

# “*Xiangcun*”, As A Landscape Productivity

Sustainable Countryside for Urban-rural Integration in the Greater Bay Area



AR3U115 Graduation Lab Urbanism Studio  
Planning Complex Cities

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**“the Greatest Invention  
of the Humanity”**

**Edward Glaeser (2012)**



**V.S.**

**Losing land resilience**

**Shrinking food production fields**

**Increasing disparities between settlements**

# THE An International Agenda COUNTRYSIDE

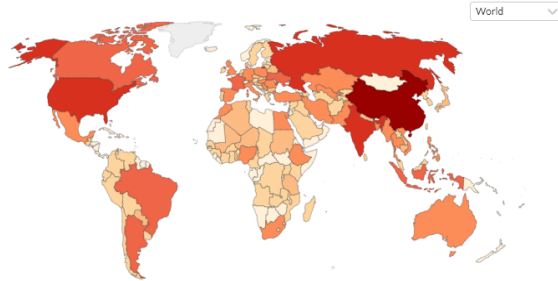


# The Countryside in A traditional Agricultural Country

The countryside in China, a traditional agricultural country.

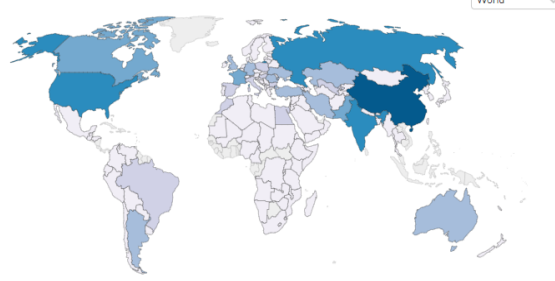
Cereal production, 2018

Cereal production is measured in tonnes, and represents the total of all cereal crops including maize, wheat, rice, barley, rye, millet and others.



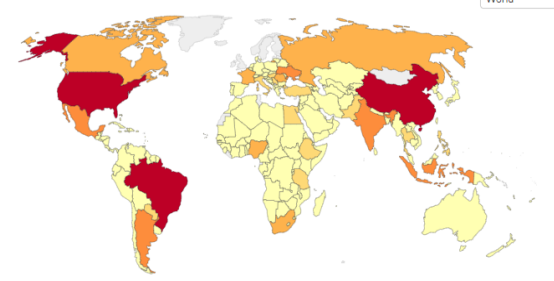
Wheat production, 2018

Wheat production is measured in tonnes.



Maize production, 2018

Maize production is measured in tonnes.

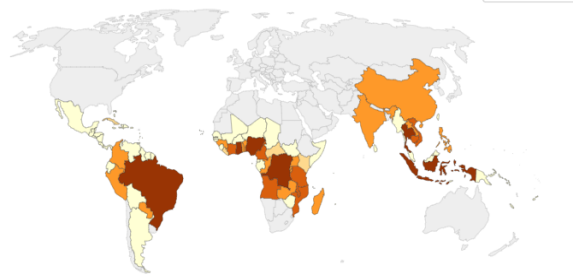


Source: UN Food and Agriculture Organization (FAO)

# 8% Global Agricultural Land

Cassava production, 2018

Cassava production is measured in tonnes.

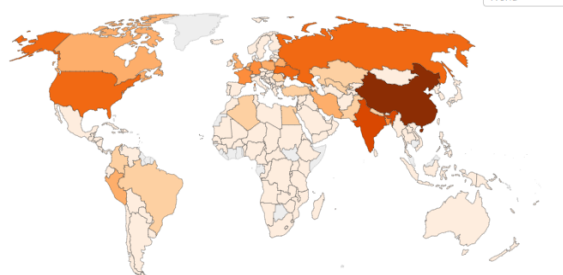


Source: UN Food and Agriculture Organization (FAO)

OurWorldInData.org/agricultural-production • CC BY

Potato production, 2018

Potato production is measured in tonnes.

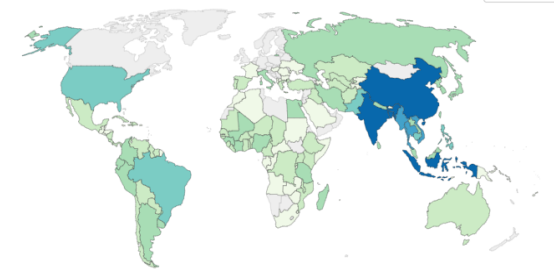


Source: UN Food and Agriculture Organization (FAO)

OurWorldInData.org/agricultural-production • CC BY

Rice production, 2018

Rice production is measured in tonnes.



Source: UN Food and Agriculture Organization (FAO)

OurWorldInData.org/agricultural-production • CC BY

## Challenges: The Sacrifice

Dual Relationship due to the 1950s policy, "Feeding the Industries by Agriculture"



# Challenges: The Escaping

1985-2019: Labor Losing from Rural Area to Megacity Regions

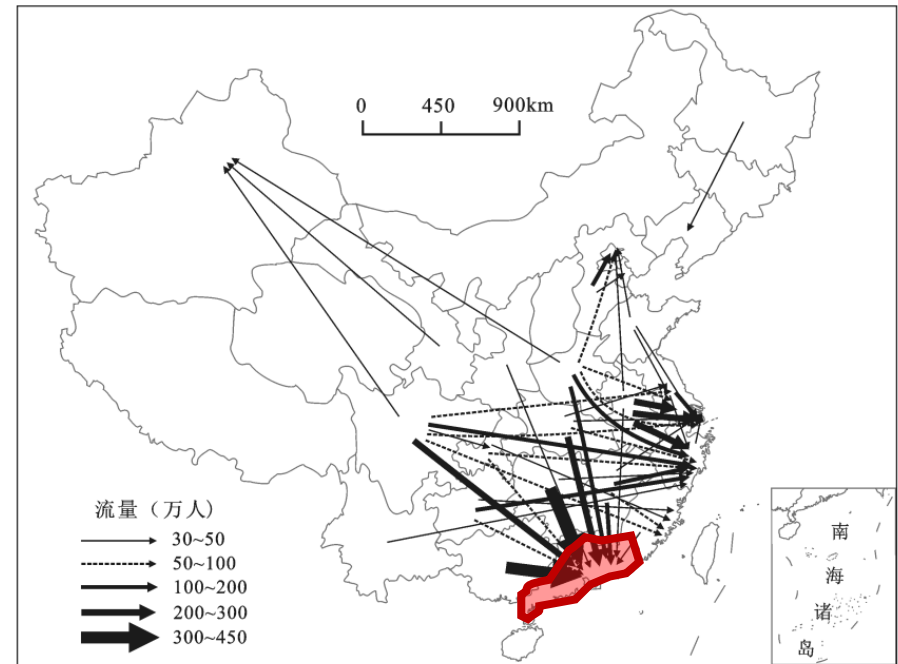


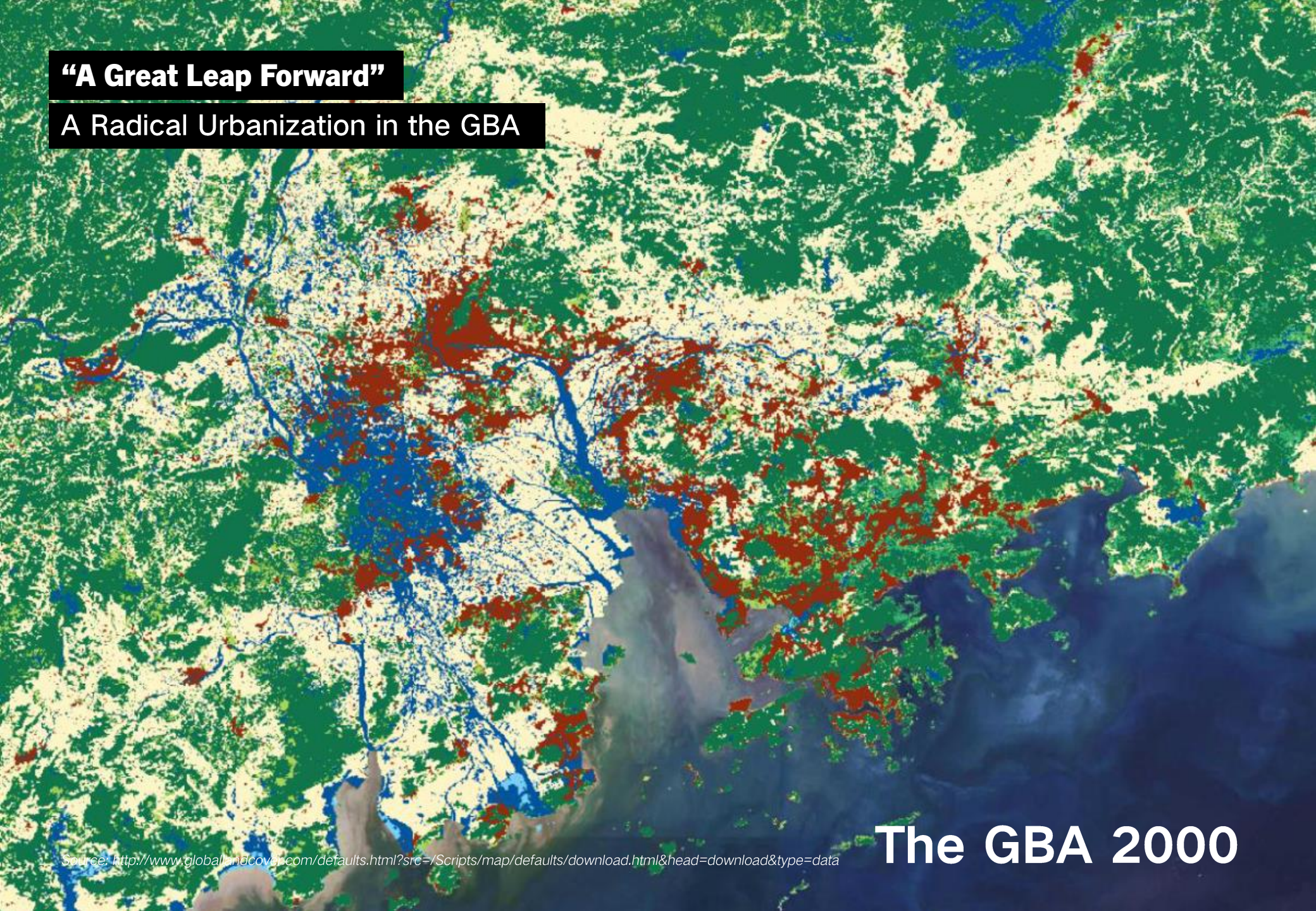
图4 中国农村人口省际流动主要流向分布示意图

Fig.4 Sketch map of main flow directions of inter-provincial rural population in China

Source: <http://geoscien.neigae.ac.cn/CN/10.13249/j.cnki.sgs.2015.012.1511>

**“A Great Leap Forward”**

**A Radical Urbanization in the GBA**



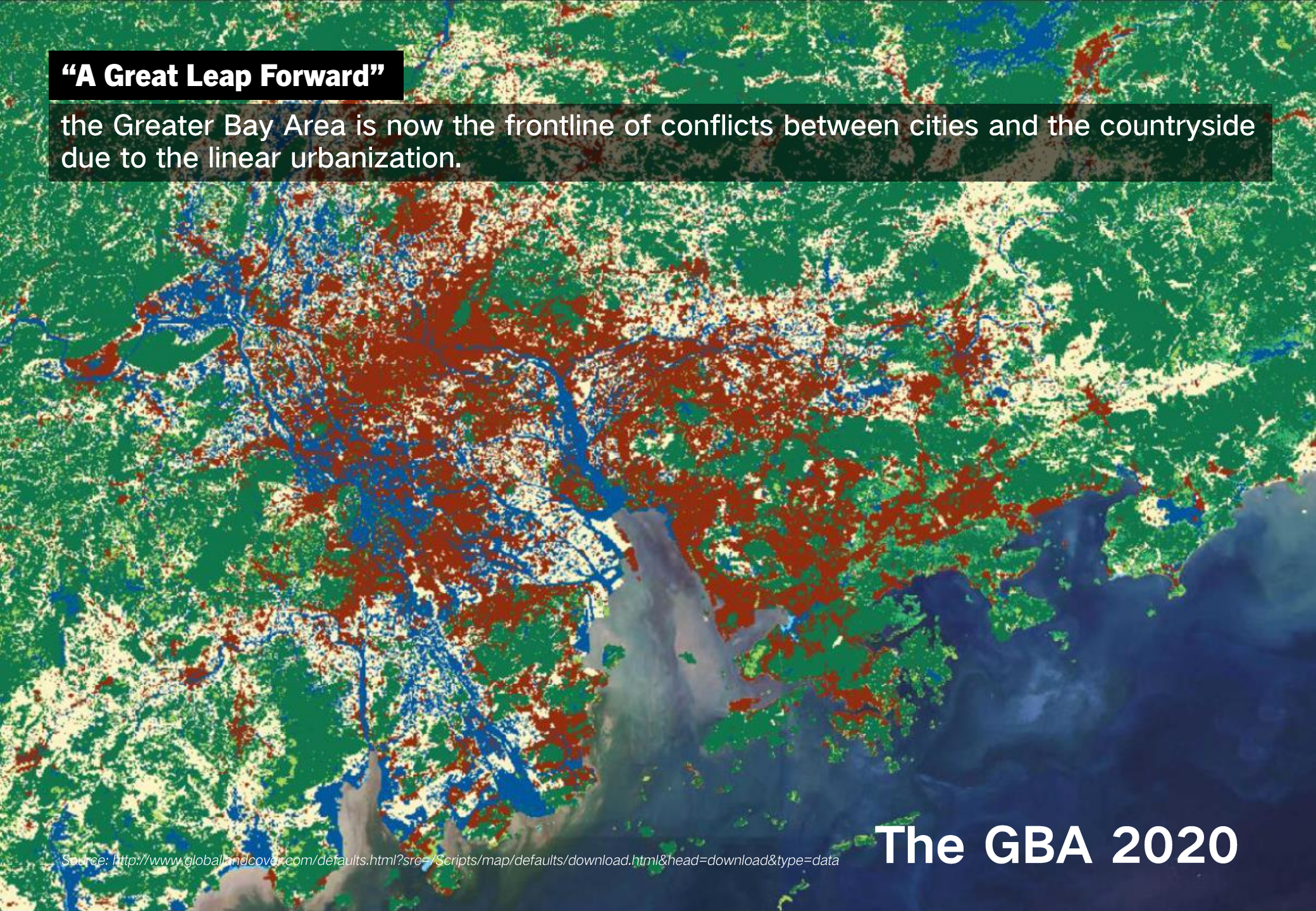
Source: <http://www.globalandcover.com/defaults.html?src=/Scripts/map/defaults/download.html&head=download&type=data>

**The GBA 2000**



## **“A Great Leap Forward”**

the Greater Bay Area is now the frontline of conflicts between cities and the countryside due to the linear urbanization.



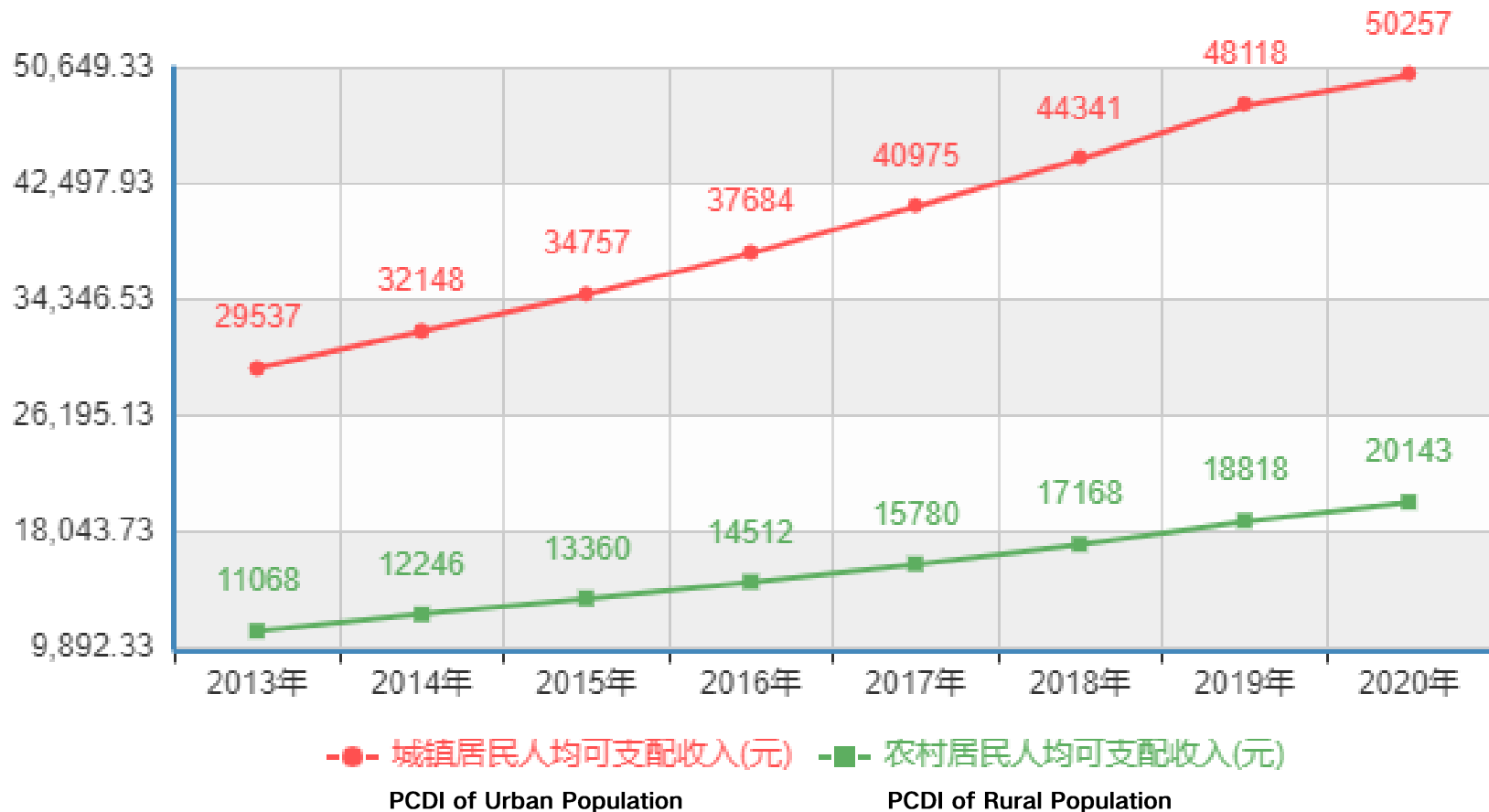
Source: <http://www.globallandcover.com/defaults.html?src=/Scripts/map/defaults/download.html&head=download&type=data>

# **The GBA 2020**

# Increasing Wealth Disparity

Result of the Linear Urbanization

## Per Capita Disposable Income in Guangdong (2013-2020)



# Industrialized Aquaculture



# Tourist Resort



# Ecological Utopia



# Barren Ponds



# Cultural Museum



# Boundary





# “The Countryside is Declining”



Development Conflicts



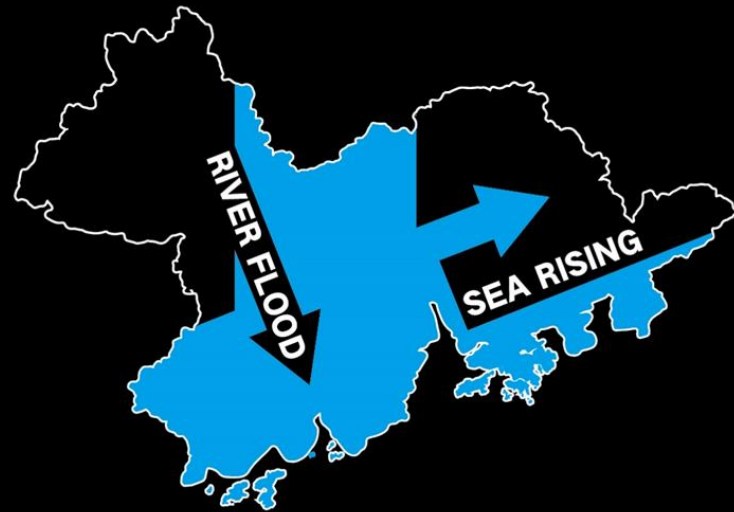
Increasing Disparities

**Linear urbanization** influenced by historical dual urban-rural relationship is leading to the **increasing disparities** between cities and the countryside in the GBA.

# “The Countryside is Declining”



Function Specialization



Environmental Risk

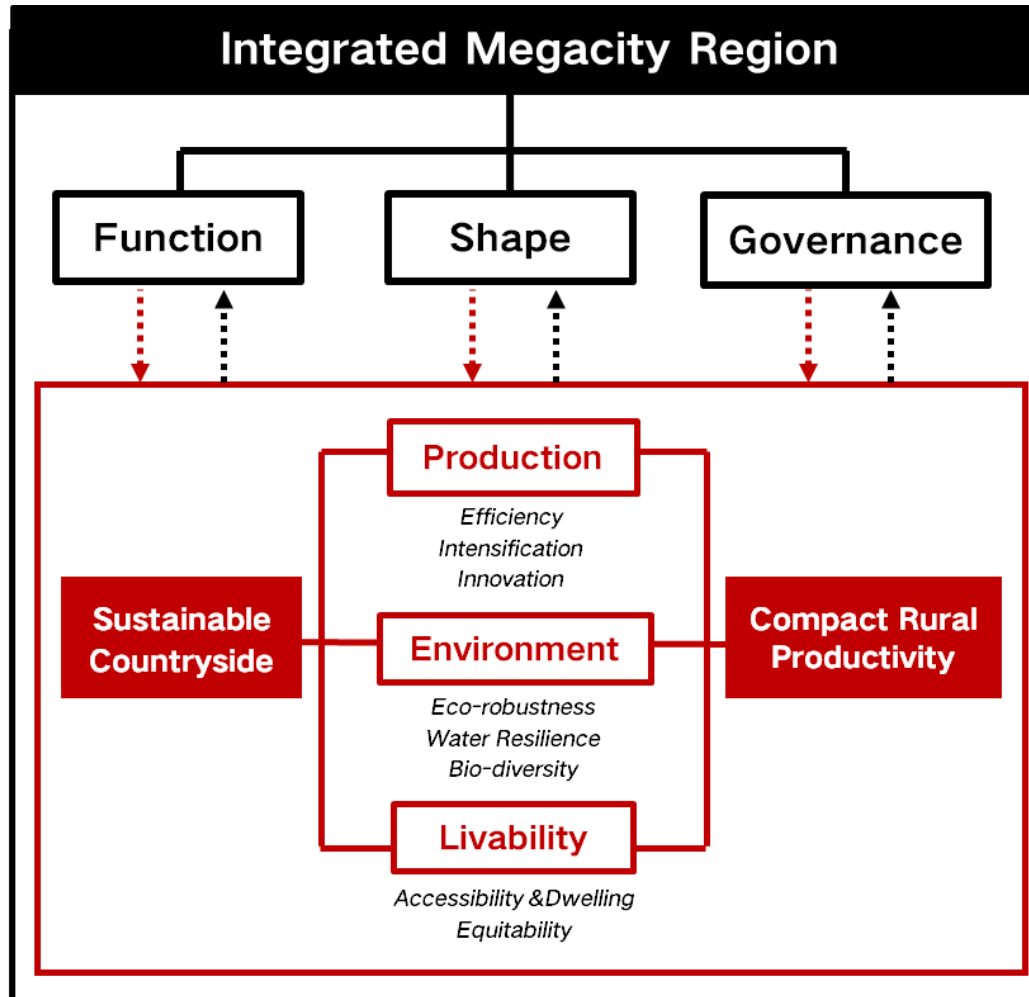
In order to cover the wealth gap, the rural land is transformed into **monofunctional land**. The **sustainable development** in rural areas is being **broken**, and the countryside is becoming service zones for city clusters.

**How to **develop the countryside sustainable** based on **multifunctional land use**, in order to **integrate** the countryside into the city-oriented network in the GBA?**

- **Redefining the roles of the Countryside**
- **Encouraging A Model for Sustainable Development**
- **Integrating the Rural Area into the Region**

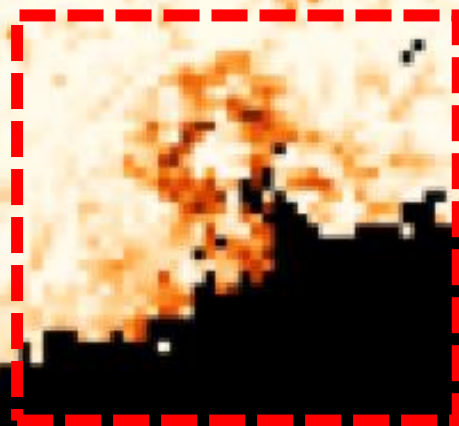
# CONCEPTUAL FRAMEWORK

Framework for Analysis and Design structured on the Integration Theory



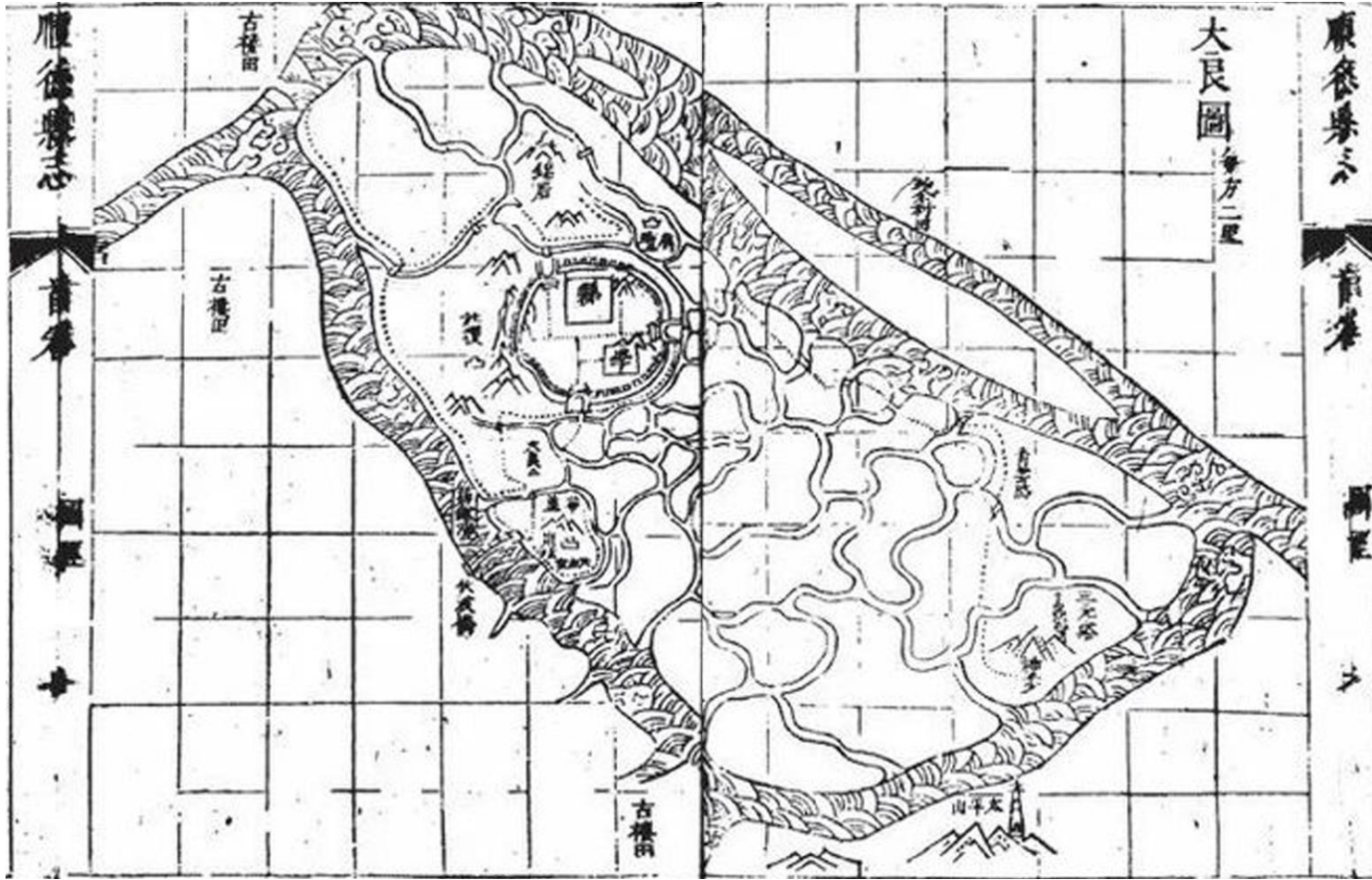
## Historical Function in China

Pearl River Delta was An Important Region for Traditional Agricultural in South China



## Function: Traditional Production

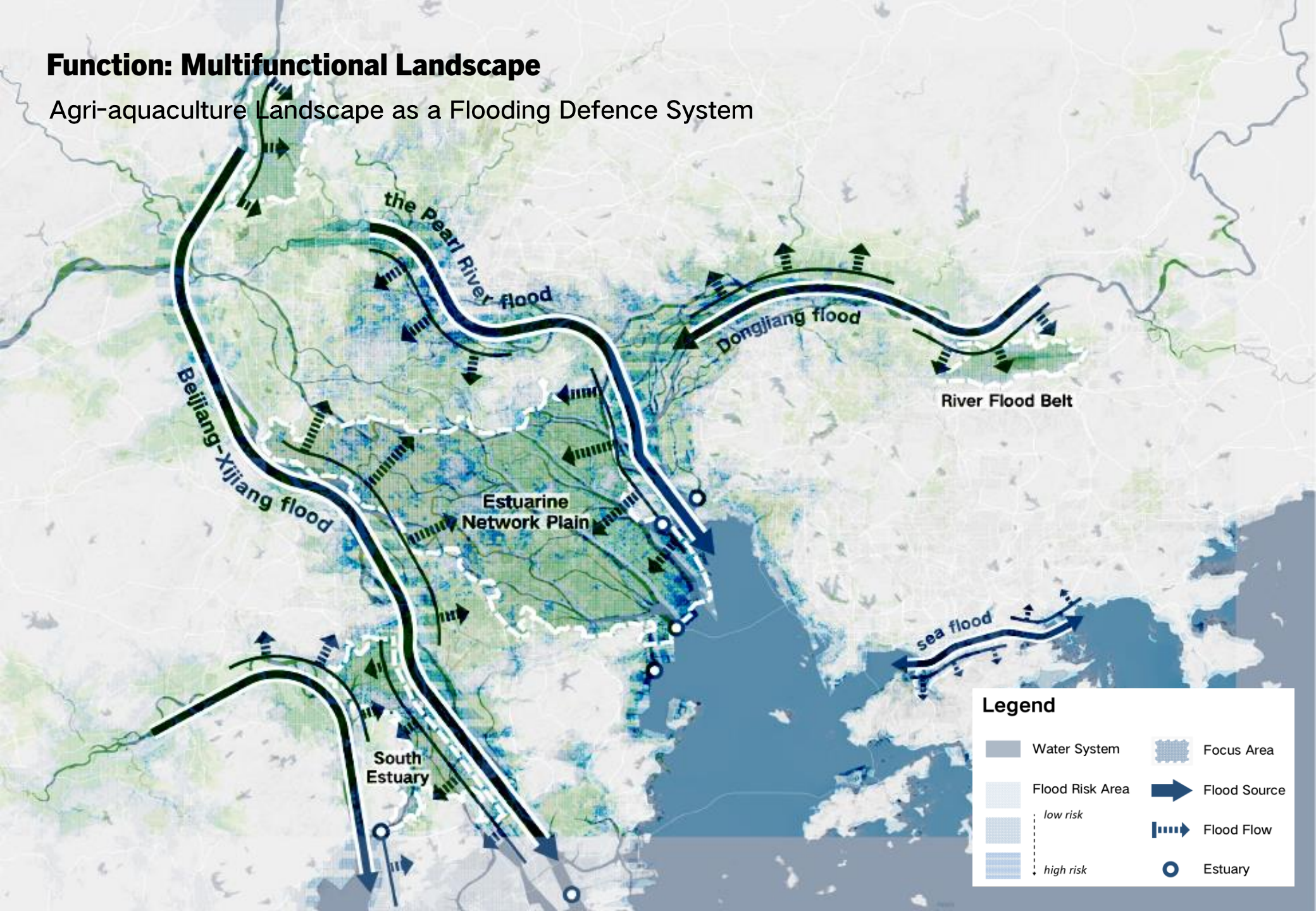
The Well-known Dike-pond System and Circular Agri-aquacultural Production



Dike-Pond System in Qing Dynasty Source: Shunde County Annals, Ye Chunji (1585)

# Function: Multifunctional Landscape

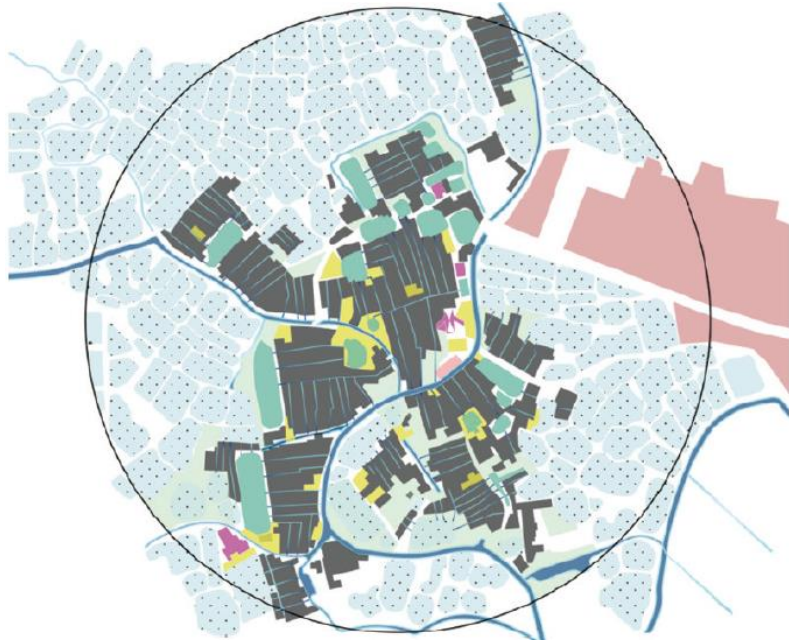
Agri-aquaculture Landscape as a Flooding Defence System





# Shape: Organic Layouts echoes the Terrain

Organic Dike-Pond Texture Combine with Two Settlement Types and Natural Condition



**the Plain Village**



**the Mountain Village**

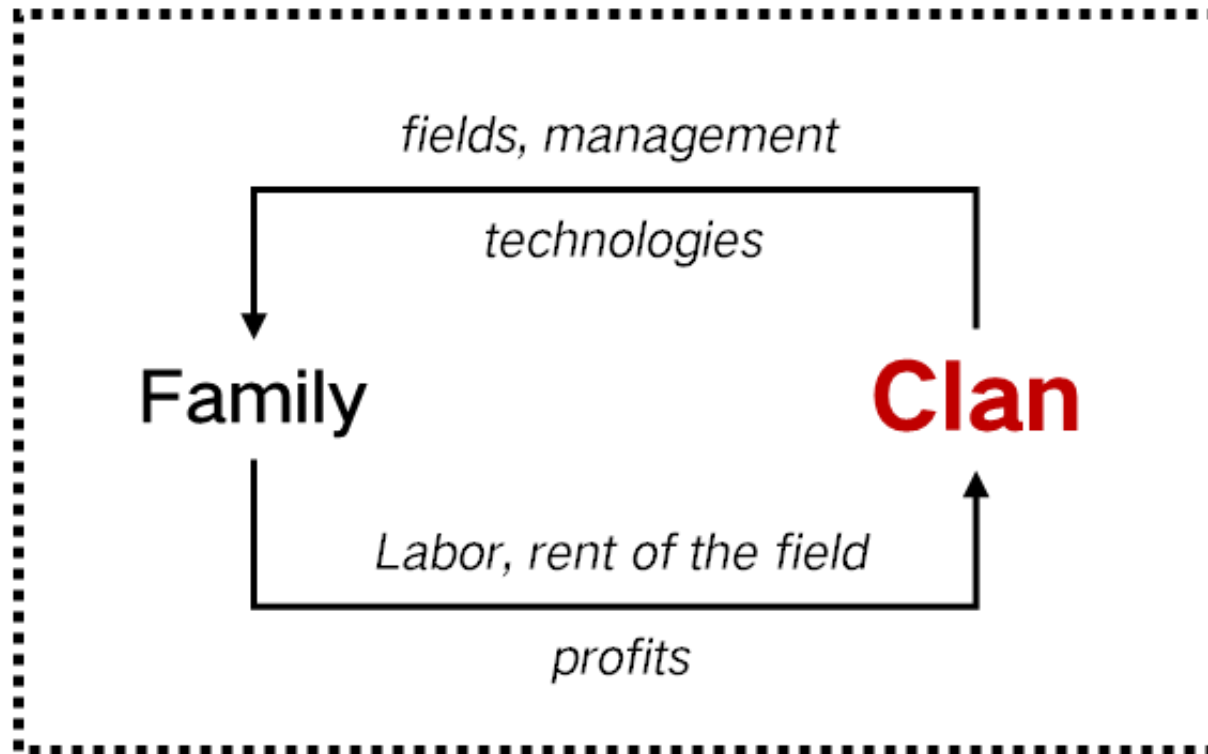
## Legend

- nature reserve
- fengshui pond
- canal
- dike fishpond
- public space
- industry
- residential building
- cultural building
- agriculture building
- underdrain
- ground drainage

## Governance: Collective Cooperation

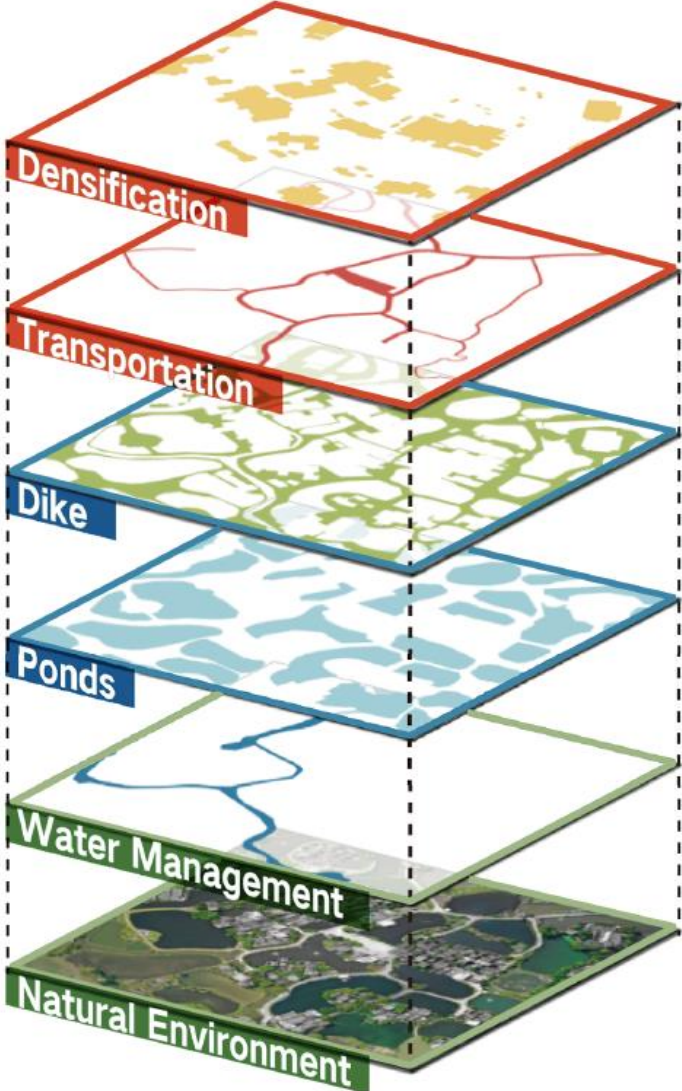
Cooperative Production Organization Based on the “Clan”

### *Cooperative Collective*



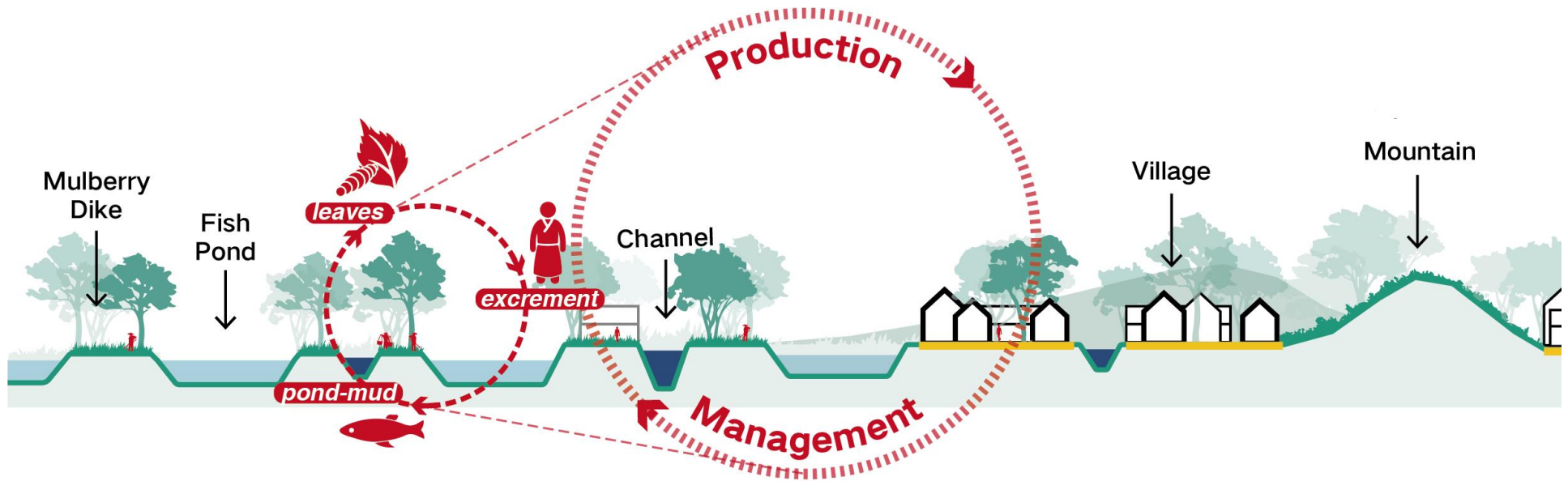
# A Self-sufficient System

Traditional Sustainable Complex integrating Elements

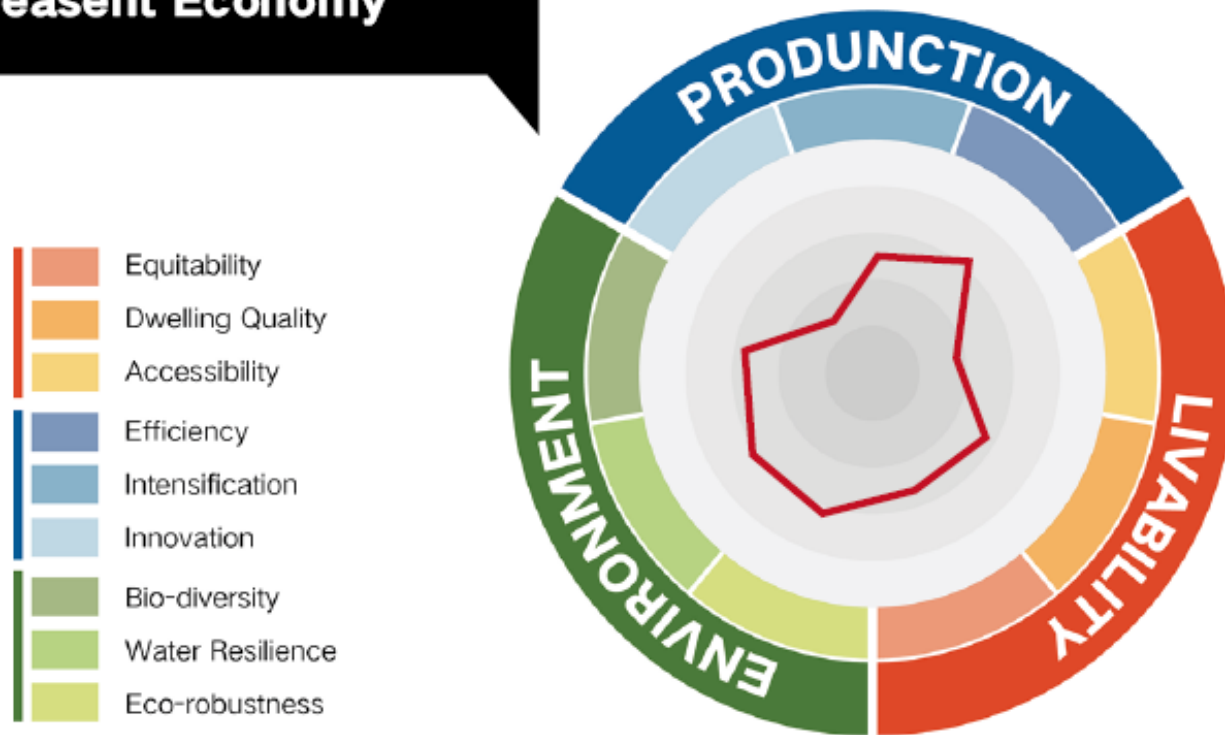


# The Gene of the Rural Culture

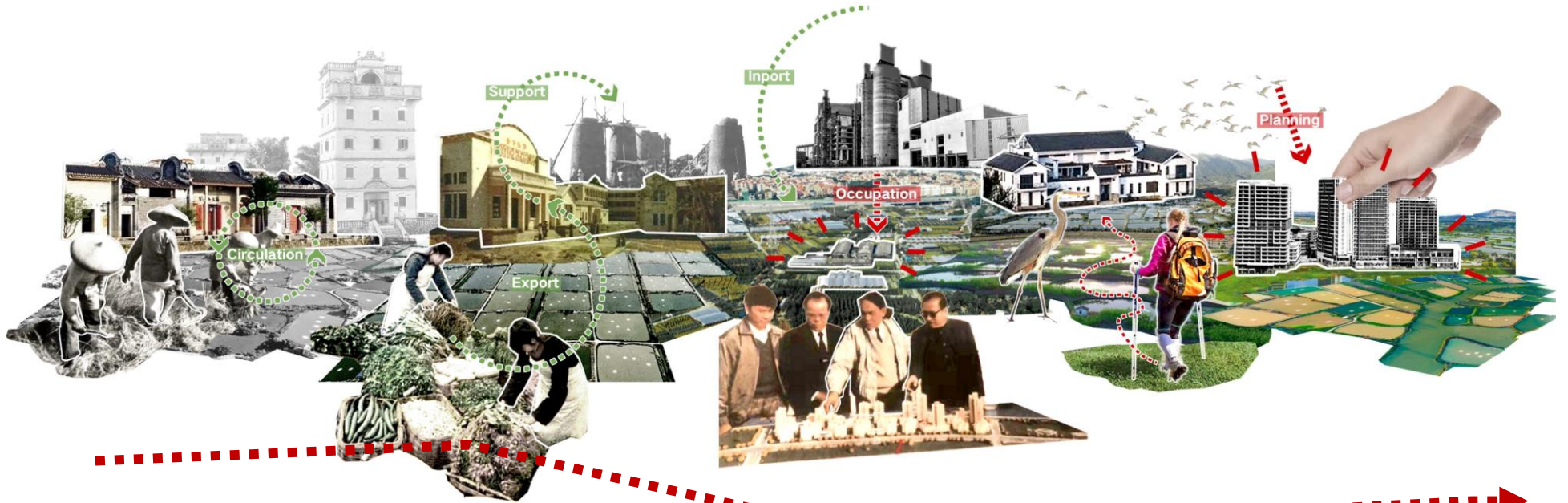
Traditional Agricultural Production is a Multifunctional Human-land System



## Sustainable Small-scale Peasant Economy



*Assessment of the Traditional Production Model in the Countryside* Source: Author



**Tradition**

**1950**

**Agricultural Field  
Standardization**

**1978**

**Local  
Industries  
Development**

**2000**

**Regional  
Green Lands**

**2012**

**Laboratory  
For Sustainable  
Urbanization**

# Metaphors of Textures

Three Monofunctional Patterns influenced by Urbanization in Rural Areas

## The Grids



## The Blanket



## The Volume



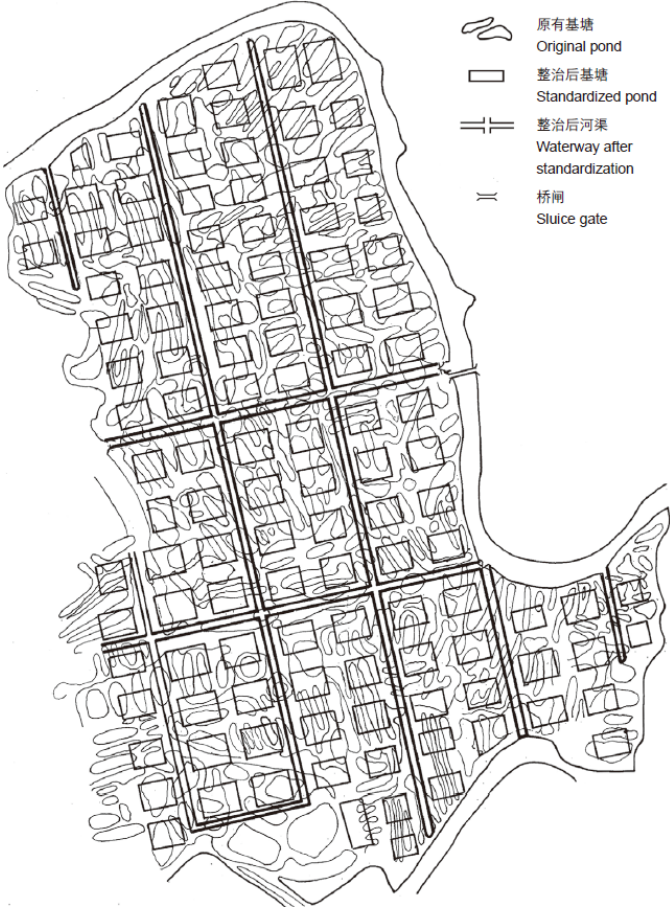
# The Grid





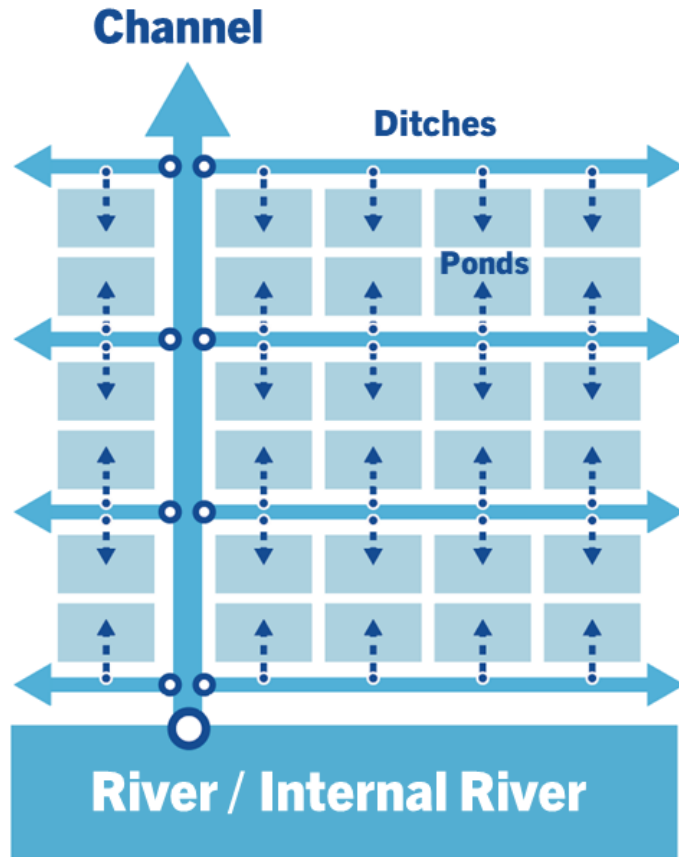
# Function: Standardization for Production Efficiency

The Grid dike-pond was born for aquaculture industrialization in 1960s

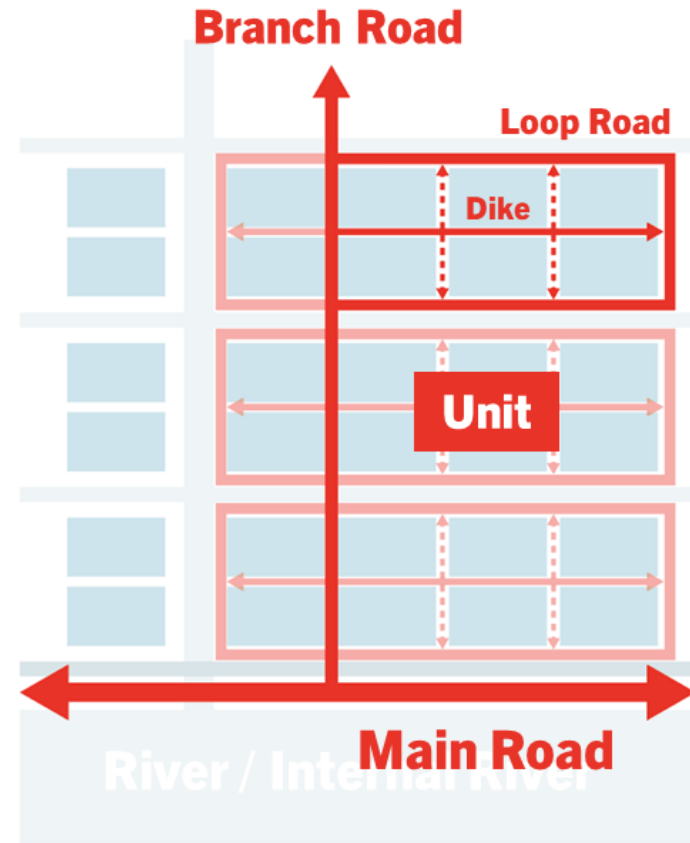


## Function: Improved Efficiency

On the One Hand, The Grid Pattern Improved the Systematic Management



**Water Management Grid**



**Transportation Grid**

# Shape: The Blindness of the Grid System

On another hand, dikes is being ignored as division lines in the production system

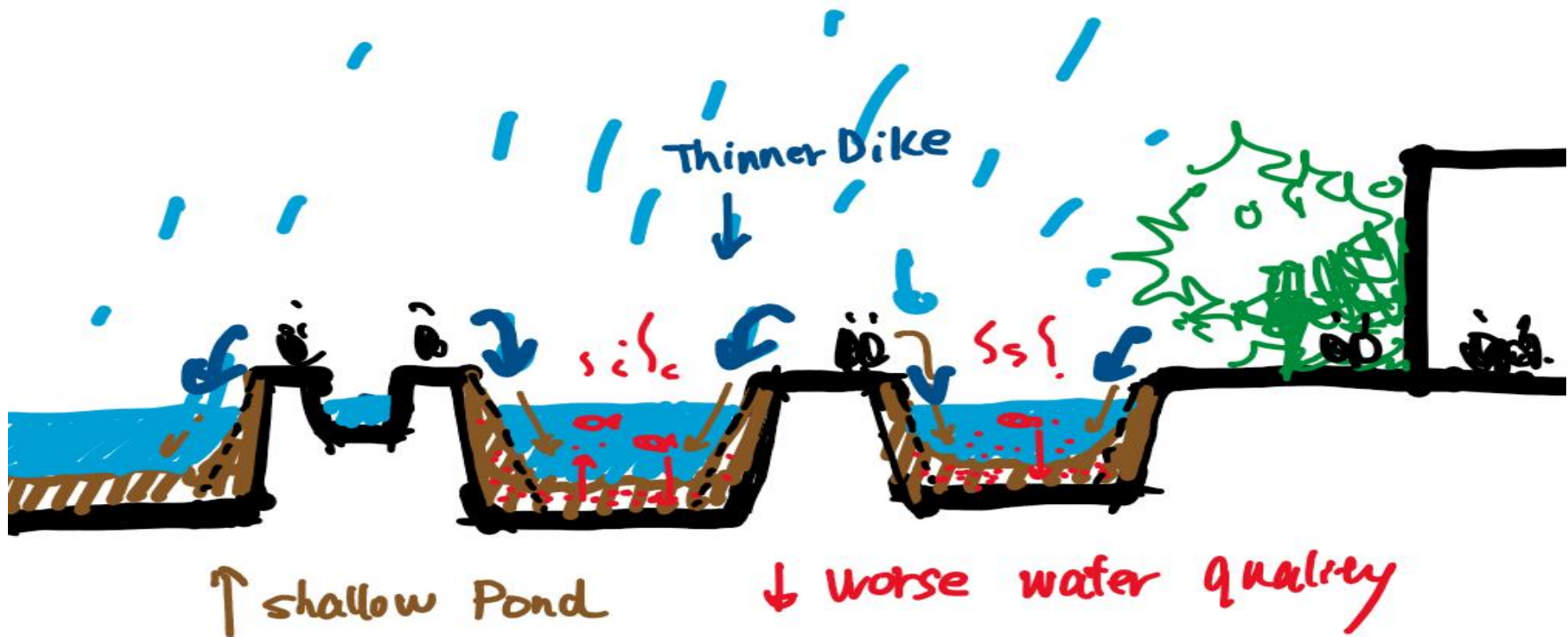


**Product Unit**

**Division Line**

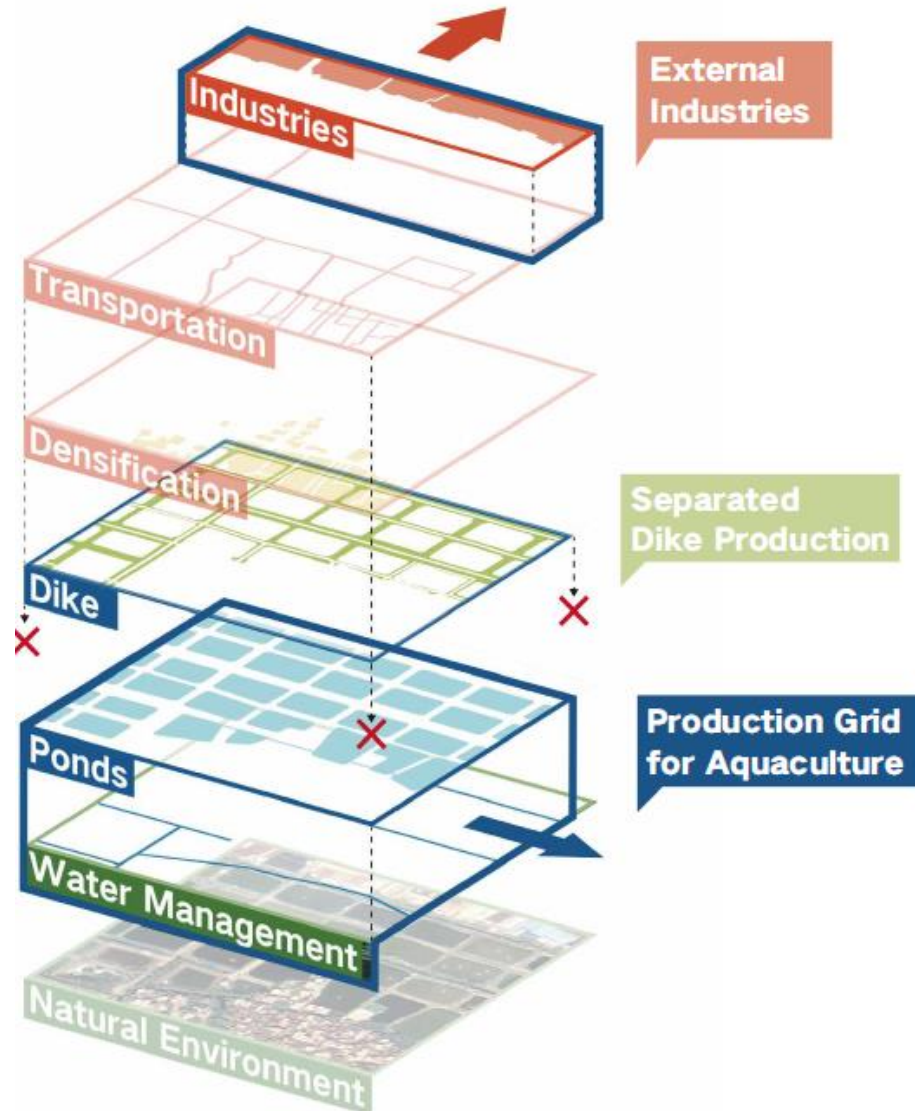
## Degeneration of the Mono-Pond System

Thinner dike leads to the resilience loss of the soil, and the mud after flood makes the pond shallow.



## Indicate: Separation

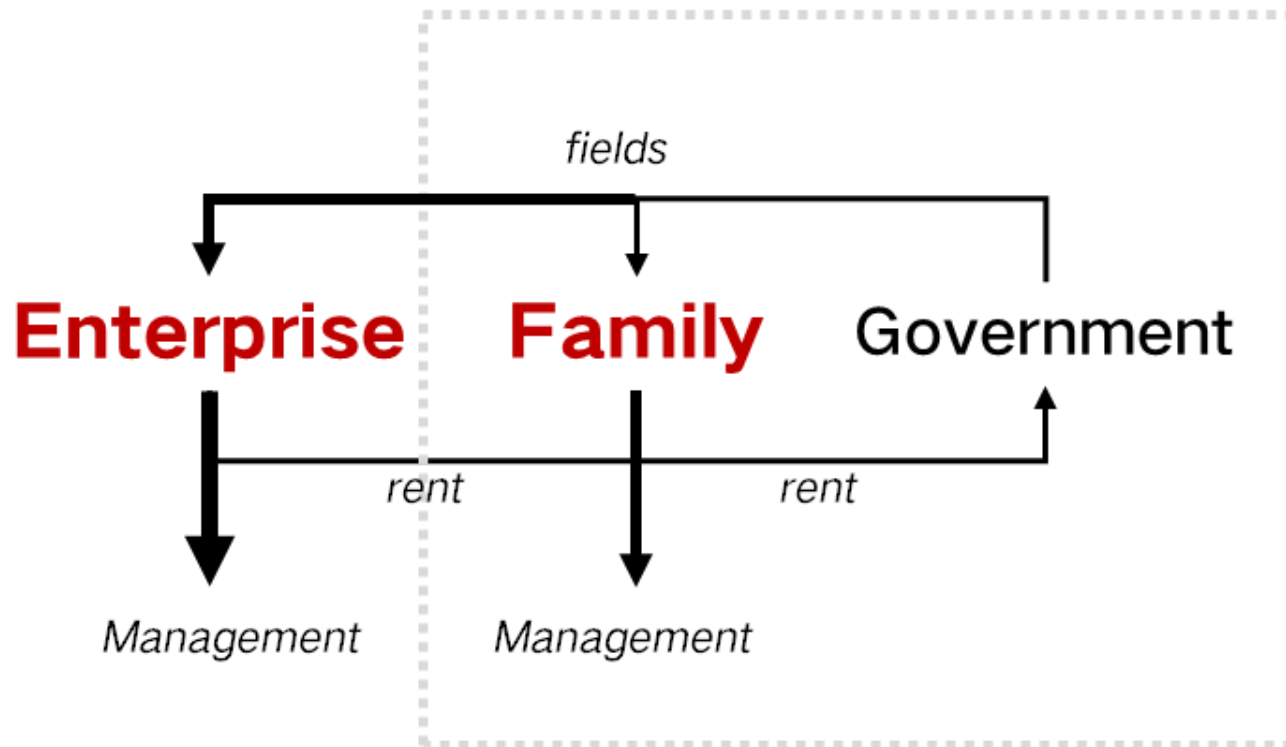
Separation of the Dike and Pond System due to the Standardization



# Governance: Competitive Production

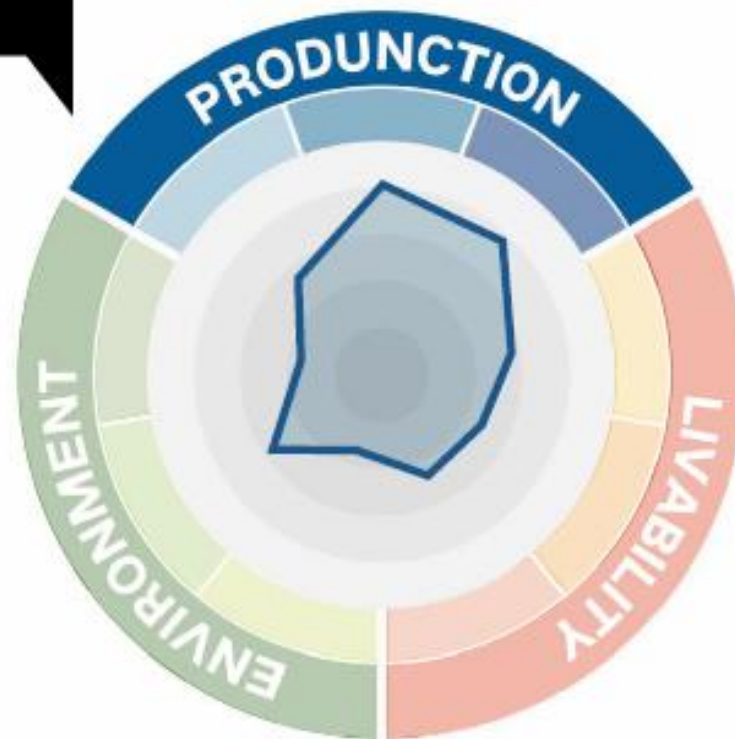
The winners and losers between Competitive Operators

*Culture of the Landscape*



## Intensive Mono-functional Production for Aquaculture

- Equitability
- Dwelling Quality
- Accessibility
- Efficiency
- Intensification
- Innovation
- Bio-diversity
- Water Resilience
- Eco-robustness



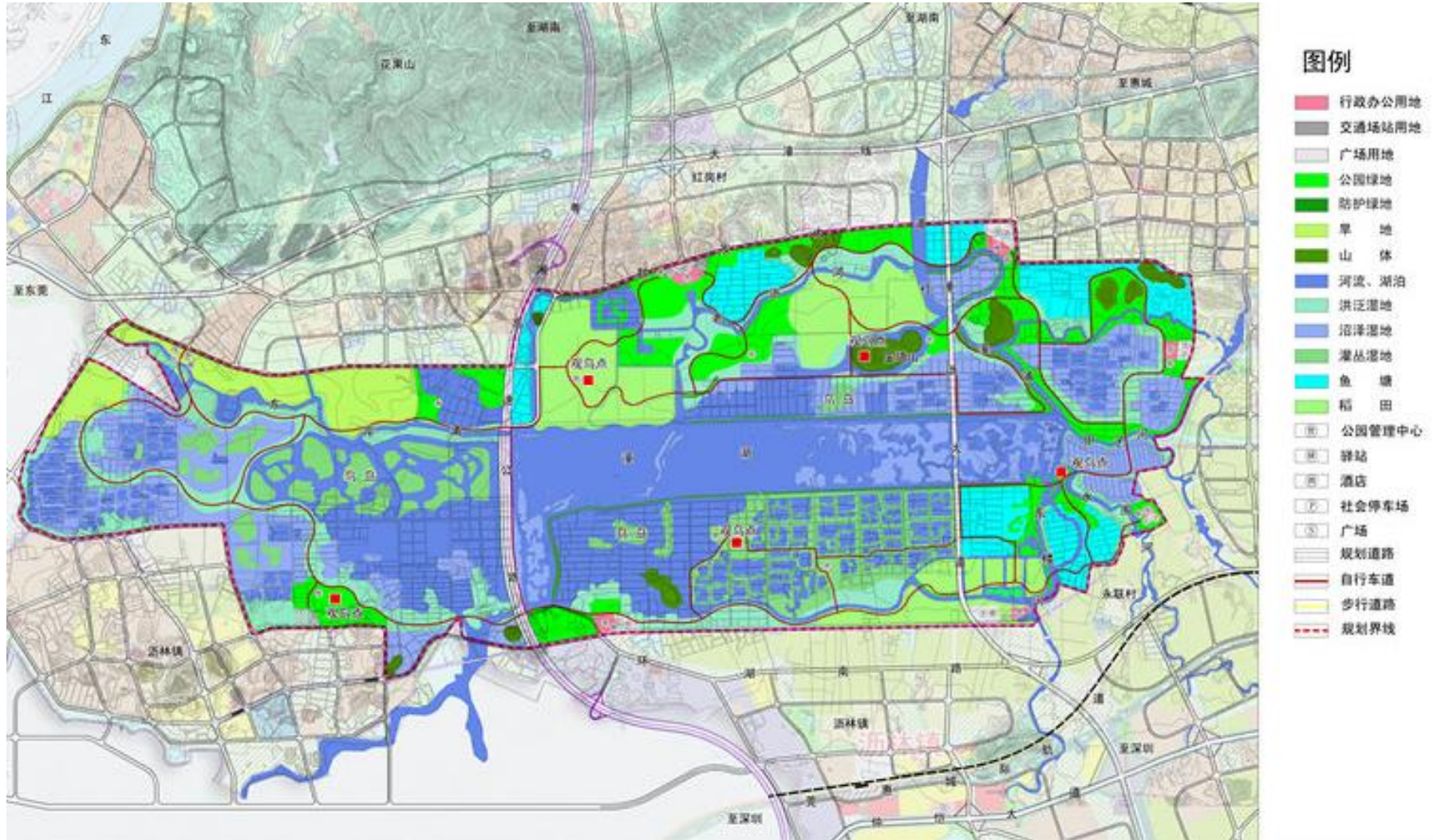
# The Blanket





# Function: An Ambition of The Ecological Park

Proposal for A Compact Ecological Park with Clear Boundary



Proposal for Tonghu Wetland Park Source: Huizhou Government (2012)

## Shape: A Green Blanket Between Cities

Super Scale Greenland Four Times Larger than the Central Park

4 × “the Central Park”

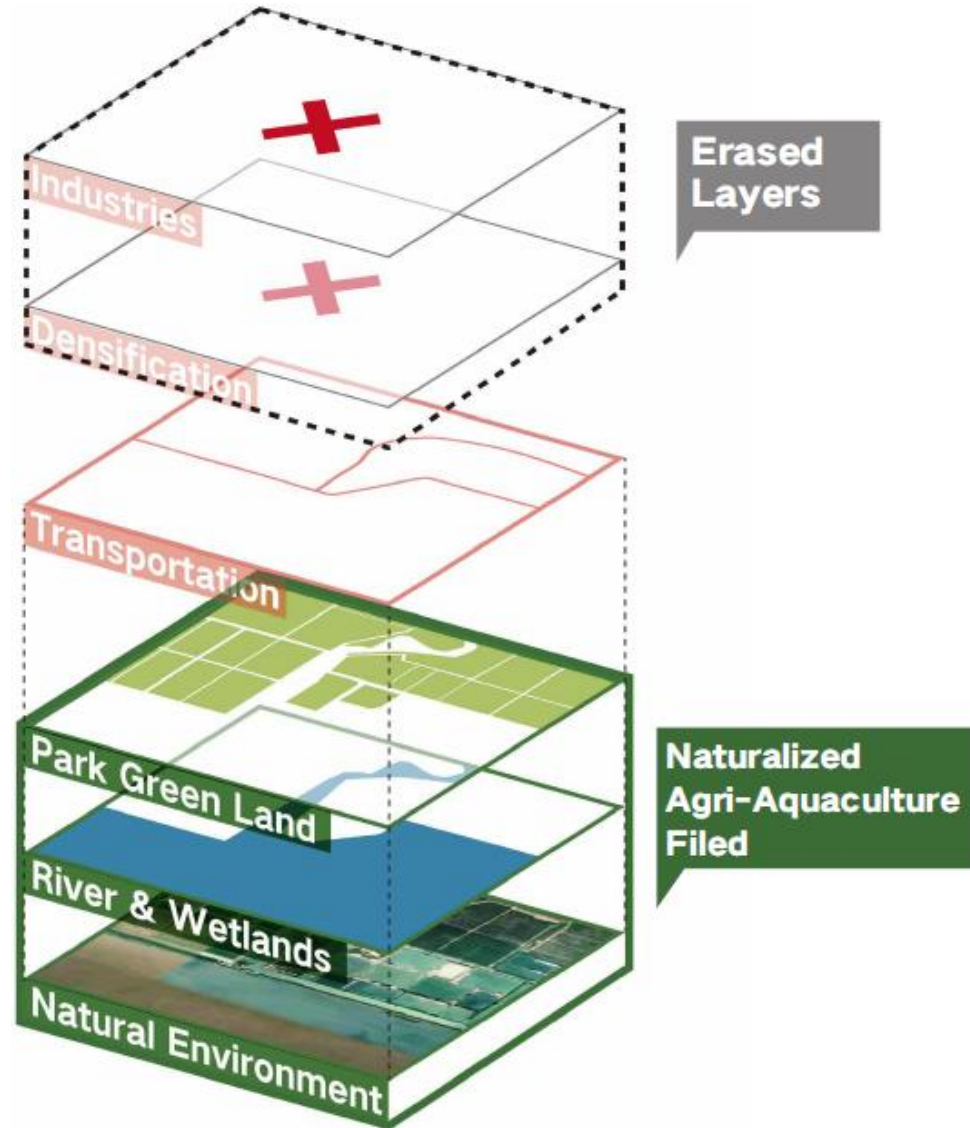
3.5km



15km

## Indicate: Isolation

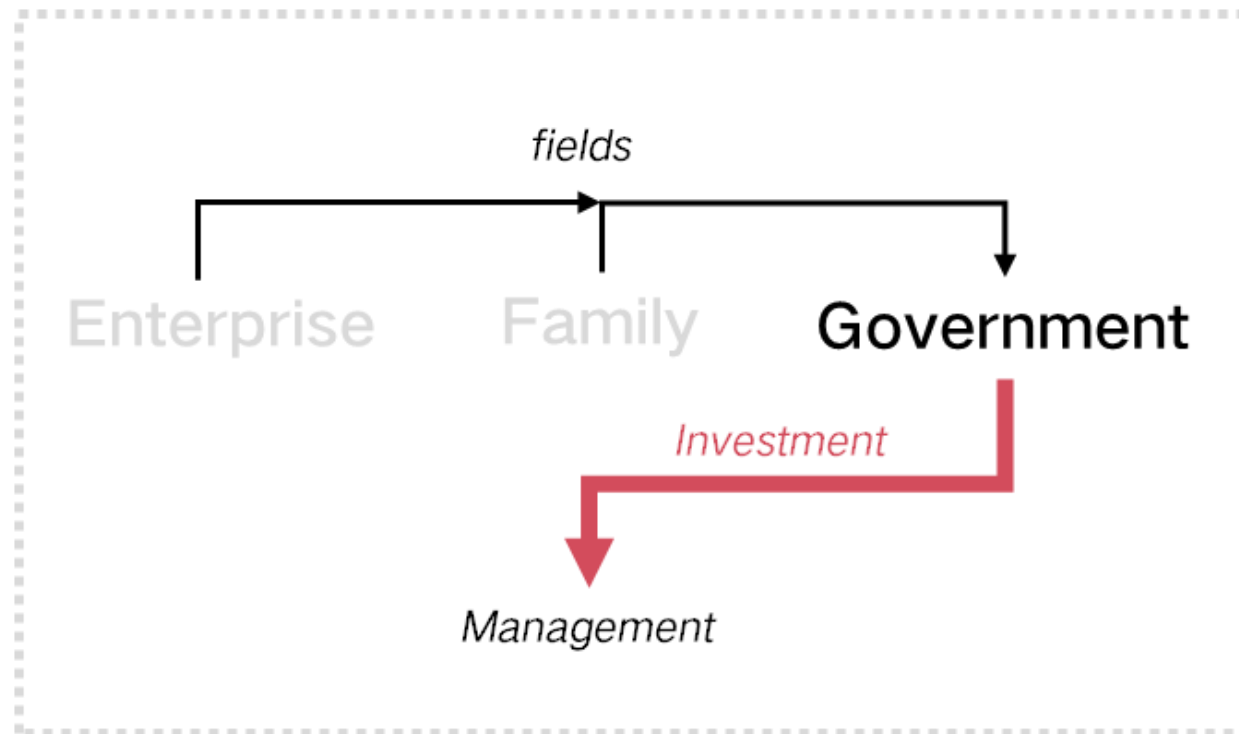
Erased Layers and the Monofunctional Ecological Consideration



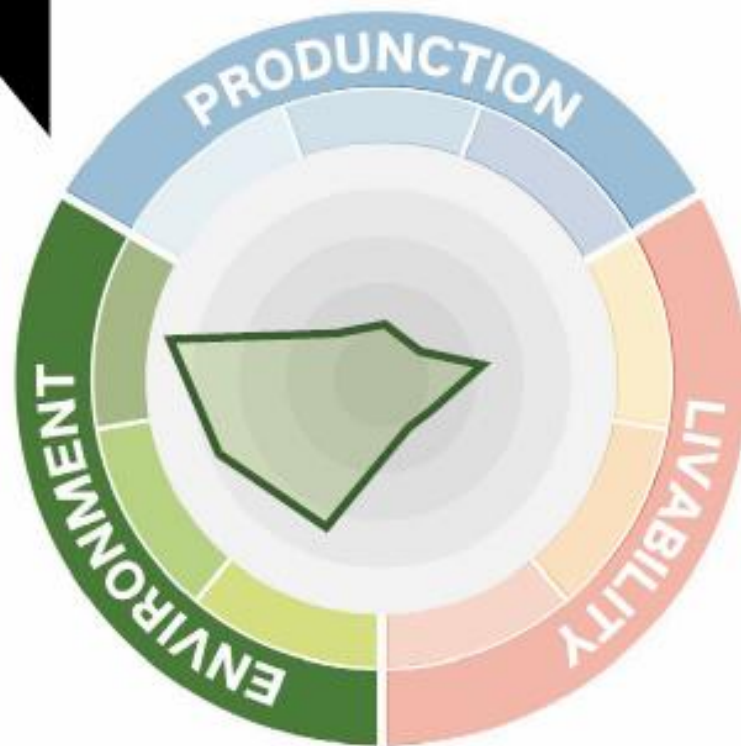
## A Deportation Order for Villagers

The Mono-functional Zoning Led to the Broken of Human-Land Relationship

*Culture of the Landscape*



## An Exclusive and Protected Vivarium

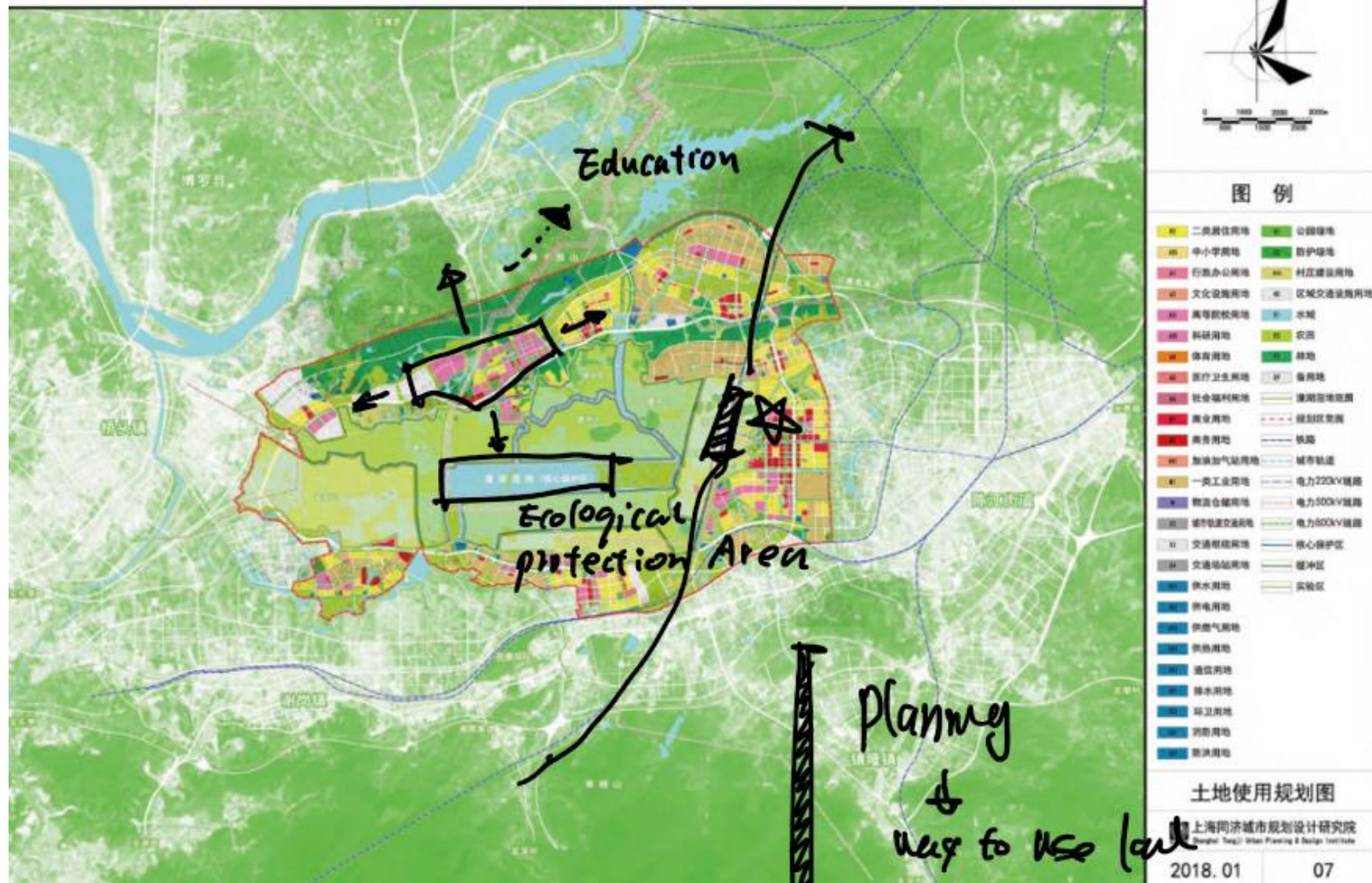


# The Volume



# Function: A New Plan for Educations And Industrials

An Urbanization Movement towards A Future Satellite Town



Proposal for Tonghu Innovation Park Source: Huizhou Government (2018)

## Two Types of Volumes

Utopian Devices Create by Local Industrialization and Top-down Planning



**Local Industrial Factories** Source: *Urban China*, 2017



**New Built Official Towers** Source: *Fei Hao*, 2020

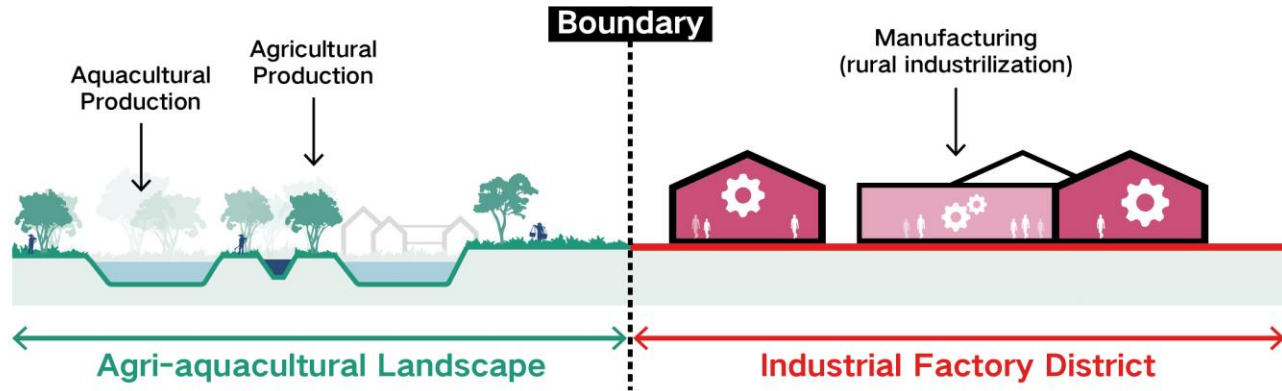


# Function: Human-Land Separation

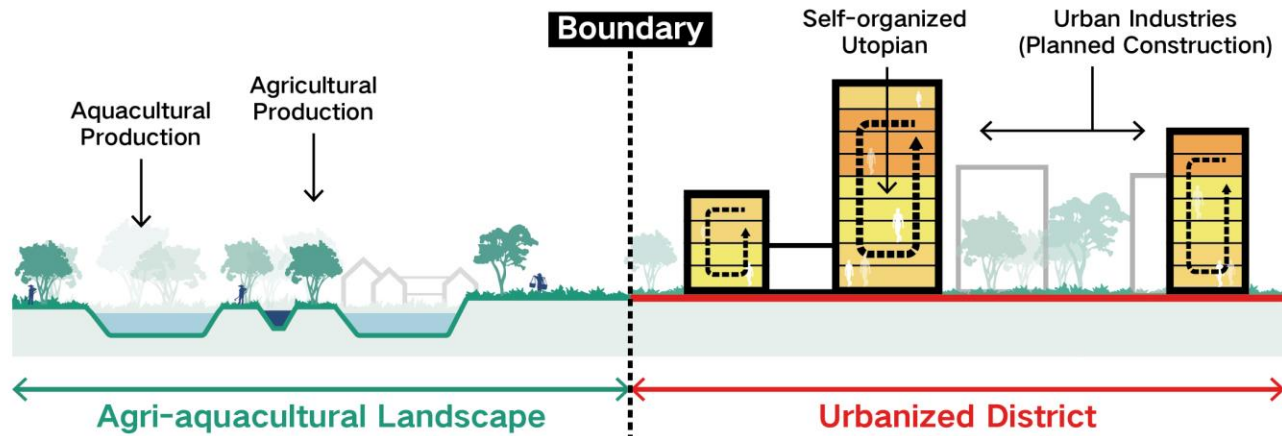
Self-Organized Systems Lift from the Agricultural Surface



**Manufacture  
Factory**



**Official  
Tower**



# Colony of Volumes

Texture Conflicts between Volumes and Organic Landscape

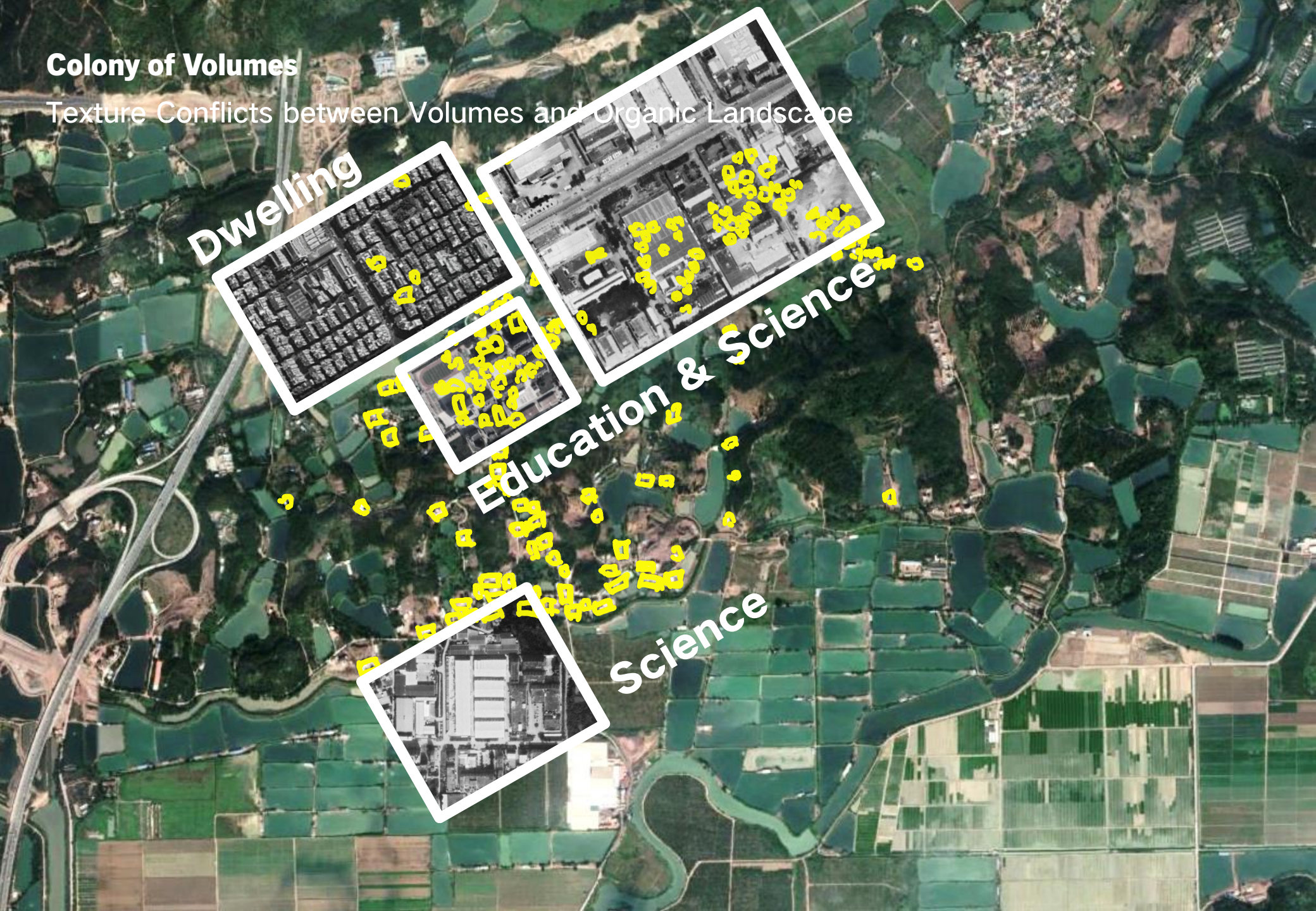
Dwelling



Education & Science

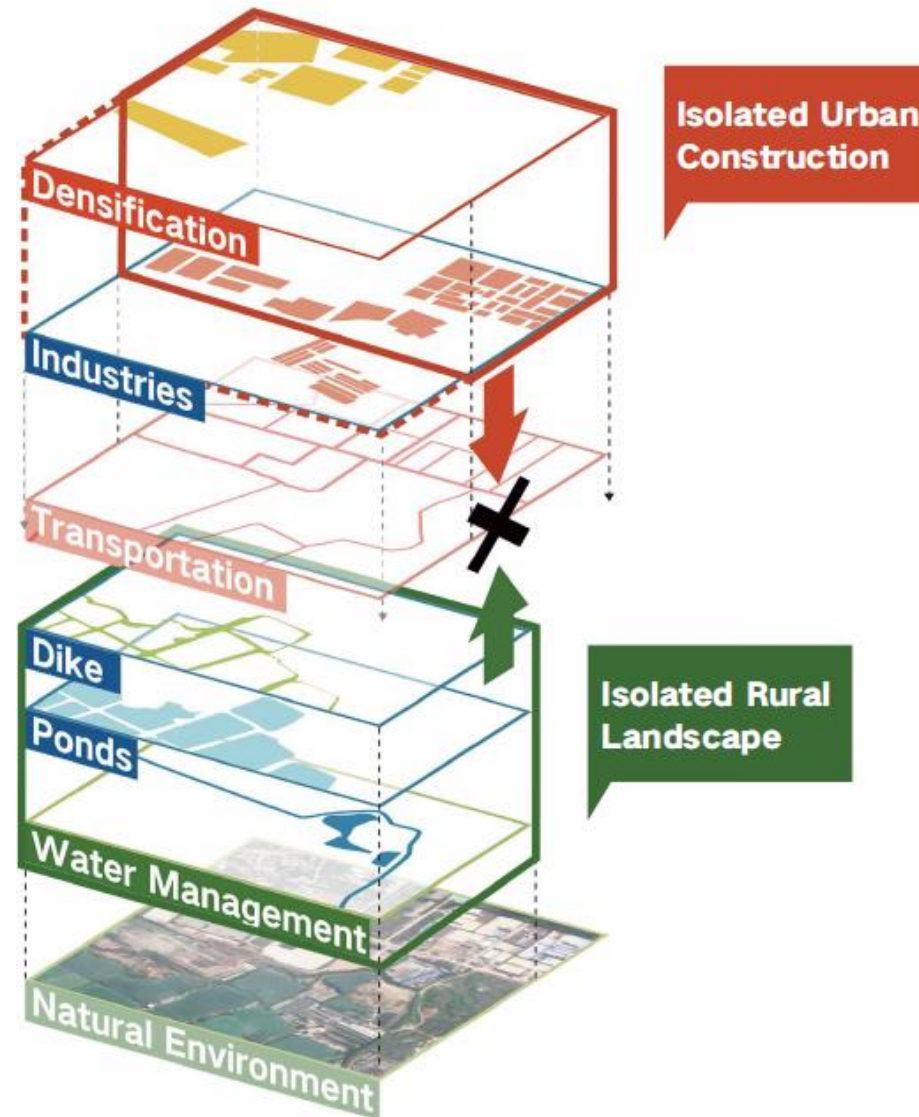


Science



## Indicate: Opposition

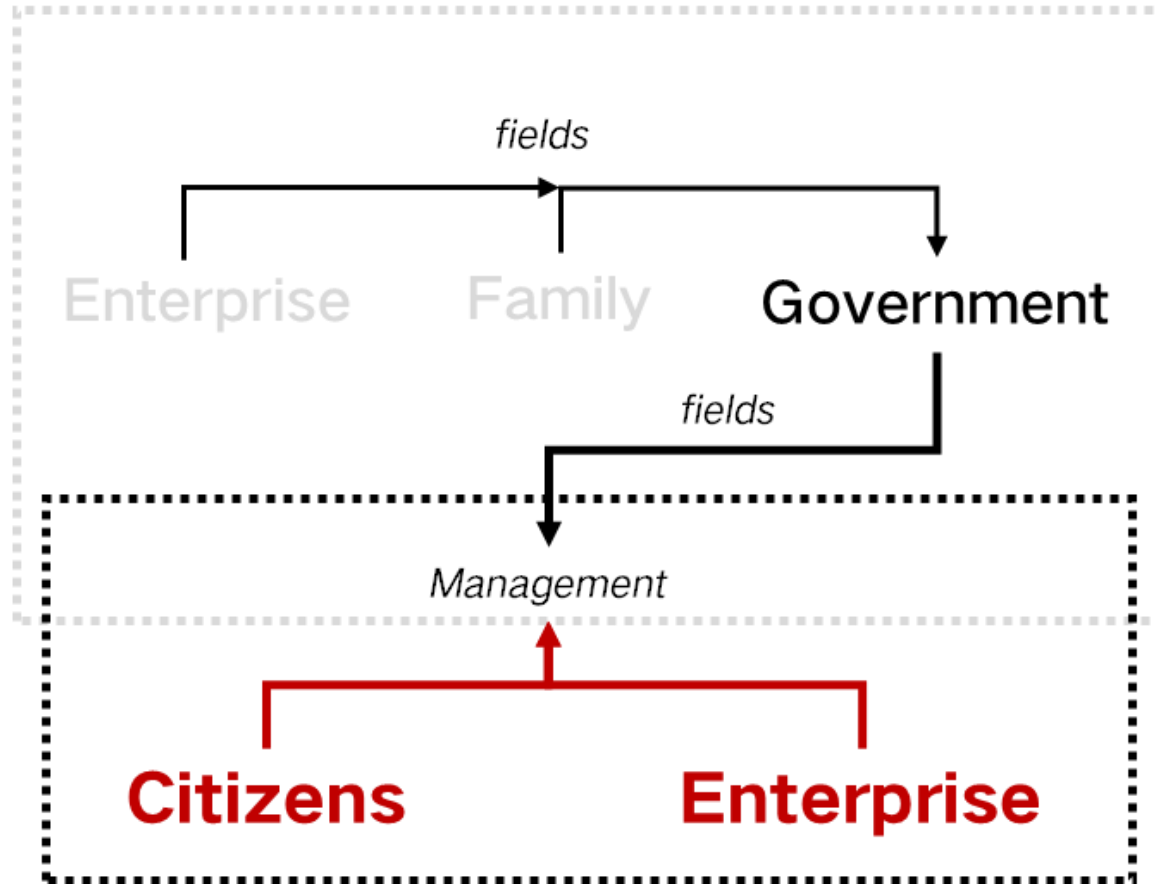
Opposite Urban-Rural Elements within A Unified Space



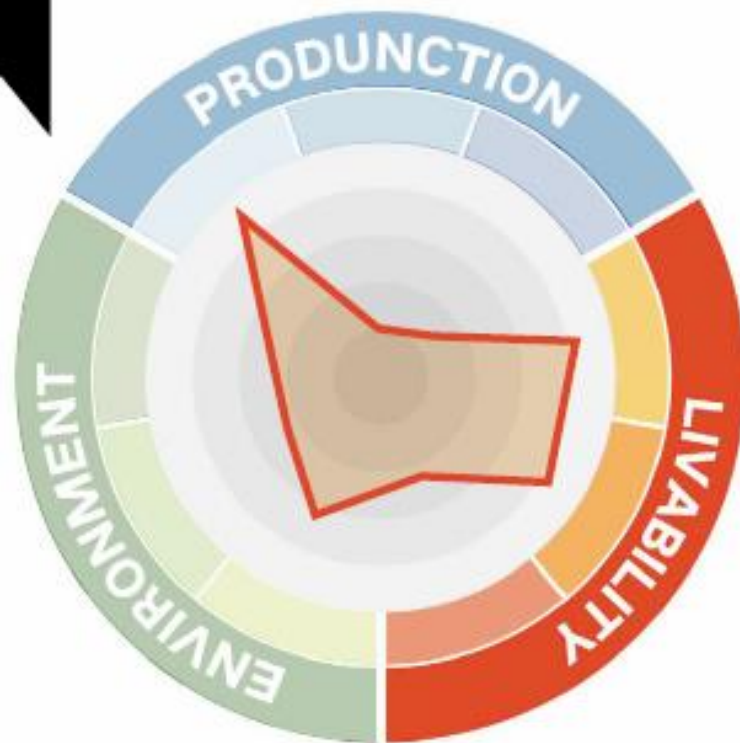
# Planning for Citizens

Top-down Plan Leading to the Human-Land Separation

*Culture of the Landscape*



## A Mono-Functional Satellite Town



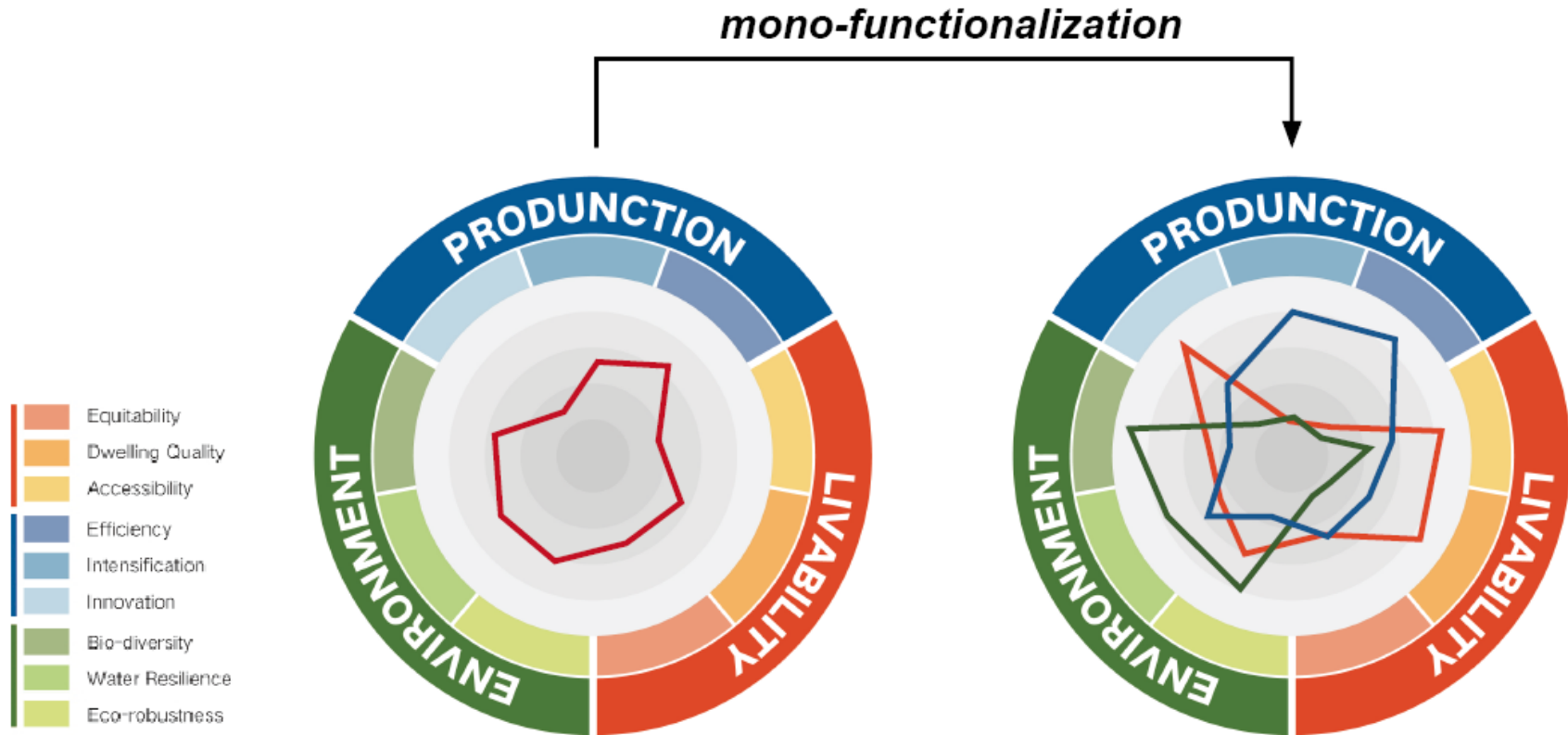
# Conclusion: Deconstructed Monofunctional Components

An Image Collage for Existing Agri-aquacultural Landscape in the GBA



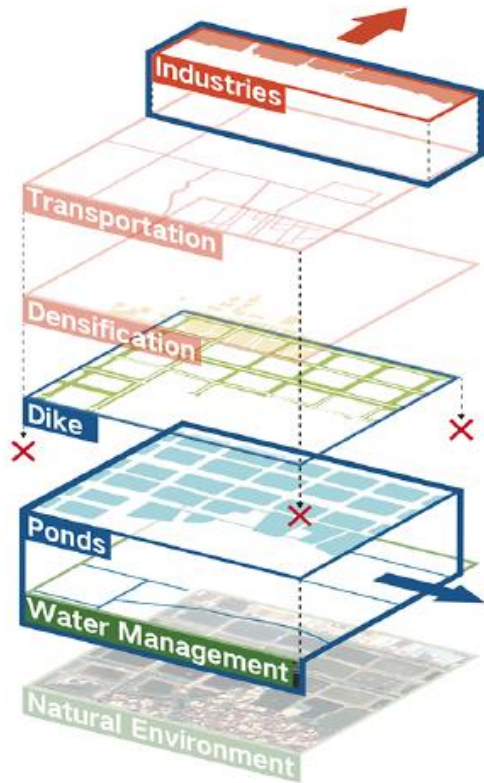
# Conclusion: Mono-Functionalization

Impact of Modernism Urbanization on Rural Development

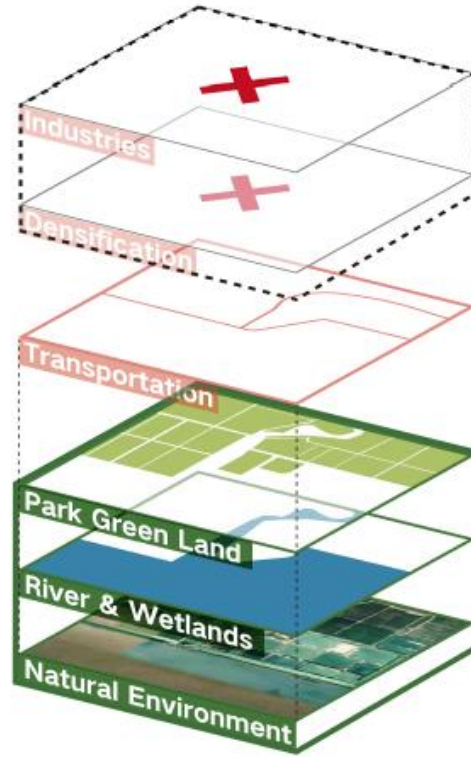


# Conclusion: The Broken System

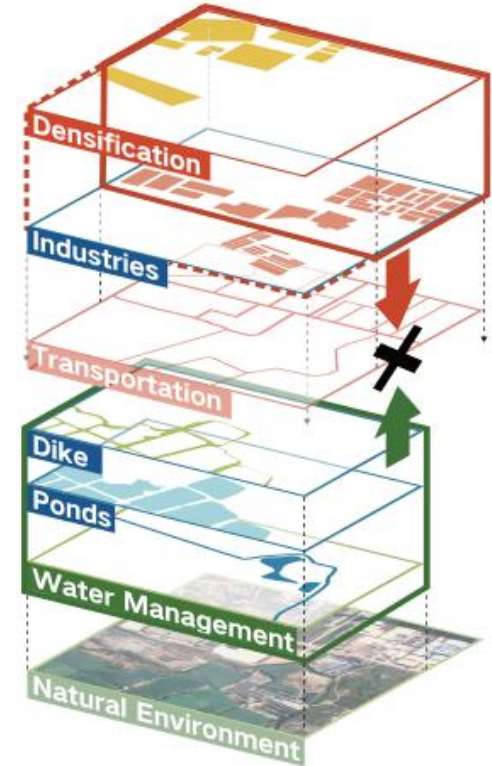
Orderly Plan and Ignored Interactions between Layers



**Separation**



**Isolation**

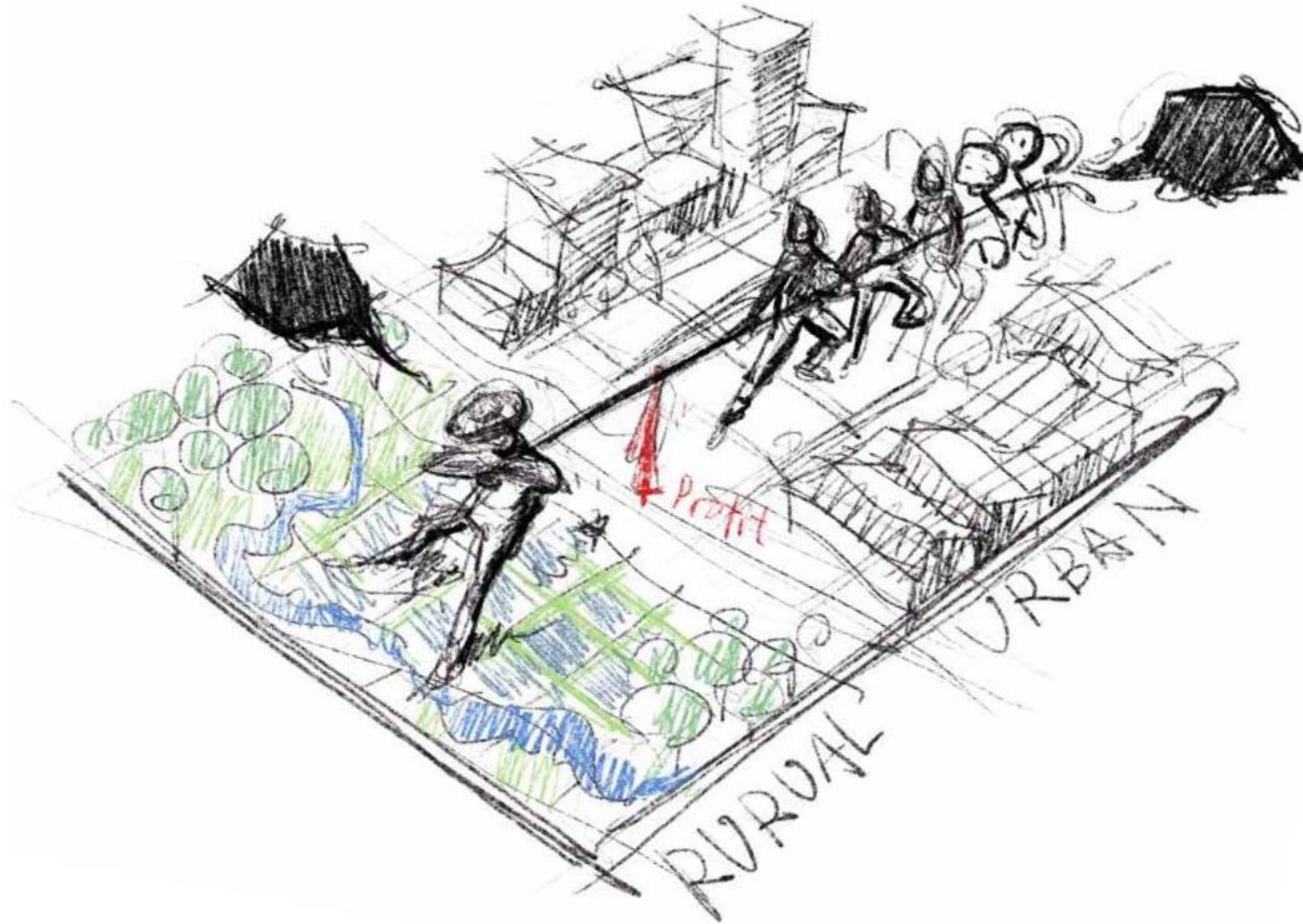


**Opposition**



## Conclusion: Winner & Loser

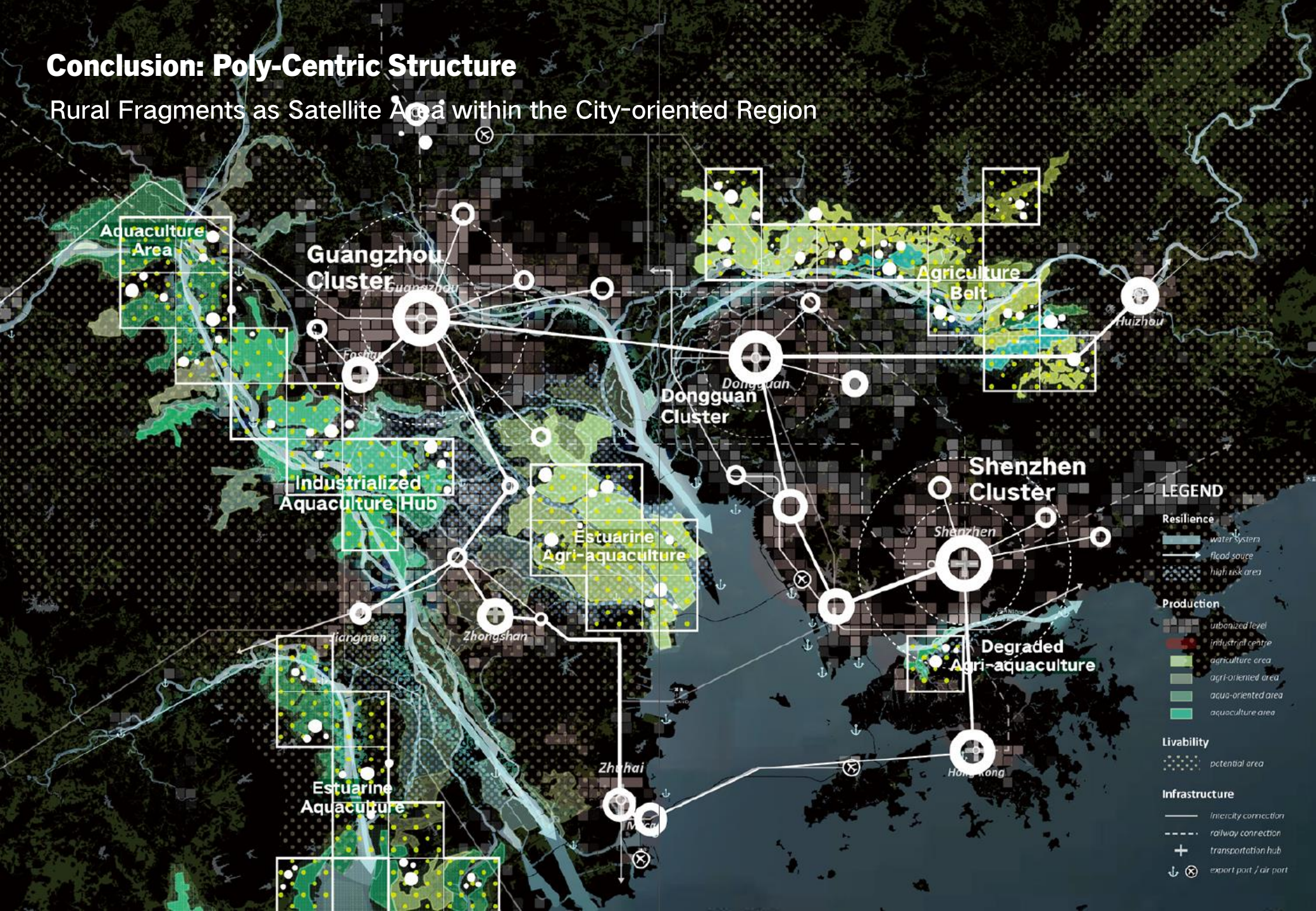
Competition and Human-land Separation after Collapse of the Clan



*Comic: Conflicting Interest between Villagers and Other Stakeholders Source: Author*

# Conclusion: Poly-Centric Structure

Rural Fragments as Satellite Area within the City-oriented Region





**2035**

**Are there only two choices for the countryside in the future?**

- **Imaged Utopia without the locals?**
- **Monofunctional Seattleites Feeding Cities?**

# “Xiangcun”, as A Landscape Productive

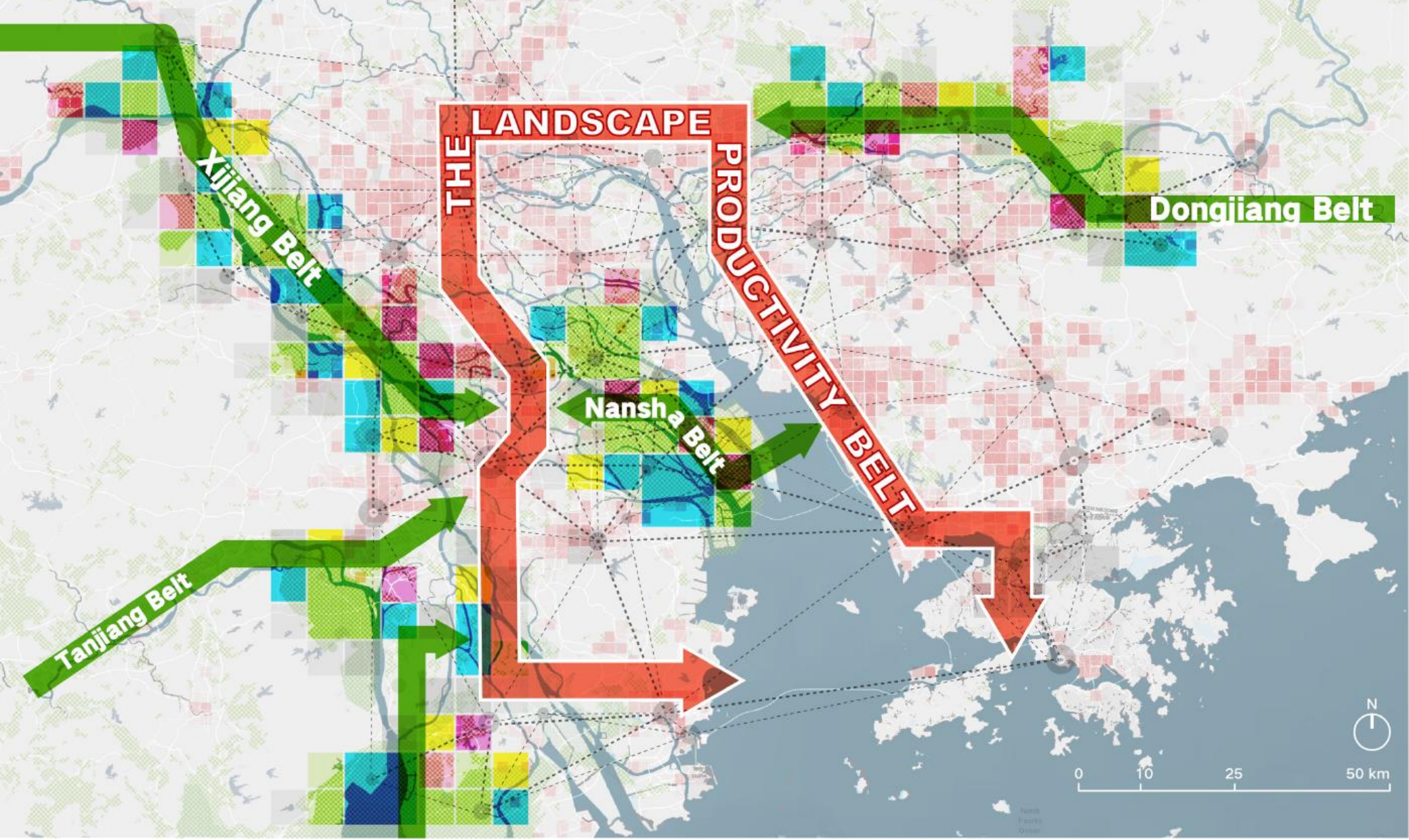
A Manifesto as the Preliminary Vision

- **Urbanization is not the only choice for the settlement development.**
- **Multifunctional independent systems based on modern productivities integrating agricultures and multiple industries**
- **Providing eco-friendly production and liveable environment.**
- **Contribute to a diverse and decentred regional structure**



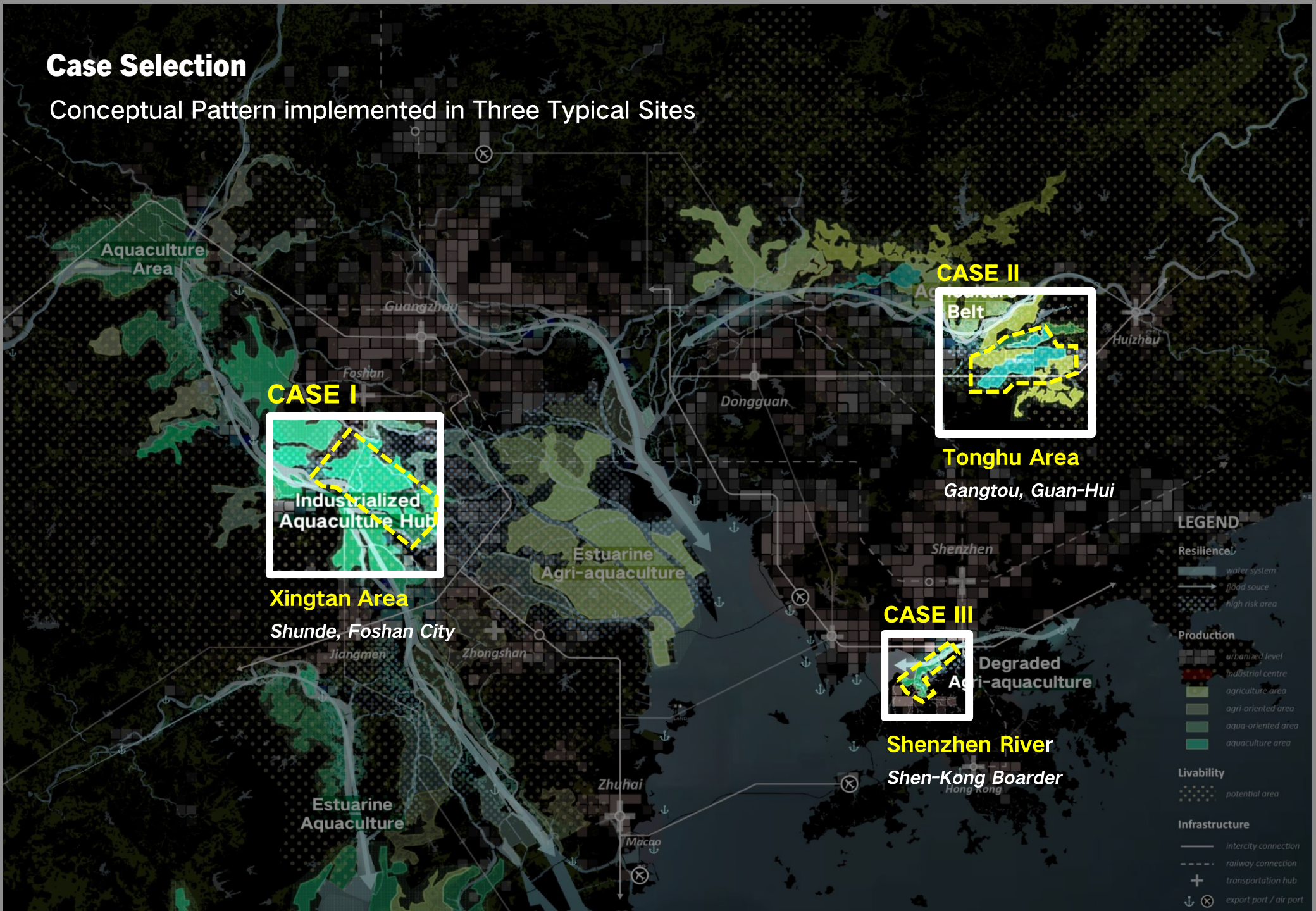
# “The Landscape Productivity Belt”

The Spatial Concept for Countryside Development in GBA



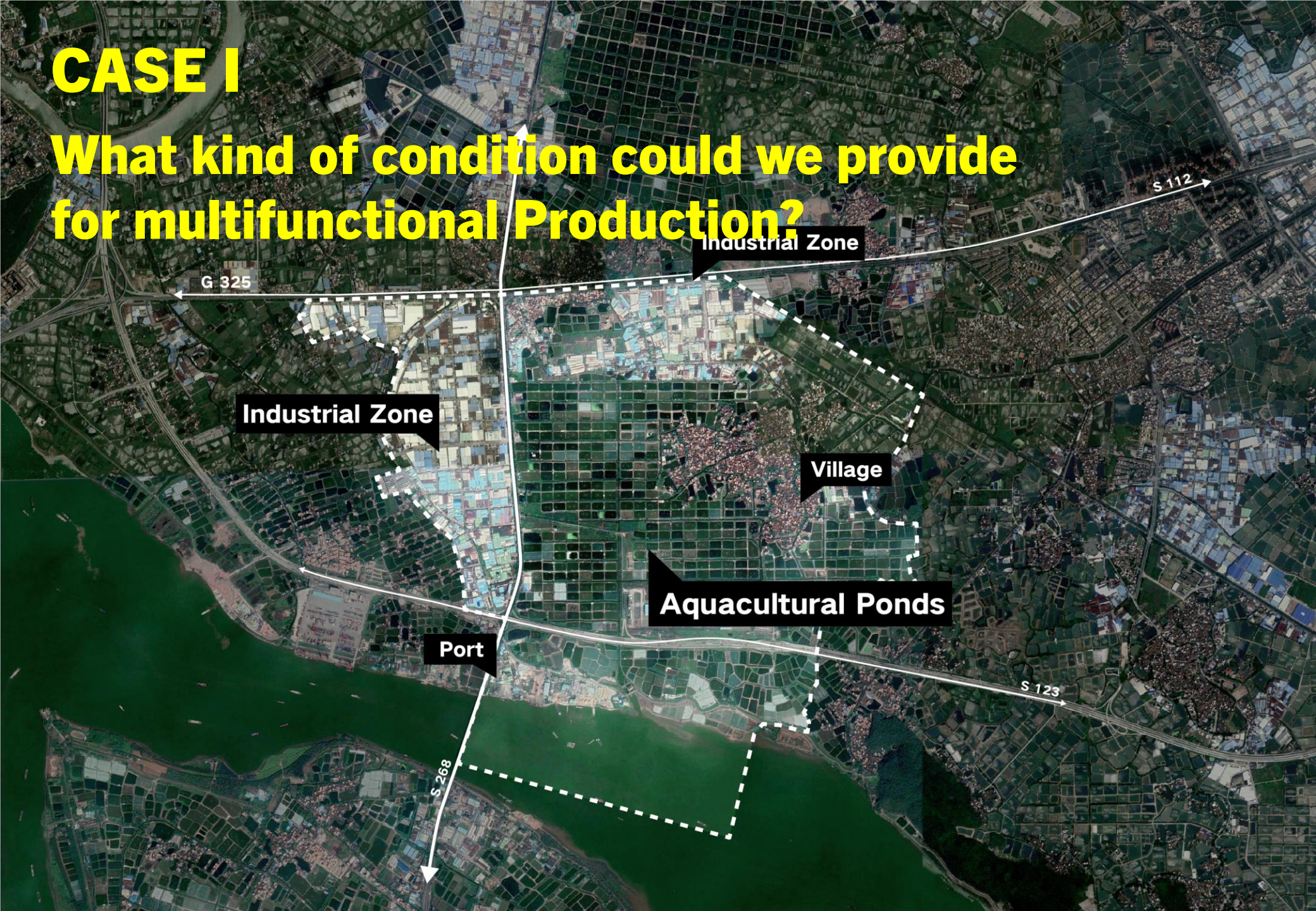
# Case Selection

Conceptual Pattern implemented in Three Typical Sites



# CASE I

What kind of condition could we provide for multifunctional Production?



G 325

S 112

Industrial Zone

Industrial Zone

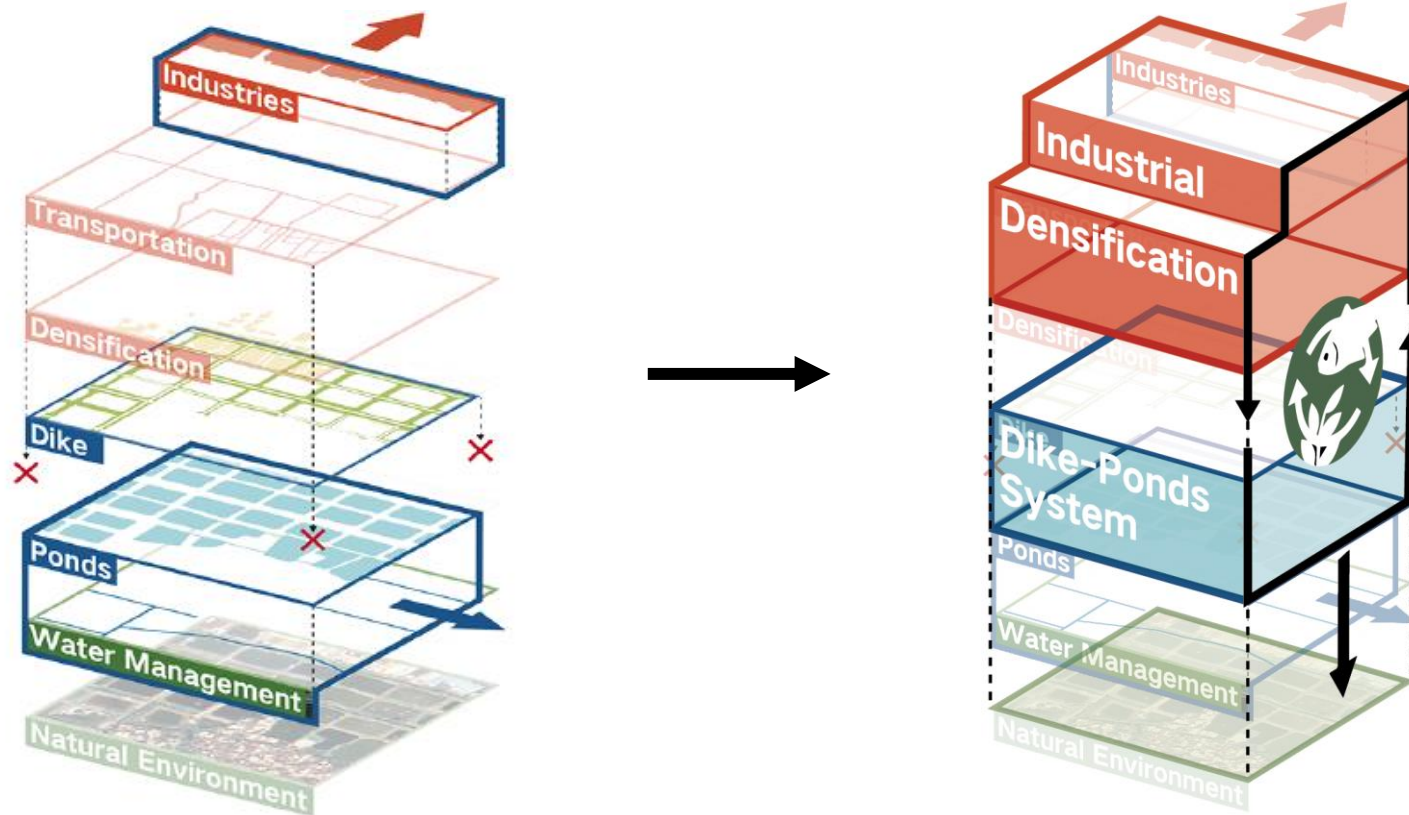
Village

Aquacultural Ponds

Port

S 123

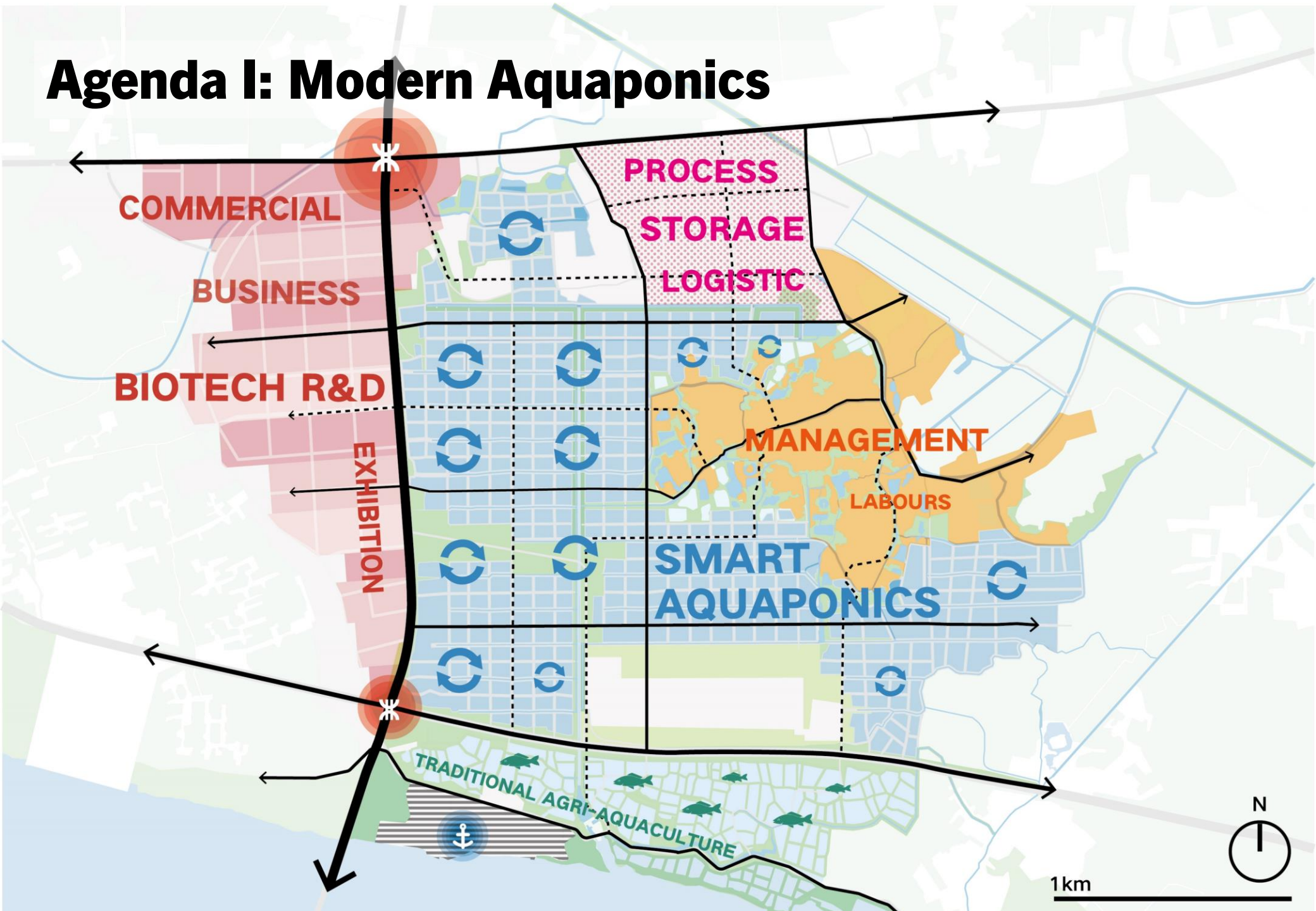
S 268



Rebuilding Dike-Pond System & Encouraging Cooperative Production

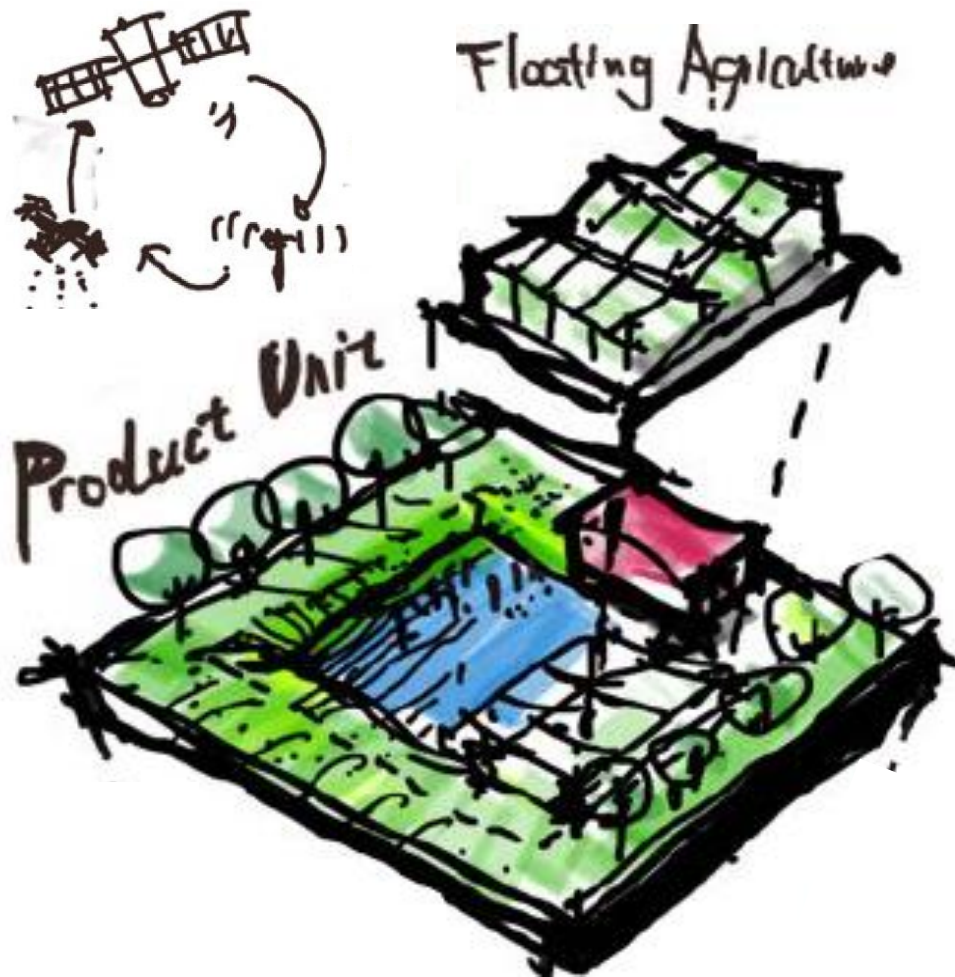


# Agenda I: Modern Aquaponics



# Modern Aquaponics

Productive Informationalized Dike-Ponds Units

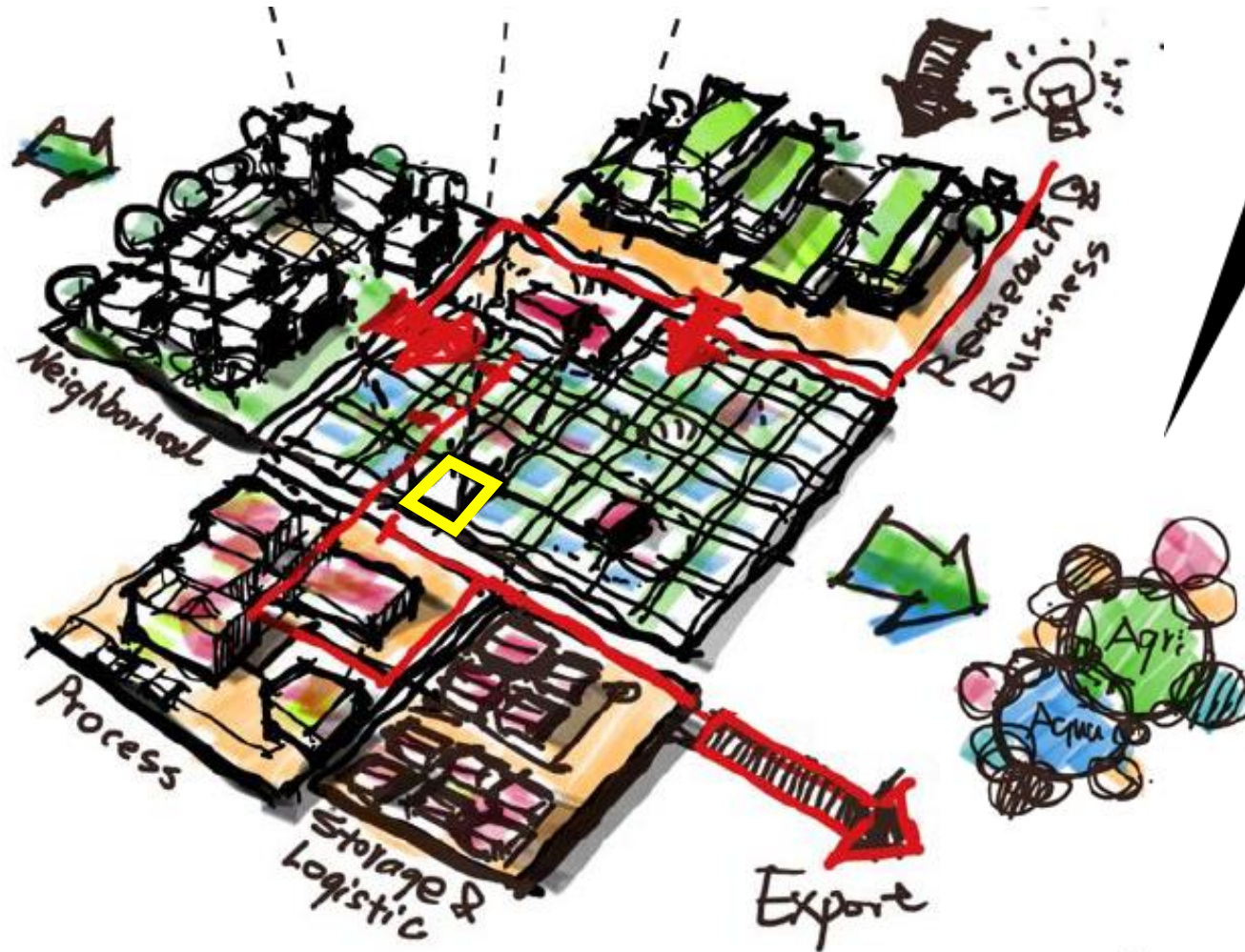


## Smart Aquaponics Unit

- Informationalized Water Management
- Roboticized Production
- Floating Agriculture
- Dike Farm

# Modern Aquaponics

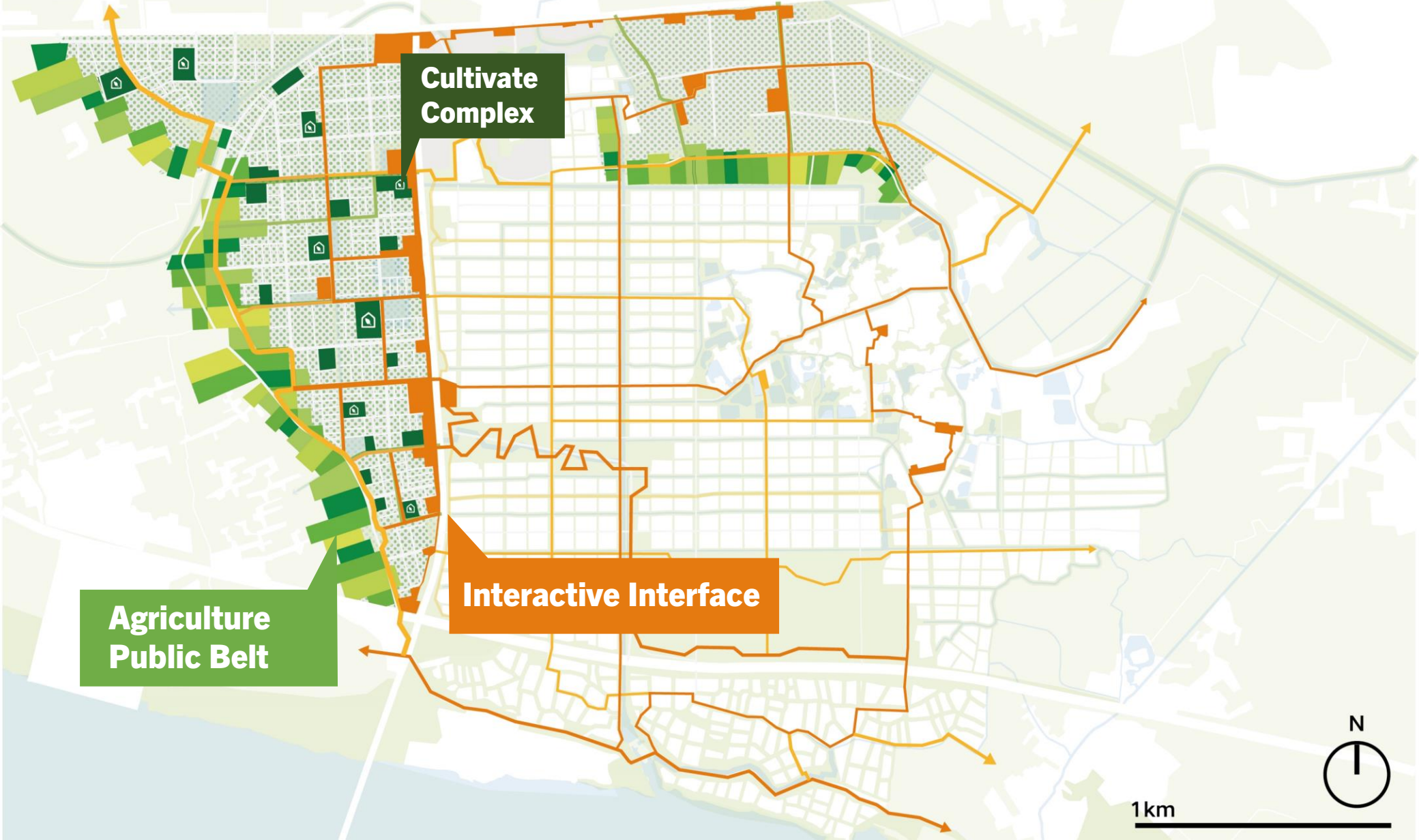
Building Complete Local Production Chain



## Complete Local Production Chain

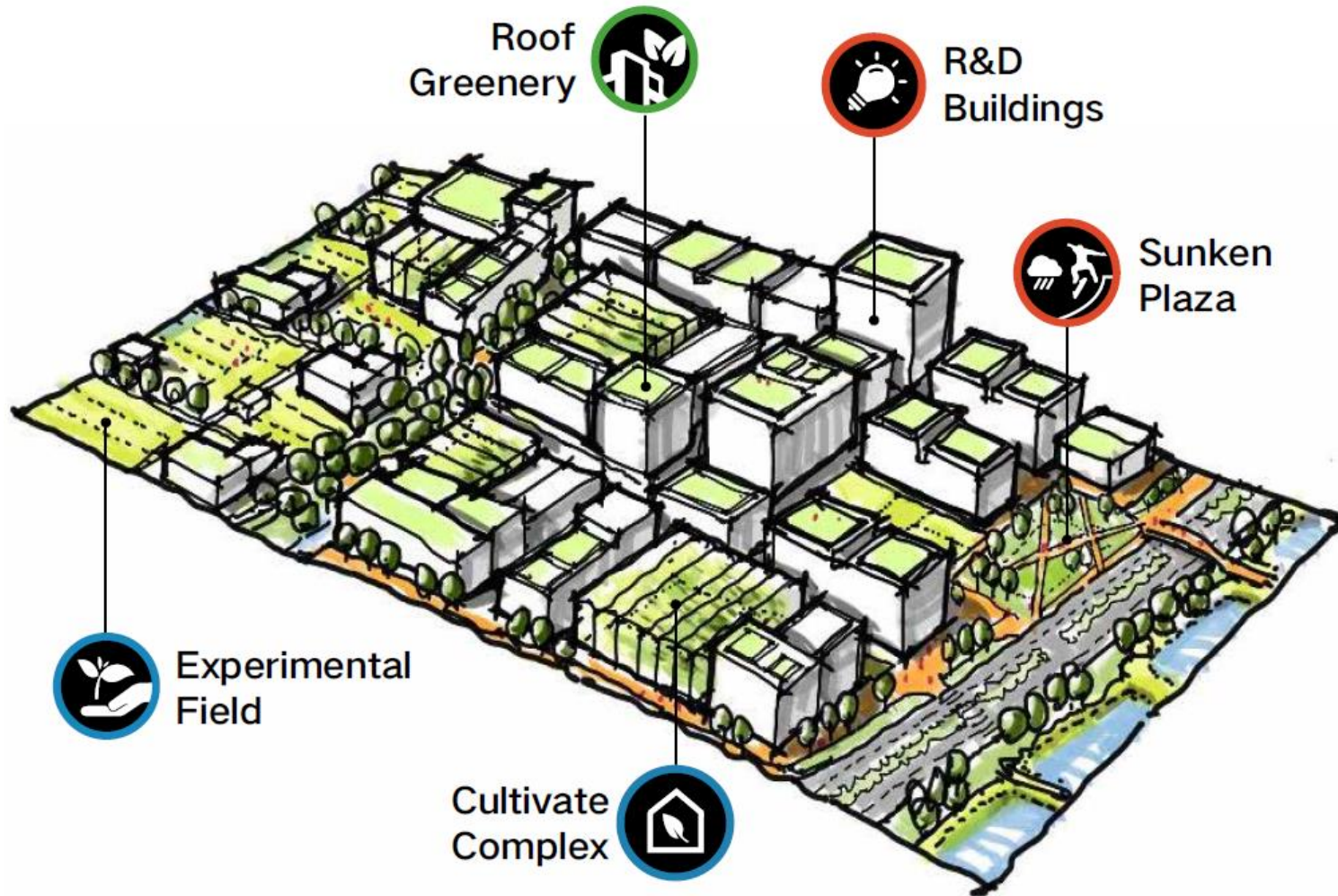
- Local Aquaponics Production
- Full Production Chain
- Spatial Connections across Different Scales

# Agenda II: Organic Densification



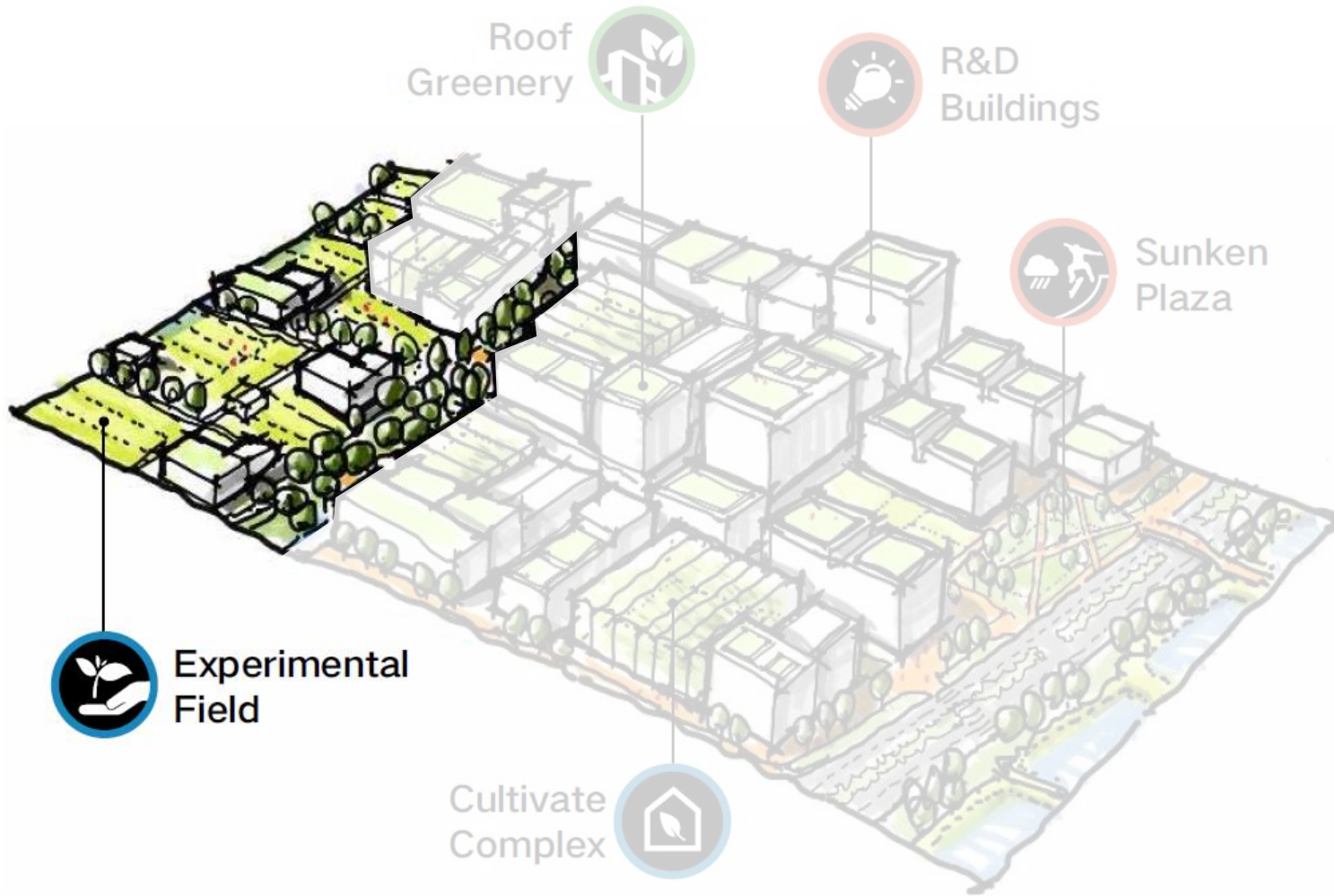
# Organic Densification

From Manufactory Factories to Aquaponics Innovation Hub



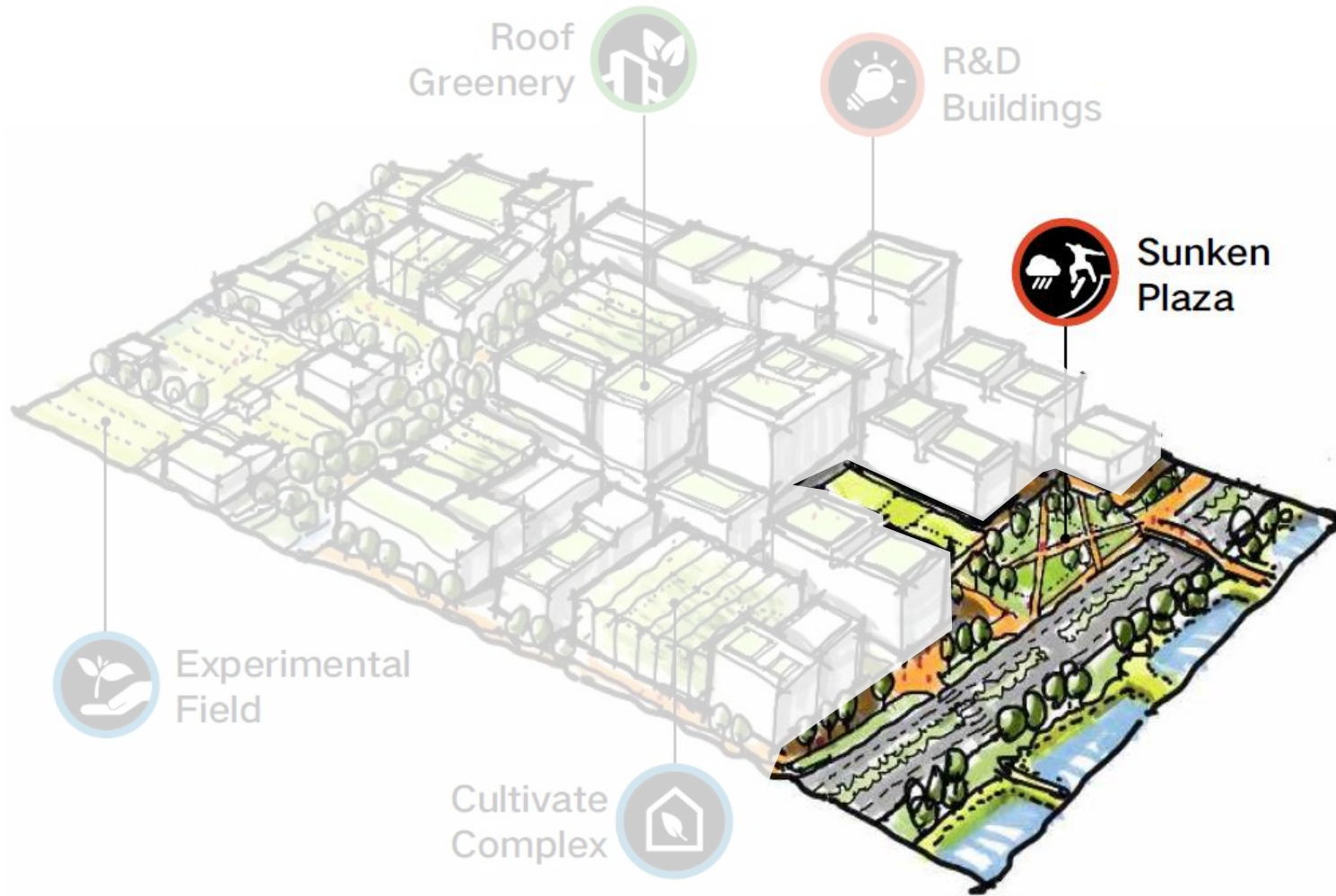
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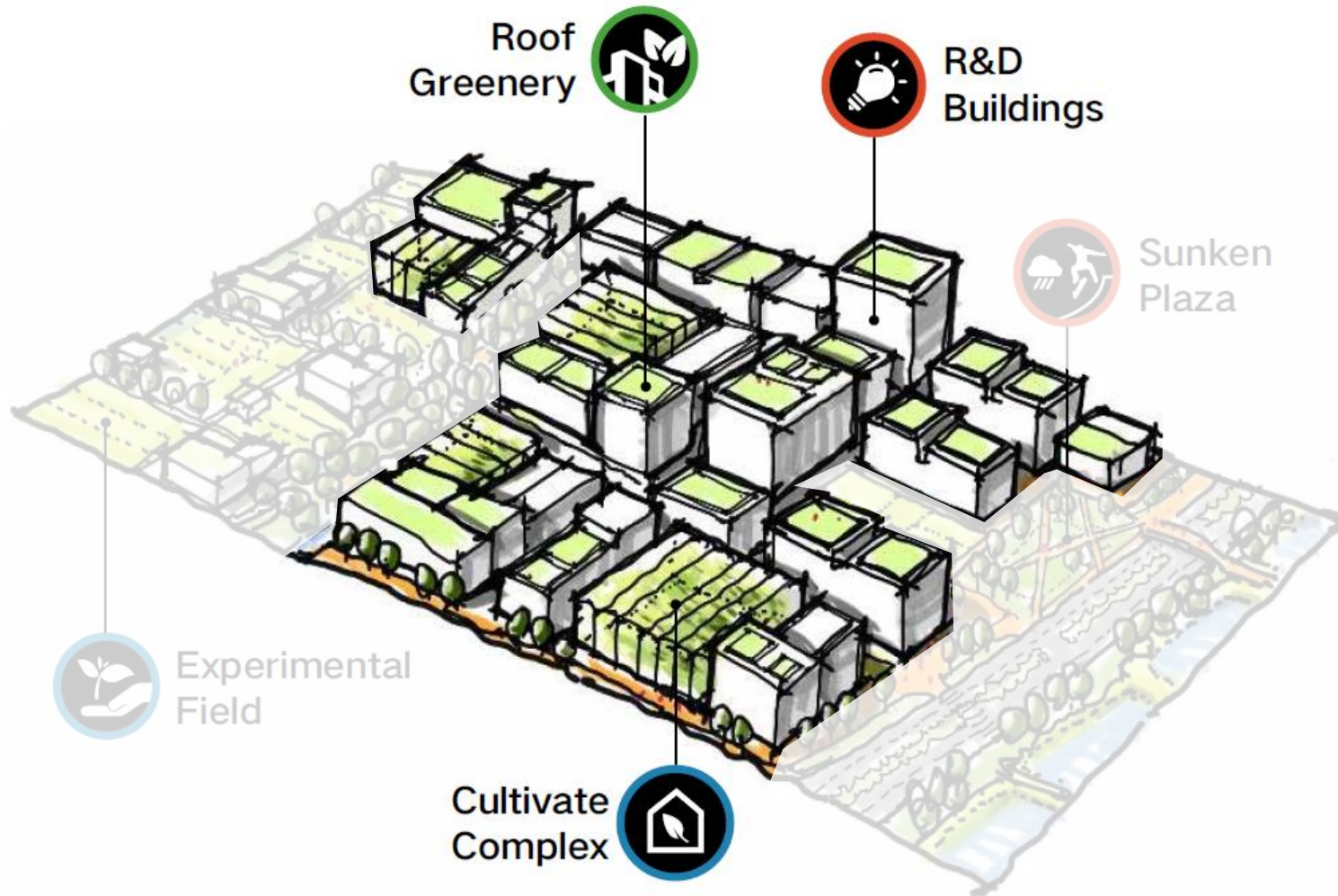
# Organic Densification

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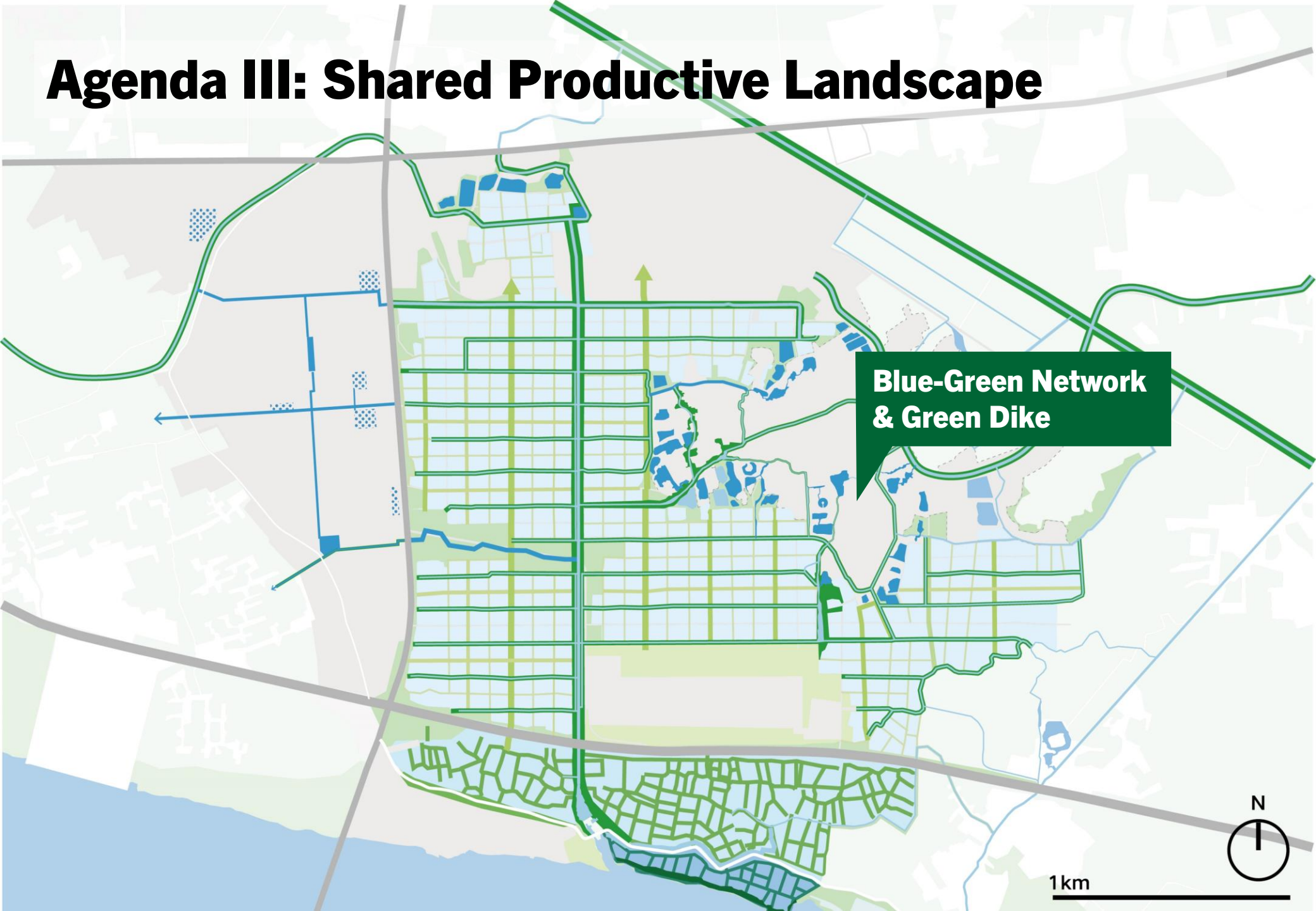
# Organic Densification

From Manufactory Factories to Aquaponics Innovation Hub





# Agenda III: Shared Productive Landscape

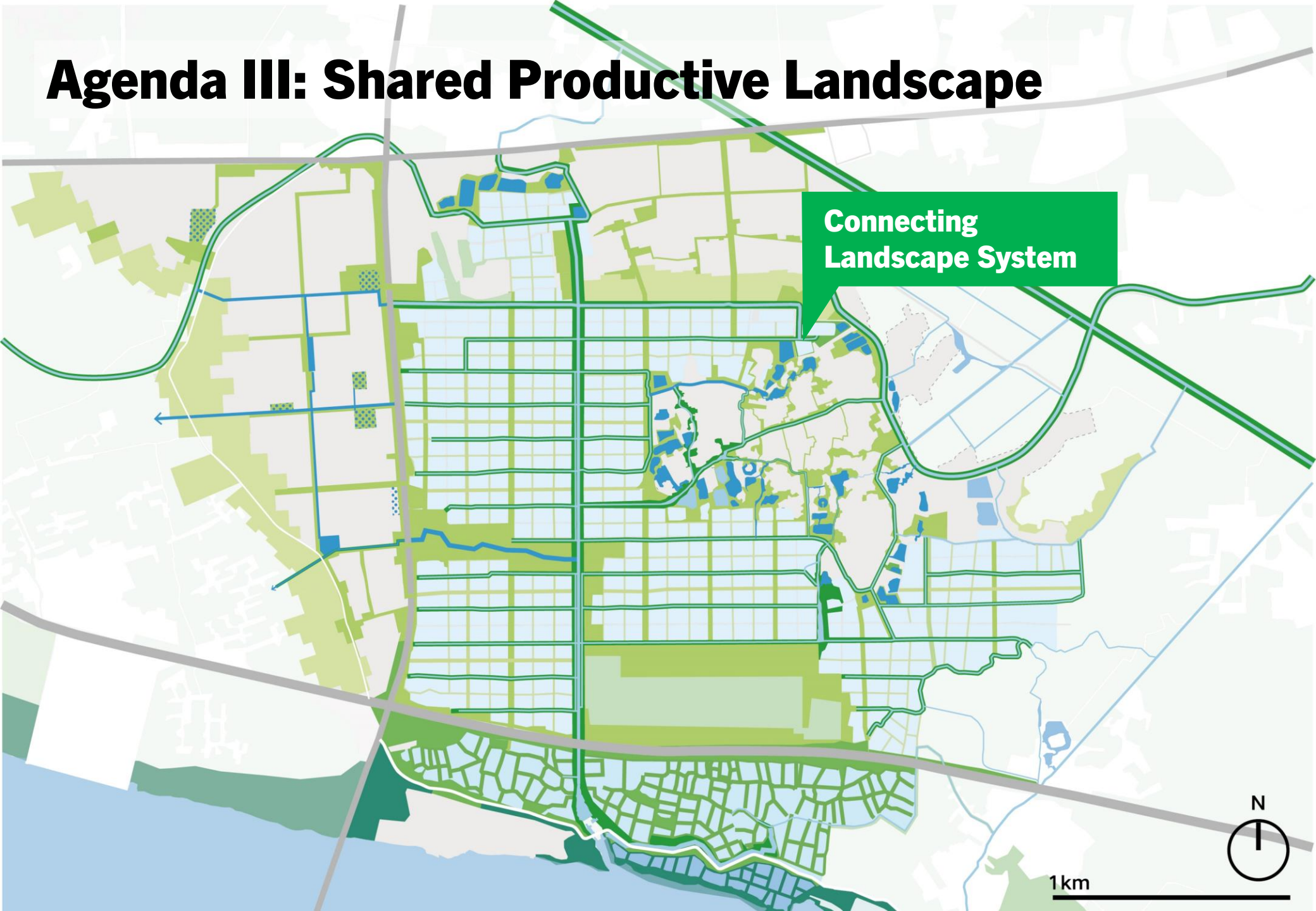


**Blue-Green Network  
& Green Dike**

1km



# Agenda III: Shared Productive Landscape

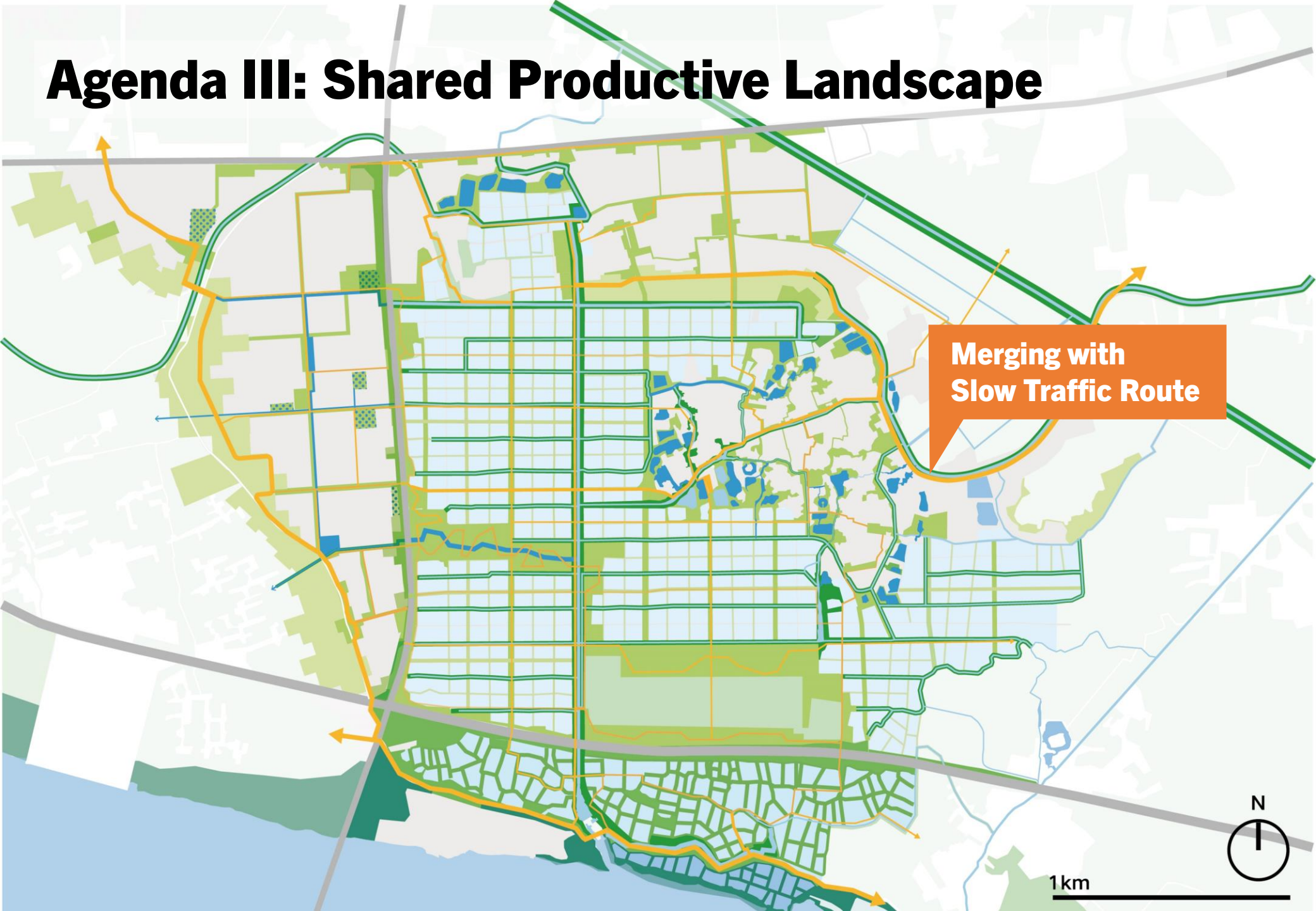


**Connecting  
Landscape System**



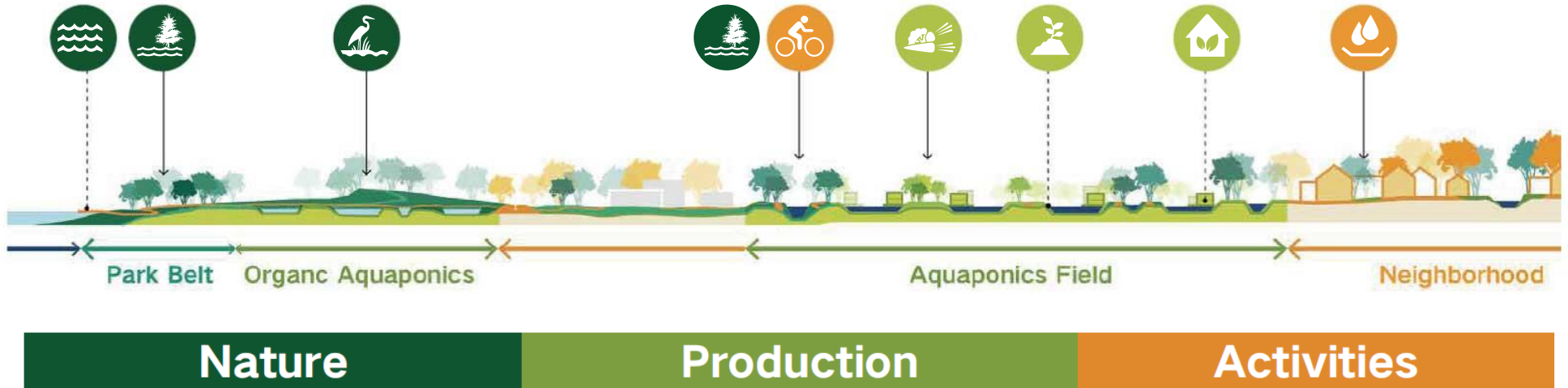
1km

# Agenda III: Shared Productive Landscape



# Shared Productive Landscape

Hybrid Landscape combined Nature, Production and Human Activities

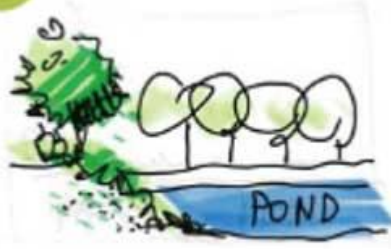


# Shared Productive Landscape

Hybrid Landscape combined Nature, Production and Human Activities



Hydrophilic Bank



Soft Slope



Eco-Lane



Green-blue Corridor



Aquaponic Wetland



Green Dike

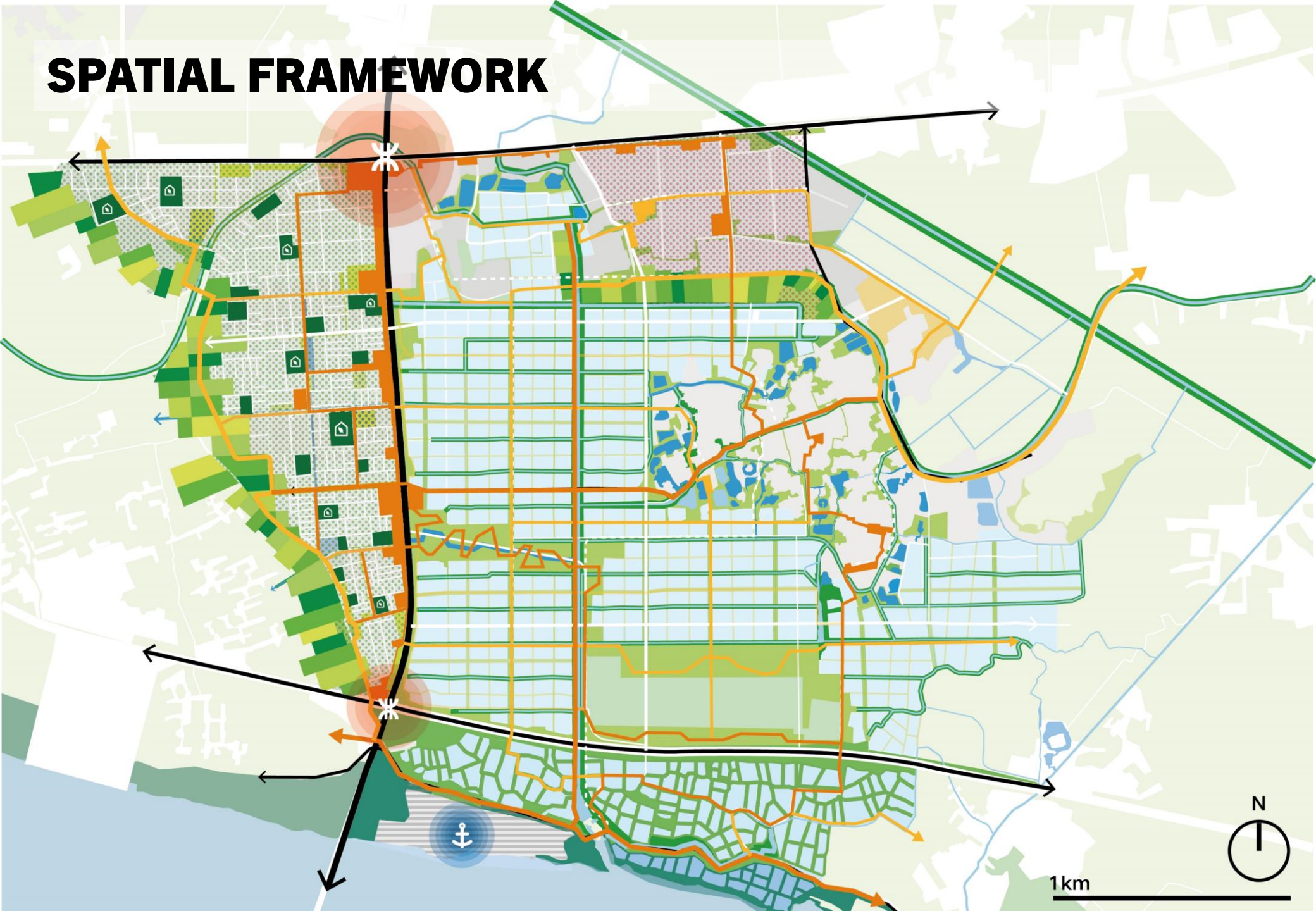


Eco-Densification



Sponge Plaza

# SPATIAL FRAMEWORK

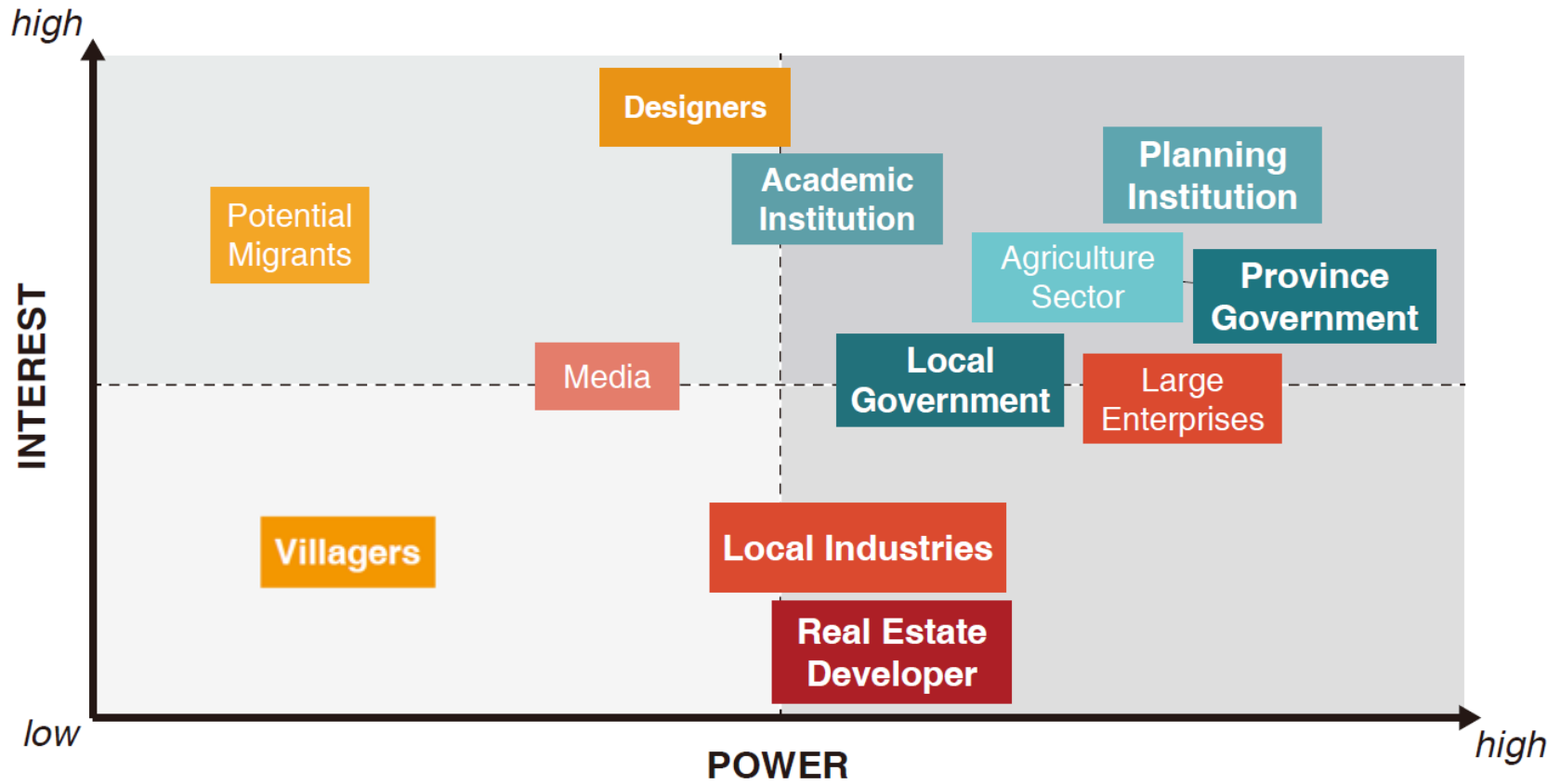


# Innovation Grids for Modern Aquaponics



# Existing Stakeholders

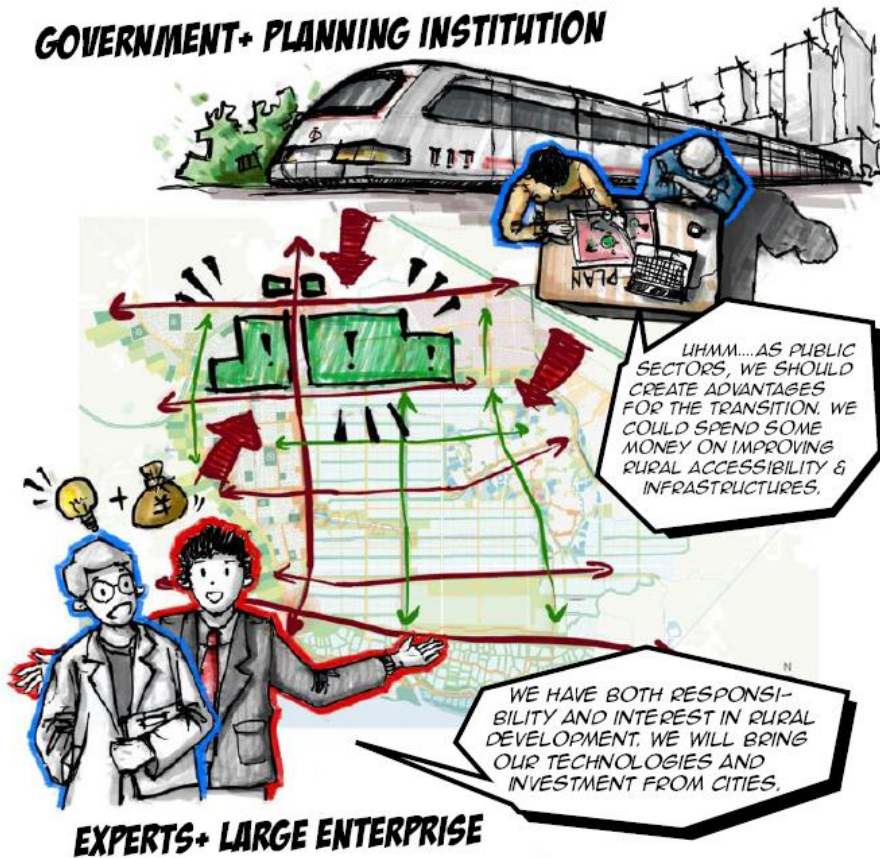
From Manufactory Factories to Aquaponics Innovation Hub



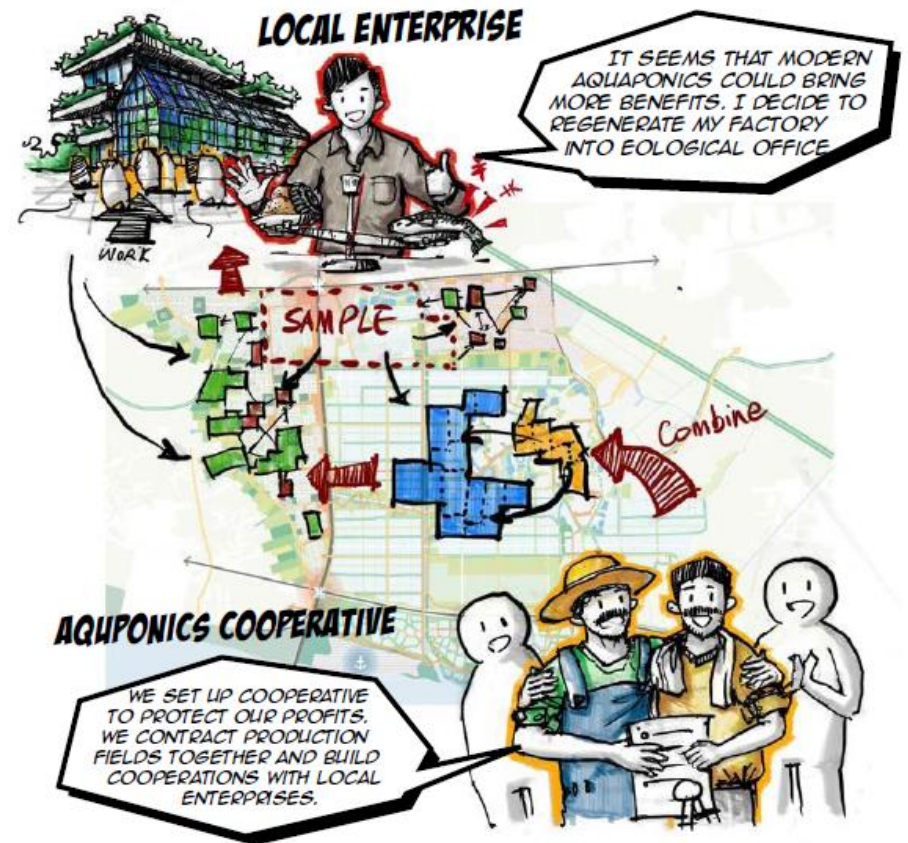


# Governance Transition

From Stakeholders to Actors



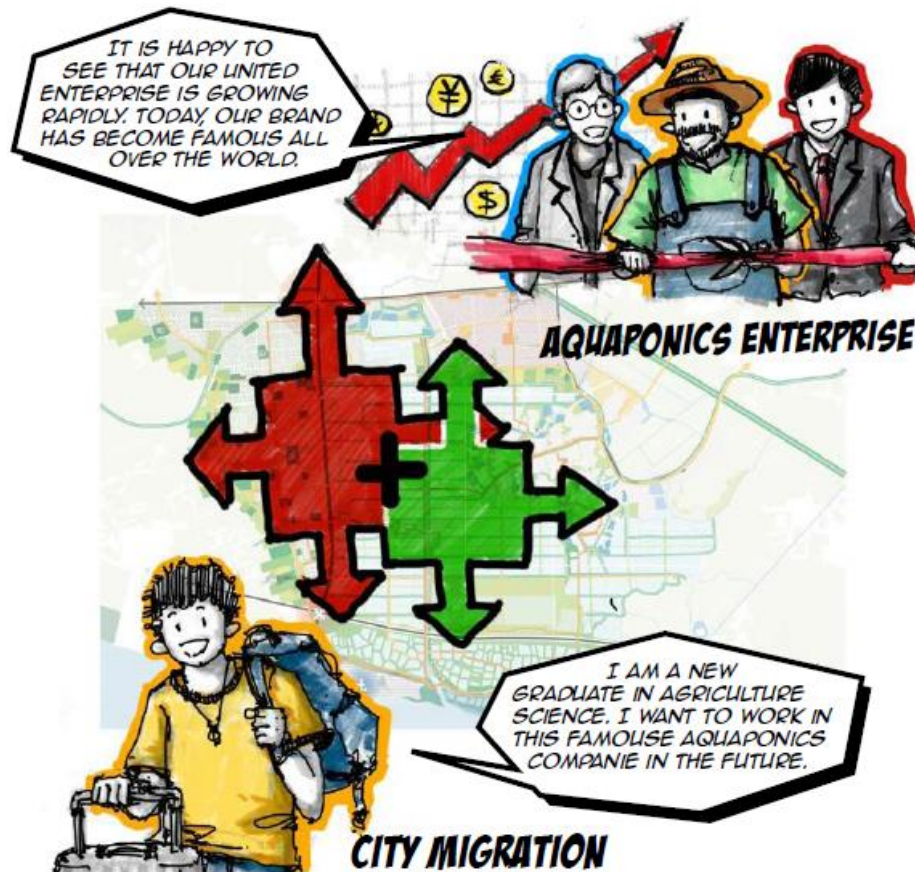
**Phase I Condition**



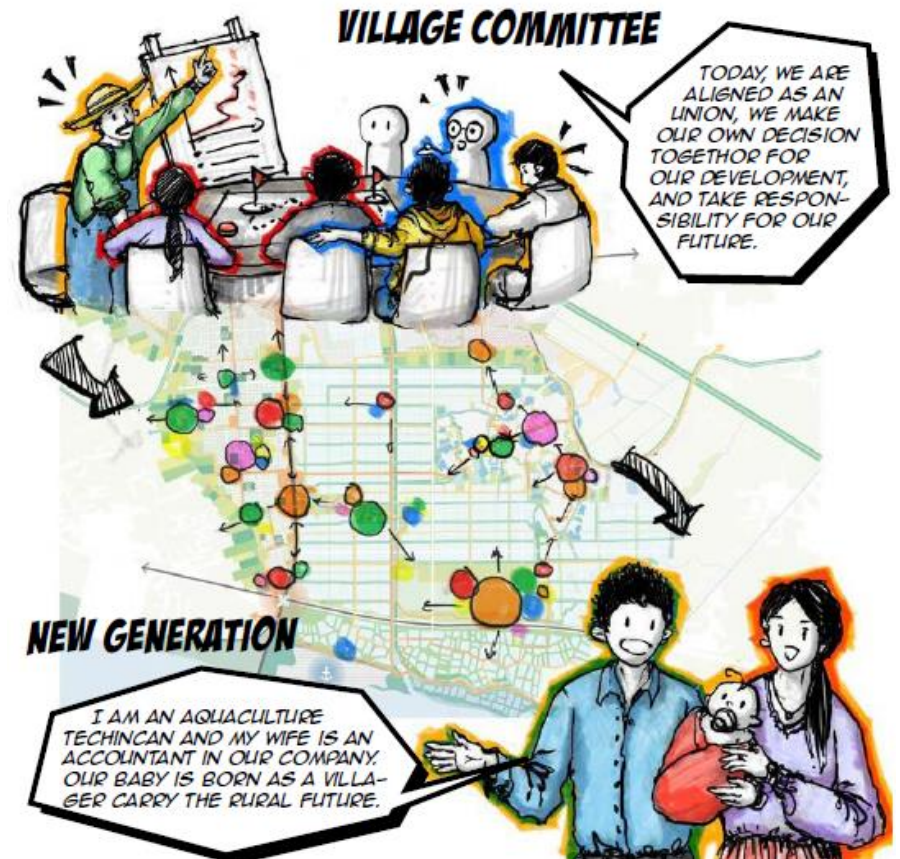
**Phase II Innovation**

# Governance Transition

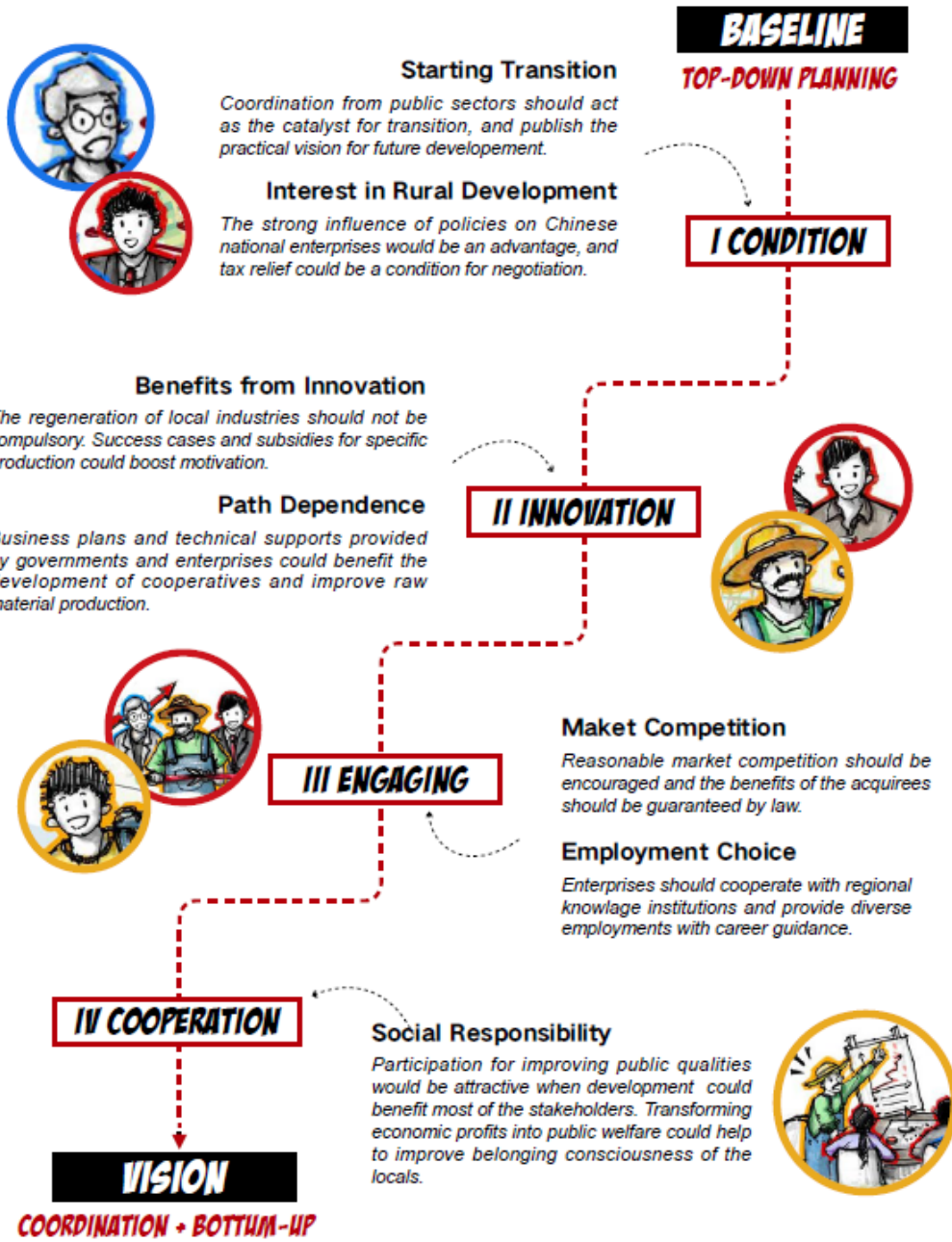
From Stakeholders to Actors



**Phase III Engaging**



**Phase IV Cooperation**



**Coordination**



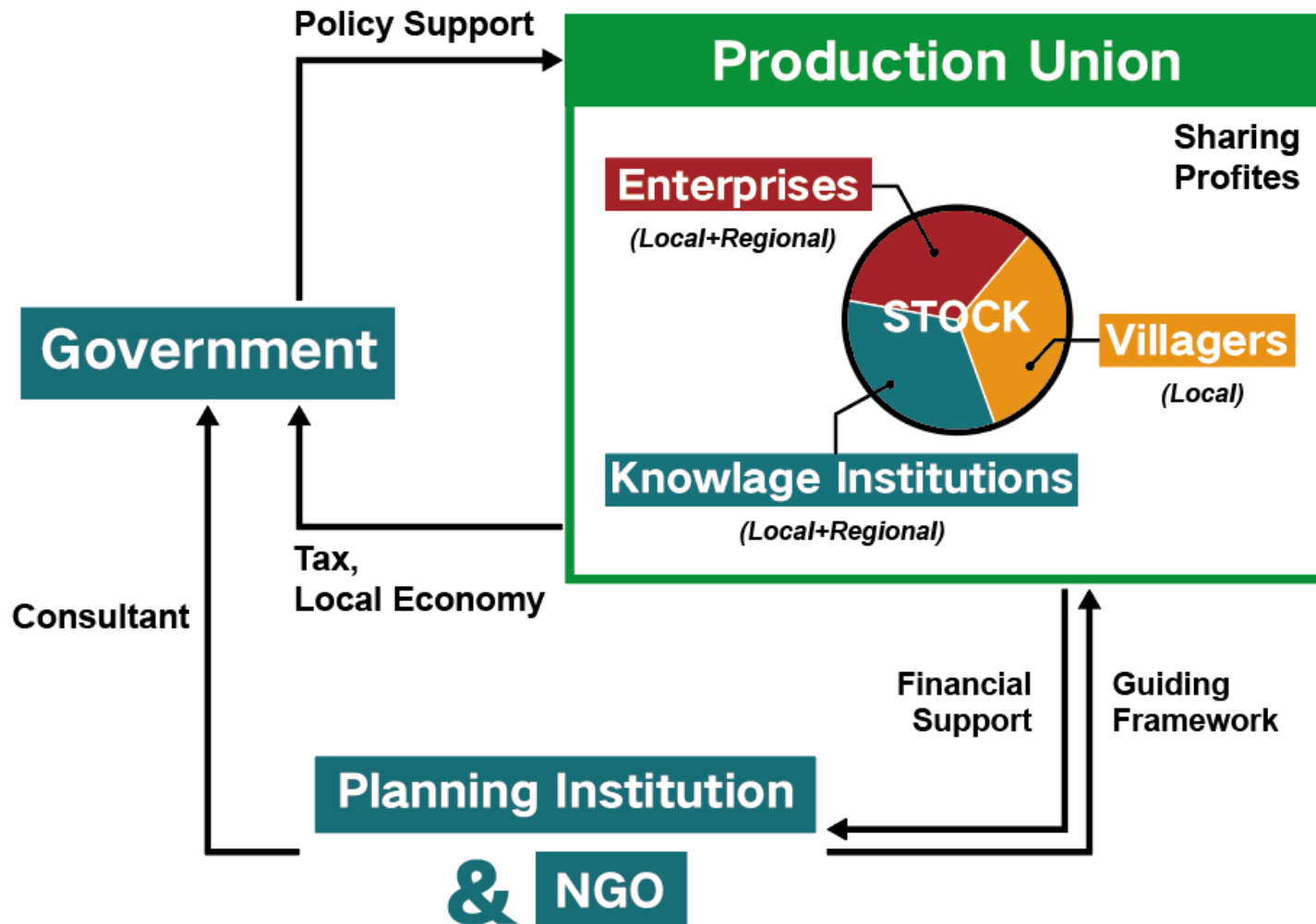
**Engaging through  
Common Interest**

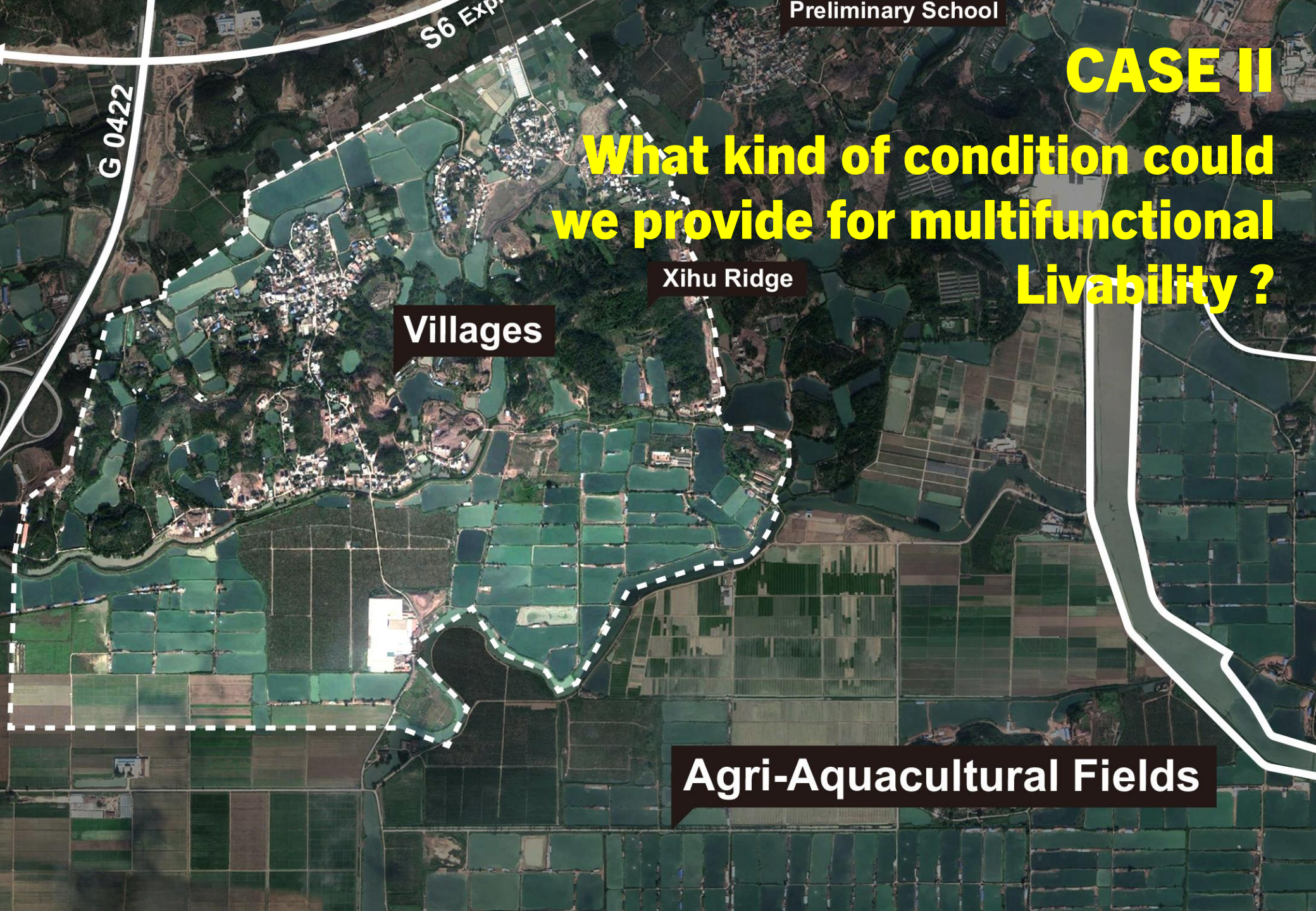


**Co-Creation**

# Cooperative Platform

A Profit-Sharing Governance Model in Post Clan Age





S6 Exp

Preliminary School

G 0422

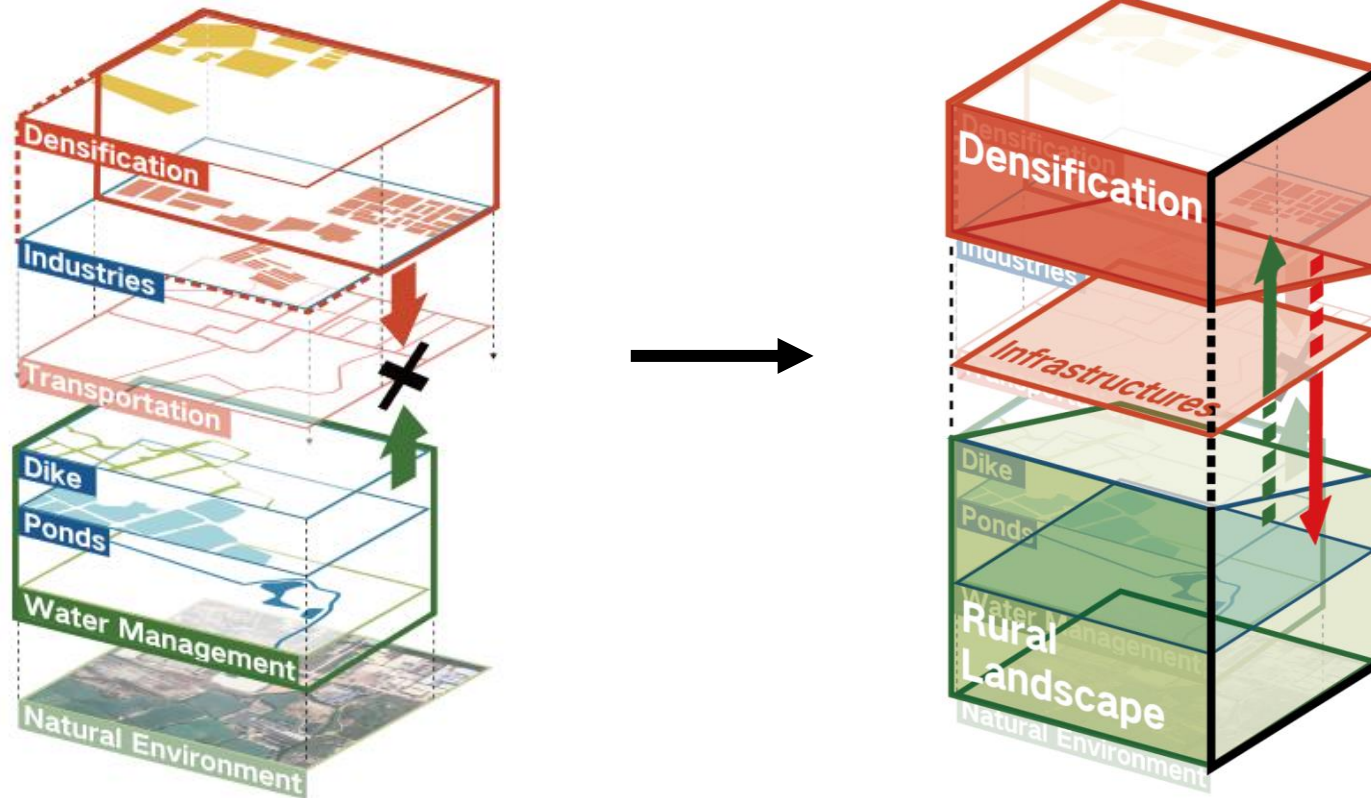
# CASE II

**What kind of condition could we provide for multifunctional Livability ?**

Xihu Ridge

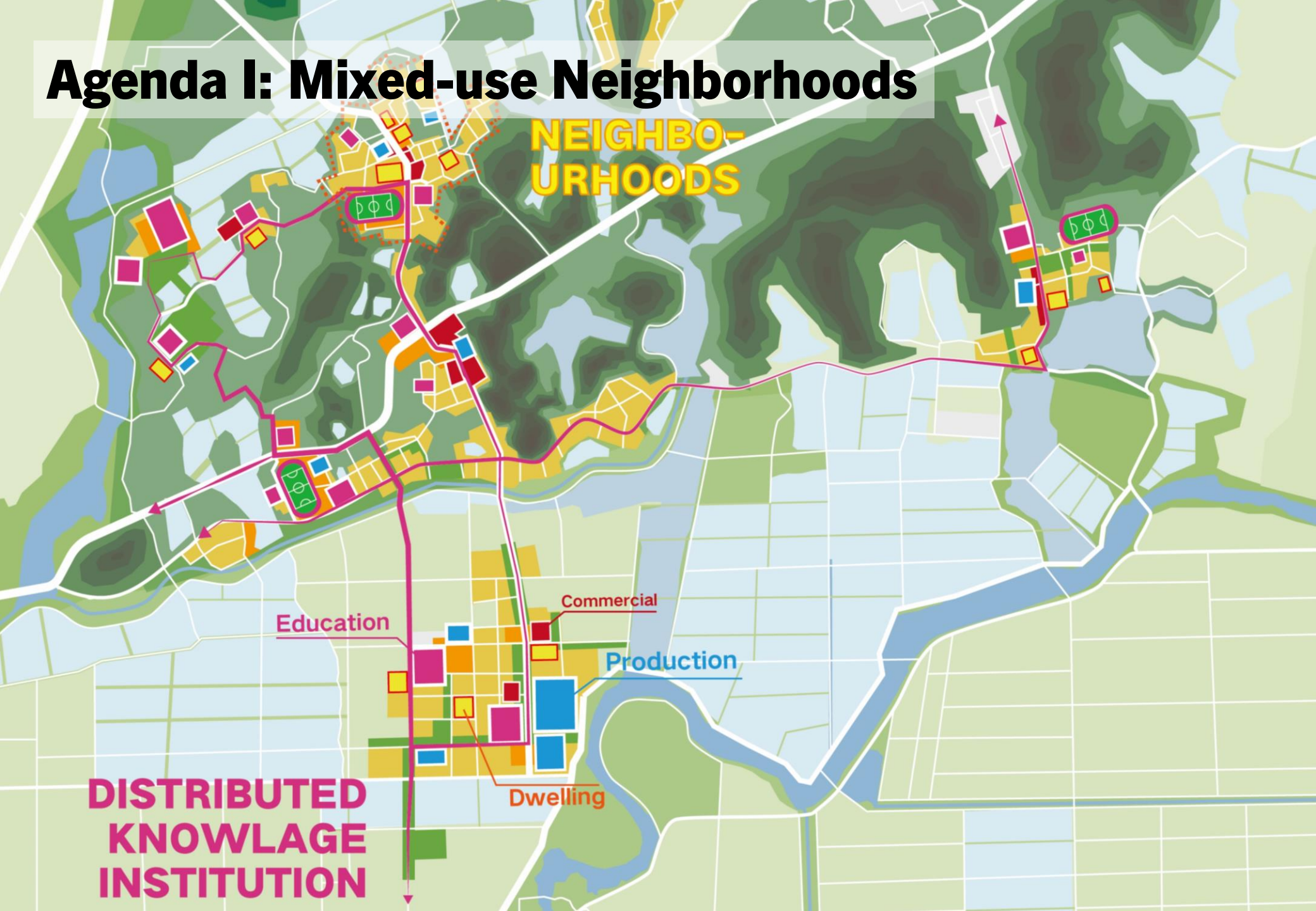
Villages

Agri-Aquacultural Fields



Blurring via Interactive Structure & Accessible Composite

# Agenda I: Mixed-use Neighborhoods



NEIGHBORHOODS

Education

Commercial

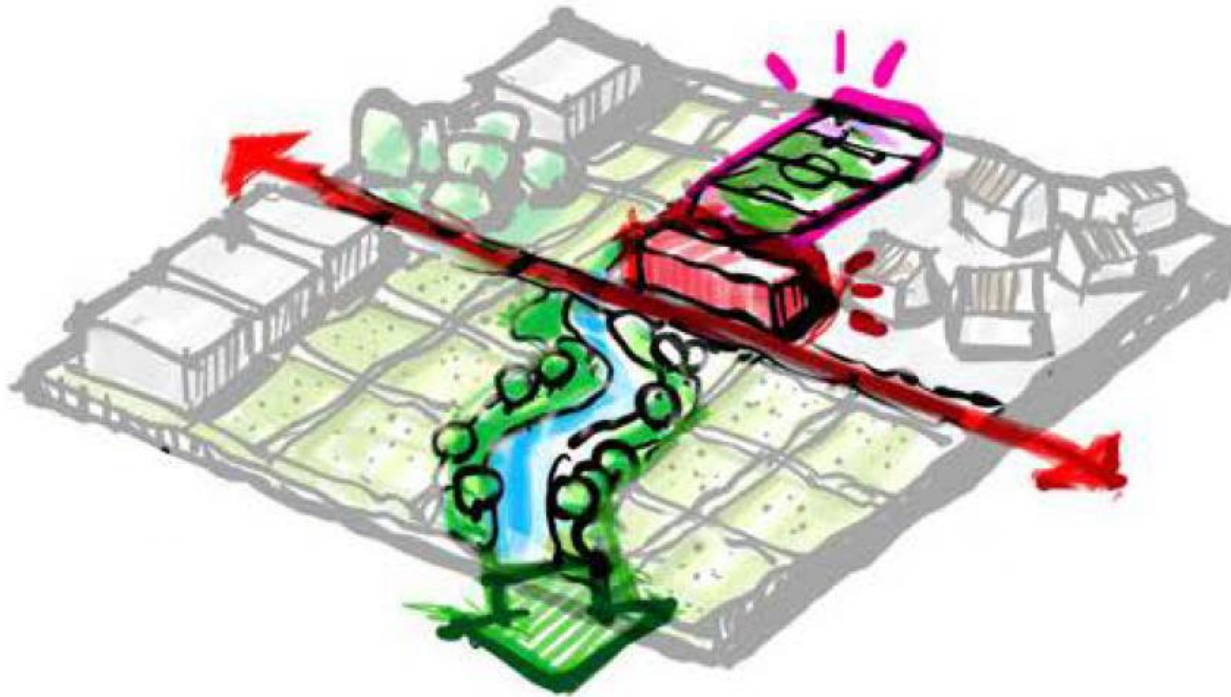
Production

Dwelling

DISTRIBUTED KNOWLEDGE INSTITUTION

# Agenda I: Mixed-use Neighborhoods

Distributed Work-live Composite for Low Density Agglomeration



## Shared Facilities

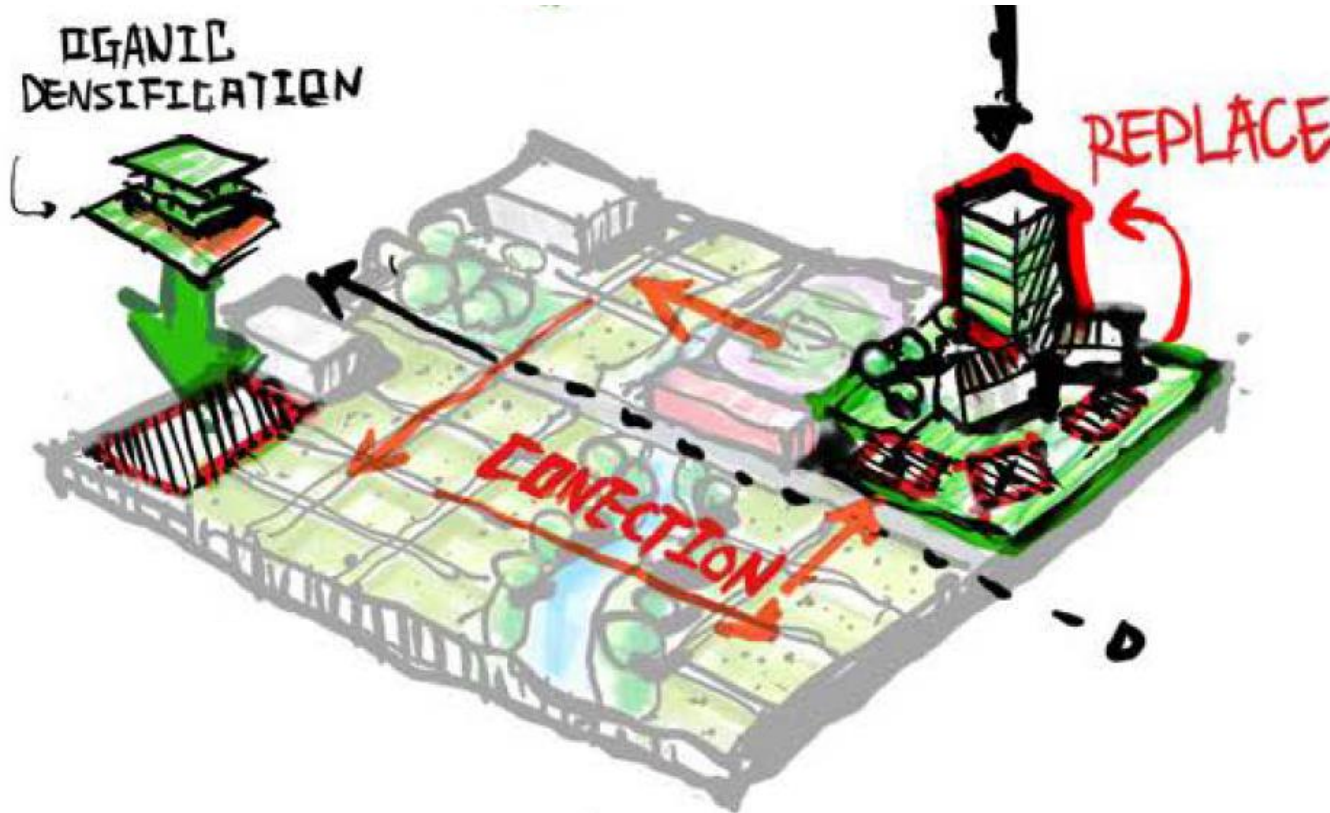
### Infrastructures Basis

- Intercity transportation hub
- Green-blue structure
- Priority facilities which could be shared with future constructions



# Agenda I: Mixed-use Neighborhoods

Distributed Work-live Composite for Low Density Agglomeration



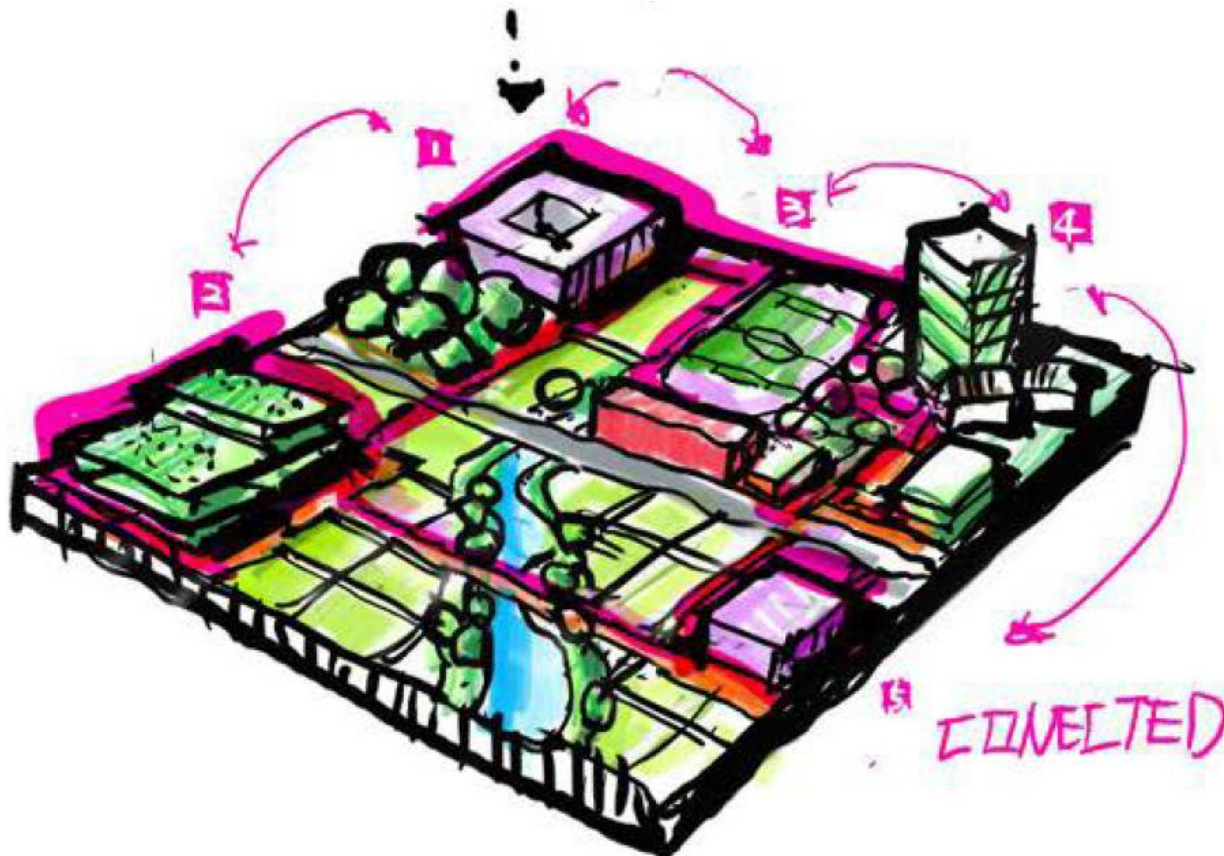
## Regeneration

### Quality Densification

- Organic regeneration of the local Industrial buildings
- Replacing low-quality houses with green apartments
- Improving the quality of the public space in neighbourhoods

# Agenda I: Mixed-use Neighborhoods

Distributed Work-live Composite for Low Density Agglomeration

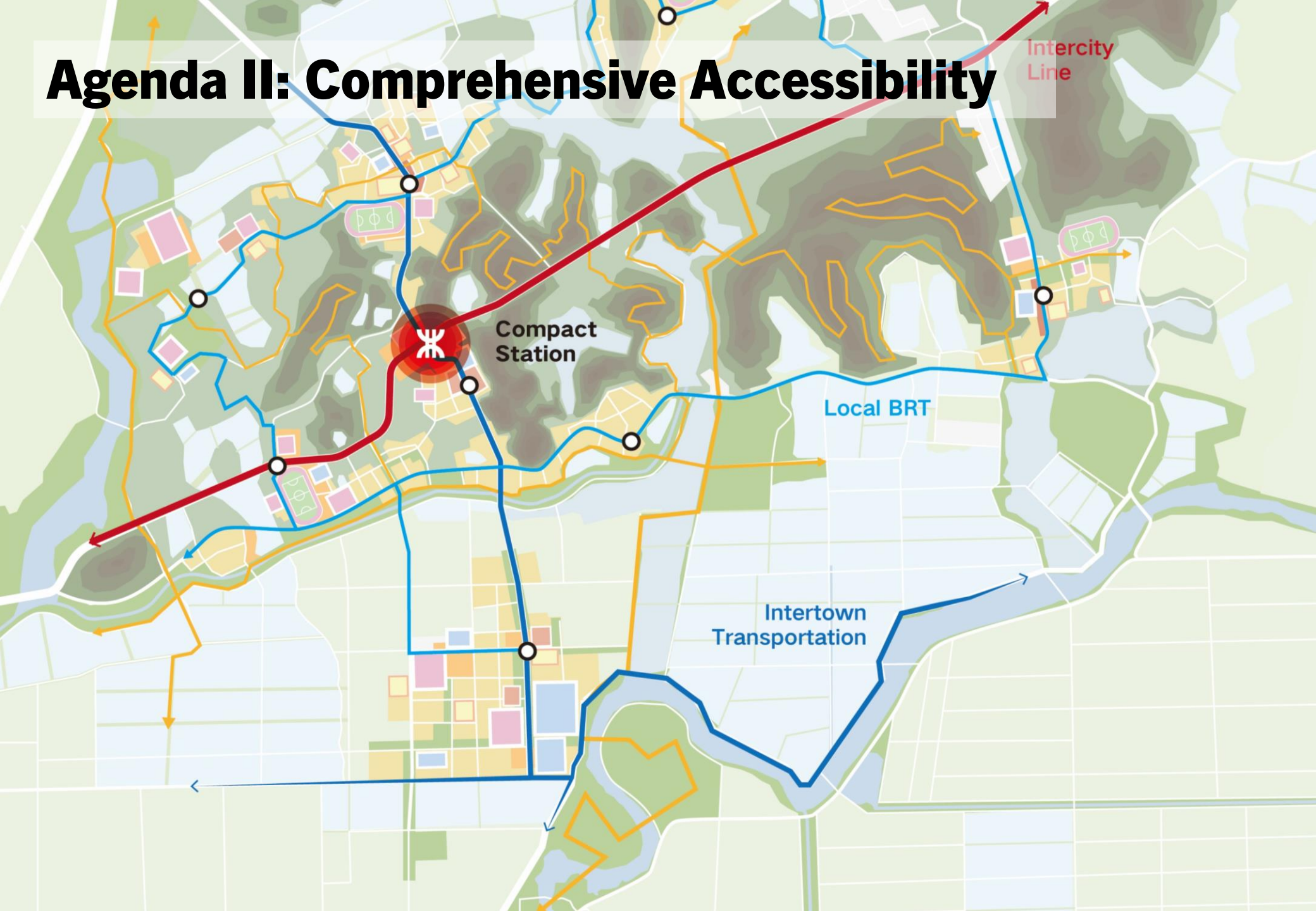


## Industries

### Mixed Development

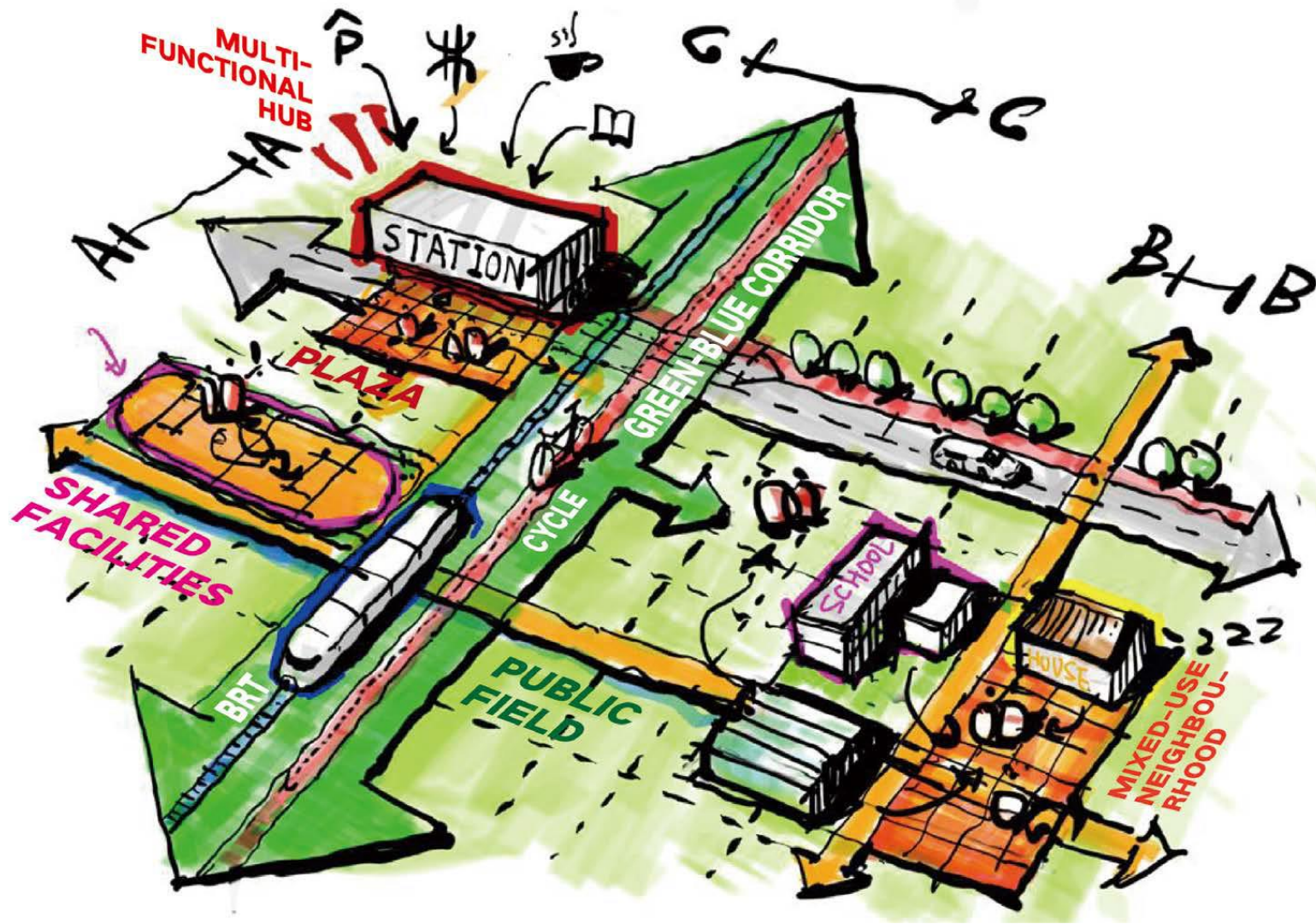
- Developing new buildings for local industries distributely in different neighbourhoods
- Mixed-use neighbourhoods contain various functions
- Building connections between neighbourhoods, landscape and constructed areas

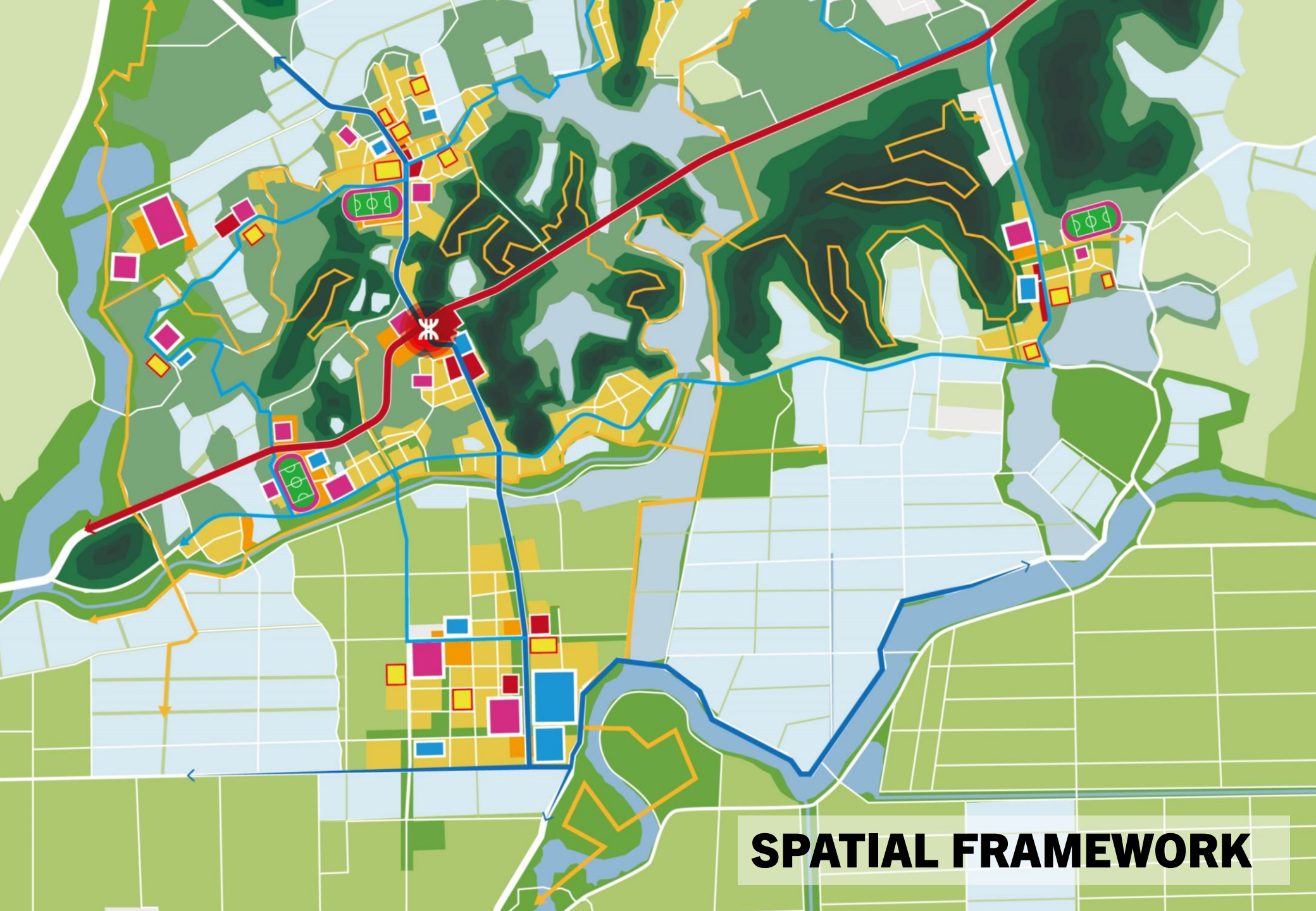
# Agenda II: Comprehensive Accessibility



# Comprehensive Accessibility

Multi-model Transpiration System As A Coherent Network

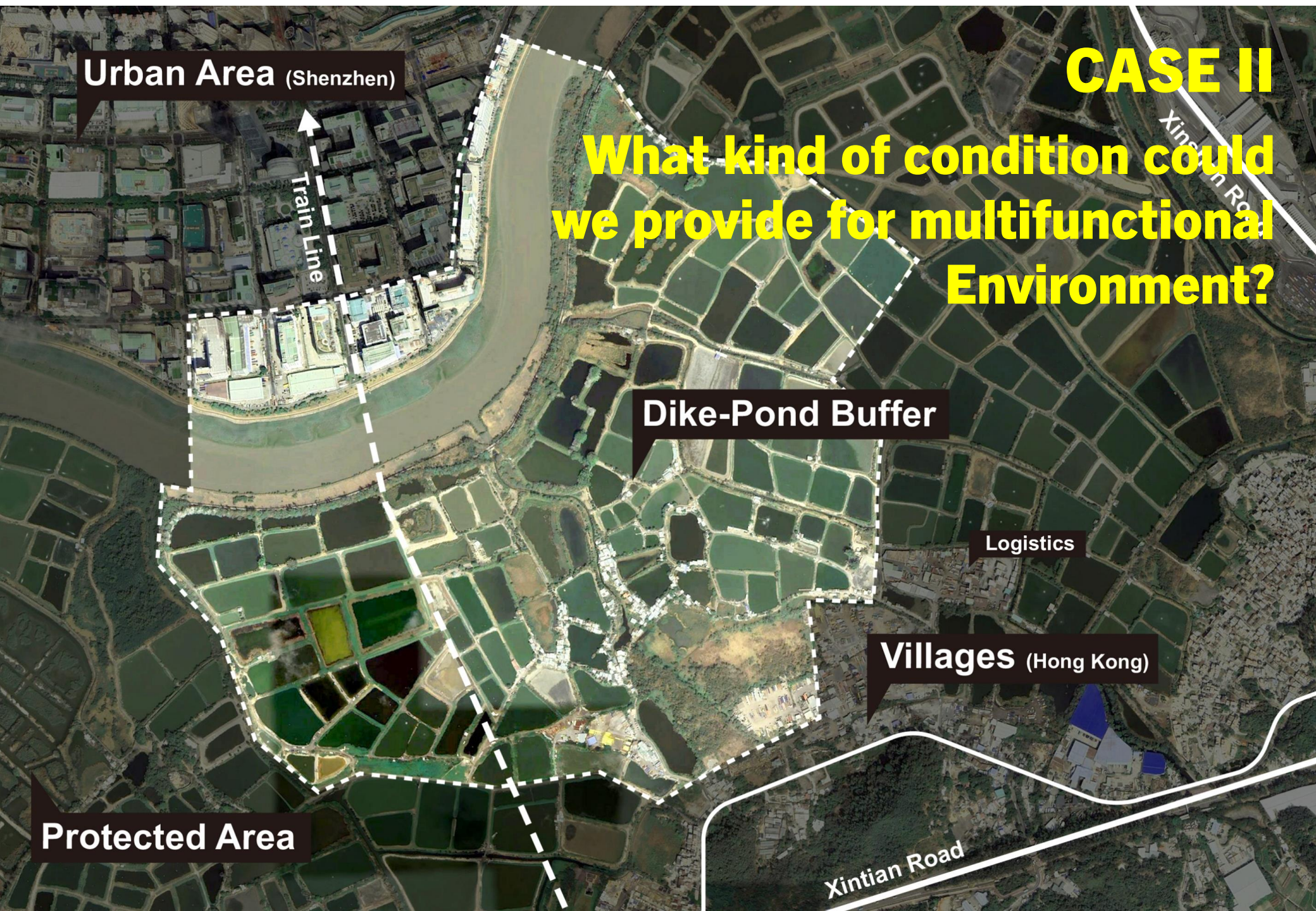




**SPATIAL FRAMEWORK**

# Composite Community with Organic Densification





**Urban Area (Shenzhen)**

**Train Line**

**CASE II**

**What kind of condition could we provide for multifunctional Environment?**

**Dike-Pond Buffer**

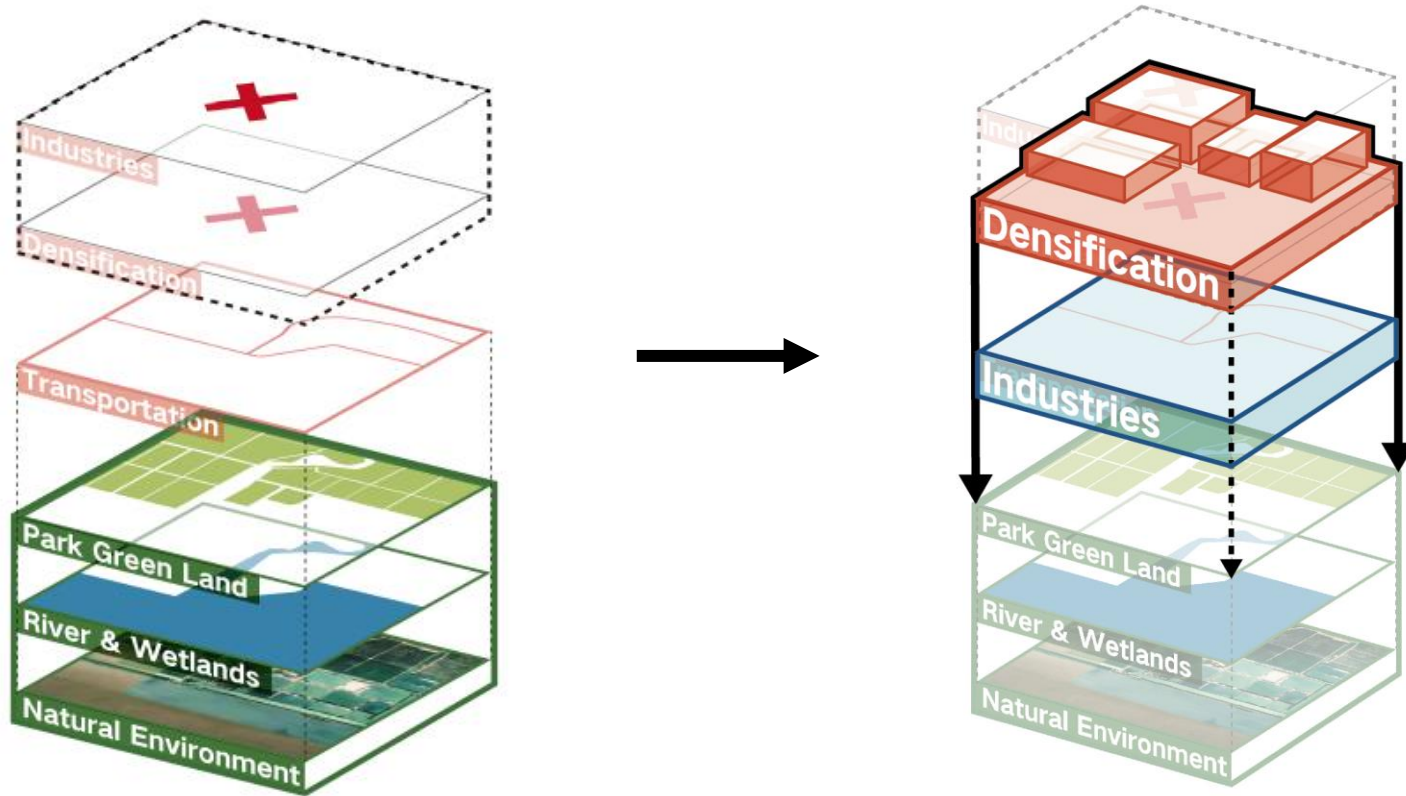
**Logistics**

**Villages (Hong Kong)**

**Protected Area**

**Xintian Road**

**Xinshun Road**

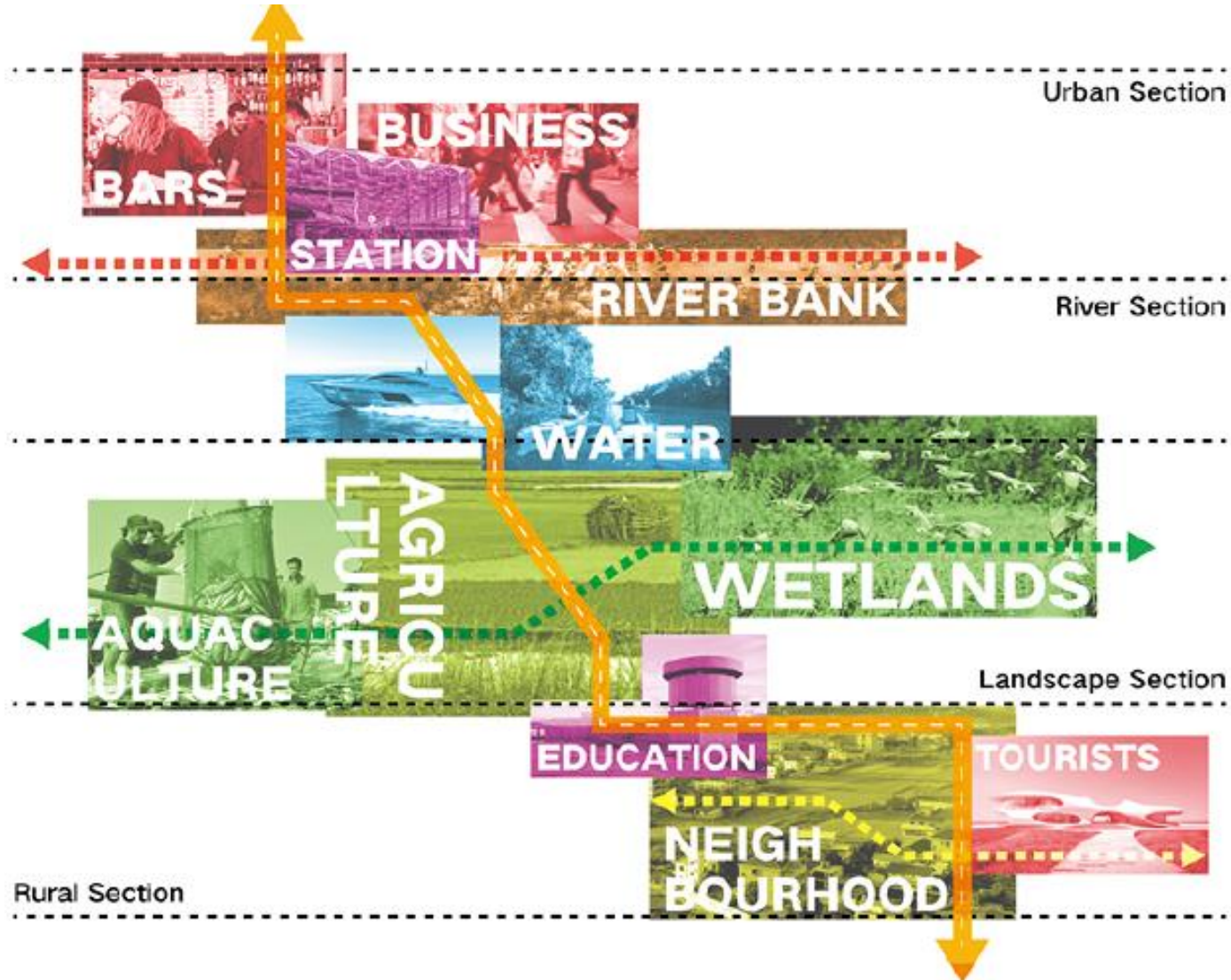


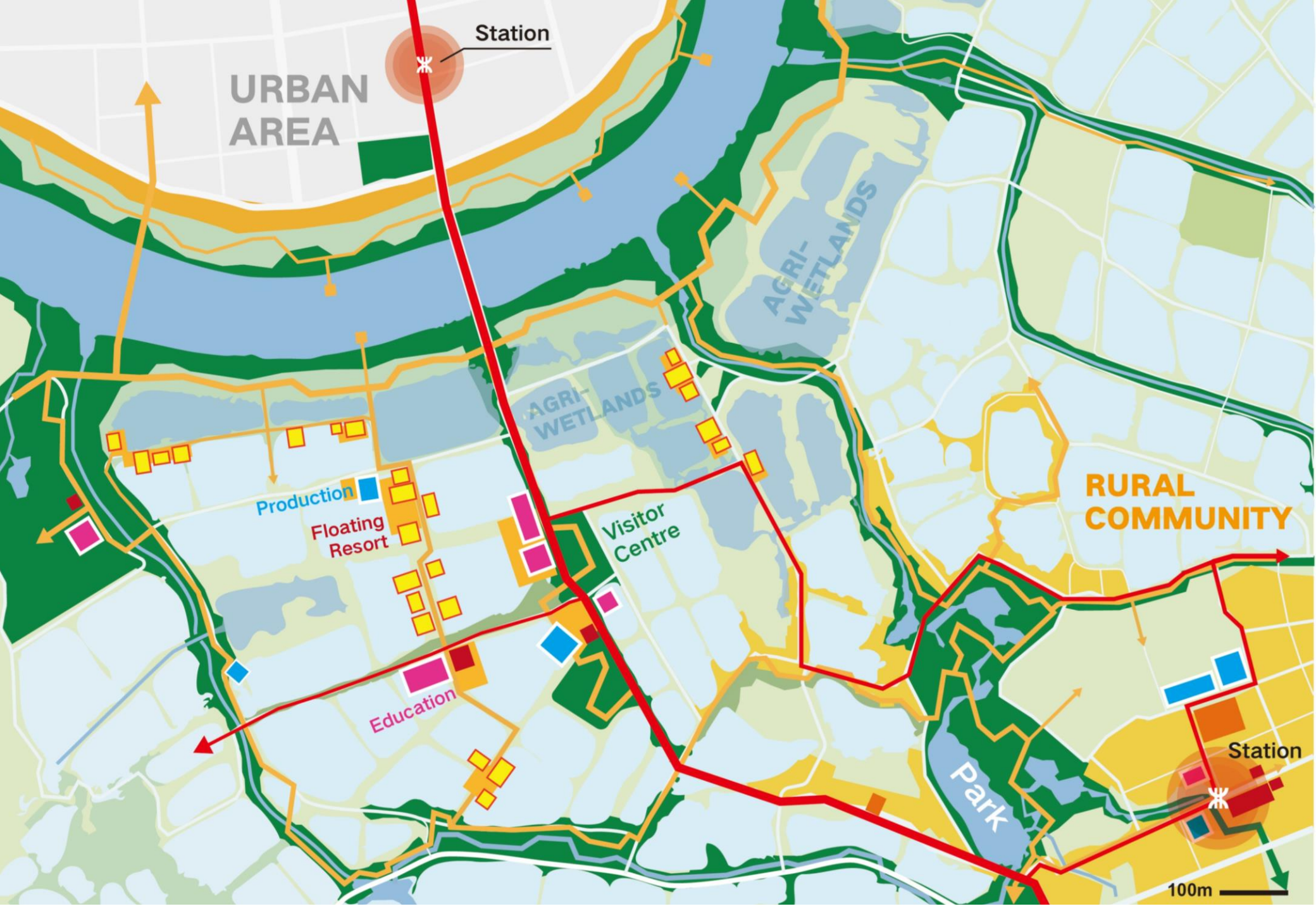
Corridor for Connections & Iterating Human Activities



# Agenda: Shared Productive Landscape

Hybrid Landscape combined the Nature, Production and Human Activities





Station

URBAN  
AREA

AGRI-  
WETLANDS

AGRI-  
WETLANDS

RURAL  
COMMUNITY

Production

Floating  
Resort

Visitor  
Centre

Education

Park

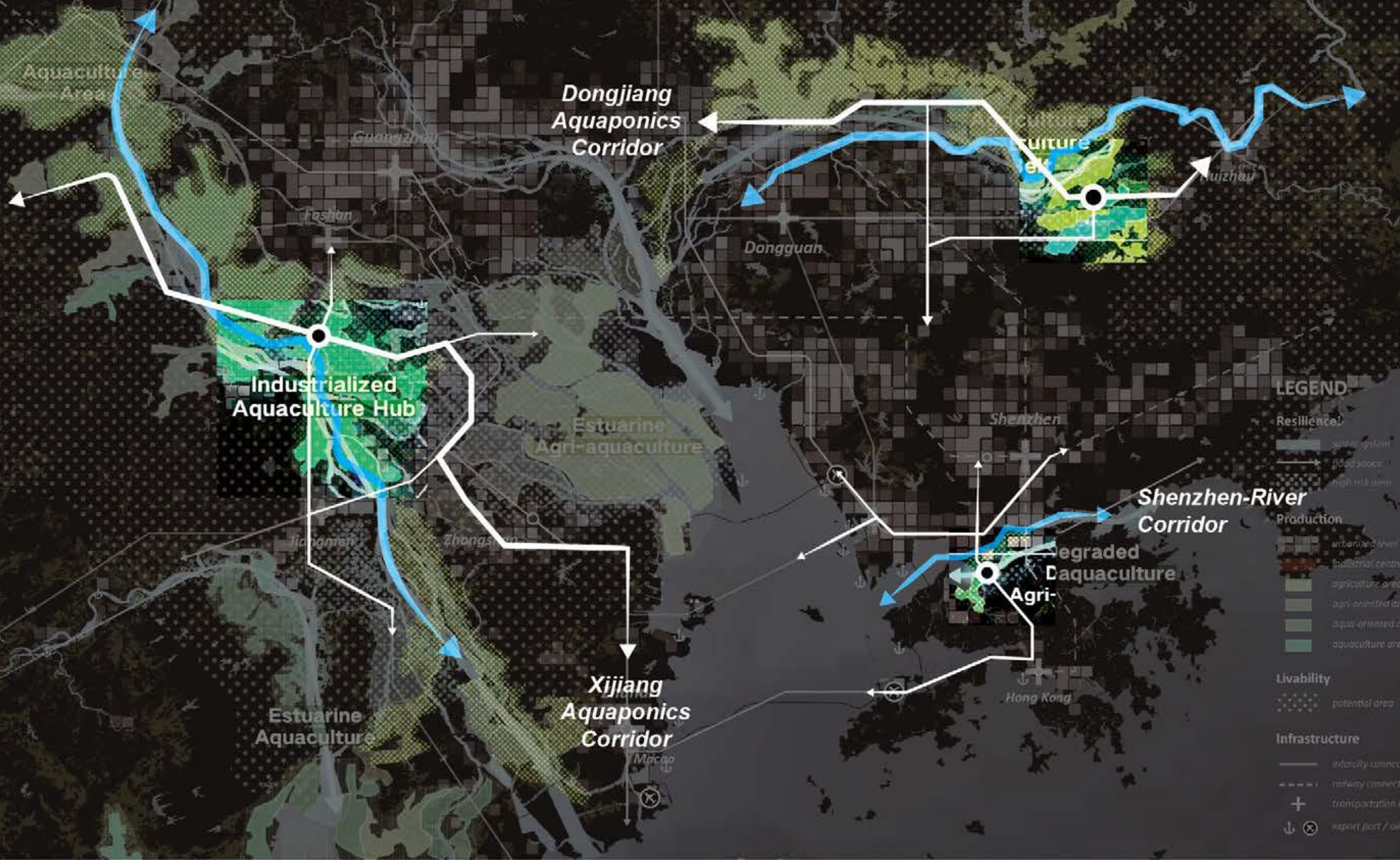
Station

100m

# Hybrid Habitats as A Lively Corridor

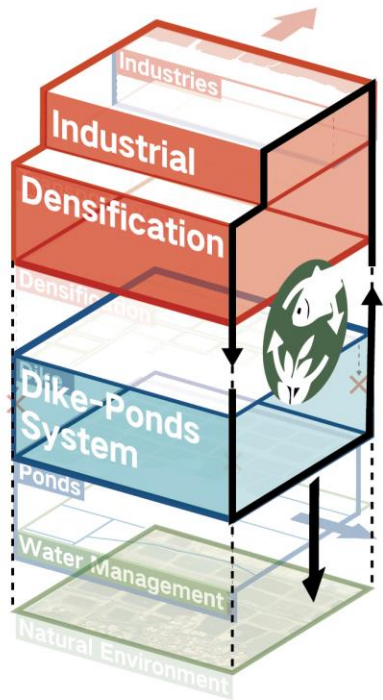


# CONCLUSION



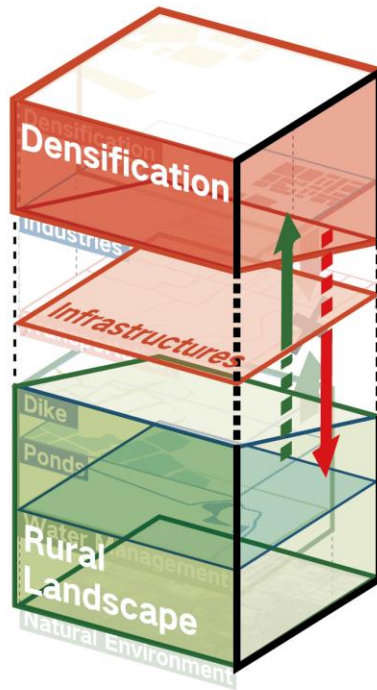
# Xiangcun, An Independent Settlement System

Three Conceptual Patterns for Multifunctional and Comprehensive Rural System



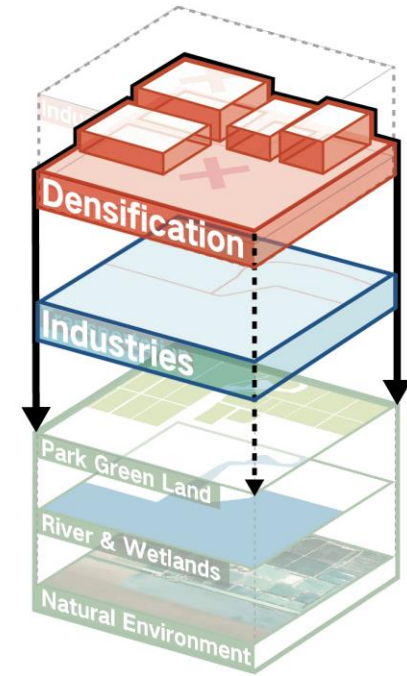
**Concept I**

**Innovation Grid**



**Concept II**

**Composite Community**



**Concept III**

**Hybrid Habitats**

# Comprehensive Agglomeration

A Flexible Framework formed by Six Rural Agendas in the GBA



**Modern  
Aquaponics  
Production**



**Comprehensive  
Accessibility**



**Shared  
Productive  
Landscape**



**Technic  
Innovation  
of Local  
Industries**



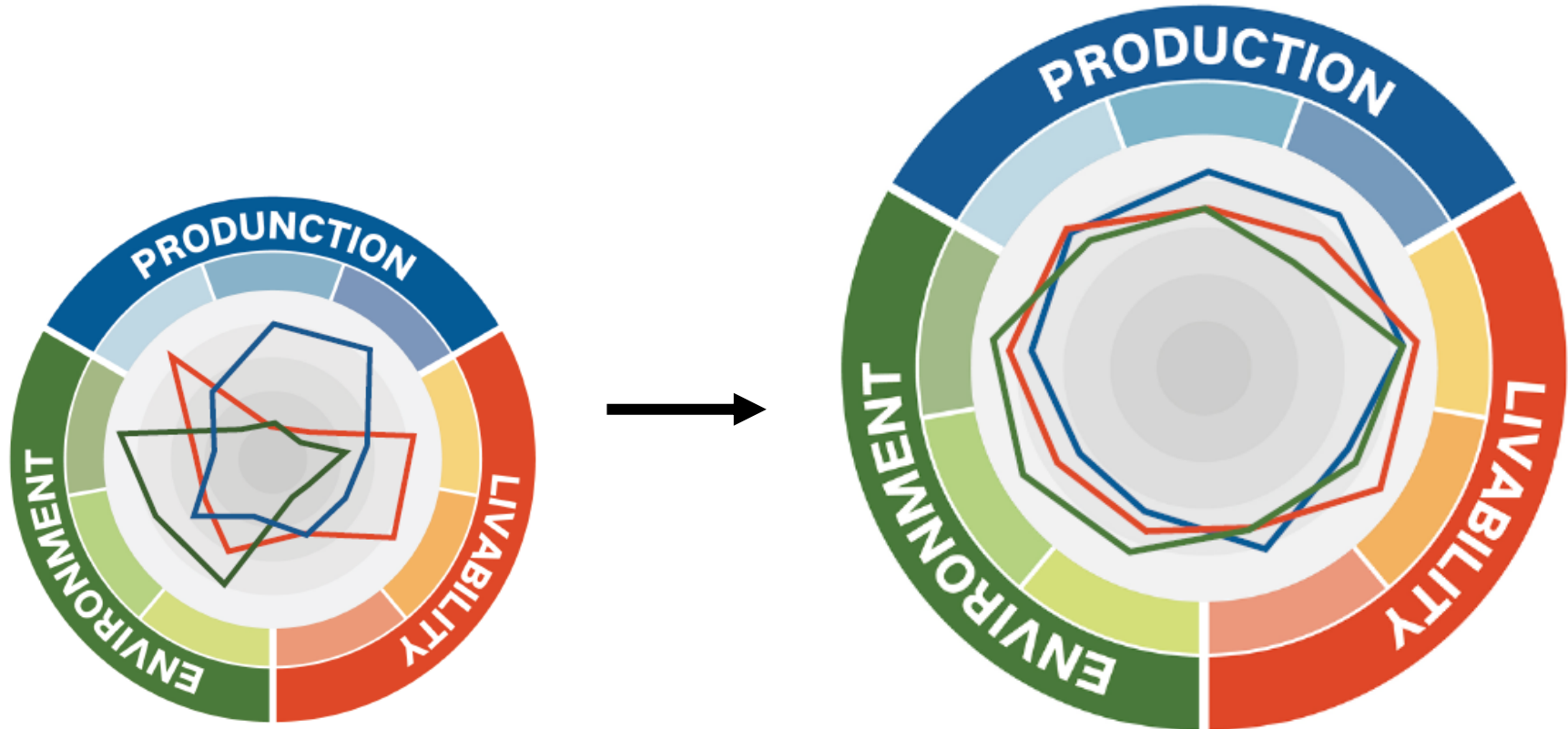
**Smart &  
Mixed-Use  
Neighbourhoods**



**Governance  
with  
Shared Profits**

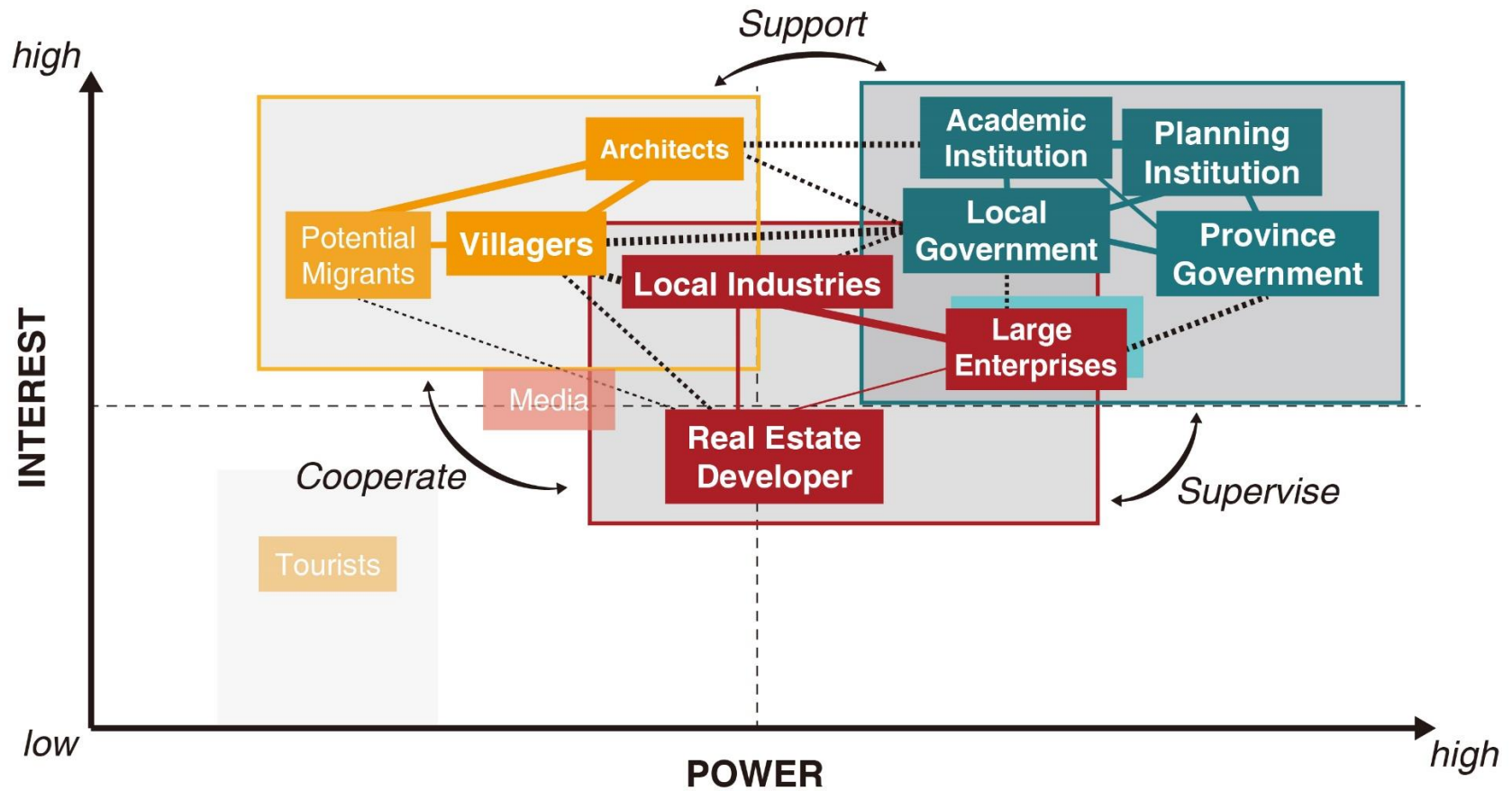
# Sustainable Balance Model for Rural Development

Composite and Sustainable Productivities in the Future Countryside



# Cooperative Align of the New Villagers

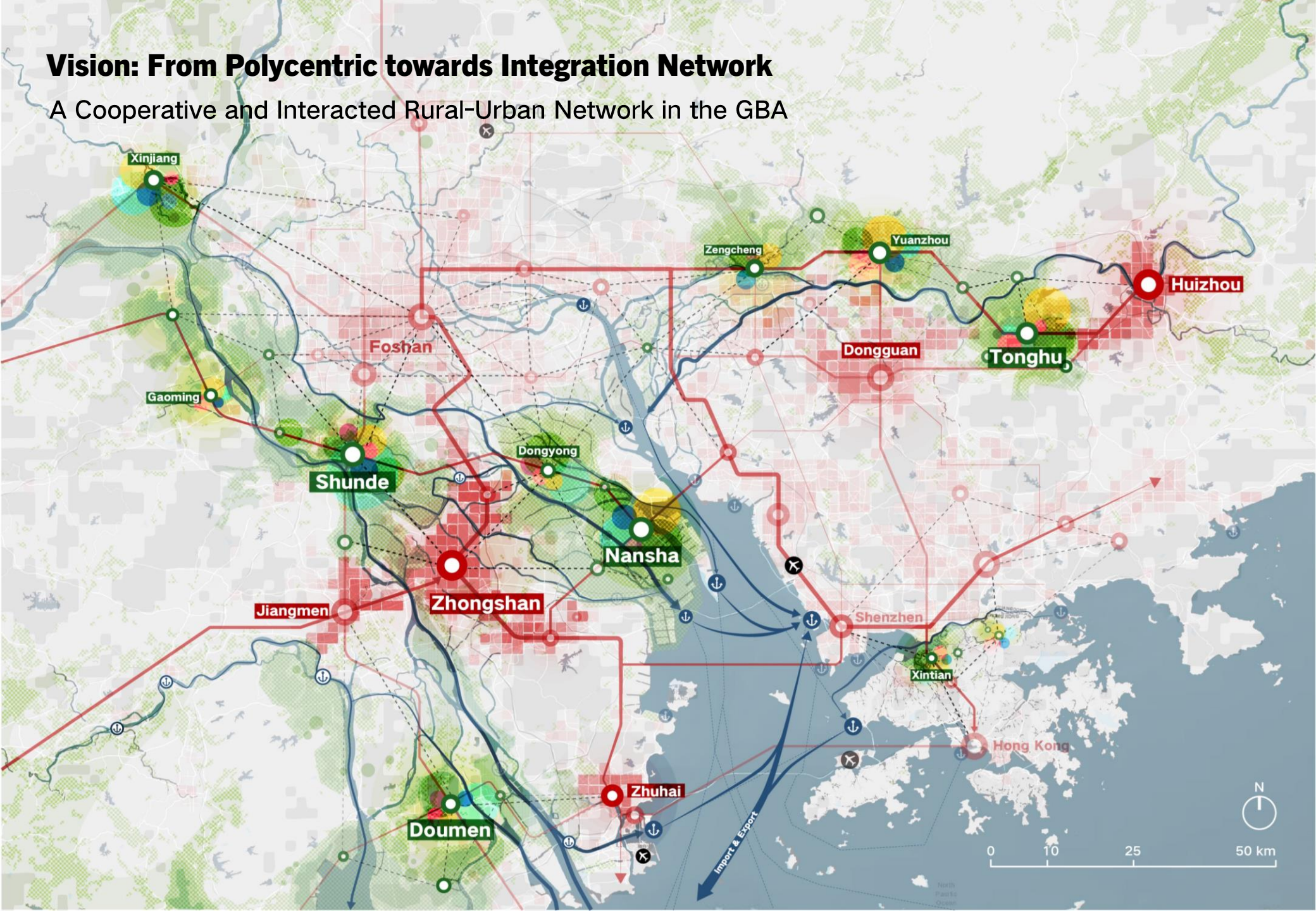
Co-create Governance by the Locals, Enterprise Stuffs and Experts





# Vision: From Polycentric towards Integration Network

A Cooperative and Interacted Rural-Urban Network in the GBA



# Reflection

## Lessons Learn From the Project

- **The Countryside is an integrated human-land system** based on the agri-aquaculture production. **Agricultural production** should be regarded as the basic Industry
- **Top-down monofunctional planning** ignored the complexity of the social-spatial system
- **Layers approach** is a tool deal with this complexity. It focus on both elements and interactions between elements
- Design in the planning should provide flexible spatial framework guiding development. The local development should be **a co-created result by various stakeholders**
- **Diverse settlements** could reduce the spatial homogenization, and provide optional living and work place for people in the region.

# The Countryside for A Sustainable Future





*"Challenge the Future"*

**Many thanks to Lei, Steffen, Martin, my parents and friends**  
for your knowledge, accompany and love during the journey of my exploration

# Thanks!

“Xiangcun”, As A Productive Landscape  
Sustainable countryside in the urban-rural integrating megacity region

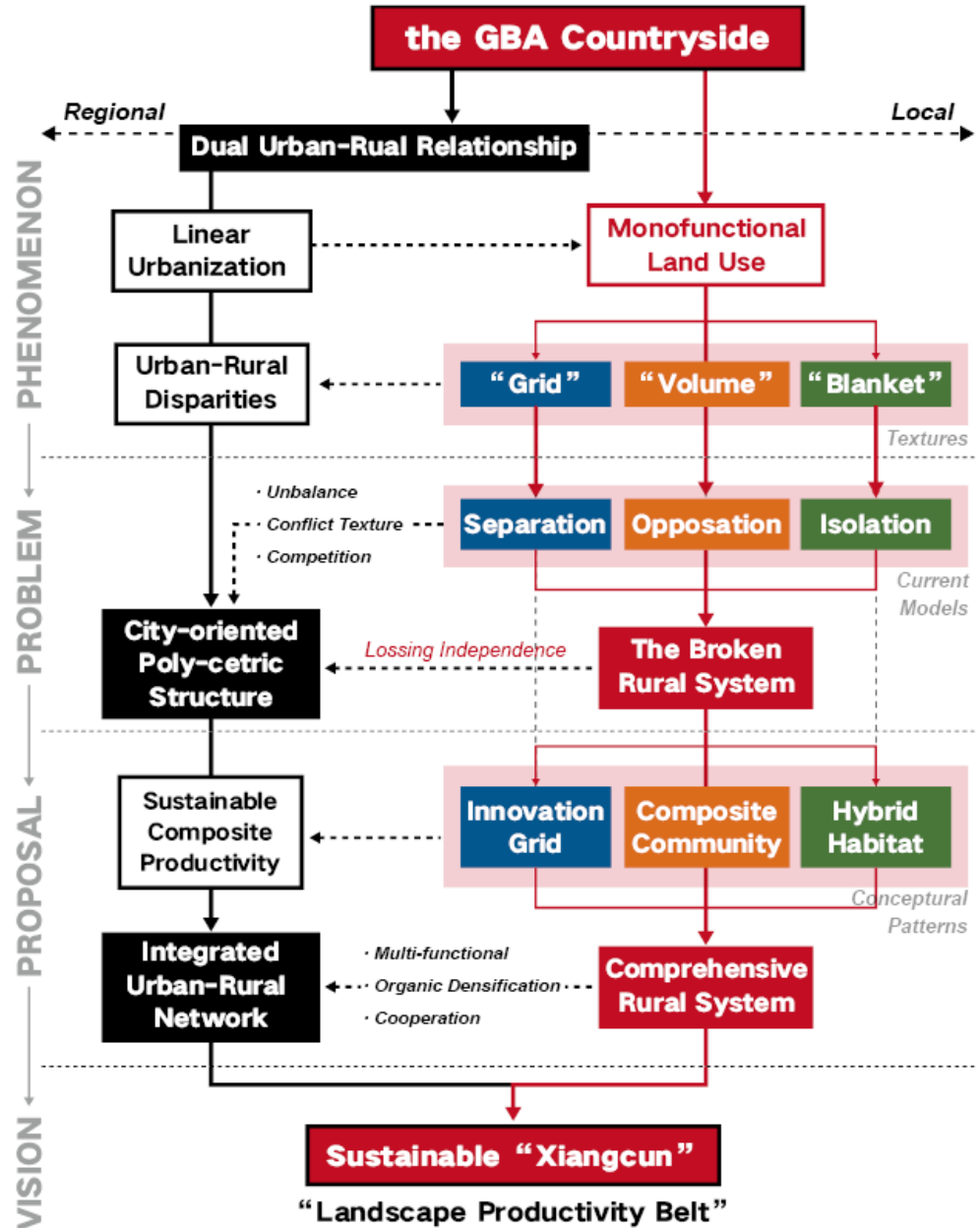
Jie Chu 5002206

1st Mentor Dr. Lei Qu 2st Mentor Dr. Steffen Nijhuis

2022/06/23

# Appendix

## Summarizing Framework



# Appendix

## Exploration Roadmap and Methodology

