



Integrating Edible City Solutions in Southern China – Best Practices from Guangzhou





Guangzhou City Team: Members and Organization Structure

The main functions of each group

President
Deng Xingdong
邓兴栋

Vice President & Expert Advisor
Wang Zhifang
王志芳

Enterprise GZPI Group GM (Group Manager)
Xu Yunfei 许云飞

Members: Wang Xiaobing 王小兵

Members: Liu Ben 刘犇

Members: Wang Qinqiaodan 王秦乔丹

- 1) Connect with relevant departments and institutions at the regional level
- 2) Organize and compile work results; Promote work coordination
- 3) Collaborate to carry out EdiCitNet research work

Community Designers Group
GM: Zhai Qiang 翟强

Members: 刘珏颖
Liu Jueying

Members: Zheng Chenkun 郑臣坤

- 1) Connect with relevant departments at the community level
- 2) Carry out research work in community units

PKU Group
GM: Dr. Wang zhifang

Members: Wang Xizun
王锡尊

Members: Huang Zhibin
黄志彬

- 1) Provide academic guidance
- 2) Collaborate to carry out EdiCitNet research work
- 3) Compilation of the results



ONGOING ACTIONS

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Societal challenges &
Geographical area

02/

Existing ECSs & Fields
of action

03/

Scenario Process Goal &
Scenarios scope

04/

Goals combinations &
Scenario Description





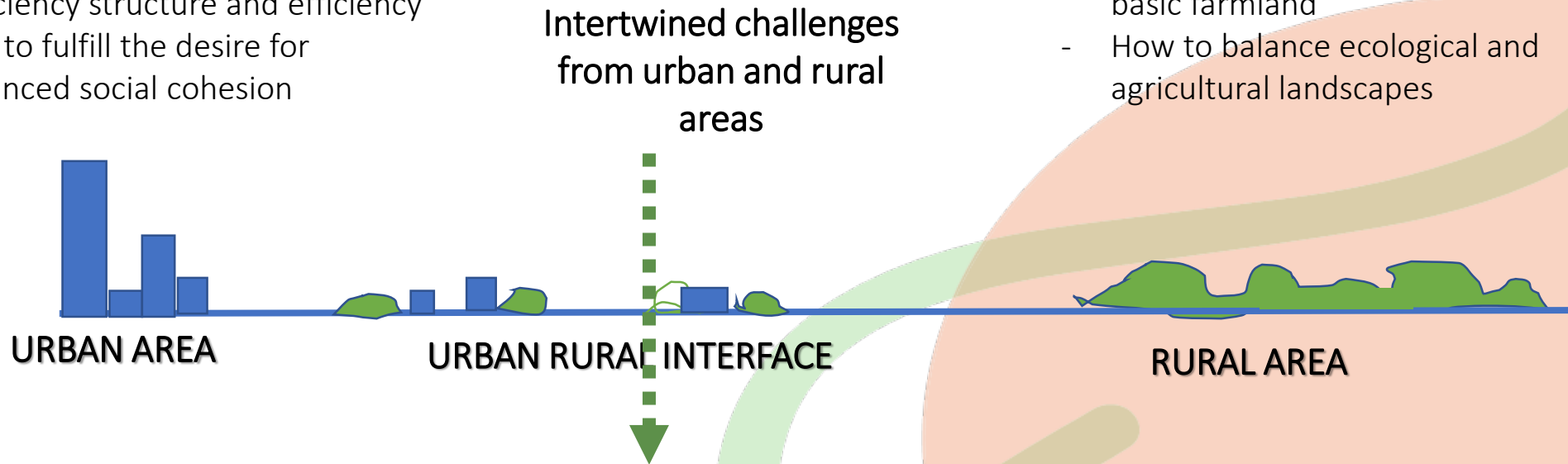
01 Societal Challenges & Geographical Area



Societal Challenge

- How to improve food self-sufficiency structure and efficiency
- How to fulfill the desire for enhanced social cohesion

- How to preserve permanent basic farmland
- How to balance ecological and agricultural landscapes



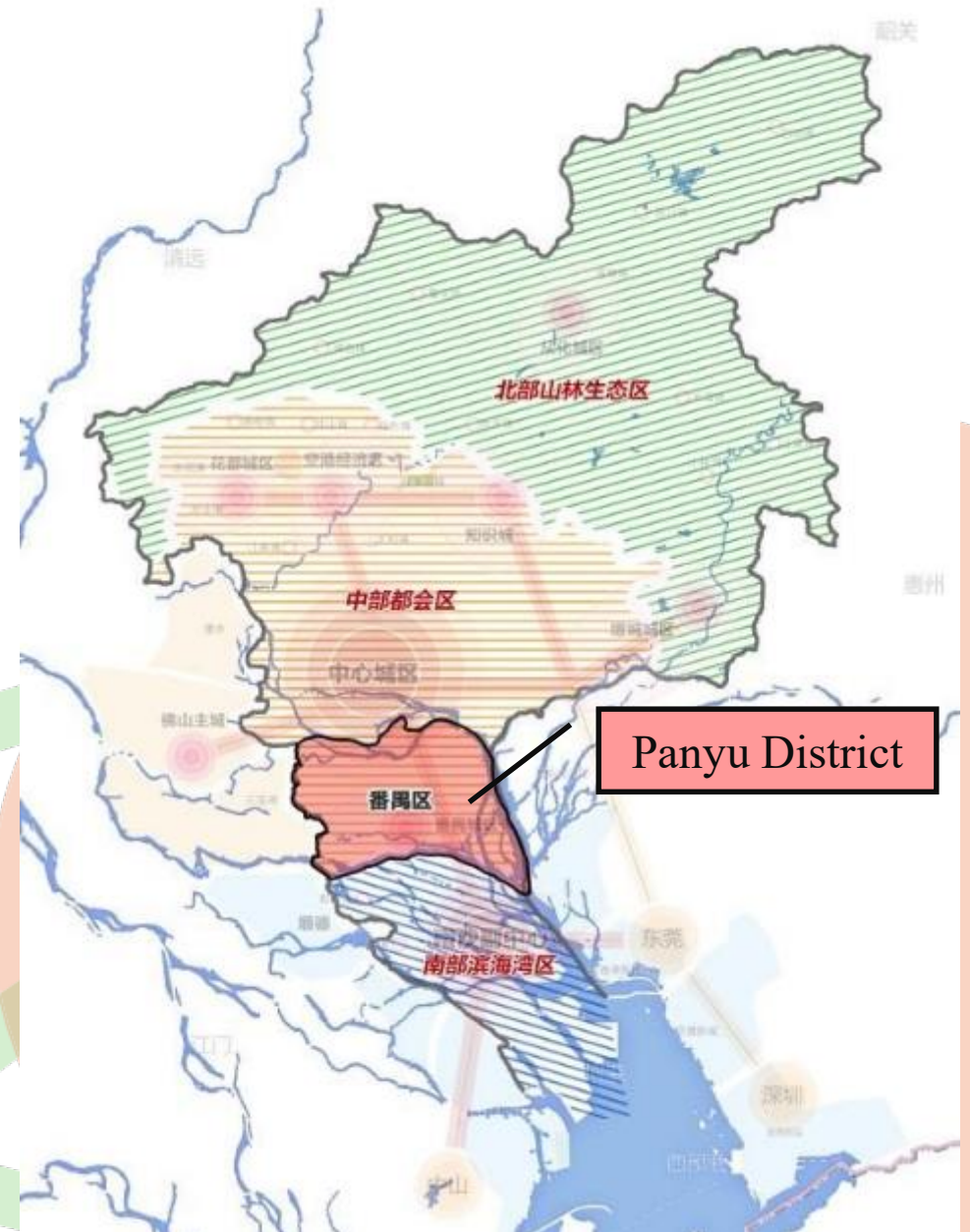
To address the need of food self-sufficiency through sustainable urban agriculture (or ECS), considering the needs for social cohesion and ecological conservation.

Geographical area

◆ Overview of Panyu District

Panyu District is located in the south-central part of Guangzhou.

1. District area: over 530 square kilometers
2. Population: more than 2.6 million permanent population
3. Weather: the south subtropical marine monsoon climate zone



Location map of Panyu



◆ Fig. Layout of urban agricultural demonstration sites in Guangzhou



The regional distribution of urban agricultural eco-tourism attractions in Guangzhou is "more in the North and South, less in middle area".

Panyu and Nansha districts in the south of Guangzhou are agricultural land use areas in Guangzhou. They have many coastal areas and open plains. They are important suppliers of "Shopping Basket Program" in Guangzhou and are suitable for the development of agricultural ecotourism.

Reference : 高星星. 广州都市型农业生态旅游的发展现状、问题与对策研究[D].华南农业大学,2016.



Geographical area

◆ Shatian-Weitian Special Space

Panyu District is the boundary of “Shatian” and “Weitian”.

“Shatian” is the flood plain with dense water network.

“Weitian” is hilly area surrounded by low hills.



Geographical Spatial Pattern of Panyu District

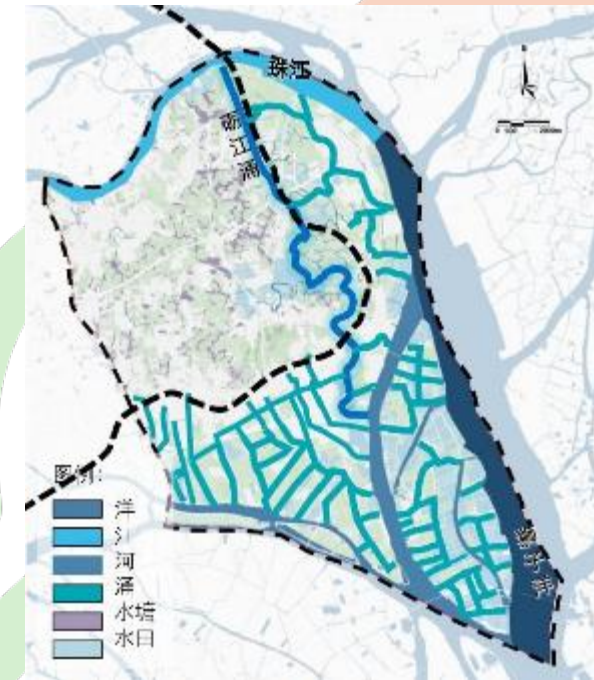
Geographical area

◆ Shatian-Weitian Special Space

The form of villages and water system is different. The water system of “Weitian” area is dominated by **ponds and lakes**, while “Shatian” is dominated by **river with village arranged along it**.



Traditional spatial settlement type



Water system characteristics



Weitian Spatial Pattern



Shatian Spatial Pattern

02 Existing ECSs & Fields of action



Existing ECSs in Guangzhou

① Edible landscape research group, School of forestry and landscape architecture, South China Agricultural University



Established in 2016, the design and construction of edible landscape is the focus of the team's research. At present, college teachers or organizations are promoting the development of edible landscape in Guangzhou and other places. Many farms, community gardens, schools, shopping malls and artists also contact the research group to seek project cooperation.

(https://www.sohu.com/a/414998236_120543965)

② Guangzhou Conghua agricultural park



In Conghua agricultural park in Guangzhou, walking on the country road of the park, what you hear most is that tourists discuss the creation of "edible landscape" with each other. **"Vegetables & fruits × garden = Edible Landscape"** has also become the hottest thing in the nearby rural farmland. This has not only fulfilled an idyllic dream of urban residents, but also become a popular science education base of traditional agricultural culture in Guangzhou. (<http://static.nfapp.southcn.com/content/201802/14/c973920.html?from=groupmessage>)

③ Guangzhou Taiguhui roof vegetable garden



The vegetable garden is located in the open-air garden on the third floor of the shopping mall. The property management party specially employs professors to check the growth of vegetables and fruits every 1-2 weeks and provide technical guidance for the daily management and crop planting of the vegetable garden, at the same time, the vegetable garden is equipped with special greening workers for daily maintenance.

(https://www.sohu.com/na/436307180_161795)

Existing ECSs: Agricultural Heritage

◆ Dike-pond landscape -Mulberry Fish pond

It is a special agricultural landscape of Guangzhou. Farmers grow vegetable and fruit beside fish pond, especially mulberry.

At present, there are more than 1,000 mulberry ponds formed in Panyu.



The Dike-pond Landscape Unit inside the Village



Dike-pond Landscape Unit with Mixed Layout of Villages



Real View of the Dike-pond Landscape Unit

Fields of action

System Model for Guangzhou



03 Scenario Process Goal & Scenarios scope

Goal 01: Improve food self-sufficiency structure and efficiency

- **Fragmentation distribution of agricultural land**
- In 2018, the arable land in Panyu District was 95.33km². Among them, the proportion of scattered arable land is nearly 40%, scattered in high-density urban built-up areas, showing fragmentation.
- **Low productivity of scattered arable land**
- The productivity of scattered arable land is lower than the average level, and there are problems of abandonment of farmland and accumulation of waste.

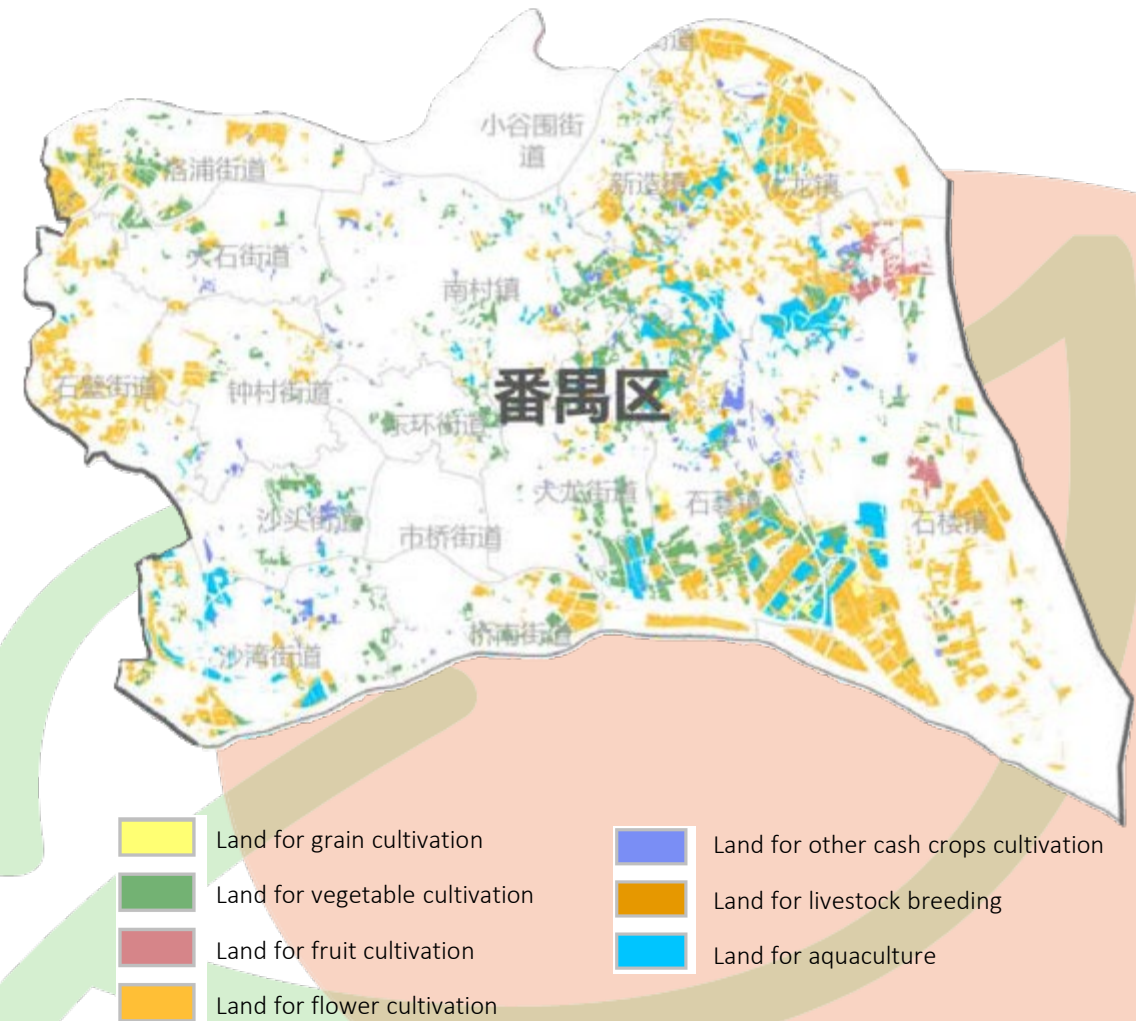
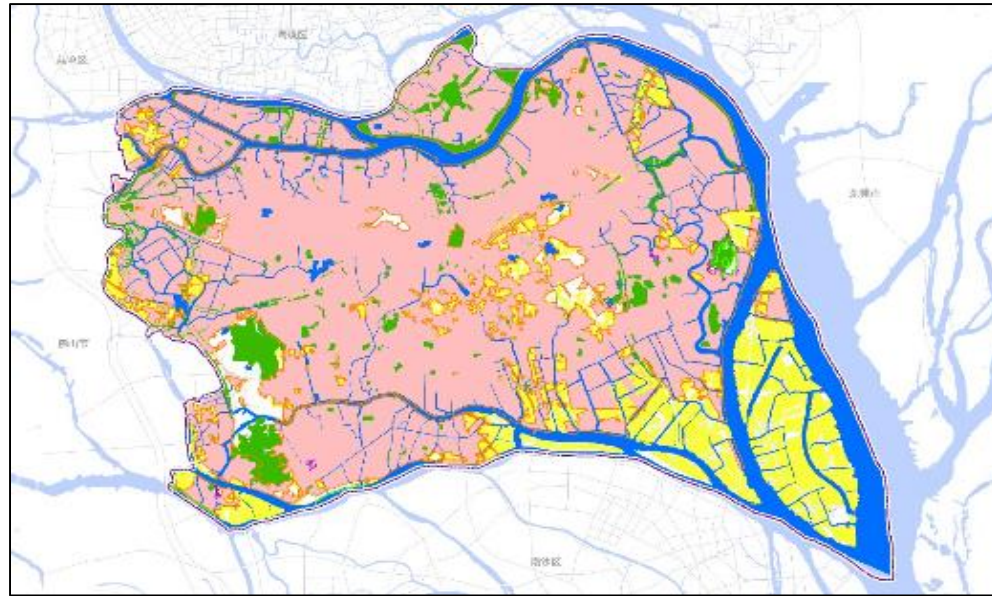


Fig. Current Situation and Pattern of Agricultural Industry Space in Panyu District

Goal 02: Fulfill the desire for enhanced social cohesion

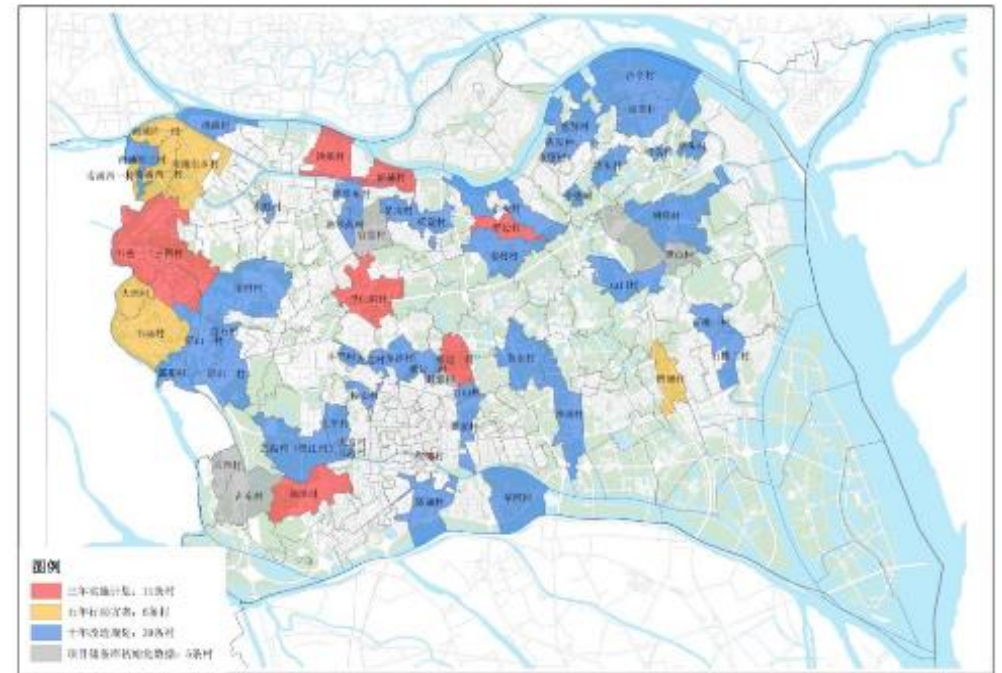
- High desire for urban agriculture vs Low efficiently used community public spaces
- There are 61 villages plan to regenerate within 10 years and become business area, high-tech area or high density residential area. However, lots of Permanent Basic Farmland is located in these villages. The conflicts between high desire for urban agriculture and Low efficiently used community public spaces are need to deal with.



Legend

- Permanent Basic Farmlands
- Urban Develop Space
- Blue Line
- Green line

Fig. Permanent Basic Farmlands in Panyu District



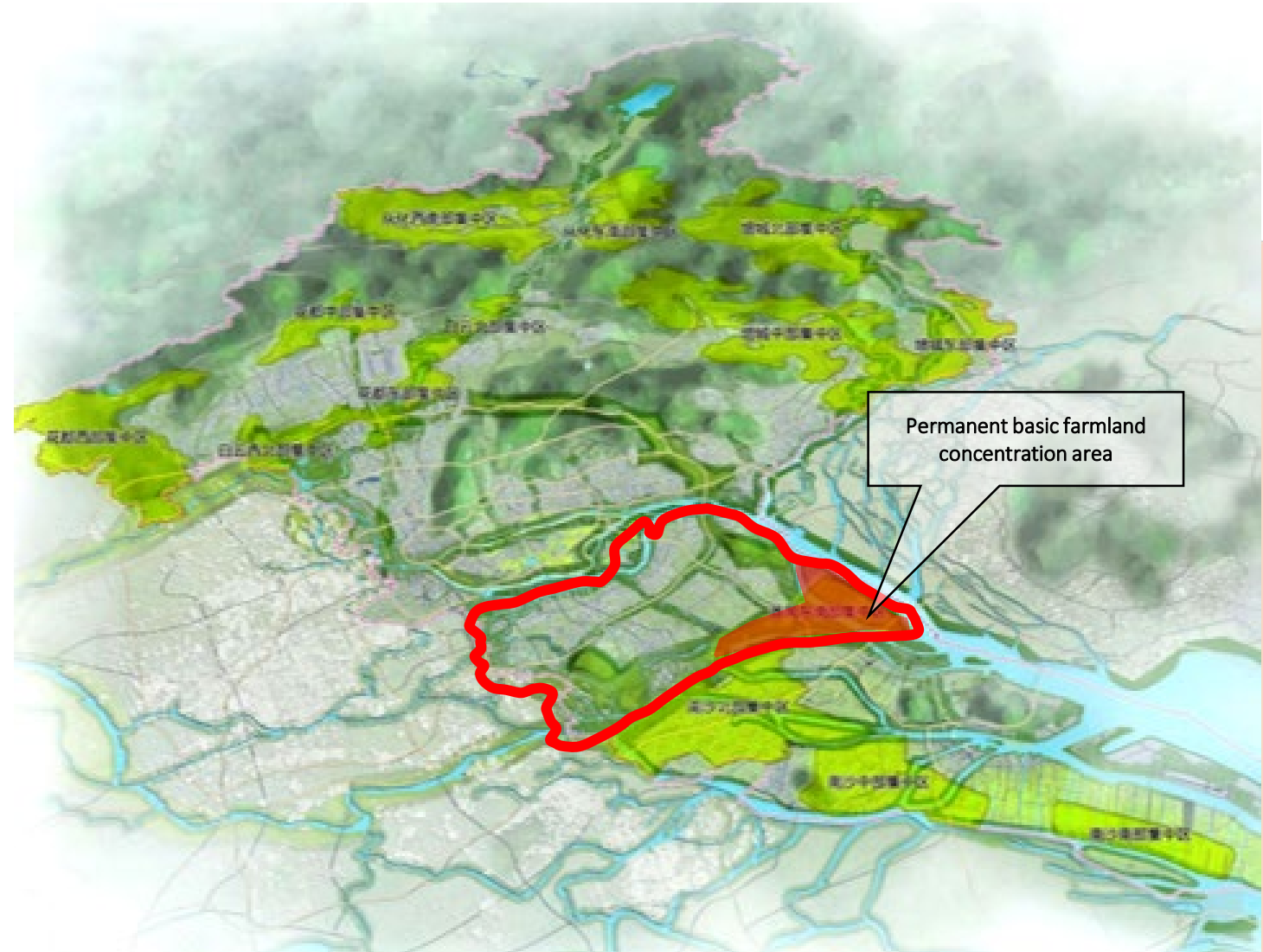
Legend

- Regenerate in 3 years
- Regenerate in 5 years
- Regenerate in 10 years

Fig. Urban Village Regeneration Develop Plan in Panyu District

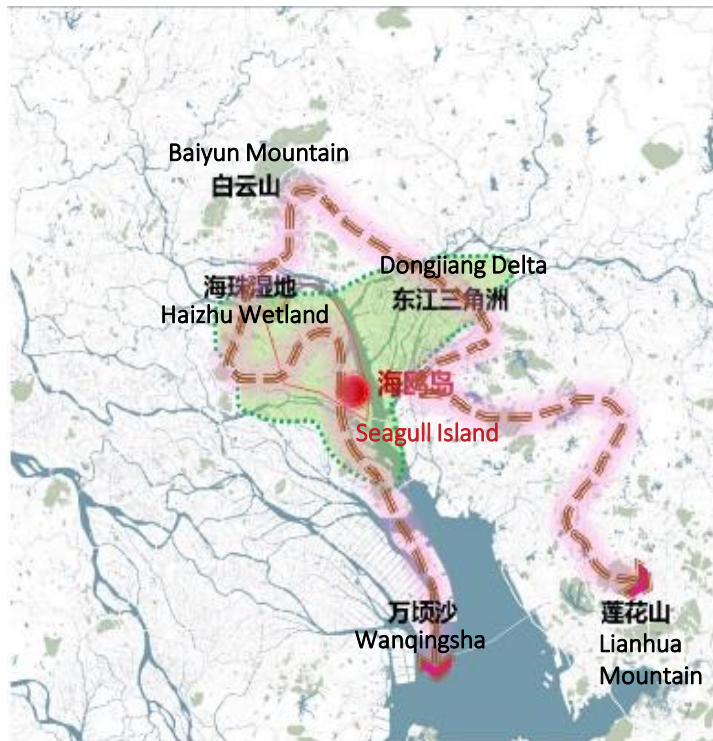
Goal 03: Preserve permanent basic farmland

- Urban construction land erode agricultural land space
- In the past 40 years , the area of arable land in Panyu District has shrunk by 63%. At the same time, urban construction land has expanded nearly 10 times, mainly due to the transfer of arable land.
- **Permanent basic farmland**
- In order to protect the current arable land and improve planting quality, the southeast of Panyu District is planed as permanent basic farmland concentration area.

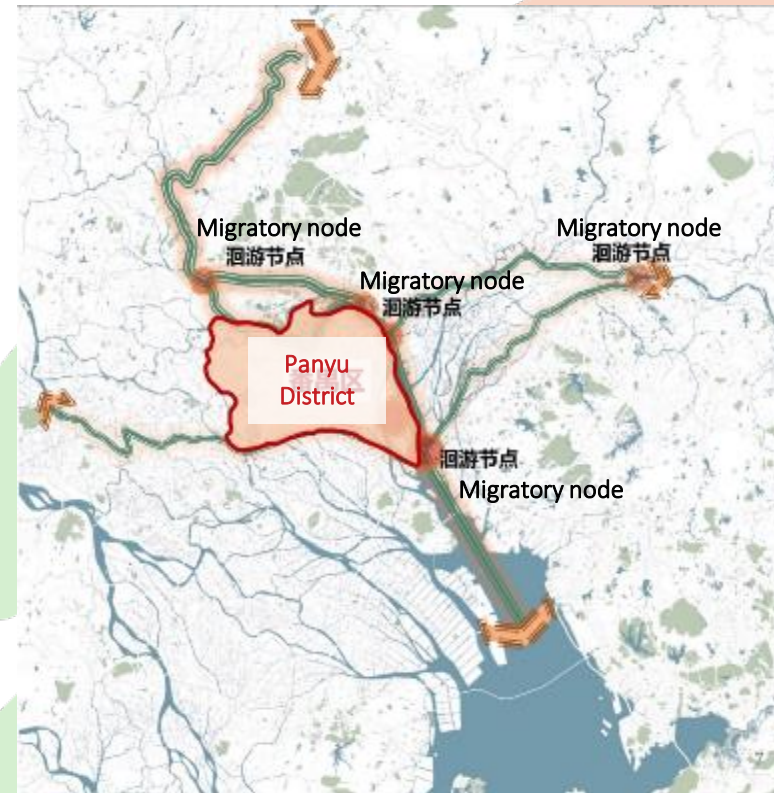


Goal 04: Balance ecological and agricultural landscapes

- An important international birds migration corridor
- Seagull Island is the largest original ecological island in Guangzhou and the "first stop" of northern migratory birds.



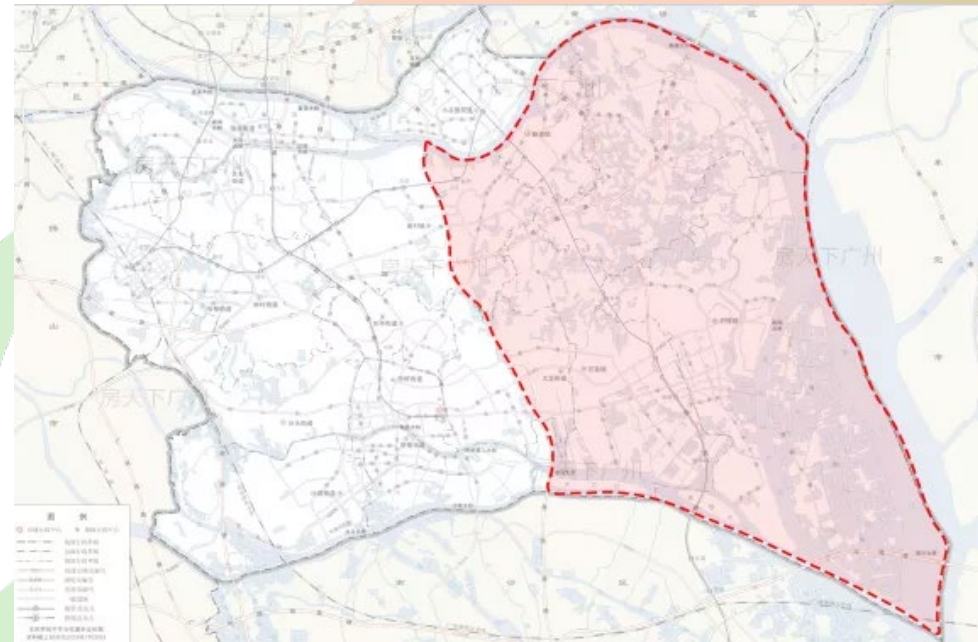
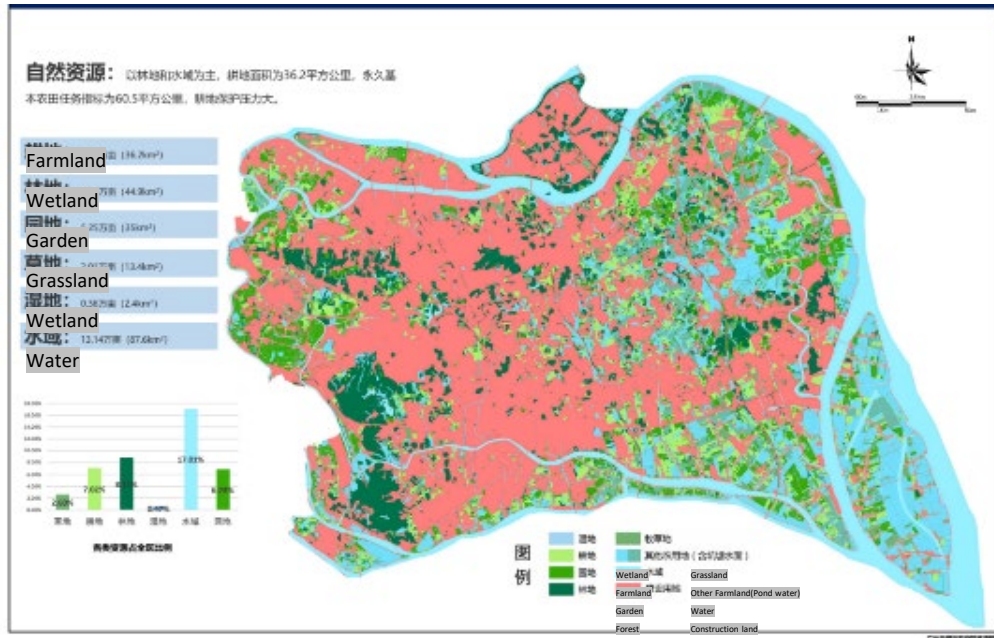
- A main fish migration corridor of Guangzhou
- Panyu is an area between the river and the sea, which make it a transfer station for the migration of saltwater and freshwater fish.



Scenarios scope

- Farmland protection pressure
- The natural resources of Panyu district are mainly forest land and water area. The arable land area is 36.2 square kilometers, and the target of permanent basic farmland is 60.5 square.

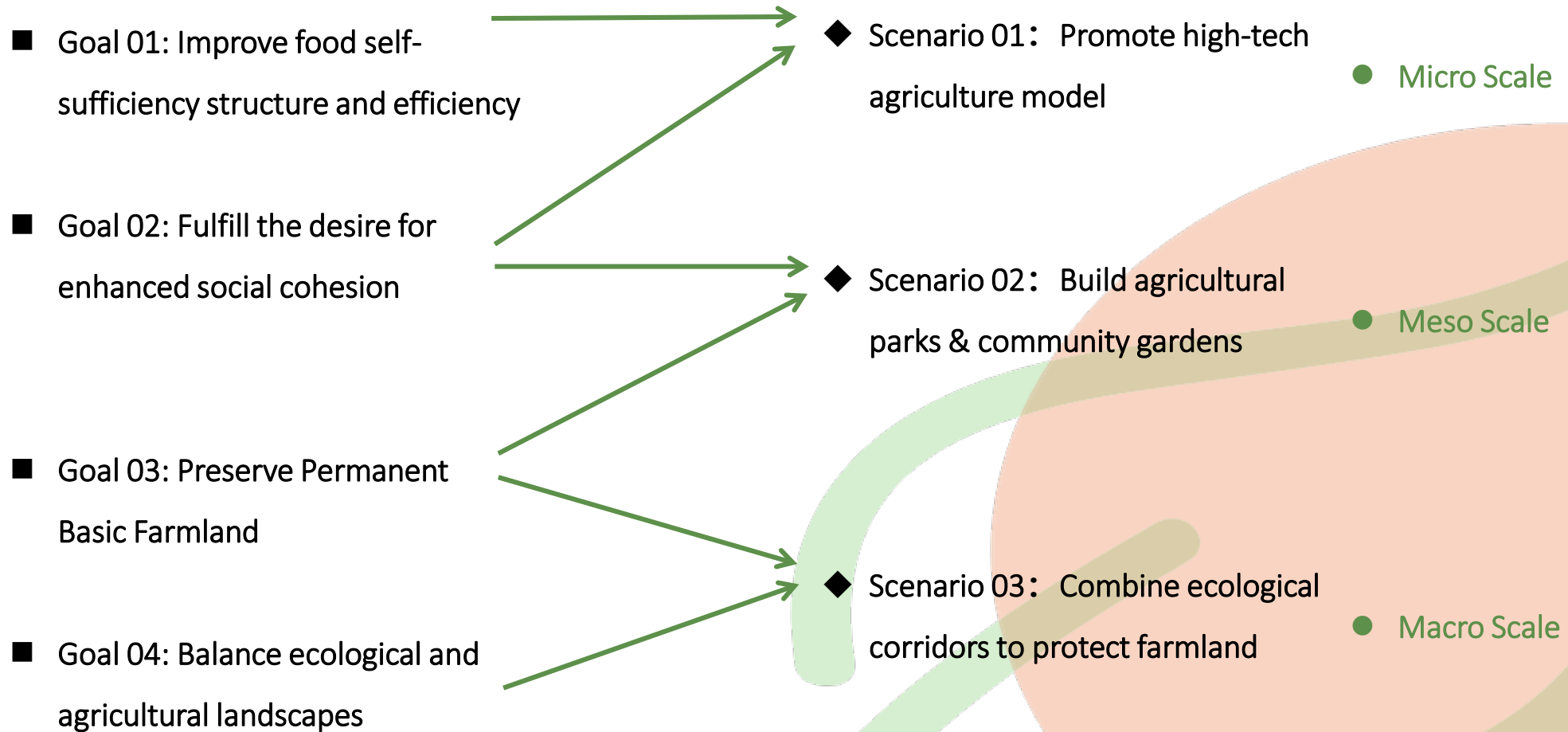
- Lianhua Bay area
- Lianhua Bay area is located in the east of Panyu District, with an area of 260 square kilometers, including 190 square kilometers on land.



04 Goals combinations & Scenario Description



04 Combinations of goals & Scenarios



Scenario 01: Promote high-tech agriculture model

- Improve food self-sufficiency structure and efficiency
- According to Guangzhou's food supply targets for the "Shopping Basket Project" in 2020, self-sufficiency targets for vegetables, fruits, potatoes, and aquatic products are set at 100%, 70%, 30%, and 90%, respectively.
- Construct a modern agricultural industry chain
- Construct a modern agricultural industry chain with the whole process of "producing, picking, processing, marketing" of agricultural products.
- Use three-dimensional vegetable farms to improve output efficiency
- The output benefit of a three-dimensional fruit farm is 4-5 times that of the same land.

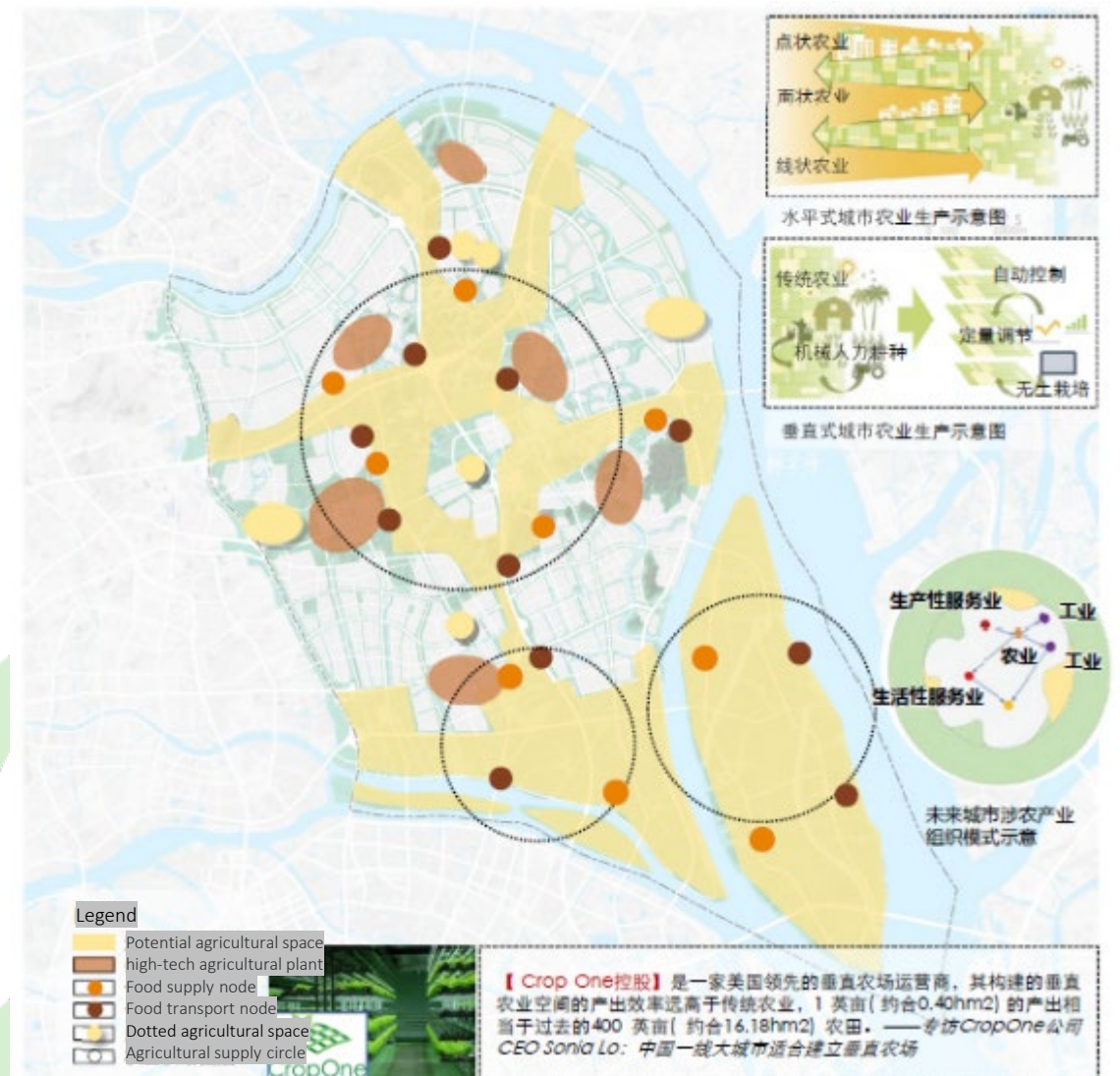


Fig. high-tech Agriculture Planning Layout Map

Scenario 01: High-tech agriculture model



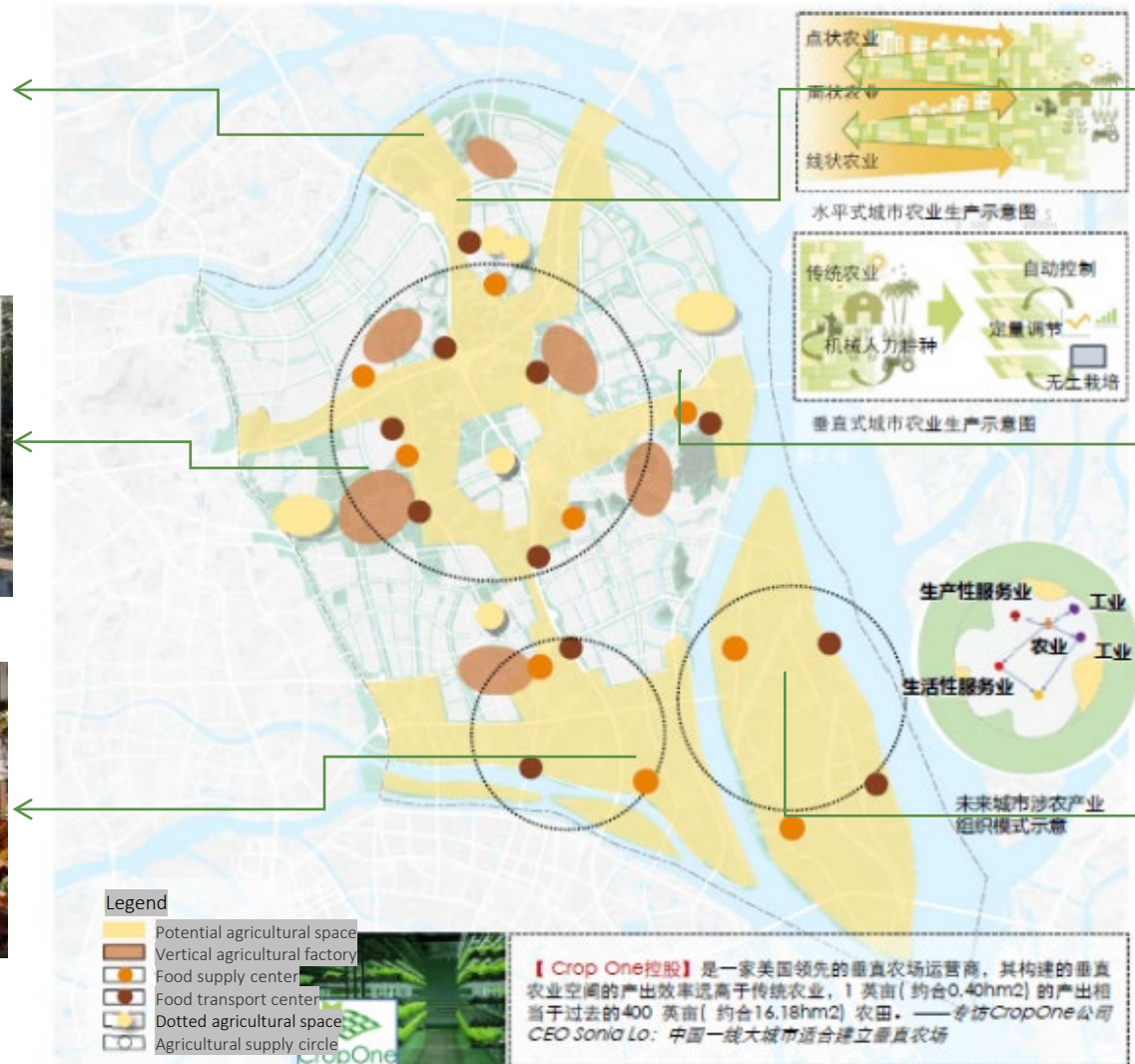
Potential agricultural space



Vertical agricultural factory



Food supply center



Food transport center



Dotted agricultural space



Agricultural supply circle

Fig. Vertical Agriculture Planning Layout Map



SWOT of Scenario 01 (High-Tech Agriculture on Micro Scale)

Strength

- Free from the destruction of disasters ;
- Lower manpower maintenance costs ;
- Improve the use of building facade space.

Opportunity

- There are many strong policy support and central fiscal subsidies
- More suitable for corporate or market capital participation

Weakness

- Existing technology is difficult to renovate the buildings; specially designed buildings are needed to effectively produce agricultural products;
- Existing technology is difficult to achieve organic production;
- More equipment invested in the early stage and high capital threshold.

Threat

- The technical requirements of high-tech agriculture are relatively high, and for traditional farmers, the technical threshold is high, and the recognition acceptance is low.



Aerial Strawberry Garden In Guangzhou Huadu
Suspended mobile cultivation bed technology



Aquaponics in Guangzhou Nansha
Circulating push aquaculture system



Soilless vegetables in Guangzhou Conghua
Agriculture without Farmland



Flower City Farm
The characteristic landscape of Guangzhou Central Axis CBD



This Project has received funding from the European Union's Horizon 2020 research and innovation programme under Grant Agreement No. 7776665.

Scenario 02: Build agricultural parks & community gardens

- Build several high-quality urban agricultural parks
- Focusing on the development of urban characteristic agriculture, smart agriculture and three-dimensional agriculture, and realize "one park, one theme".
- Construct community gardens
- Construct efficient urban farms and community gardens to activate and balance the spatial layout of food supply.

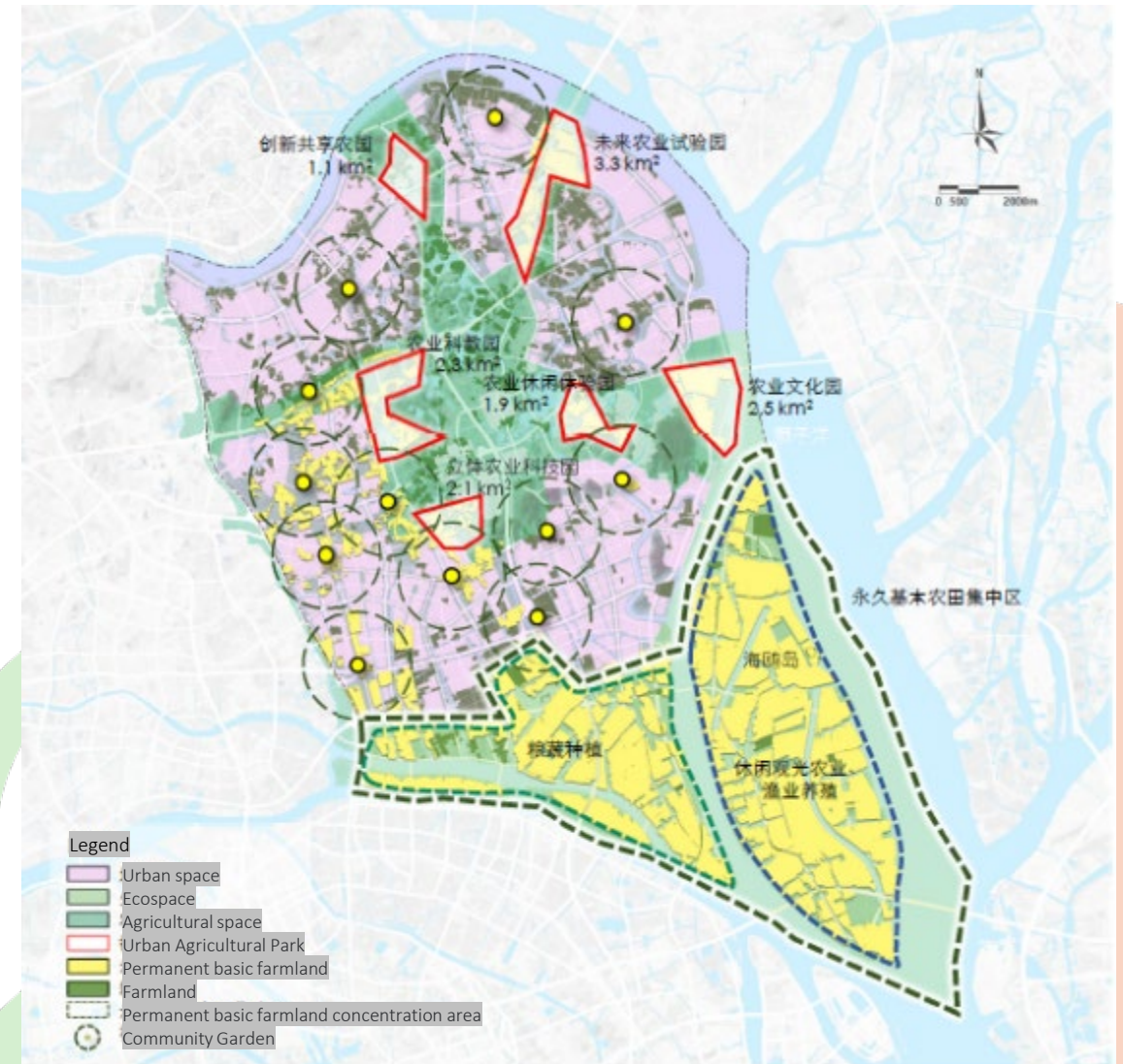


Fig. Urban Agriculture Planning Layout Map

Scenario 02: Urban agricultural parks



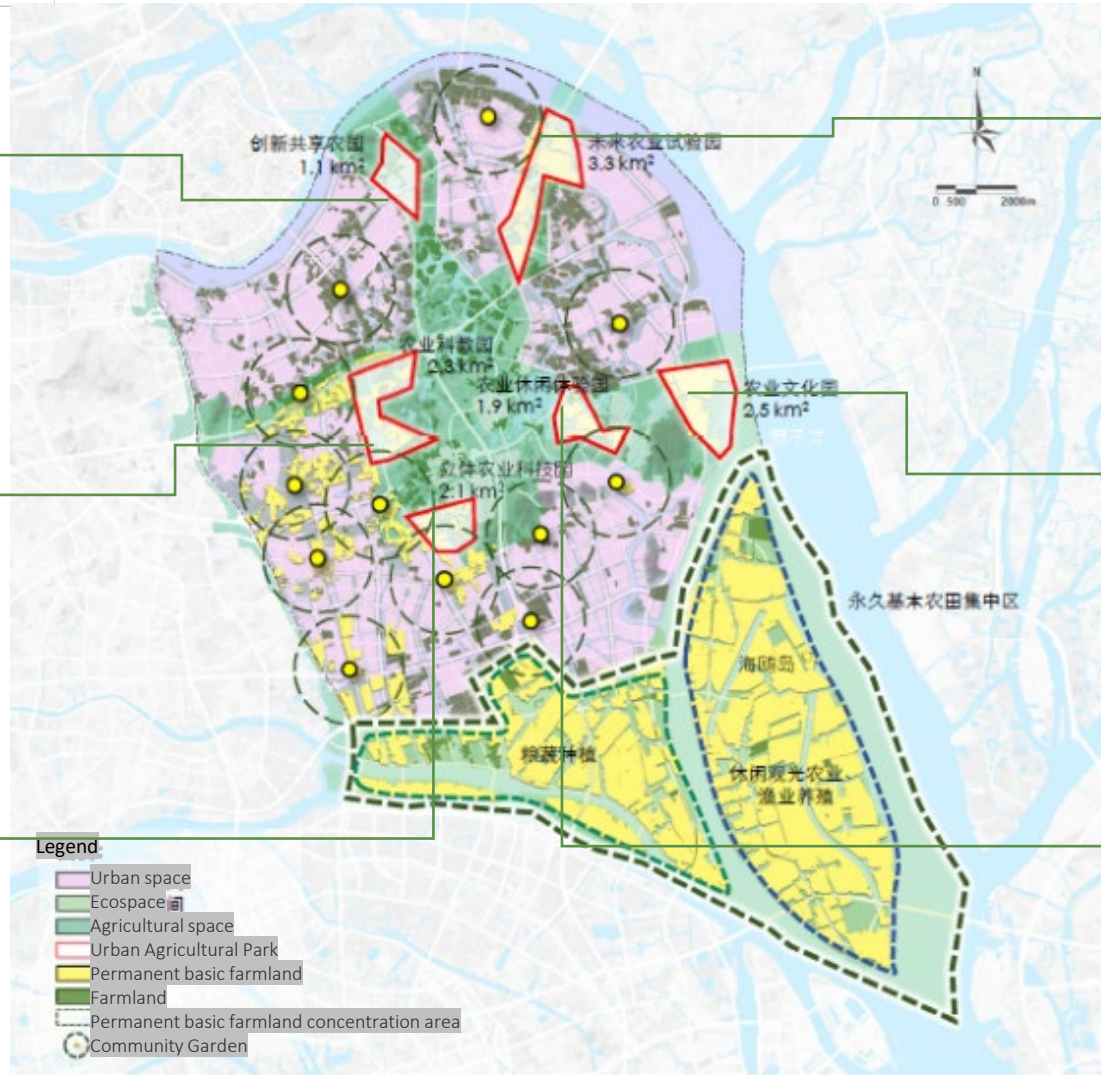
[Innovative and shared agricultural park](#)



[Agricultural science and education park](#)



[Three-dimensional agricultural science and technology park](#)



[Future agricultural experimental park](#)



[Agricultural culture park](#)



[Agricultural leisure experience park](#)

Fig. Urban Agriculture Planning Layout Map

Scenario 02: Community gardens



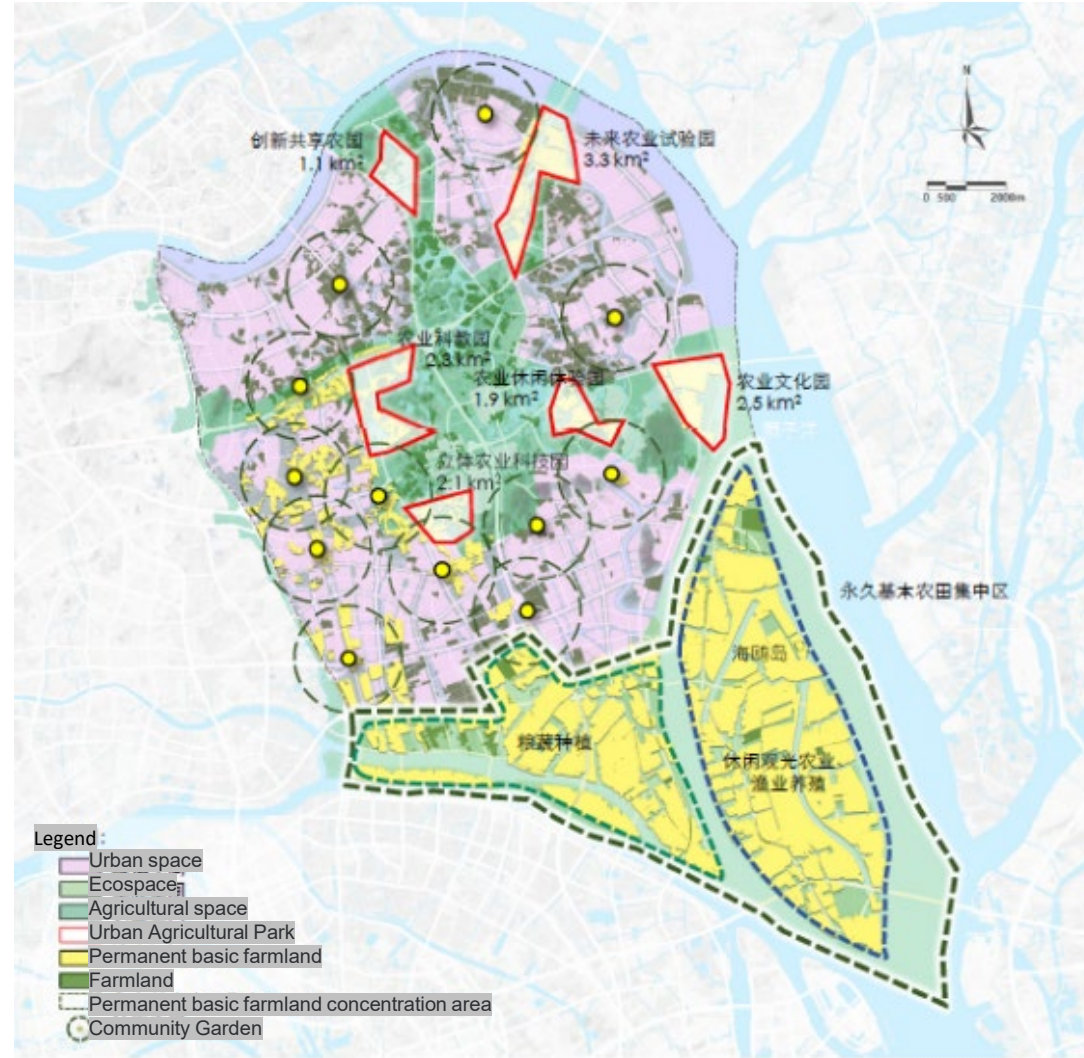
[Edible landscape](#)



[Nature education](#)



[Healing Garden](#)



[Space activation](#)



[Leisure and recreation](#)



[Green jobs](#)

Fig. Urban Agriculture Planning Layout Map

SWOT of Scenario 02 (Urban Agricultural Parks on Meso Scale)

Strength

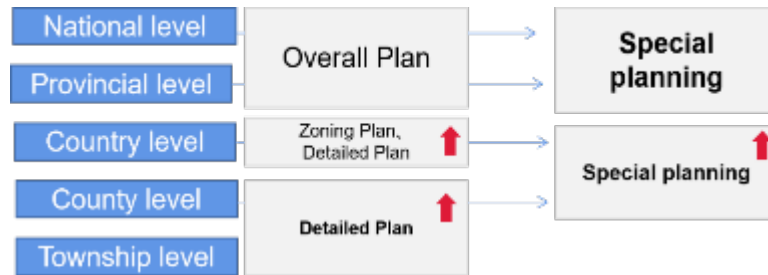


Real view of fields scene in Conghua

- The agricultural park model is conducive to the integration of fragmented farmland in the city

- Judging from successful cases in Guangzhou, urban agricultural parks can well balance farmland production and park leisure functions

Opportunity



Although, ECS has the opportunity to connect from the planning level marked by the red arrow (↑)

- As a special urban park, it can be better integrated into the existing planning system
- It is a model of policy advocacy and support to enhance farmland value

Weakness



Agriculture Equipment building

In China, these buildings can only store this kind of tools



In Korea, it was transformed to double as a cafe

- Existing land laws and regulations have strict regulations on farmland facilities, and there are policy bottlenecks to provide more leisure services

- The limited scope of leisure services limits the economic benefits of the land itself, and the market is not attractive enough

Threat



- Currently, urban agricultural parks are mostly led by the government, and the participation of enterprises and the market is low

Scenario 03: Combine ecological corridors to protect farmland

- Construct natural corridors for bird migration
- Restore the animal and plant habitats at key ecological nodes, build an ecological station for bird migration, and establish a diversified "food chain" system.
- Construct fish migratory habitat
- Using the north-oriented fish migration channel of Lion Ocean to create fish migration nodes, repair and build fish spawning grounds and feeding grounds.
- Repair Seagull Island to protect farmland
- Seagull Island covers an area of 35 square kilometers, of which 25% is ecological space, 63% is agricultural space, and 12% is construction space.



Fig. Regional ecology and biological space

Scenario 03: Bird & fish migration corridors



[Fish migration corridor](#)



[Haizhu Wetland](#)



[Seagull Island](#)



[Bird migration corridor](#)



[Lianhua Mountain](#)



[Huangshanlu Forestry Park](#)

Fig. Regional ecology and biological space

SWOT of Scenario 03 (Integrate into Ecological Corridor on Macro Scale)

Strength



Real view of fields scene in Jiangdu

Opportunity



Eco-Corridor with City-Fields in Munster

Weakness



Threat



- Farmland in the city can be used as an important patch of bird migration corridor
- The farmland along the river and coast is an important habitat for fish migration

- Ecological corridor is an indispensable technical content in the current planning system
- Not only in China, the planning of incorporating farmland in urban areas into ecological corridors has been practiced in many countries such as Germany and Austria.

- May bring potential agricultural non-point source pollution
- The current planning system is cautious about incorporating agricultural land into the urban green space system

- The governance is dominated by the government, and the participation and attractiveness of the market and enterprises are insufficient



PS: Guangzhou Community Planner and ongoing ECS project



This Project has received funding from the European Union's Horizon 2020 research and innovation programme under Grant Agreement No. 7776665.



Guangzhou Community Planner

- Guangzhou Community Planner is a group of people provide technical suggestion of communities and village. They are professional and technical talents and design institutions who invited by government in the form of a combination of full-time or part-time.
- As a link between the government and the public, Guangzhou Community Planner play a role as a regional planner think tank and do a job of site selection of community infrastructure , technical consultation and technical guidance.
- There two teams of Community Planner in Panyu district, one focuses on east part of Panyu.



Community planner studio listed

Picture delivered by Guangzhou Panyu Community Planner Office



Community planners communicate with residents

Picture delivered by Guangzhou Panyu Community Planner Office



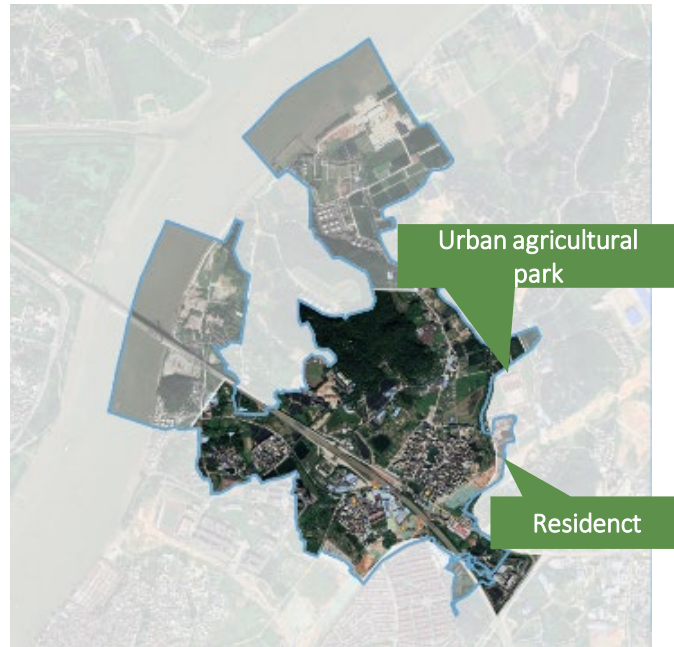
Picture delivered by Guangzhou Urban Planning & Design Survey Research Institute





The Role Of Community Planners In ECS:

- Communicate with the government and planning bureau and play an important role in the practice and promotion of the better integration of ECS into the Guangzhou planning system.
- Collect local Information and promote public participation in ECS projects
- Select site of ECS and practice ECS projects.



Sixian Village Regeneration Project



Investigate in Sixian village

Picture delivered by Guangzhou Urban Planning & Design Survey Research Institute

Picture delivered by Guangzhou Urban Planning & Design Survey Research Institute



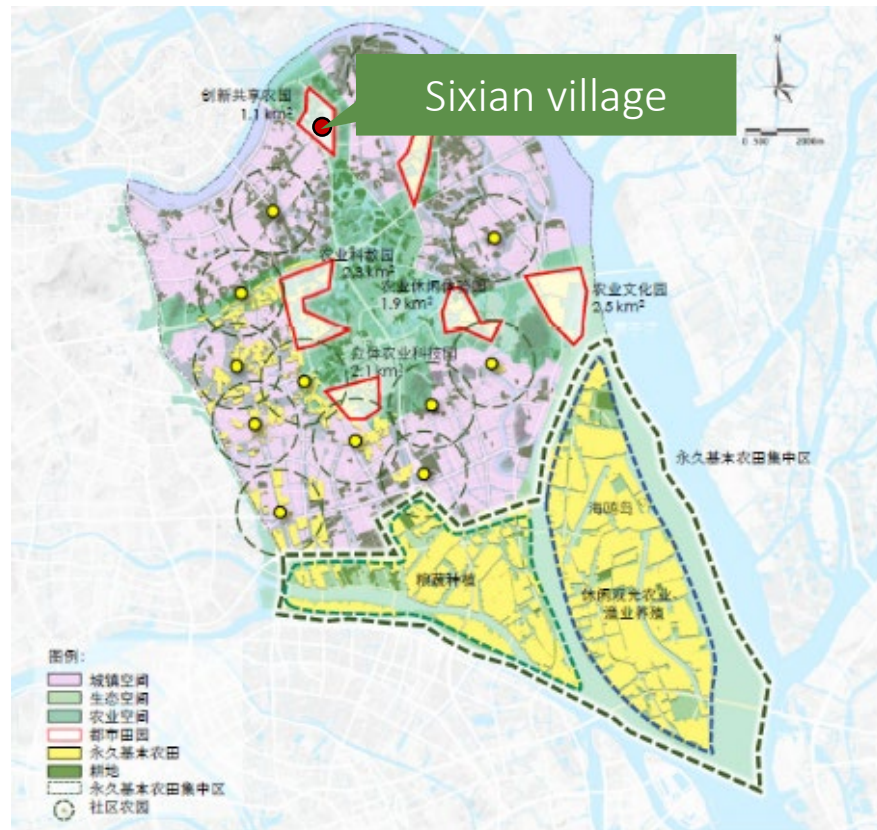
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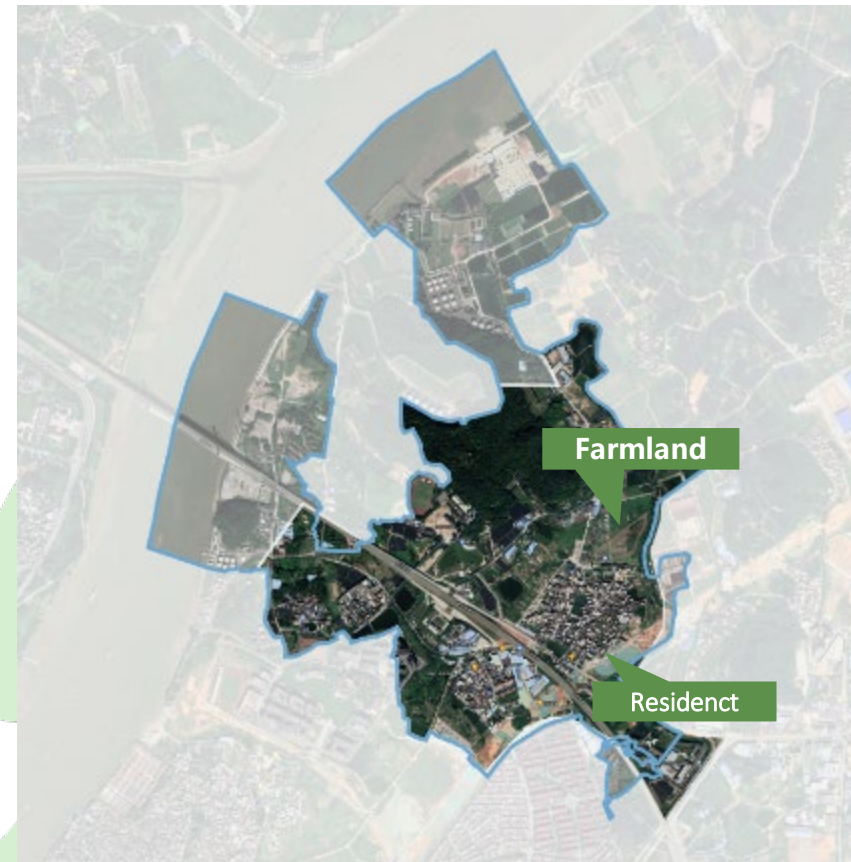
Scenario 02: Urban agricultural parks

Possible site for **Urban agricultural parks**:

Some of the village in the city center need regenerate and the farmland belong to the village can be used to built Urban Agricultural Parks, for example, Sixian Village.



Location of Sixian Village



Sixian Village Regeneration Project



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Sixian Village Regeneration Project

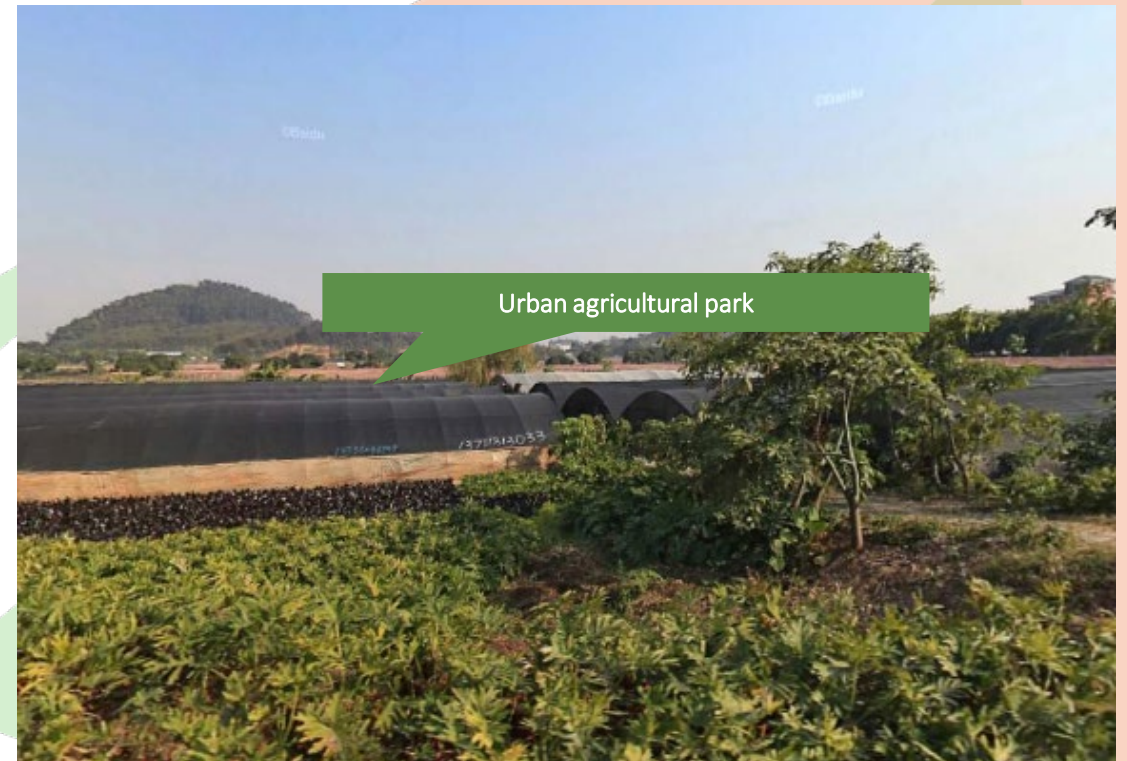
- Sixian Village is located in the south-east part of Panyu with lot of farmland.
- The village is planed to be Regenerated within recent 5 years.
- In the materplan of the regeneration project, south-east part is planed to build an urban agricultural park which is for nature education, agriculture touristy and High-tech agricultural experiment.



Resident

Urban agricultural park

Sixian Village Regeneration Project



Urban agricultural park

Farmland in Sixian village

