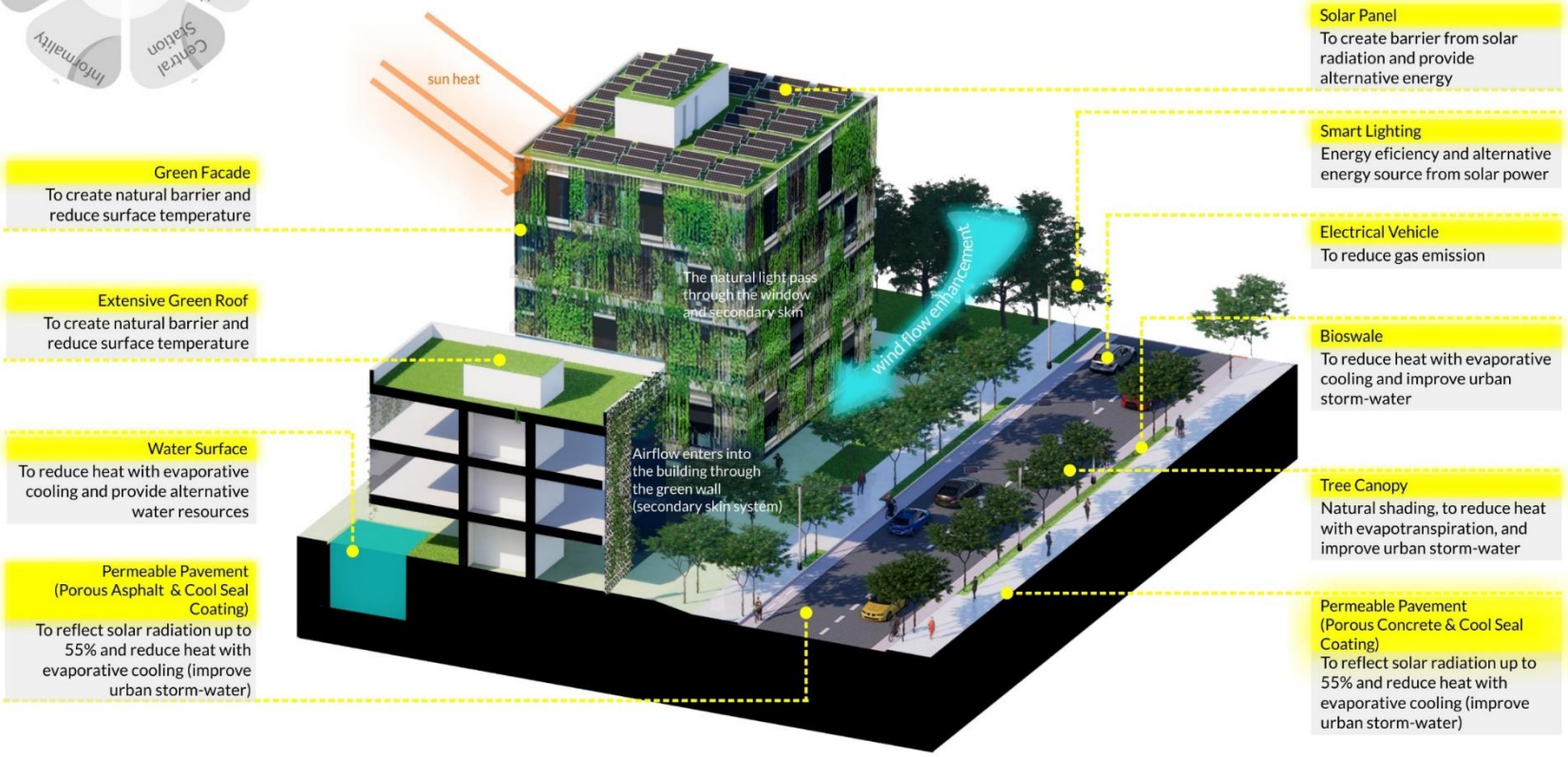
COOLING COMMERCIAL AND BUSINESS DISTRICT

Regulating Commercial Building

- This project applies a set of regulations for commercial building permits.
- It regulates building elements that should be implemented to reduce the temperature of building envelopes, **by adding green roof and facade, tree canopy and water element within site, permeable pavement and high reflective color material, and the use of solar panel**.







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MAIN FEATURES OF THE PROJECT

COOLING COMMERCIAL AND BUSINESS DISTRICT

- This placemaking project in 1.3 km China Town Corridor **applies harmonization between cooling strategy and heritage preservation.**
- Cooling elements are applied to the Chinese-style building without altering its character.

Existing Condition

SURYAKENCANA CHINA TOWN

High Reflective Material (Light Color)
To reflect solar radiation

Smart Lighting
Energy eficiency and alternative energy source from solar power

Extensive Green Roof
To create natural barrier and reduce surface temperature

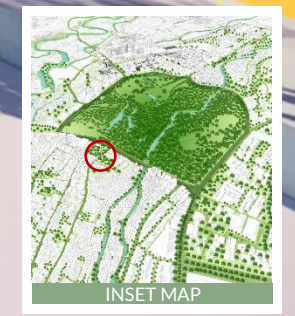
Green Shading
To create natural shading and reduce surface temperature

Electrical Vehicle
To reduce gas emission

Permeable Pavement (Porous Concrete & Cool Seal Coating)
To reflect solar radiation up to 55% and reduce heat with evaporative cooling (improve urban storm-water)

Permeable Pavement (Porous Asphalt & Cool Seal Coating)
To reflect solar radiation up to 55% and reduce heat with evaporative cooling (improve urban storm-water)

Bioswale
To reduce heat with evaporative cooling and improve urban storm-water



MAIN FEATURES OF THE PROJECT

IMPROVING THE QUALITY OF PUBLIC SPACES

- This project is the revitalization of Bogor City Square, with an area around 1.7 Ha (estimated cost around 15 billion rupiahs) **in front of Central Station**.
- The cooling city strategy is applied to create a more pleasant public space, improve the quality of places, resulting in a **more vibrant public space**.

Existing Condition

BOGOR CITY SQUARE

Tree Canopy
Natural shading, reduce heat with evapotranspiration, and improve urban storm-water

Permeable Pavement (Porous Concrete & Cool Seal Coating)
To reflect solar radiation up to 55% and reduce heat with evaporative cooling (improve urban storm-water)

High Reflective Material (Light Color)
To reflect solar radiation

Water Surface
To reduce heat with evaporative cooling

Herbs & Beneficial Plants
To reduce heat with evapotranspiration

Permeable Pavement (Porous Paving)
To reduce heat with evaporative cooling (improve urban storm-water)

Bioswale
To reduce heat with evaporative cooling, improve urban storm-water, and provide alternative water resources

Permeable Pavement (Porous Asphalt & Cool Seal Coating)
To reflect solar radiation up to 55% and reduce heat with evaporative cooling (improve urban storm-water)

MAIN FEATURES OF THE PROJECT

IMPROVING THE QUALITY OF PUBLIC SPACES

With an area of 6.723 sqm, this park is located in the China Town District. Thus designing and applying **the cooling strategy should be harmonized with its unique Chinese-character.**

Existing Condition

SURYAKENCANA CHINATOWN PARK

Tree Canopy
Natural shading,reduce heat with evapotranspiration,and improve urban storm-water

High Reflective Material (Light Color)
To reflect solar radiation

Water Surface
To reduce heat with evaporative cooling

High Reflective Material (Light Color)
To reflect solar radiation

High Reflective Material (Light Color)
To reflect solar radiation

Permeable Pavement (Porous Paving)
To reduce heat with evaporative cooling (improve urban storm-water)

MAIN FEATURES OF THE PROJECT

DEALING WITH INFORMALITY: EMPOWERING LOCAL ECONOMY

- Applying cooling strategies in this 900 sqm area can also be **harmonized with street vendors' empowerment and integrating it with open space improvement.**
- It could thus help to **solve socio-economic problems.**
- This project aims to convert the unorganized streets **to be a well-managed culinary street.**

Existing Condition

BATA CULINARY STREET

Shading Structure
To create barrier and reduce surface temperature

High Reflective Material (Light Color)
To reflect solar radiation

Tree Canopy
Natural shading,reduce heat with evapotranspiration,and improve urban storm-water

Smart Lighting
Energy eficiency and alternative energy source from solar power

Organizing Street Vendors
To improve local economic development

Permeable Pavement (Porous Paving)
To reduce heat with evaporative cooling (improve urban storm-water)

MAIN FEATURES OF THE PROJECT

DEALING WITH INFORMALITY: EMPOWERING LOCAL ECONOMY

Within an area of 1,254 sqm, this project applies cooling strategies in building a culinary park, which **integrates culinary street vendors, plant street vendors, and public space**.

Existing Condition

SUKASARI CULINARY PARK

High Reflective Material (Light Color)
To reflect solar radiation

High Reflective Material (Light Color)
To reflect solar radiation

Eco-friendly Material (Natural Wood)
To reduce heat transmission and building temperature

Tree Canopy
Natural shading,reduce heat with evapotranspiration,and improve urban storm-water

Permeable Pavement (Porous Concrete & Cool Seal Coating)
To reflect solar radiation up to 55% and reduce heat with evaporative cooling (improve urban storm-water)

High Reflective Material (Light Color)
To reflect solar radiation

MAIN FEATURES OF THE PROJECT

DEALING WITH INFORMALITY: EMPOWERING LOCAL ECONOMY

- This project aims **to convert a neglected alleys into a well-managed culinary alley,** thus creating a new community place in the alleys.
- Besides cooling the microclimate, **this strategy could empower the local economy and enhance public life**.
- Cooling strategies in the alleyway could be done by adding porous concrete to result in evaporative cooling, green shading to create natural shade, and light color material to reflect solar radiation.

Existing Condition

RODA CULINARY ALLEY

Green Shading
To create natural shading and reduce surface temperature

Organizing Street Vendors
To improve local economic development

High Reflective Material (Light Color)
To reflect solar radiation

Rain Water Management
To improve urban storm-water management

Permeable Pavement (Porous Concrete & Cool Seal Coating)
To reflect solar radiation up to 55% and reduce heat with evaporative cooling (improve urban storm-water)

MAIN FEATURES OF THE PROJECT

IMPROVING THE QUALITY OF KAMPUNG SETTLEMENT

- **More than 70%** of Bogor City is formed from kampung settlement.
- **Applying cooling strategies in the kampung settlement is necessary** to create continuous urban ventilation
- This strategy is **also improving the quality of life** for local citizen
- Providing vegetation, reflective material and natural material use, also trees planting in the residential area mean to reduce the temperature

Existing Condition

PULO GEULIS KAMPUNG SETTLEMENT

Smart Lighting
Energy eficiency and alternative energy source from solar power

Tree Canopy
Natural shading, reduce heat with evapotranspiration, and improve urban storm-water

High Reflective Material (Light Color)
To reflect solar radiation

Green Facades
To create natural barrier and reduce surface temperature

Shading Structure
To create barrier and reduce surface temperature

Rainwater Harvesting
to store stormwater then process the reuse water for surrounding area

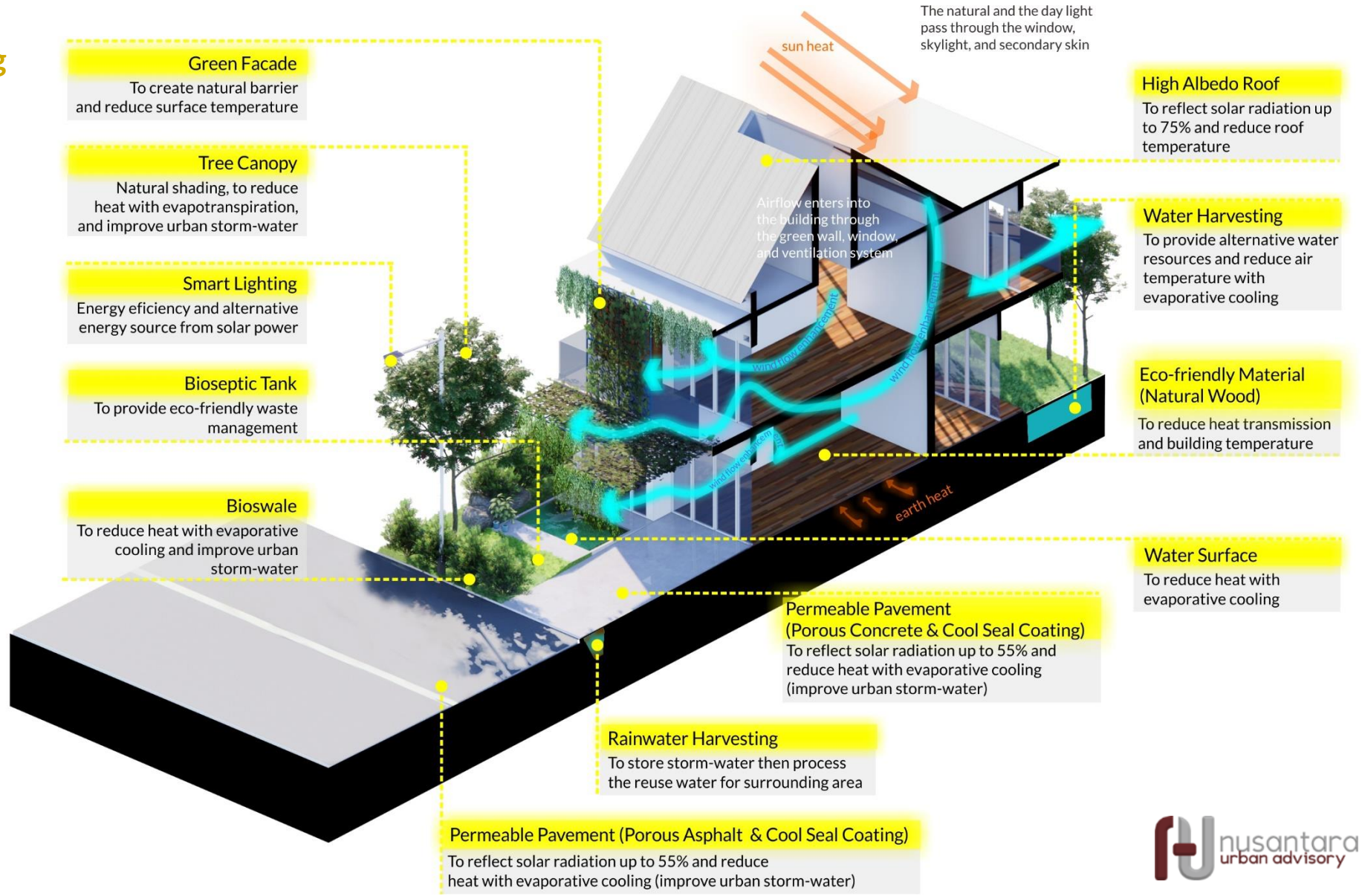
Permeable Pavement (Porous Paving)
To reduce heat with evaporative cooling (improve urban storm-water)

MAIN FEATURES OF THE PROJECT

IMPROVING THE QUALITY OF KAMPUNG SETTLEMENT

Regulating Incentives for Housing

- **A set of regulations for housing** should be enforced to reduce the temperature of building envelopes.
- **Tax incentives could be given to those who build cooling elements** (adding green facade, tree canopy, permeable pavement, and high reflective color material



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MAIN FEATURES OF THE PROJECT

PLANNING PROCESS: A COLLABORATIVE APPROACH

BOGOR CITY GOVERNMENT, PRIVATE, ACADEMIC, MASS MEDIA, AND SOCIETY

Multi-stakeholder involvement is the key to achieve a sustainable strategy. The ideas of each stakeholder are summarized through the discussions and wokrshop.

Planning Workshop with Local Stakeholders

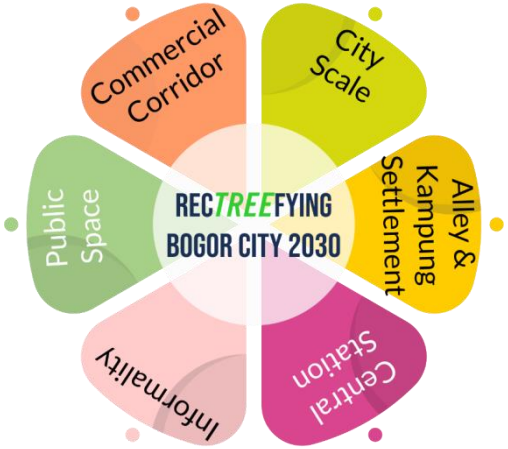
Planning Discussion with Street Vendors

Visioning with The Mayor Team

Planning Discussion with Suryakencana China Town Local Residents

EXPECTATIONS AND FUTURE PROJECTS

"REC *TREE*FYING" BOGOR CITY ROADMAP



2019
Master Planning
Rectreefying Bogor

2022 - 2025
- Central Station & CBD Revitalization
- Cooling Commercial corridor
- Trees Network Planting

2030
Rectreefying Bogor

50% rectreefying
2025

2020 - 2023
- Establishing Regulation
- City Parks Revitalization
- Organizing Street Vendors
- Alleyways Reactivation
- Trees Network Planting

2026 - 2029
- Cooling Kampung Settlement
- Cooling Commercial Corridor
- Alleys Revitalization
- Trees Network Planting

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CONCLUSION

Mitigating the GHG emission and addressing the impacts of urban heat island effects to the urban environment should be taken seriously **by implementing relevant cooling city strategies**

Urban greening and cooling strategy should be able to work with **the existing urban condition, and local unique value** of a city

Urban greening and cooling strategy should be **a tool to solve specific socio-economic issues (and to improve local economy).** A series of interventions should respond to community and informal economy needs

Stakeholder engagement between local government, private sector, community/ society, academic institution, and media **is the key to achieve sustainability**

Cooling City Strategy **should be embed and mainstreamed into Indonesian cities spatial plans** and regulations

This project could be **an innovation** or a pioneer and an example **for other Indonesian cities**

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THANK YOU
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