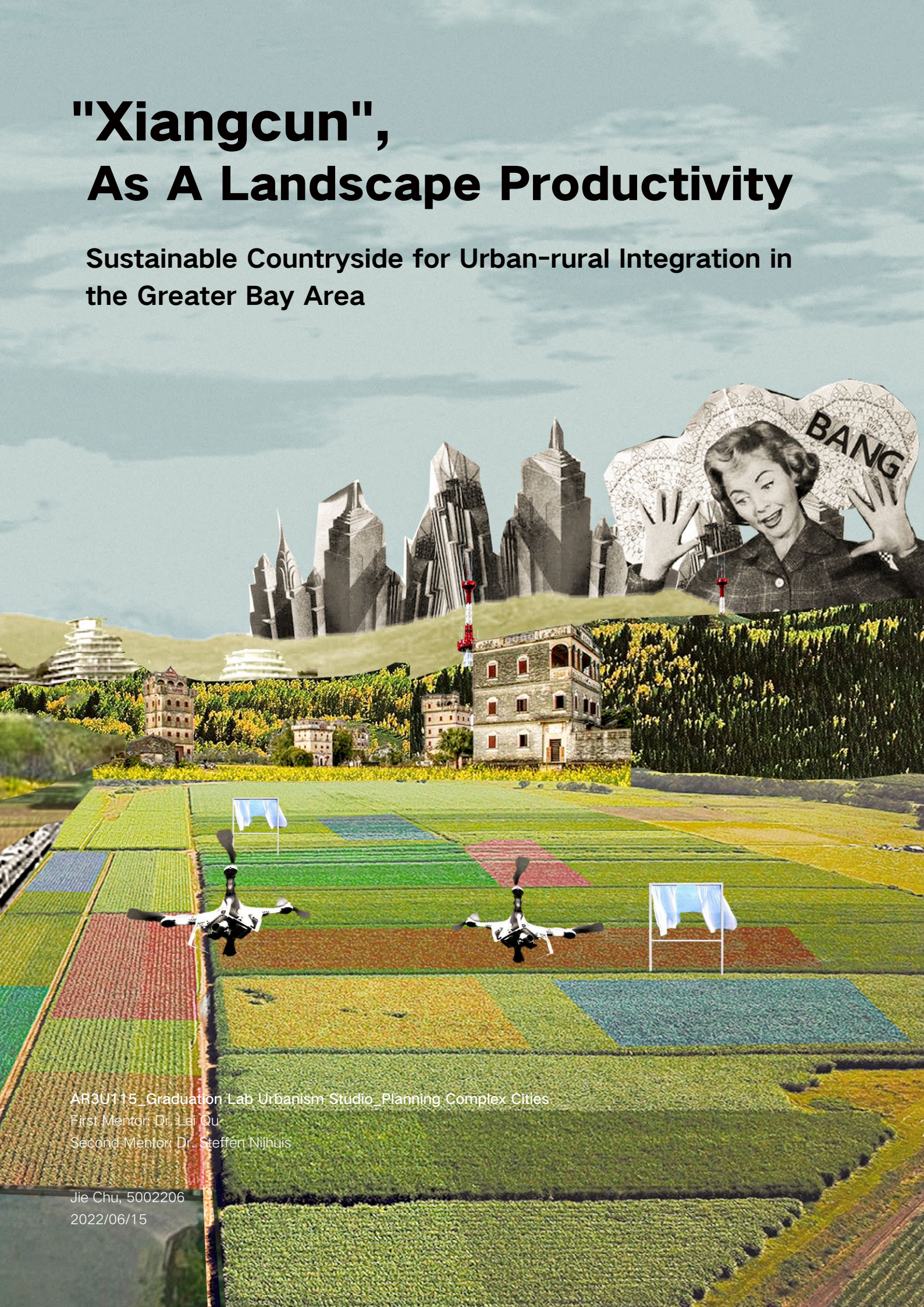
"Xiangcun", As A Landscape Productivity

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



AR3U115_Graduation Lab Urbanism Studio_Planning Complex Cities
First Mentor: Dr. Lei Qu
Second Mentor: Dr. Steffen Nijhuis

Jie Chu, 5002206
2022/06/15

"Challenge the Future"

"Xiangcun", As A Landscape Productivity

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

“乡村”，一种景观生产力

基于乡村多功能可持续发展的粤港澳大湾区城乡融合模式

P5 Report

Submission Date	19 June 2022
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The Delft Autumn through the Window of the Faculty Library *by Author in 2021.11*

Acknowledgment

The report is a result of my graduation exploration and a summary of my master's research in TUD. Studying the countryside within one of the most well-known Chinese metropolitan areas reveals my interest in spatial conflicts and strategies. It is a milestone in my Urbanism study and my curiosity about the possibilities of the future. It is fortunate that I have received so much help from many people during this period and I would like to express my sincere gratitude to them.

First of all, I would like to thank my first mentor Dr. Lei Qu, and my second mentor Dr. Steffen Nijhuis. They are both teachers and friends for me during my graduation year. They support my interest in exploring the world with their rich knowledge and patience, always giving me timely inspiration and deep insight. They understand my ambitions and help me to translate my enthusiasm into clear ideas step by step. My studio mentor Verena Balz in Planning Complex Cities. She organized interesting discussions and listened to our voices patiently. Every little conversation we had besides our faculty building encouraged me to continue loving the discipline. They offer me guidance at every important moment and this report would be difficult for me to present without their help.

Secondly, I would like to thank my faithful friends, Te Zang and Peishan Zhang. We went through the gap year together, chose the common studio, helped and accompanied each other throughout the journey. As well as the friends from the Urbanism and the Landscape Lab, we were brought together by our common interest and contributed diverse perspectives to it. We shared memories and grew together with laughs and complaints. I am honoured to have them alongside me in the dark unknown.

I would like to thank MLA+ and PILLS, the places where I worked during my gap year. They offered me opportunities to participate in meaningful and interesting projects which improved my knowledge and gave me lots of inspiration for my project. Also the friends I have met during the period, who help me to feel the pleasure of contributing to the development of the city in practices. They always give me confidence to keep challenging myself and warm suggestions in my graduation research.

Additionally, I am grateful to my parents. They have provided constant support, both financially and emotionally, for my exploration with all of their love.

There are many other friends. It is a pity that it is difficult to mention every one of them, but the selfless help from these true friends means a lot to me. I am so happy to have you all and want to share this moment of pride with you.

In Chinese, “无远弗届” means that there is nothing that cannot be achieved. I am looking forward to the future with great anticipation.

CONTENTS

Motivation

Preface: *"Sous Les Pavés La Plage"*

Exploring Possibilities of Future Life and Human-land Relationship

In 1956, the exhibition "This Is Tomorrow" was held at the Whitechapel Art Gallery under the dramatic technology advances after the second war. A group of young people from different fields gathered and discussed the influences of the technological revolution on human life through various media. Hamilton described the charm of modern life as Pop-ism based on productivity and electric leap forward in his famous collage artwork (Fig.1). As a carrier of industry and capital, the metropolis was undoubtedly the central topic of "modern" in the last century. However, the rapid expansion of cities has brought significant negative impacts on the environment and society today, so it is increasingly important to re-think the meaning of "modernization" and explore new possibilities for future lifestyles.

Fig.1 Just what is it that makes today's homes so different, so appealing?
Exhibit of "This is Tomorrow" in 1956

The development of digital productivities brings new opportunities for harmonizing the relationship between humans and nature. In traditional cities, productive area and the landscape are divided by clear boundaries (Fig.2), people continuously occupy the natural surface to expand production space for profits. But with technological advances, we have a chance to redefine the feature of products and space for production in the future, thus mitigating the conflicts between traditional industries and the natural landscape. At the same time, the polycentric character of the informational network breaks the agglomeration logic of urbanization and creates natural-based development potential for ignored marginal areas within the urbanized region.

Fig.2 Mirro: City & Landscape,
An obvious boundary in Shenzhen

Therefore, I have a strong interest in the possible development beyond the urban area facilitated by technological advances, and exploring path different from traditional urbanization. "Sous Les Paves La Plage", the radical slogan from the last century, could adequately describe my understanding of Urbanism: the discipline is more than the science for cities. it is the imagination of future possibilities based on research and understanding of the complex system. This is the broad but root motivation of my graduation project.

Countryside, An International Agenda

Fig.3 Exhibition: "Countryside, The Future"
Rem Koolhaas, AMO, 2020

Due to the increasing environmental and social crises, architects and urbanists all around the world start to reflect on the methods people developed settlements in past centuries. The countryside attracted number of attentions because of the extensive area and characters of nature-based production which is opposite from the urban (Fig.3). The city and the countryside have become two parallel agendas today.

The transition of the focus point is not denying the importance of cities, but a chance to look at the ignored area beyond the urbanized land. It is the reason for me to choose the countryside as my central topic, and it is aiming to propose a practical vision for these margin settlements from the perspective of a planner.

Countryside in Chinese Agglomeration Region

Compared with developed countries, China experienced a more dramatic urbanization after the reform and opening up policy. However, the explosive development in the urban area leads to expanding wealth disparity between cities and villages at the same time. The project chose the rural area within the agglomeration region, which is significantly influenced by regional urbanization process, as a typical object for researching this problem, in order to contribute specific knowledge to the broad "Countryside" topic.

Fig.4 Views of the Agri-aquaculture Landscape along the Shenzhen River

Abstract

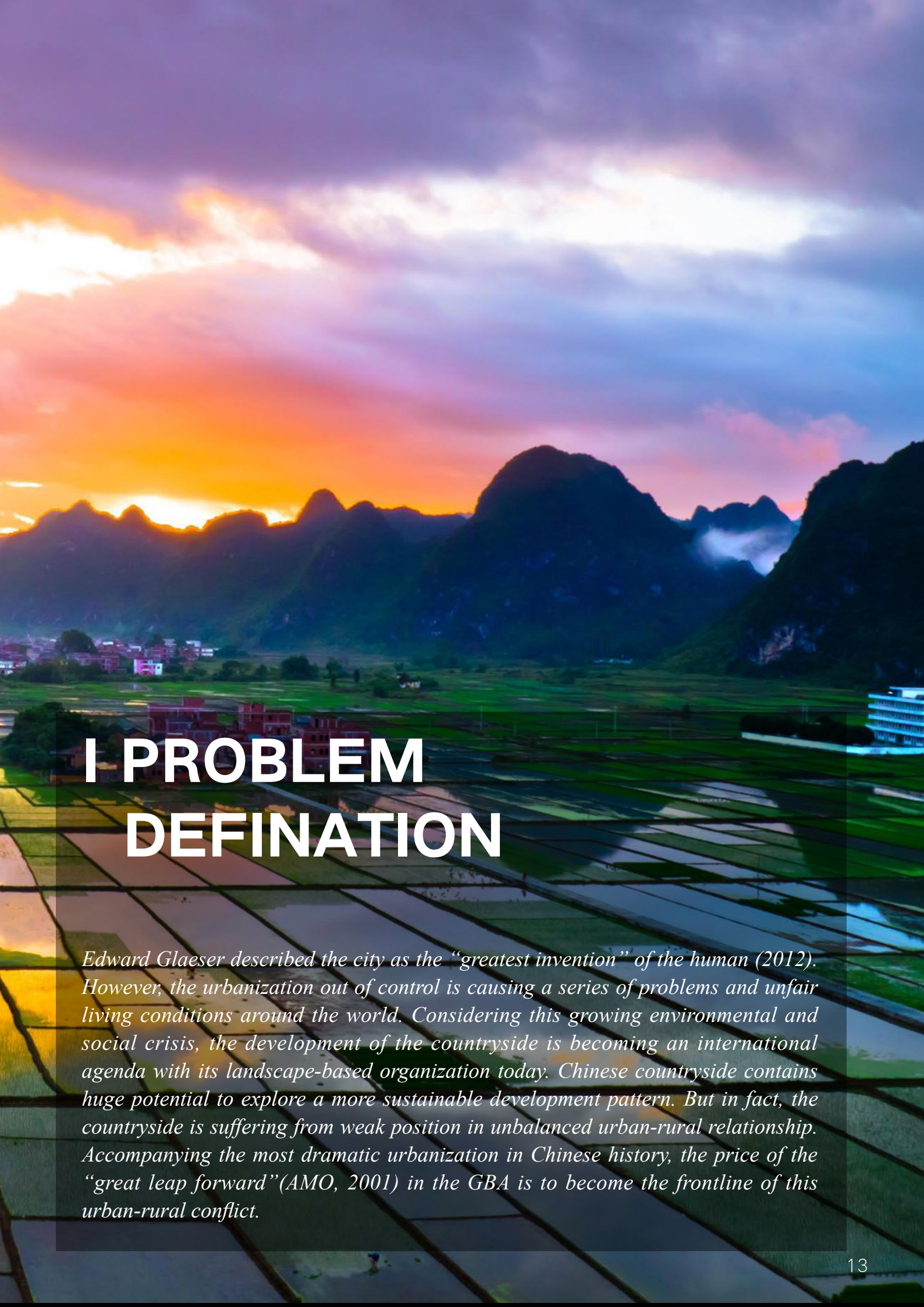
The countryside is standing at the cross of its destiny due to rapid urbanization. Influenced by the historical dual urban-rural relationship, the countryside in China was regarded as the sacrifice of regional modernization. Since the reform and opening up, a miraculous expansion of cities could be seen within the Great Bay Area (GBA). However, the price of this great leap is the broken countryside losing independence: City-oriented planning has led to increasing urban-rural disparities, which is replacing the agriculture landscape with monofunctional land use and transforming rural area into satellite areas within the poly-centric regional structure. Therefore, how to redefine the countryside and propose development patterns jumping out of the urbanization path has become an urgent problem, yet effective spatial strategies and theory-based practices are currently limited (Magel, 2019).

The thesis aims to explore the potential of the modern countryside as a sustainable settlement in the GBA. Through comprehensive methodology taking the layers approach as a critical method, the project retrospects the transition from perspectives of form, function and governance in the countryside, and critiques the functional zoning planning approach which reinforces the unbalanced local development. It proposes a vision of the hybrid and productive rural system based on agricultural innovation, a flexible spatial framework that considers production, environment and livability comprehensively, and a series of possible strategies related to existing patterns. In the future, the countryside could become a development option complementary to cities and contribute to the formation of a diverse and urban-rural integrated network of this international mega-metropolitan region.

Keywords

sustainable countryside, urban-rural disparities, agriculture innovation, strategic planning, integration, the Greater Bay Area

Fig.5 Colorful Agricultral Field in Yunfu



I PROBLEM DEFINATION

Edward Glaeser described the city as the "greatest invention" of the human (2012). However, the urbanization out of control is causing a series of problems and unfair living conditions around the world. Considering this growing environmental and social crisis, the development of the countryside is becoming an international agenda with its landscape-based organization today. Chinese countryside contains huge potential to explore a more sustainable development pattern. But in fact, the countryside is suffering from weak position in unbalanced urban-rural relationship. Accompanying the most dramatic urbanization in Chinese history, the price of the "great leap forward"(AMO, 2001) in the GBA is to become the frontline of this urban-rural conflict.

Challenges

The Global Crisis as Broad Context

Food Shortage: A Global Crisis

As the most important resource for human survival, food production is a long standing global issue. Accompanying the process of urbanization, traditional agricultural land is shrinking under the expanding cities, meanwhile a large amount of arable land is being converted for higher-value production functions , the crisis is growing. The report from the Food Security Information Network (FSIN) shows that 135 million people worldwide are under the risk of food shortage in 2019 (Fig. 5).

Besides, the meaning of the food crisis is not limited to the quantity of food supply, but is also highly relevant to the food safety. The out-migration of traditional industries from cities can threaten agricultural land and lead to pollution of agricultural products.

The Sustainable Development Goals

The sustainable development goals, a series of guidance aims in various fileds including economy, social, evironment and hungry topics (fig 6), are aiming to encourage the transition towards resource saving and eco friendly development in the long term.

The prelimenary time for achieving all of the goals is 2030. But the issues brought by rapid urbanization is enhancing the difficulties of the process. The development orieted only by cities are insuffcient to deal with the problems and contribute to the sustainable vision.

Fig.6 The Global Crisis of the Food Shortage in 2019

Fig.7 Sustainable Development Goals of the United Nations

Challenges

Countryside, A Cliche Dealing with Urbanization Problems

The Agricultural & Nature-based Settlement

The countryside is becoming an international agenda. Under the growing crisis of the worldwide food shortage and environmental challenges, the urbanization is no longer the priority choice for human to satisfy the increasing needs for survival space. Countryside, the traditional agriculture area and the typical natural-based settlement, provides new possibilities for the future settlement which could contribute to the food production, deal with issues caused by urbanization, and restore the relationship between human and the natural landscape.

China, A Traditional Agriculture Country

As a traditional agricultural country, the agriculture sector plays a significant role in the Chinese economic and social system. At the same time, Chinese agricultural products occupied a large proportion of the global food production (fig.7), which exposes the importance and responsibility of the rural development in China for dealing with the global food crisis in the future.

Compared with the countryside in the European developed countries, development in Chinese rural areas is still incomplete. However, the existing gaps also provide flexible room for possible revolution under the transition of urbanization and the uncertain future of the countryside. Unlimited potentials are lying in the Chinese countryside.

What possible roles would the Chinese countryside play in the future? Is there a sustainable development pattern for the Chinese countryside, which could relieve pressures of urbanization and contribute to global food production?

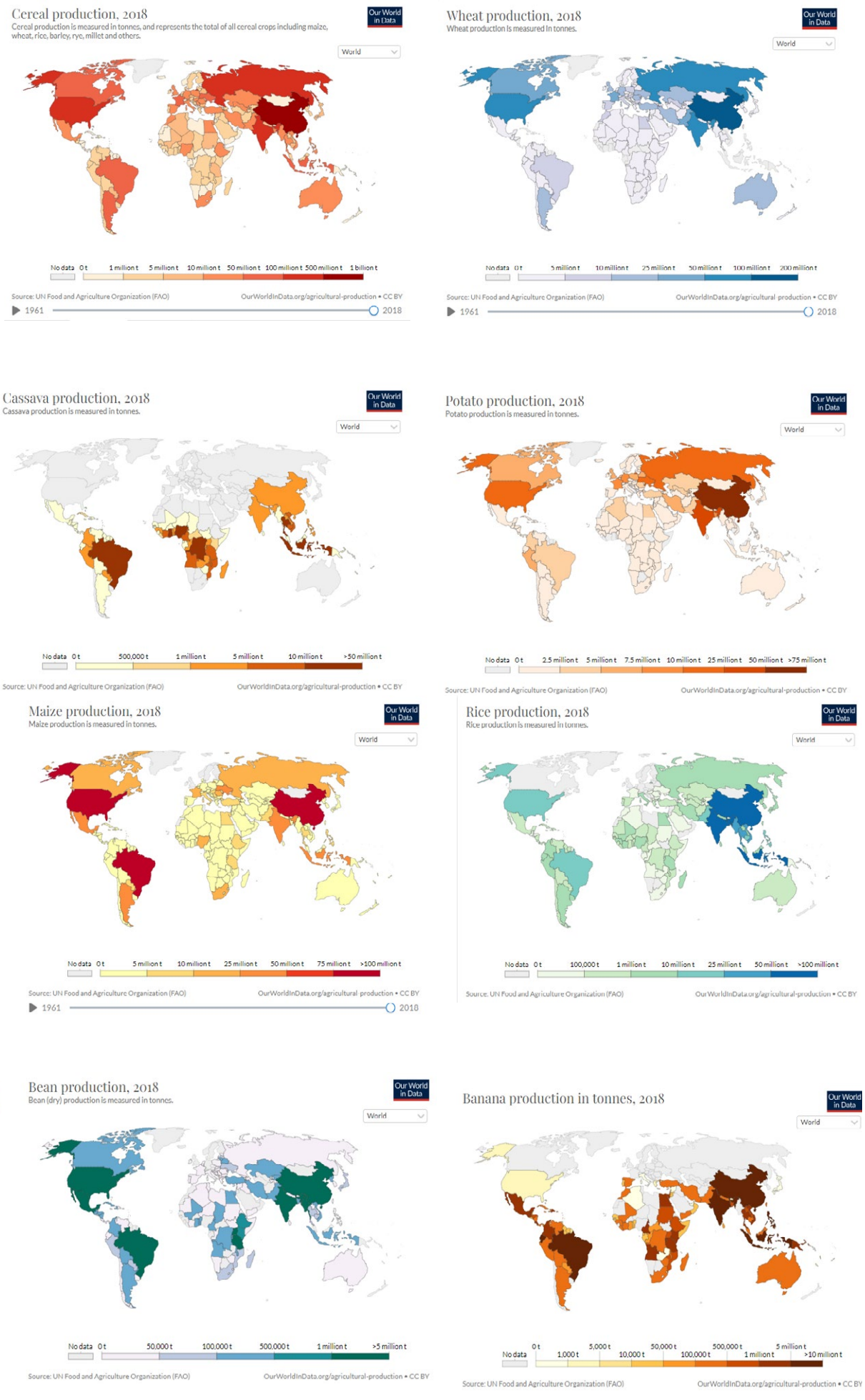


Fig.8 Ratios of Chinese Agriculture Sector in the World

Challenges

Tough Countryside Issues in Modern Chinese Development

The Shrinking Sacrifice in A Tranditional Agricultural Country

Due to the demands of economy development in the early stage of the PRC, villages played a role of sacrifice in the regional development. Rural areas were defined as the early stage of settlement development under the city-oriented urbanization and asked to support the regional industries in the urban area through donating agricultural products and natural resources. The policy leads to the dual urban-rural relationship today and put the countryside in a weak position.

Fig.9. 1950s Policy
"Feeding the Industries by Agriculture"

Since the reform and opening-up, the relaxation of the dual policy enabled the movement of large numbers of rural laborers into urban areas, which stimulated the miraculous rise of Chinese cities. However, market-driven urbanization exacerbated the unbalanced urban-rural relationship inherited from the dua policies, and linear mobility caused rural areas to suffer from persistent economic disparities between settlements. Although this challenge has been recognised by the government, the current strategy has not revolutionised the urban-industrial-dominated model for regional development. The countryside, as the primary habitat before the city, is standing at the crossroads of its destiny in the historic and rapid urbanization.

1950s-1978
Establishment of the dual Urban-Rural Relationship

This period was a forming phase in Chinese dual urban-rural relationships. The newly established People's Republic of China was a backward agricultural country and the conflicting international environment made it extremely difficult to obtain economic growth from external trade. As a result, the concentration of surplus agricultural production became the only option for developing national industry (Guangdong Center for Rural Policy Studies, 2019). Against this backdrop, the

central government adopted 'feeding industry through agriculture' as an important policy and formulated a series of related strategies.

Firstly, the rural function was clearly defined to provided the basic materials for urban development, and the unequal exchange system between agricultural and industrial products were established through the collective economy to provide the economic basis for the modernisation of the whole country. Secondly, to safeguard this anti-market mechanism, an urban-rural dichotomy was established, based on the 'hukou' system. During this period, the movement of people and elements between rural and urban areas was strictly controlled, and the relationship between agriculture and industry was one-way and linear. Additionally, the "Up to the Mountains and Down to the Countryside" movement and the people's commune system were also manifestations of top-down state control of the means of production. Although the dualistic urban-rural relationship was the result of a specific history, the unbalanced development has a lasting and profound impact on Chinese rural development.

Fig.10 1950s ,"Feeding the Industries by Agriculture"

Challenges

Tough Countryside Issues in Modern Chinese Development

Fig.11 Collage: Escping to the Concrete Jungle

1978-2000
Escaping During Relax Period of the Dual System

After the reform and opening up, the strict dualistic urban-rural system was gradually liberalised. However, under the context of the linear urbanization and existed economic disparity, the weak position of the countryside pushed villages into a passive and continue dual urban-rural relationship. A national migration happed: villagers, most of them are the young people, espaced to cities for

quality modern life, advance education, health care and work opportunities.

During this period, Guangdong province was the most popular destination for people escaping from the rural area in the past decades. The map visualized migration flow shows the movement is highly related to the urban development of the region people chose to move into. The three most important megacity regions, the Jing-Jin-Ji Area, the Yangtze River Delta and the Greater Bay Area (GBA), show strong attractions to rural immigrants seek opportunities and profits. With the highest speed of city development (Feng, et al., 2016) among urbanized areas, the GBA accepted the largest number of the floating population from the countryside area since the 1980s.

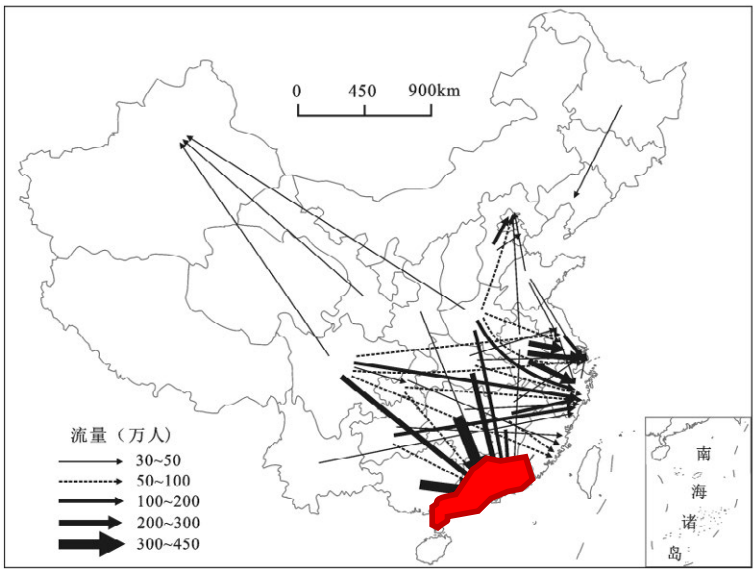


Fig. 12
Main flow directions of rural population in China, 2010

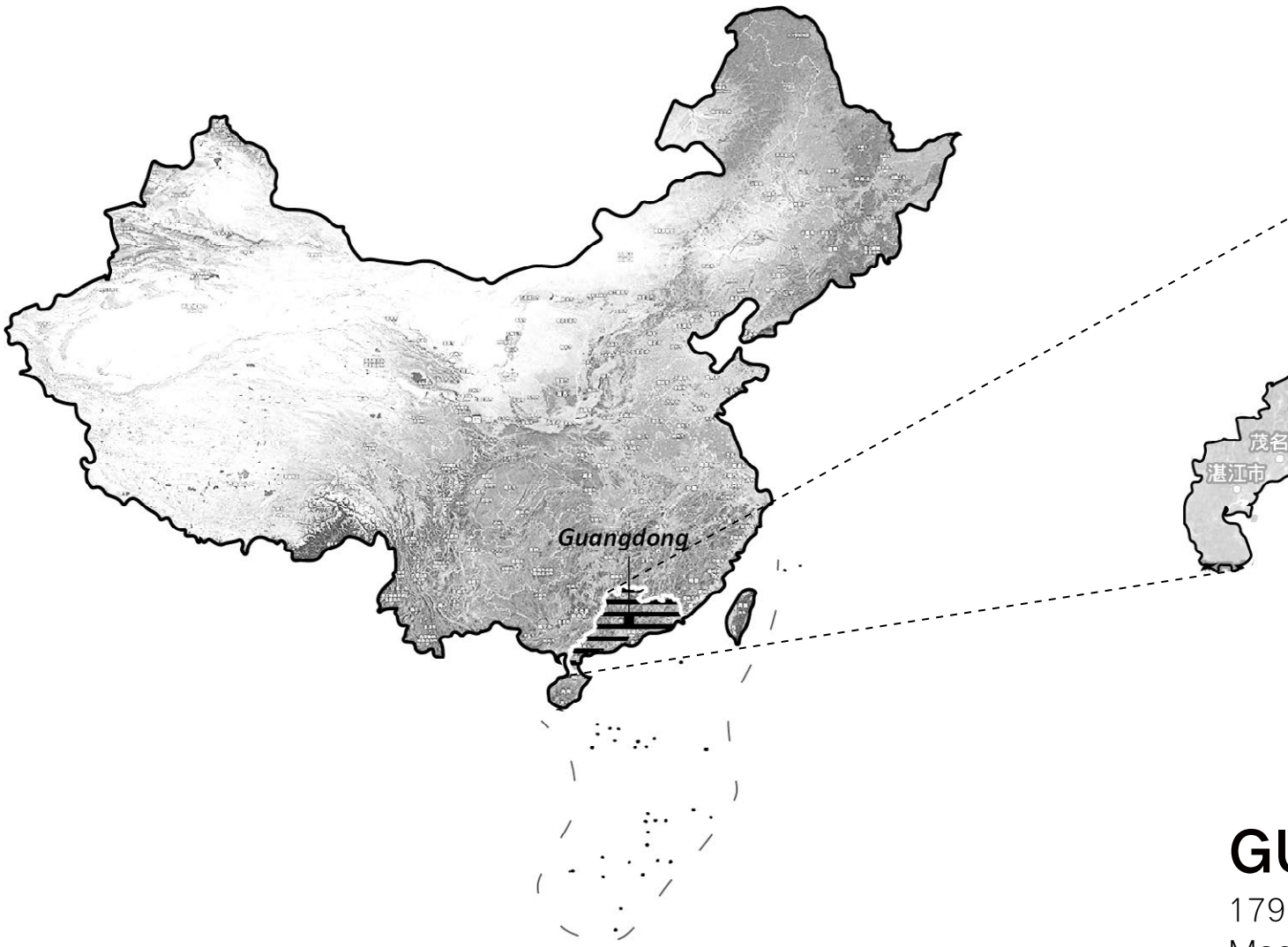
In an objective sense, the movement has made a significant contribution to Chinese urbanization, with the reallocation of labour released surplus labour from traditional agriculture sector. On the other hand, the "leaving the land and the countryside" approach is a market-driven process of balancing individual income differences. The money earned by peasants in the cities did not feed back into the economic growth of the countryside, and the linear movement exacerbated the development gap between the cpuntryside and cities.

2000-2012
Proposal of The "Intergration" Concept

The long-standing unbalanced development has forced the Chinese government to recognise the importance of adjusting the relationship between urban and rural areas. In 2002, the integration concept of " coordinating urban-rural economies" was proposed and national investment in rural development, including infrastructure development and encouraging local industries, was increased. However, the traditional industrial-oriented approach for urbanisationz continues to have a long-term impact and modernisation of the agriculture has not been given priority. Besides, the bidirectional flows in open markets are based on reciprocal attraction. The elements exchange between urban and rural areas is difficult to realise with the preseant disparities cased by historical development. This reform is still in its early stages.

Study Area

Chinese Countryside in the Greater Bay Area



CHINA

9,600,000 km²
Macro Scale

- The largest and the most important developing country in the world
- Important Agriculture Country

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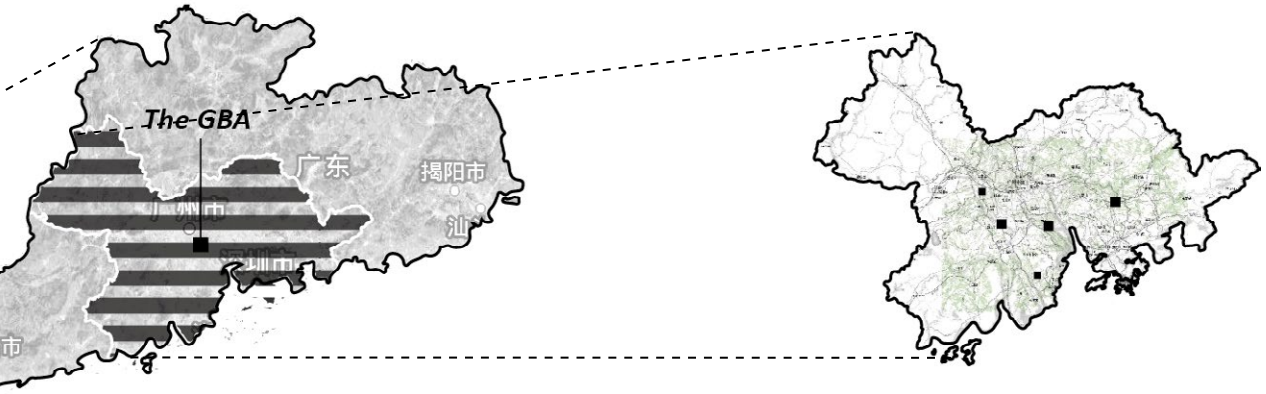


THE GBA

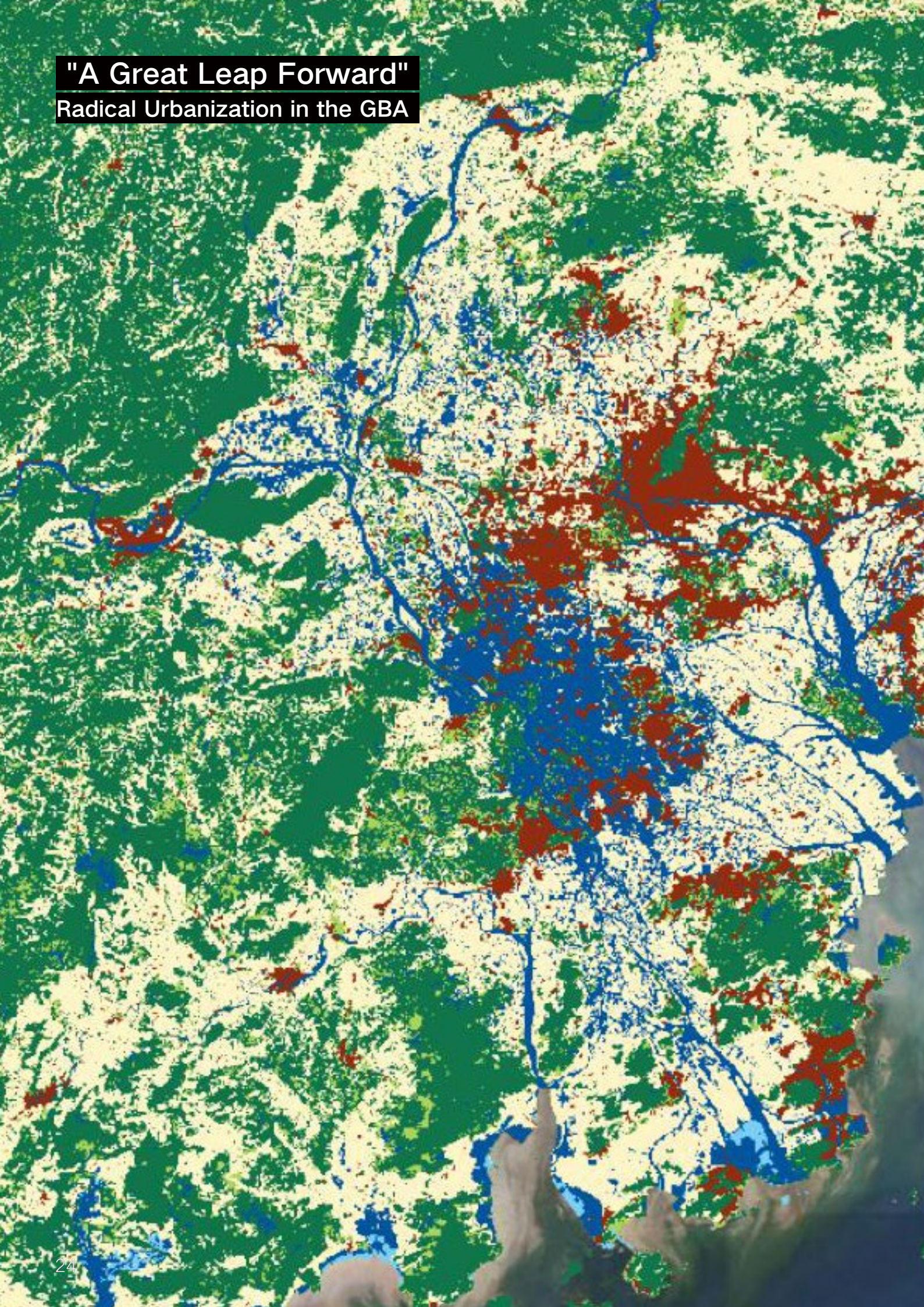
56,000 km²
Meso Scale

- One of the four global bay areas in the world
- One of the most important megacity regions (including the Jing-Jin-Ji Area, the Yangtze River Delta and the GBA) in China

JANGDONG

,725 km²
cro Scale

window province of the reform
opening-up polices
most popular destination province
ural immigrants in the historical
anization


"A Great Leap Forward"
Radical Urbanization in the GBA

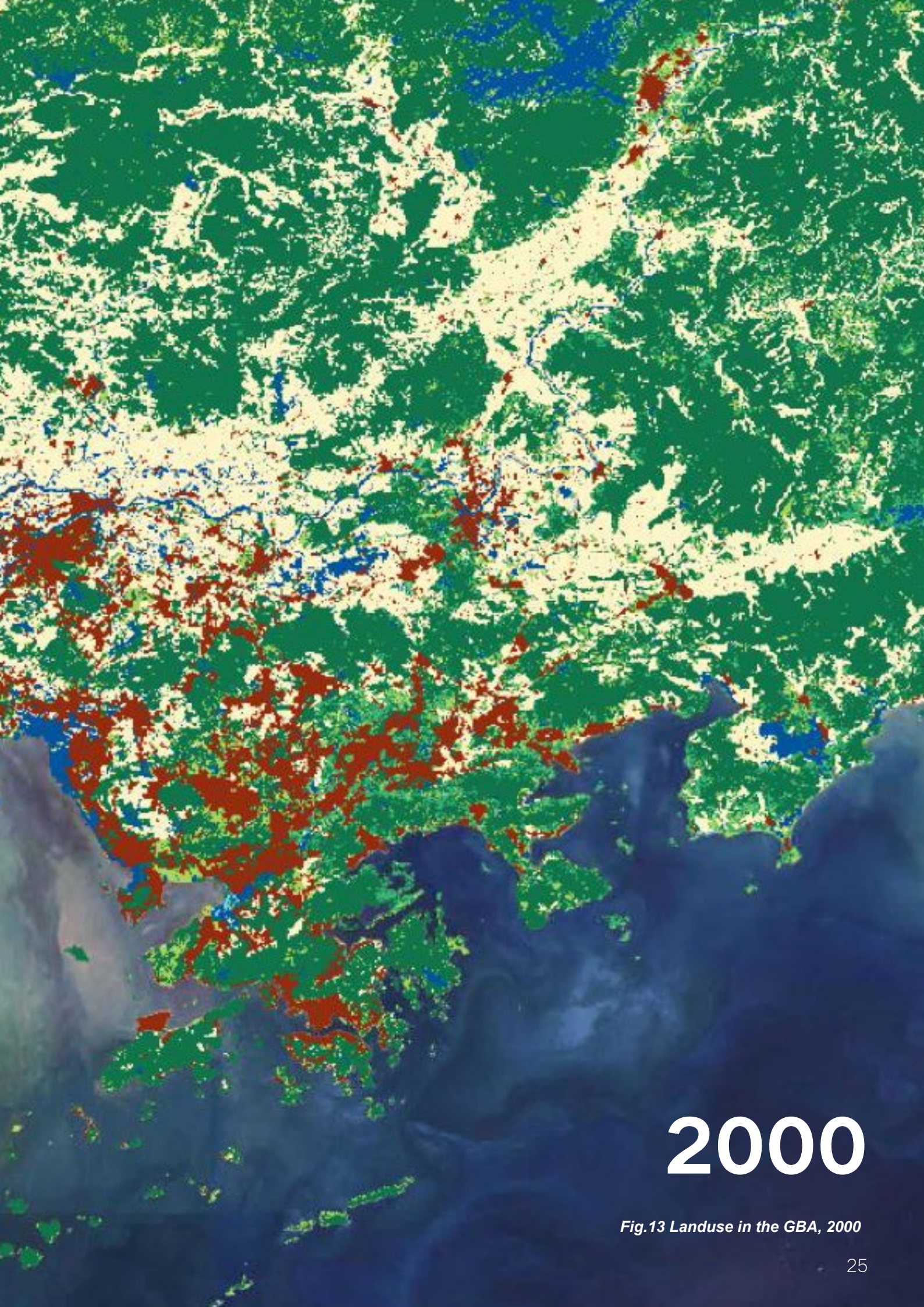
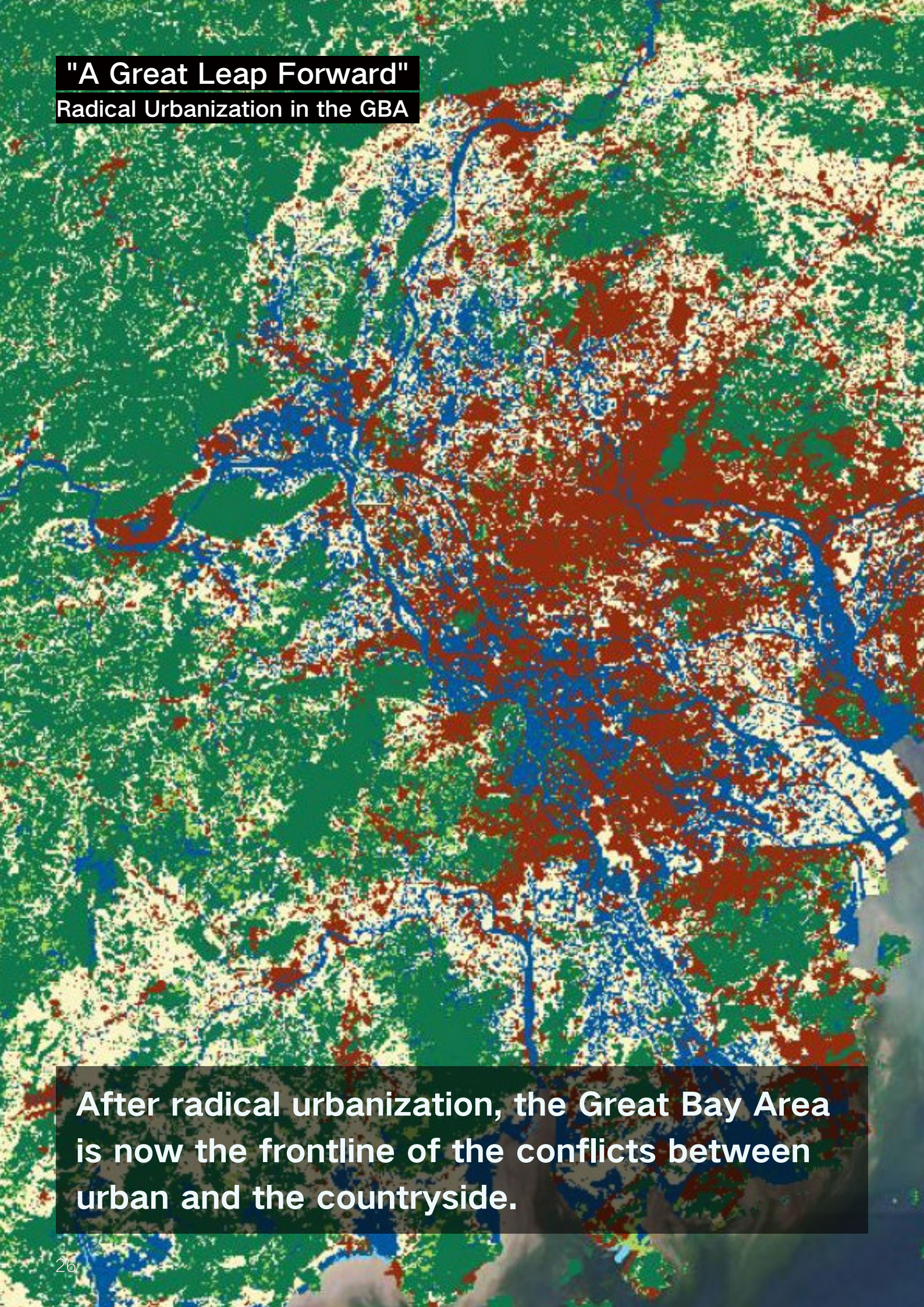


Fig.13 Landuse in the GBA, 2000



"A Great Leap Forward"

Radical Urbanization in the GBA

After radical urbanization, the Great Bay Area is now the frontline of the conflicts between urban and the countryside.

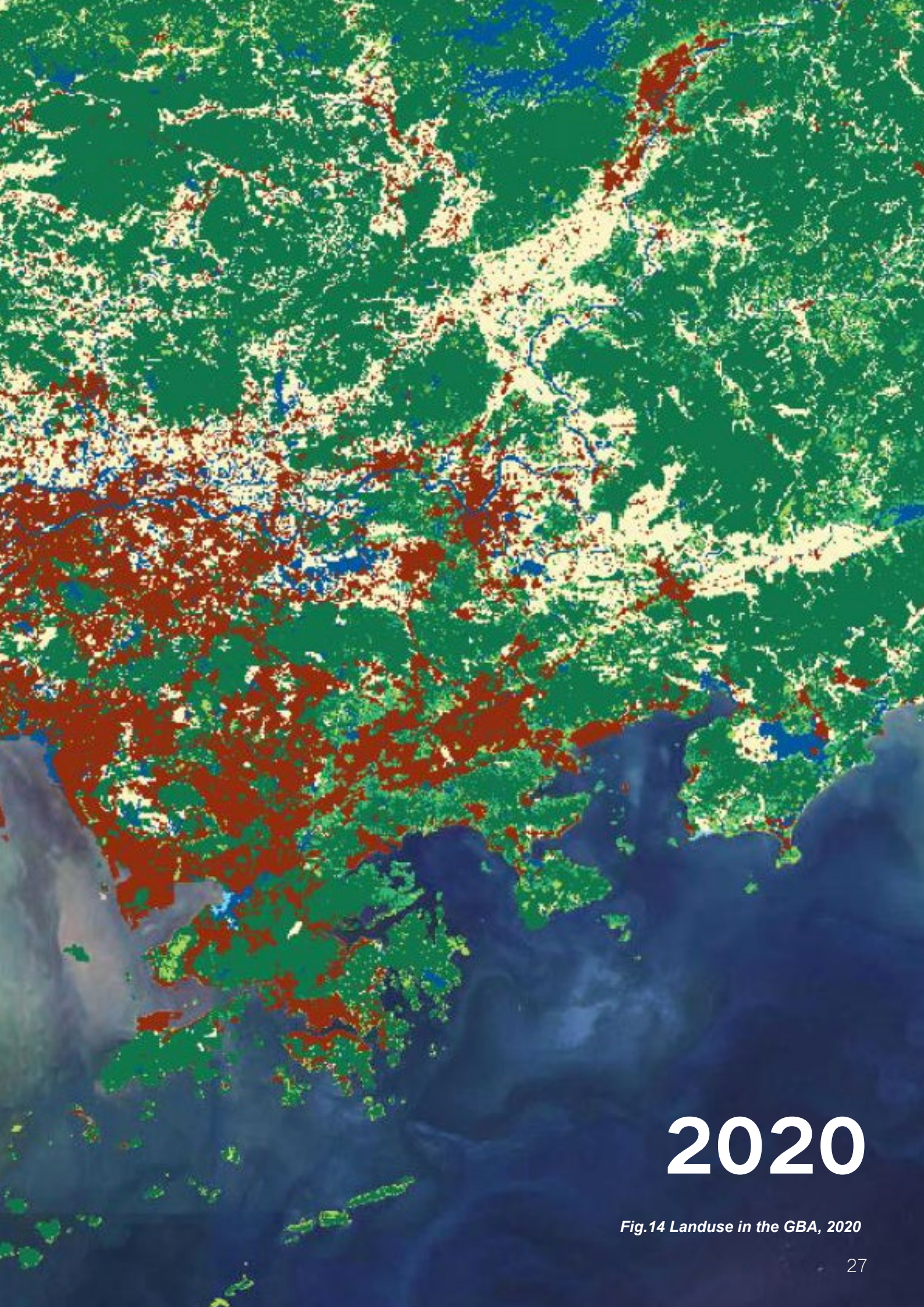


Fig.14 Landuse in the GBA, 2020

Declining Countryside

Dilemmas: Spatial Limitations

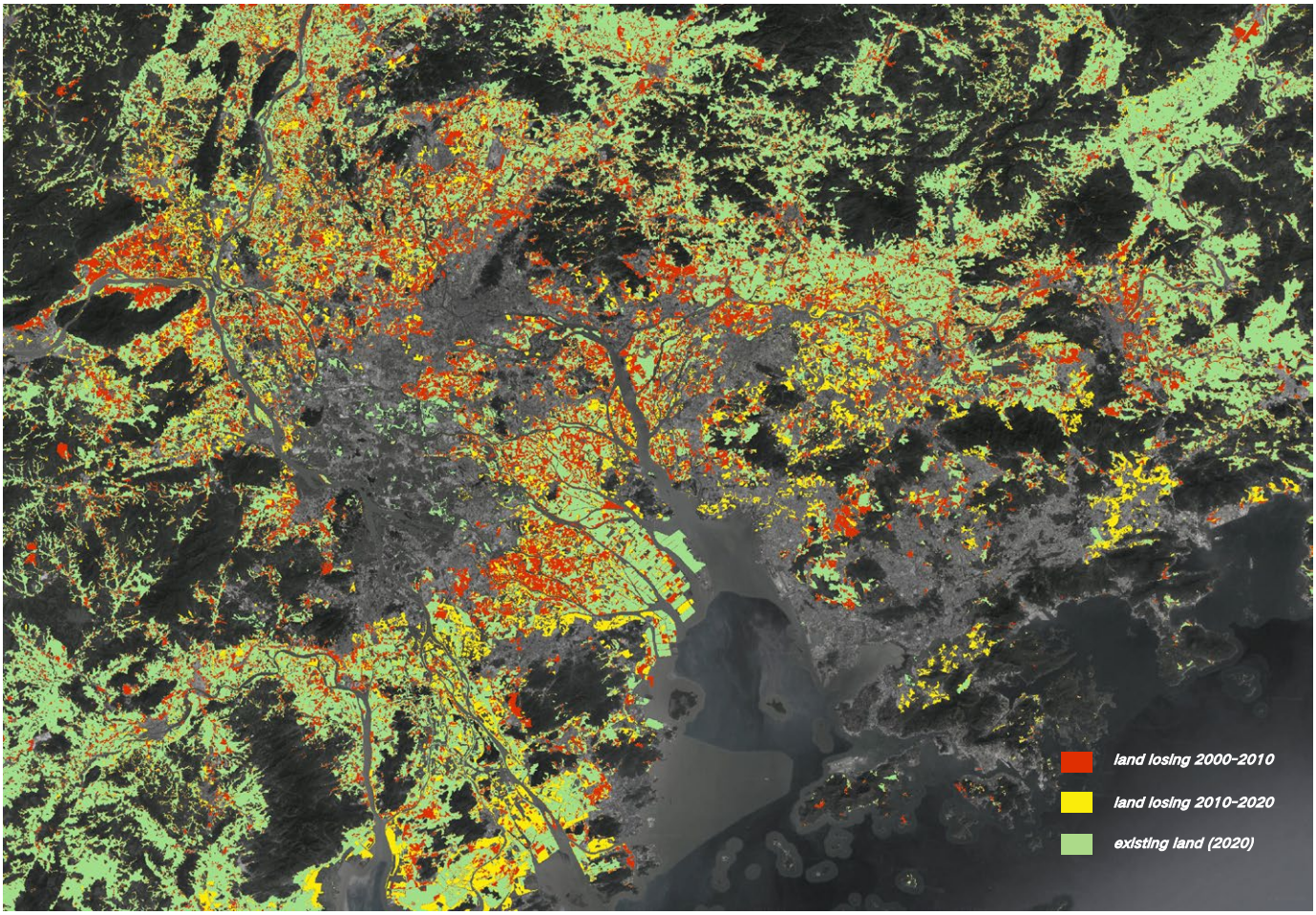


Fig. 15 Agricultural Lands Transition in the GBA

Land Occupation

The area of the agricultural land is decreasing as an impact of urbanization. From 2000 to 2020, rural lands were occupied by large-scale construction in the peri-urban areas rapidly, the red and yellow colours in the map points the areas of transformed agri-aquaculture land in this period. The loss of the base for production limits the economic development of the countryside within the region.

Besides, the continued agricultural lands were divided into patchy pixels due to the encroach. This has led to the fact that today it is becoming more difficult to use the land in the countryside efficiently for scale production.

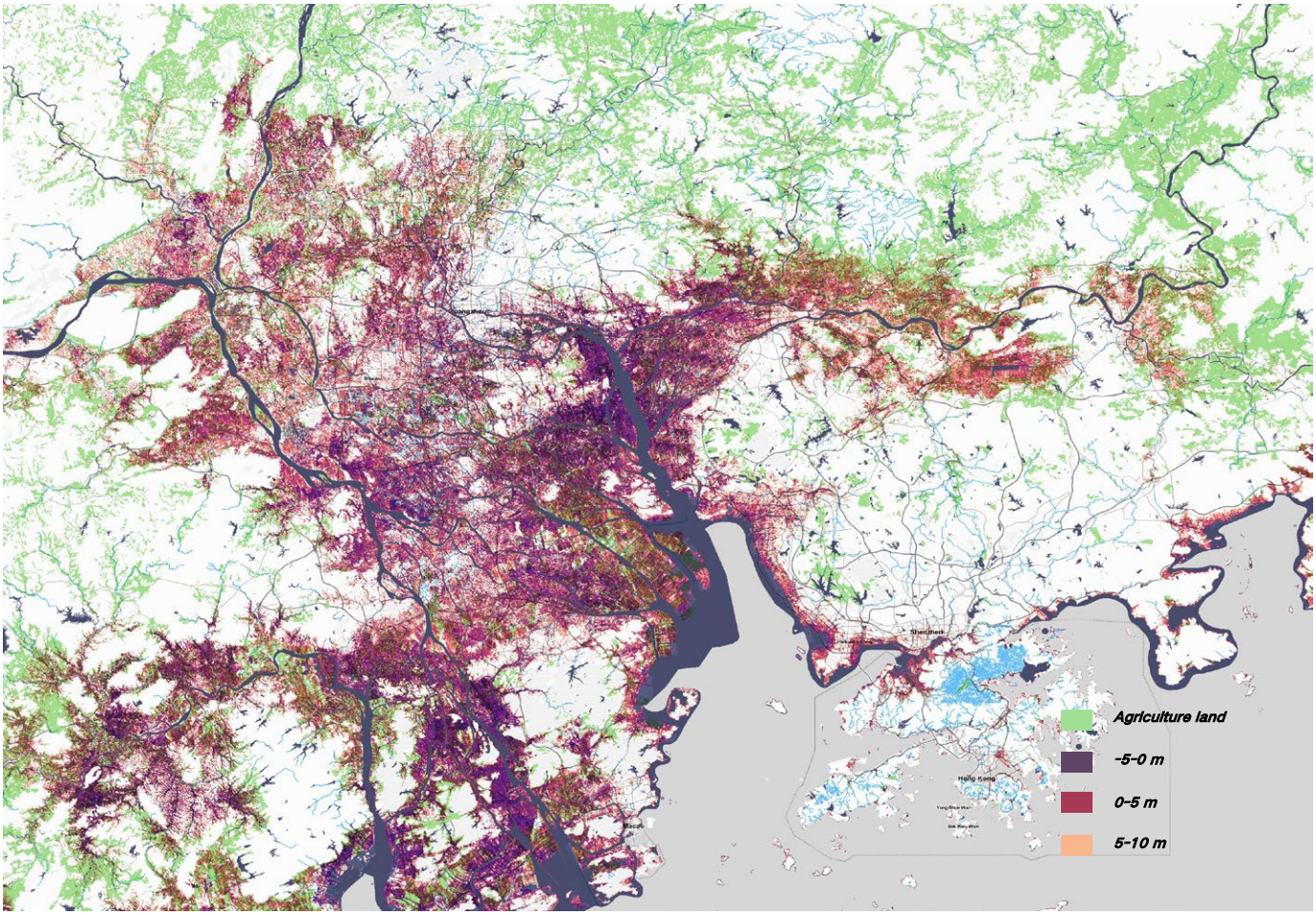


Fig.16 The Altitude of the Land in the GBA

The Flooding Risk

Another dilemma brought by city expansions for the countryside within the GBA is that most of the rural lands in the un-urbanised area are facing serious flooding risk.

Under the assessment criteria for construction in cities, lands with quality stable soil conditions and less influenced by disasters are priority used for industries and urban constructions. As the result, extant rural areas are mainly distributed in the west bank of the Pearl River and along the Dongjiang River, which are highly threatened by river floods and sea-level rise. The dilemma has become a spatial limitation for rural development today.

Declining Countryside

Dilemmas: Policies and Increasing Disparity

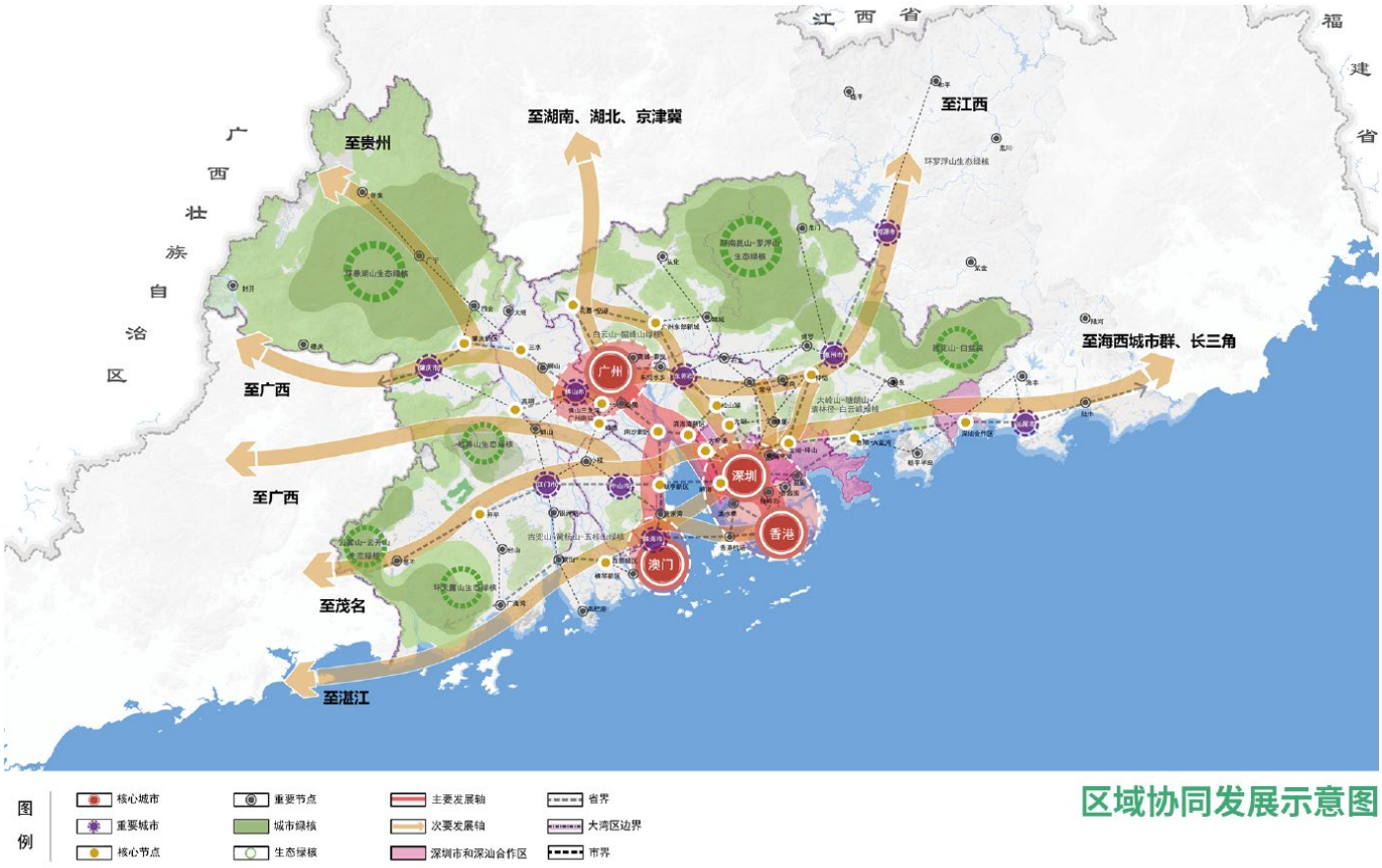


Fig. 17 Territorial Spatial Planning of Guangdong (2020-2035)

Blind Grey Area in The Point-lines Structure Plan

It is becoming increasingly urgent to deal with the social, environmental and economic issues caused by linear urbanization in rural areas within the GBA.

However, the countryside is still lying in the blind area of the point-line structure planning. The spatial plan for the future vision is a continuation of the city-oriented logic and is insufficient to optimize the unbalanced urban-rural relationship, which would lead to the polarized development between different areas in this region.

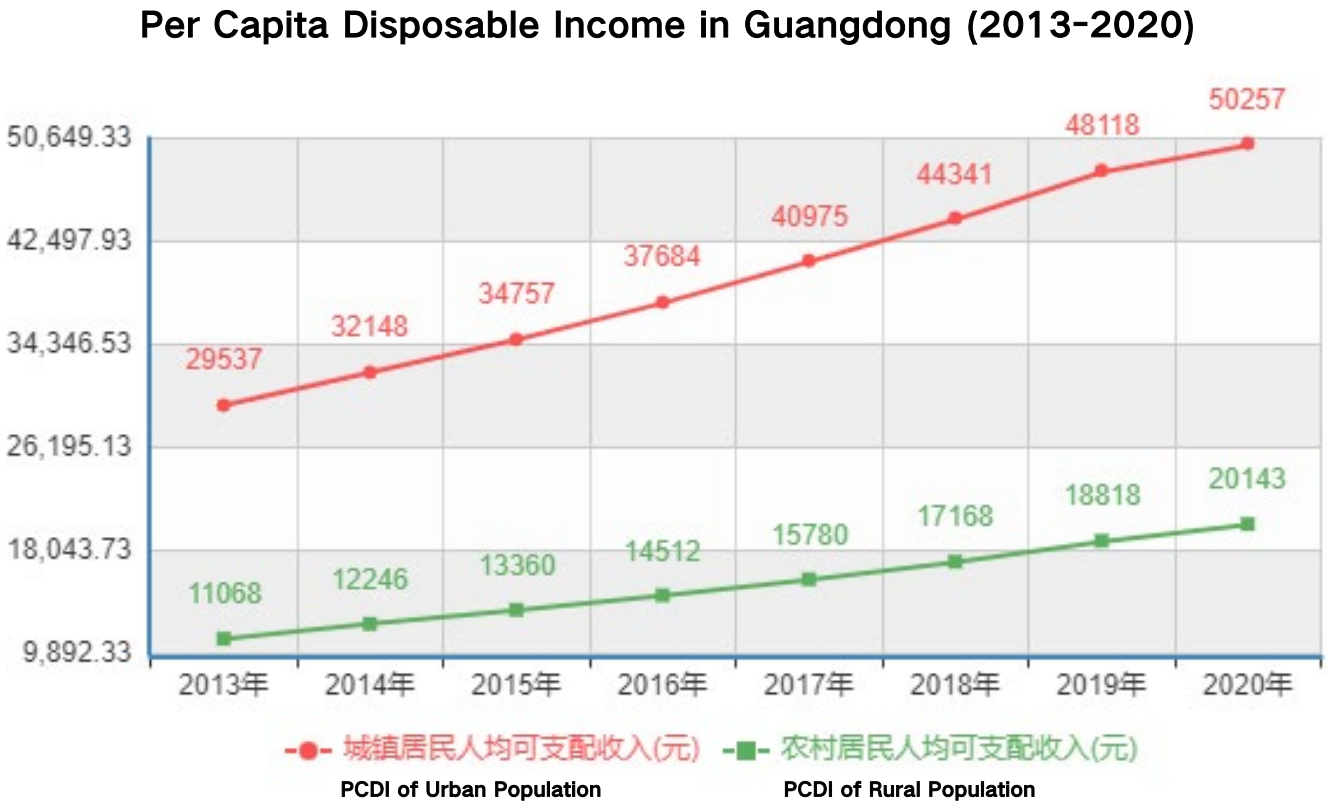


Fig.18 Diagram of the Disparities between Urban and Rural Areas in Guangdong

Fig. 19 Rapid Development in Shenzhen

Fig.20 Abandoned Rural Field in Huizhou

Increasing Wealth Disparities

As a result of the city-oriented development and dilemmas in the countryside area, the wealth disparities between cities and the countryside within the GBA is continually increasing.

Although the incomes level of urban and rural areas are both growing in Guangdong province during the period from 2013 to 2020, the gap between the incomes is expanding at the same time.

The comparison shows that the weak position of the rural economy and the unbalanced development still exists, the situation would deteriorate due to the stronger attraction of the cities based on economic advantage under the market-driven agglomeration.

Declining Countryside

Existing Monofunctional Strategies

Strategies for Specific Functions

After losing out in the competition for land with urban construction, traditional multifunctional agriaquacultural landscape are transformed in order to maximise the economic value of limited agricultural land. The specific functions in the rural areas were enhanced to meet the needs of higher level cities. The target-oriented roles include transforming the countryside into an industrial aquaculture zone; regarding the historical countryside as a cultural museum and creating traditional simulacram for bolstering tourism; creating ecological habitates formed by the degenerated agricultural landscape which is exclusive for human beings.

To a certain extent, the current strategy has increased the value of the countryside for regional development and even stimulated the growth of the local econimy in the short term. However, in the long term, the cost of short-term profits is a drain on potential for the future.

The existing radical labels are insufficient to alleviate the problems caused by the unbalanced relationship between the city and the countryside. As a result, the fish pond standardization transformed the embankment into barren surface, traditional settlements is becoming dilapidated, agricultural landscape was occupied by factories and homogenized constructions, and the boundaries between human and environment are being drawn.

Figs. 21
Existing Strategies for Rural Development

Figs. 22 Problems due to the Mono-functional Strategies in the Countrysides witin the GBA

The intensification of the specific mono-function ignored the complexity of the countryside as an integrated social-spatial system, and making it difficult for rural areas to handle the dynamic problems caused by urbanization in this International mega-city region.

Problem Statement

A Conclusion of the Problem Definition

Declining Countryside: weak position in dual urban-rural relationship

Since the reform and opening-up policy, miraculous urbanization happened within the GBA in the past decades. However, under the urban-centric development driven by market economy, countryside provides blood for cities while competing with cities in attracting product elements. Consequentially, the prices of the leap forward are shrinking agriculture land facing flooding risk, labor losing due to limit work opportunities in rural area and increasing wealth disparity between the city and the village. Countryside is declining in the GBA, and the agglomeration area is now the frontline of the conflicts between urban and countryside.

Develo

Unsustainable Pattern: city-oriented and monofunctional development

In order to maximize the economic value of the limit agriculture land after failing in the land competition with urban construction, the traditional multifunctional agri-aquaculture fields were reformed to reinforce specific functions to stimulate the short-term profits through satisfying the needs of higher-class cities. However, in the long term, the existing monofunctional strategy is insufficient to deal with issues caused by unbalanced urban-rural relationship and leads to the loss of rural independence. Essentially, the develop pattern which highly depends on regional cities is another form of the linear urbanization.

Functi

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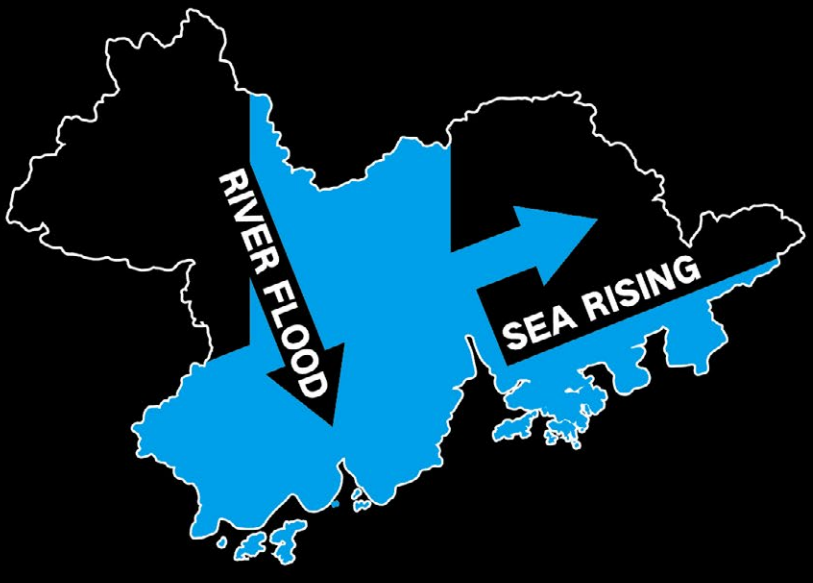
Increasing Disparities

ion Specialization



Environmental Risk

Fig. 23 The Problems faced by the Countryside in the GBA

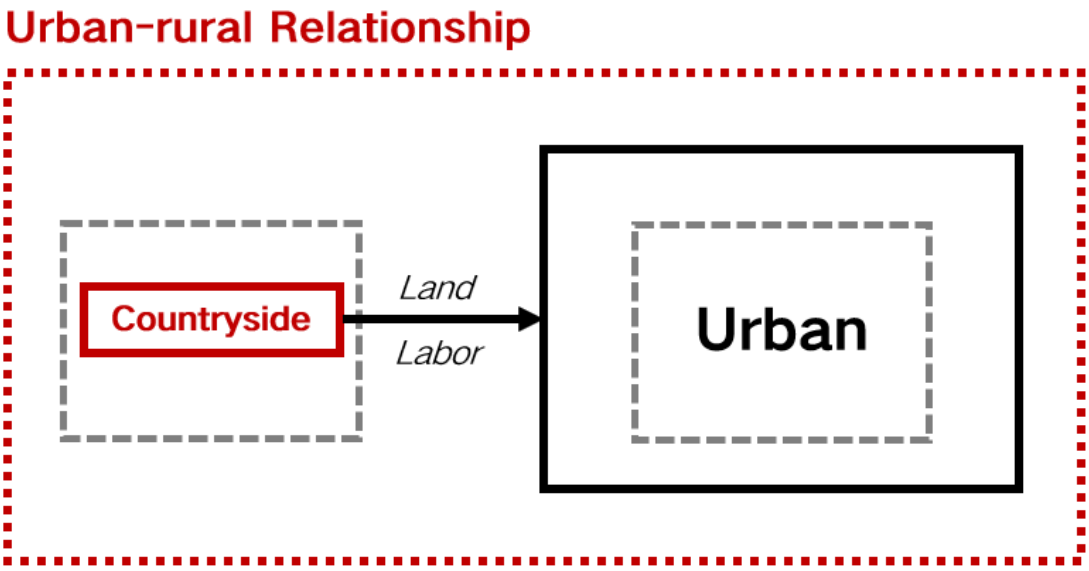
Fig.24《清明上河图》, Along the River During the Qingming Festival

II RESEARCH FOUNDATION

The integrated model by Karl Marx provides a theoretical solution to the dilemma from the socio-economic perspective. The theory pointed out that the weak position of the villages is avoidable in development, and the ideal urban-rural relationship should be complementary and integrated. The conceptual framework of the project is structured on this integration theory. Combining two key principles, the framework presents the relationship between notions across scales. Besides, the framework also provides a systematic method guiding analysis and design.

Research Aim

Urban-rural Relationship & Countryside as Main Focuses



- **Redefining the Roles of the Countryside**

  The priority aim of the project is exploring the possible future roles of the countryside in the GBA, proposing a potential vision for changing the weak position of the countryside in the existing linear urbanization model, and facilitate local development in an sustainable way.

- **Proposing Strategies from Spatial Perspective**

  From the perspective of a planner, the project is aiming to promote the transition through spatial strategies based on the innovation of agri-aquaculture land use and develop pattern, in order to deal with the economic, environmental and social problems on different scales.

- **Contributing to Regional Integration**

  Besides, the project is aiming to decrease the development gaps between cities and villages, grow a connected and decentralized regional structure within the GBA, and foster a complementary model for urban-rural relationship.

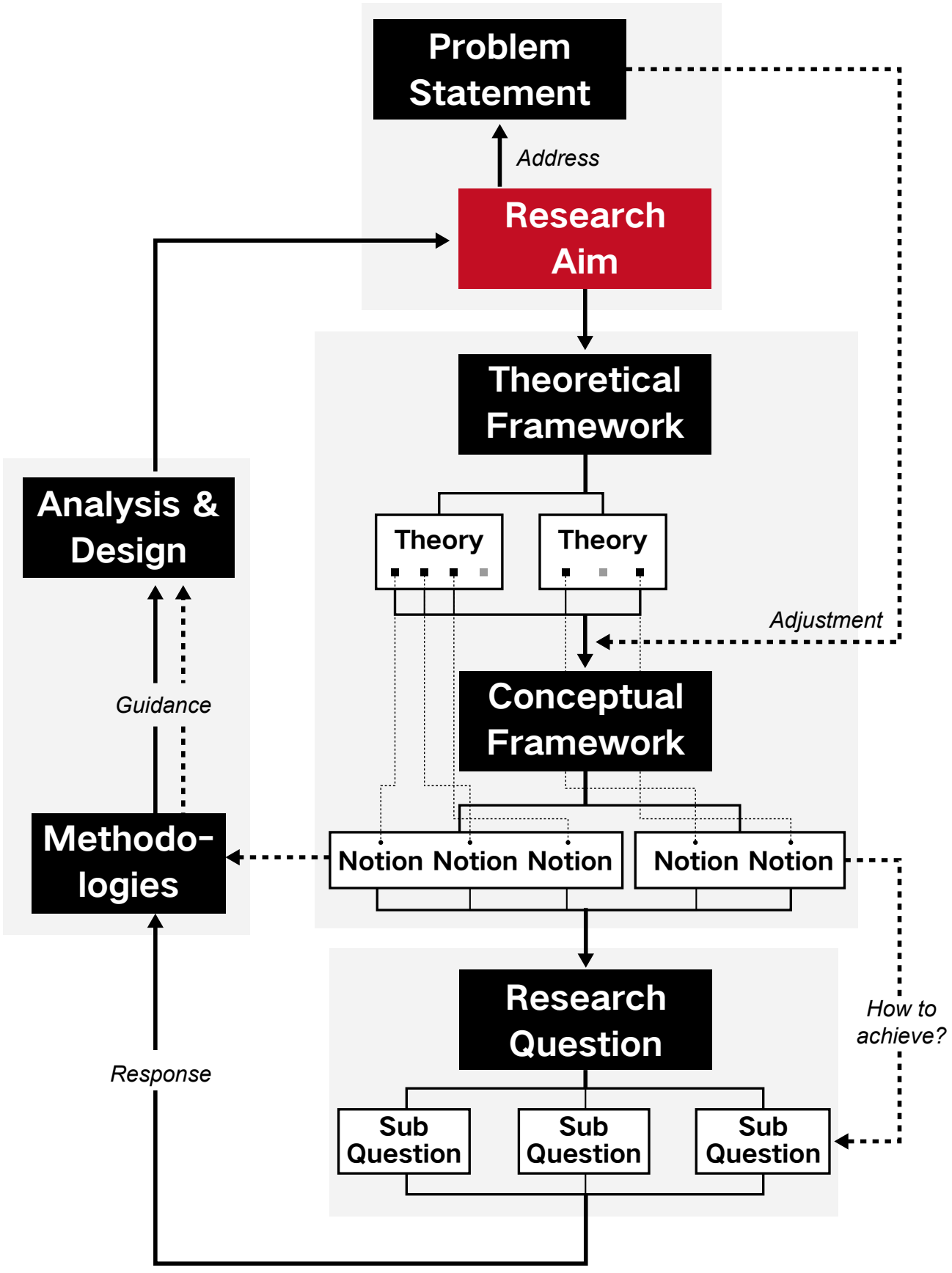


Fig.25 Diagram of the Exploration Process

Theoretical Framework

Urban-rural Relationship & Countryside as Main Focuses

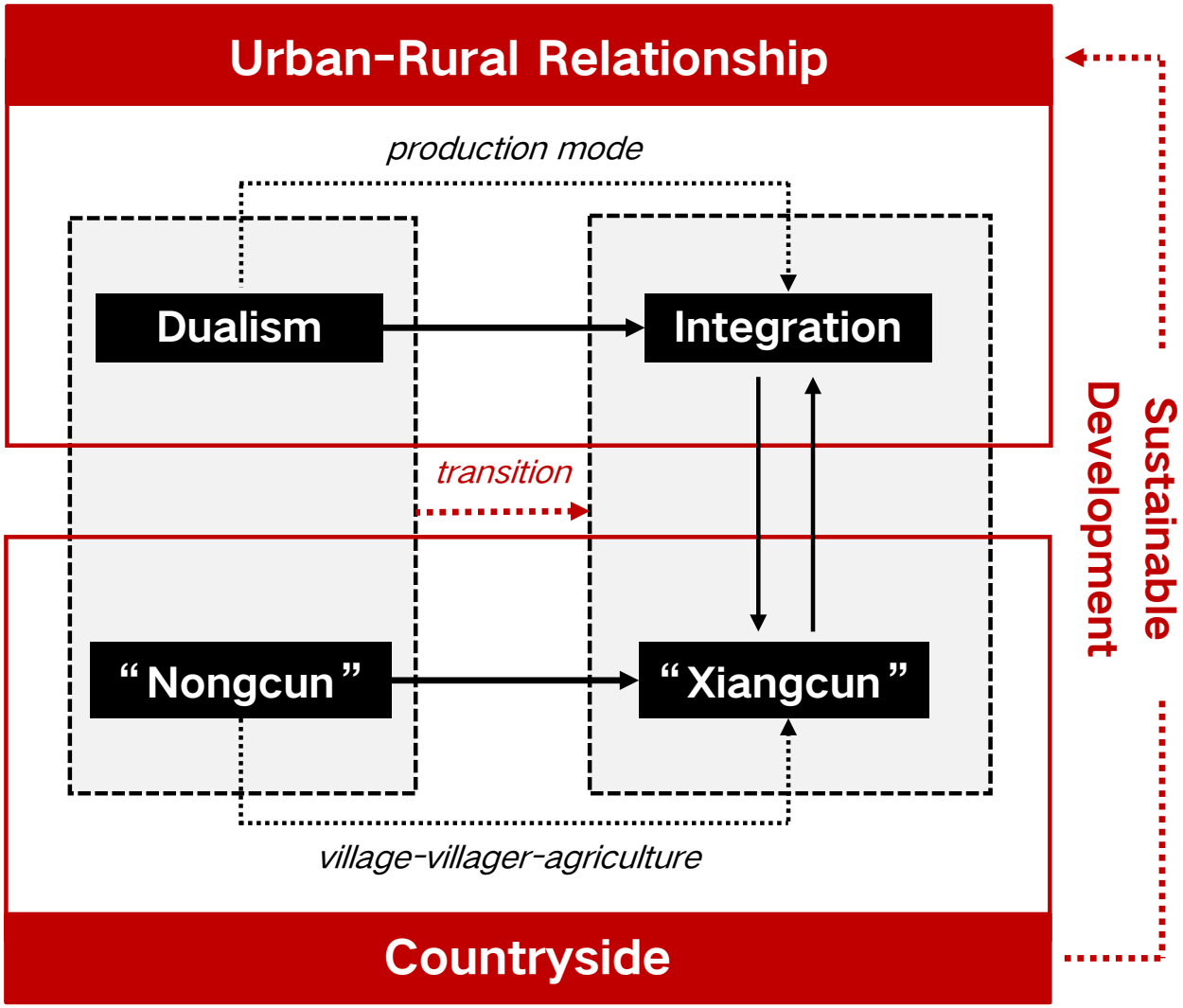


Fig.26 The Theoratical Framework of the Project

The theoretical framework is aiming to completing the understanding of the problem filed form the dynamic perspective based on the Dialectics. In order to understanding the context of the transition, define the feature contradiction of specific problems, and develop the broader topics into a specific conceptual framework.

Urban-rural Relationship: From Dualism to Integration

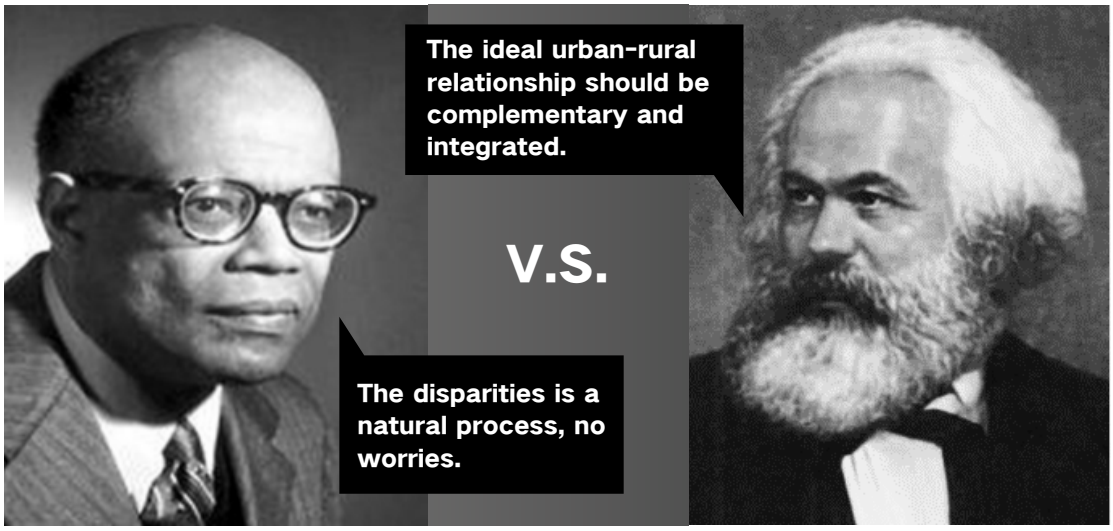


Fig.27 The Dualism Theory (W.A. Lewis) v.s The Integration Theory (Karl Marx)

In the theories of social economics, there are two models about urban-rural relationship influence the development pattern in the large part of the world today: dual economic structure by William Arthur Lewis and urban-rural integration model proposed by Karl Marx.

In the dual economic model, the contradiction of the conflicts between urban and rural development is the surplus production in the countryside. The optimization of the disparities is a natural process accompanied by a dynamic balance between marginal productivities in cities and villages, the productive elements including resources and labour will flow into the cities during the development and the decline of the countryside is an inevitable result. However, Marx pointed out that the productivity gap is the contradiction of the conflicts. The weak position of the villages in the existing system is an artificial result of city capitals. The disparities are avoidable in the process of development and the ideal urban-rural relationship should be complementary and integrated.

The dual development has caused a series of problems in the research region. The increasing disparities should not be ignored and strategies towards a just integration relationship should be taken to promote this innovation. Regarding the dual and integrated relationship as two phases of unitary development, adjusting the production model through improving the rural productivities is the key principle of the integration model. The principle contains two means: improving the productivity in the countryside based on the integration of agriculture and industries, and optimizing production structure based on resources redistribution under government intervention.

Theoretical Framework

Urban-rural Relationship & Countryside as Main Focuses

The Countryside Revitalization: From "Nongcun" to "Xiangcun"

Fig.28 Poster for the Countryside Revitalization Strategy
A slogan from Chinese Central Government points the importance of countryside development and "Three Rural Thoughts" proposed by Chinese president Xi

In the context of the dualistic urban-rural conflict, the policy of rural revitalisation is proposed to narrow the development gap between settlements, and the strategy is not just a slogan but a series of theoretical system for guiding rural development. To better understand this policy, it can be explained in terms of the transition of the countryside definition in Chinese: the traditional definition, **"Nongcun"**, means un-urbanized areas with agricultural production as the main economic base, and **"Xiangcun"** means an inclusive dynamic Agriculture land regarded as productive resources and coordination between human and land (Theory of man-land relationship, Wu CJ, 1991).

The new concept of 'Xiangcun' gives a richer meaning to rural productivity, implying that productivity does not refer only to the economic benefits of agricultural products, but also to the integrated environmental and social values. This is supported by long-standing government research on rural China: the policy of rural revitalisation states that "Three issues relating to agriculture", including "Village, Villager, Agriculture", are the specific contradictions of rural development.

In conclusion, 'revitalisation' can be understood as a process of rural development that focuses on the improvement of rural productivity, taking into account economic, social and environmental factors. According to the previously mentioned integration theory, the productivity of rural areas is the fundamental contradiction that drives rural development and is the basis of the local rural contribution to the regional urban-rural integration relationship.

The Concept of the Sustainable Development

The previous argument proved that the concept of sustainable development is the connection between countryside revitalization and urban-rural integration. To be more specific, on the local level, sustainability means coordination of environmental, social and economic aspects, which could be linked with three issues in the countryside development, and a dynamic balance of the utilization of productive resources for regional redistribution (Justice, 2019).

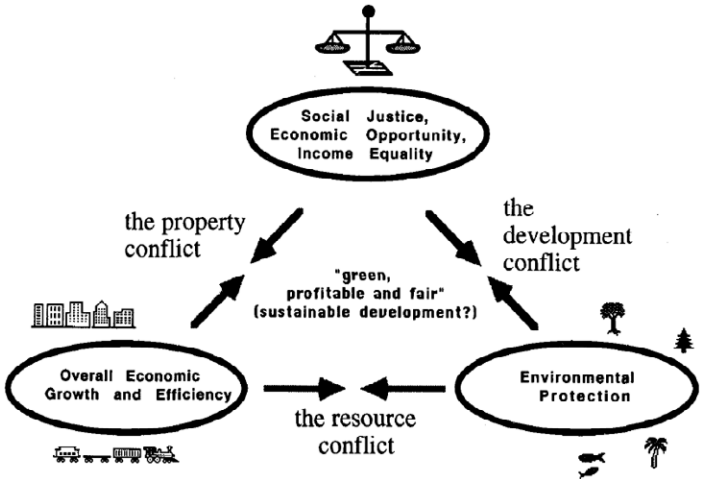


Fig. 29 The Triangle of conflicting sustainable goals

Considering the multitudinous explanation of sustainable development, the theory proposed by Campell (2007) is applied in the project to guide the development pattern. It provides an analysis triangle aiming to reduce conflicts and balance profits within the process of spatial planning.

From Theoretical Framework to Conceptual Framework

The theoretical framework in the project is theory-based research of the mechanism behind the broad system context related to the problem statement. It preliminarily analysis the relationship between urban-rural relationship and development patterns in the countryside and exposes the gaps between the present situation and the ideal model as contradictions for promoting the transition.

For elaborating the theoretical framework into the conceptual framework, the optimized model of integrated urban-rural relationship based on sustainable countryside revitalization is proposed for analysis and design.

Conceptual Framework

Integrated Megacity Region & Sustainable Countryside

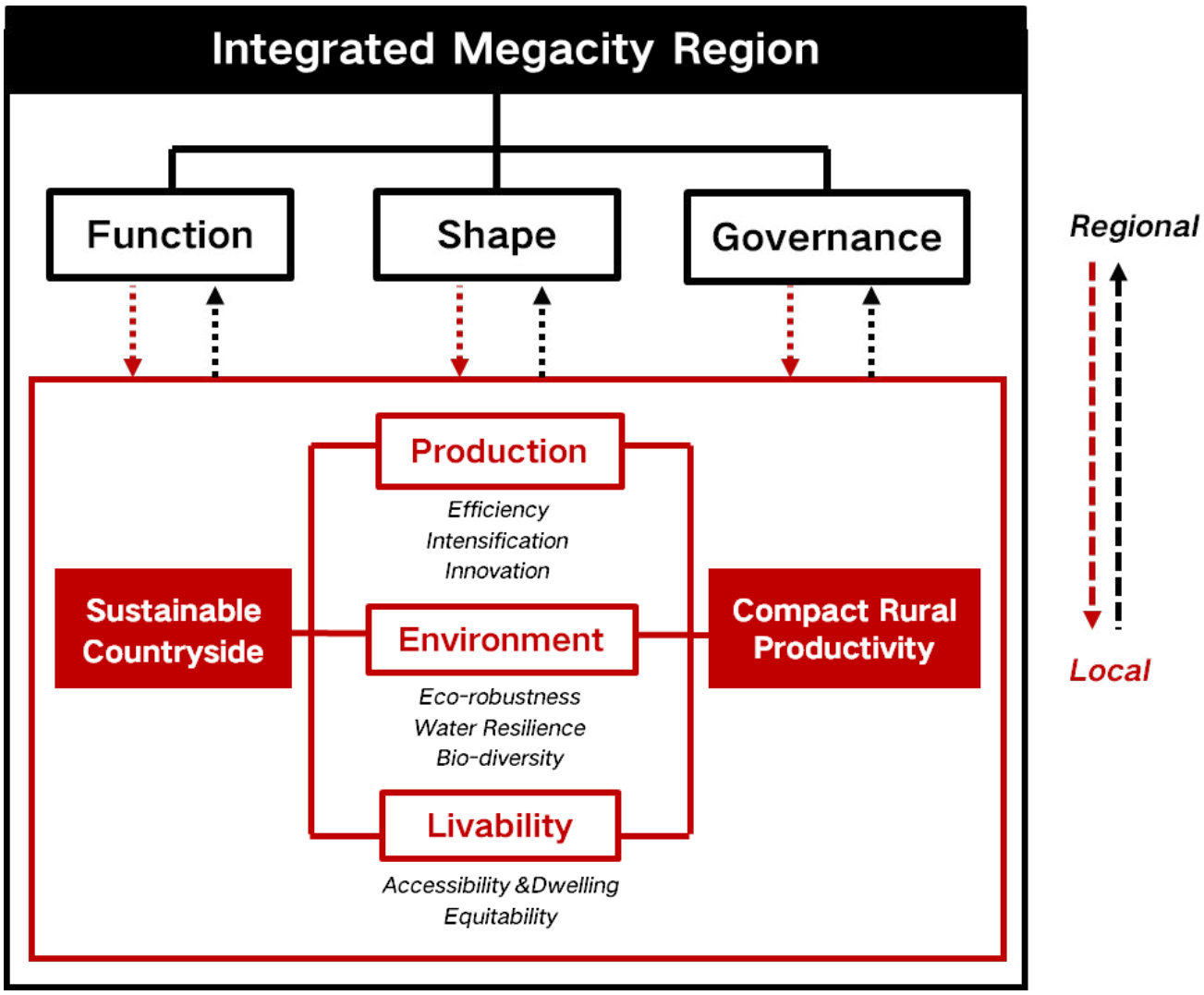


Fig.30 The Conceptual Framework of the Project

The conceptual framework is built based on the urban-rural integration model and sustainable rural development proposed in the theoretical framework. It presents the relationship between notions. Besides, the framework provides a practical method for guiding analysis and design from systematic perspectives through explaining the notions by theoretical detailing and combining with specific situations in the research region.

Megacity Region

In the project, the megacity region is the spatial context of the research object. Megacity regions are vital elements of the human settlement system in the worldwide urbanization and globalization trend. Under the influence of the agglomeration effect, land and natural resources are utilised to their maximum efficiency within a limited area, enabling the region to play important roles in the global economy, culture and politics. For example, the Tokyo region in Japan, the London region in the UK and the Randstad in the Netherlands are typical of international megacity areas. Within the agglomeration, the regional character is reflected in the development morphology of city groups, where the links between cities are strengthened by networked connections in order to encourage the flow and sharing of people, capital, knowledge and culture within the cluster (Eddie, et.al, 2020). The GBA, one of the Chinese most important megacity regions, is unique because of its rapid urbanisation over the past dxecades and its international character as the starting point of the future Maritime Silk Road.

However, despite the numerous research as well as policies on the structural development of city groups in the GBA, there are few spatial studies and practical projects that discuss how rural areas are integrated into the urban agglomeration development circle. Therefore, it is crucial for the project to explore the interactions between the countryside and the whole region in the GBA. The analysis of the megacity region builds on Cowell's theory (Cowell, 2010; Hall & Pain, 2006), which analyses the system of the megacity region from function, shape and governance. the detailed resaerch content based on the three perspectives will be introduced in the following section.

Urban-rural Integration

The research in the theoretical framework has already pointed out that the development of the integrated urban-rural relationship consists of two approaches: productivity improvement in rural areas and the optimal distribution of resources within the region. therefore, in order to understand the notion of urban-rural integration based on the site, the conceptual framework of the project is built on two principles.

The first principle is the relationship between the research objects based on the scales variation. Exploration on regional scale focuses on the overall

spatial structure of the GBA, analysis the interactions between rural areas and the current city-oriented regional system, and optimizes regional resource allocation on the basis of the understanding of the mechanism. On the local scale, the research examines the countryside as an important system in detailed analysis and design. The different scales in the study interact with each other: the existing regional urban-rural relationship is the context for research on the countryside, while local interventions reflect on the adaptation process of the regional system.

The second principle is a research dimension based on the theory of the megacity region. "Function" is qualitative study of the whole system and its subsystems, aiming to affirm the spatial context of the region and the roles of the constituent elements as prerequisites, for providing the understanding basis for proposal; "Shape" is morphology analysis of the region, in more specific terms, the analysis of the spatial structural characteristics of the GBA focuses on the three elements: flows of population and commodity movement, links between villages and the rest settlements, and the integration of the regional network (Batty, 2013); The concept of "governance" is widely explained in theories of spatial planning, but in this project, the focus is the positions of different stakeholders for countryside development patterns, in order to provide cohesive support for the spatial proposal, as a common vision, in the implementation phase.

Sustainable Countryside

As monofunctional and unsustainable land-use pattern is the main dilemma for the long-term development of the rural areas within the GBA, the improvement of rural productivity should be based on an integrated redefinition of land values based on the concept of sustainable development. Due to the causal relationship between rural productivity improvement and the achievement of regional integration in the project, the concept of sustainable development can be understood from an economic, environmental and social perspective combined with the specific problems faced by the region:

Firstly, the economic perspective focuses on the modernization of the agricultural sector, which is the traditional mode of production in the

countryside and should be the core of research as well as the main strategy for dealing with productivity contradictions. Besides, considering the influence of the regional integration aim on rural development, the opportunities offered by non-agricultural industries for rural development should be included in the research. As an expected result, the future production of rural areas should be defined as an integrated concept based on the characteristics of the region, with modern agriculture as the economic basis and various industries as complements.

Secondly, environment is the main dimension in addressing the environmental risks faced by the rural areas in the GBA. Combined with the conclusion of the challenges in the problem statement, resilience in the project refers to restoring the function of agri-aquaculture lands for flooding prevention. At the same time, in order to explore a model of rural development different from urbanization, the proposal should be an eco-friendly and low-impact strategy that aims to negotiate a harmonious relationship between human activities and the natural landscape.

Finally, livability is a broad topic of concern in the planning field. To guide the analysis and design more specifically, livability in the context of the project focuses on the attractiveness of the countryside as potential settlements. Referring to the loss of agricultural labour, which is currently the significant social conflict between urban and rural areas, the attractiveness is reflected in the affordable price, the potential job opportunities and quality living environment that rural industries may offer in the future.

To sum up, the concept of sustainable rural development in the project focuses on the three dimensions of production, resilience and livability.

Compact Productivity

The compact productivity proposed by the project is a driven force behind the comprehensive development model that balances production, environment and liveability. Distinguished from averaging iterations of functions, the concept of multifunctionality should adjust three dimensions with priorities based on the spatial characteristics of the different cases for maximising regional potential under the sustainable framework. At the regional scale, the diversity of rural developments will enrich the functional complementarity between villages and cities in the GBA, enhance the position of the countryside in the regional network and contribute to the process of urban-rural integration in this agglomeration area.

Research Questions

How to develop the countryside sustainable based on multifunctional agri-aqualculture landscape, in order to contribute to an integrated urban-rural network in the GBA?

Redefining the Countryside in the GBA

- What are the characters of the GBA as the system context?
- What are present roles of the countryside in the GBA?
- What are potential roles of the countryside in the future?

Sustainable development in the Countryside

- How to promote production innovation in the countryside based on the multifunctional agri-aquaculture land use strategies?
- How could spatial strategies contribute to the flooding resilience and livability in the countryside?
- How to propose a sustainable and multifunctional development pattern for the countryside considering production, flooding resilience and livability comprehensively?
- How to implement the proposal through phased strategies and polices?

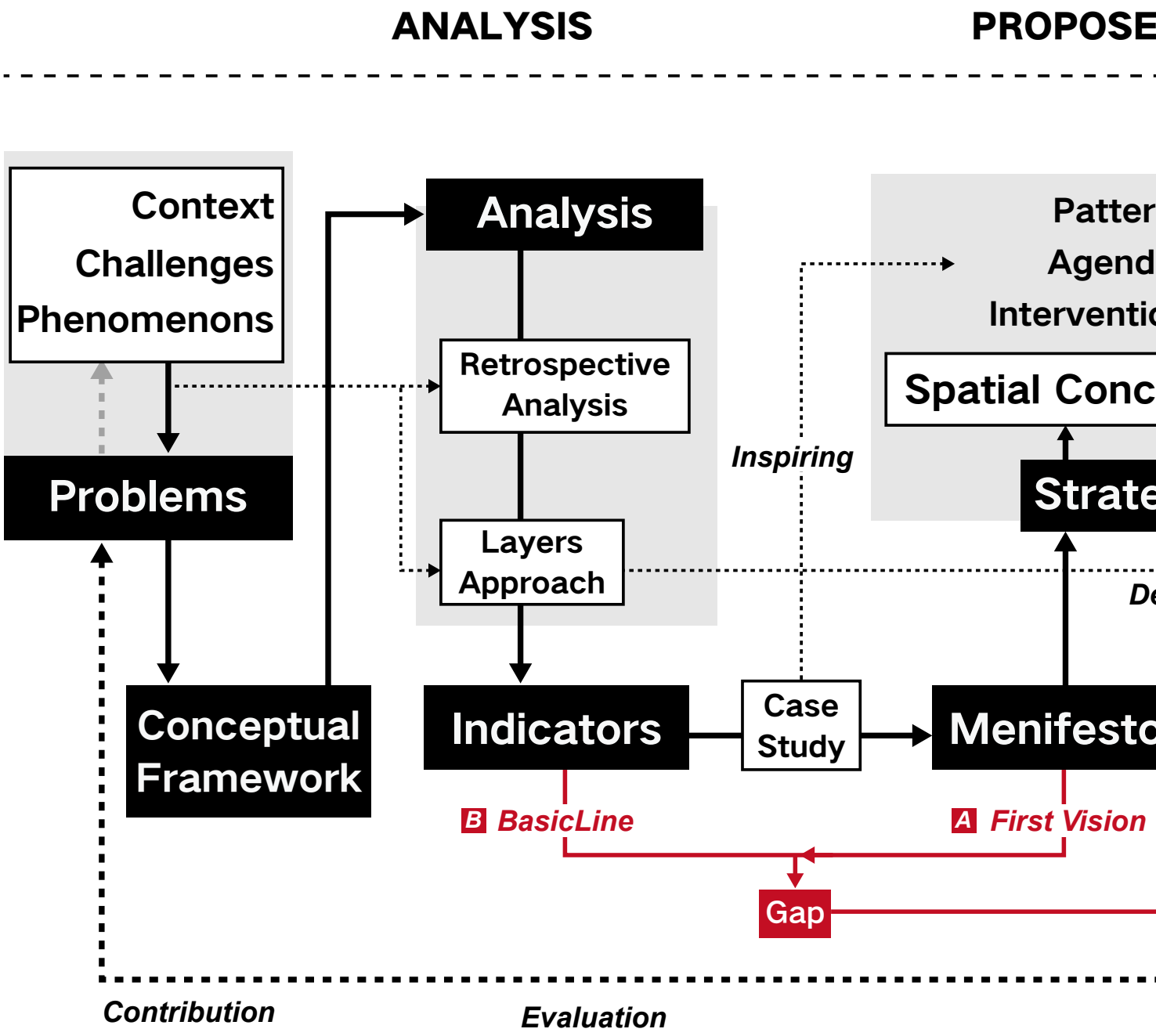
Urban-rural Integration in the GBA

- How could local development in the countryside contribute to an integrated urban-rural network in the GBA?

Methodology Framework

Roadmap of the Research Process

The research and design program could be divided into four phases: "Analysis, Propose, Expose and Politicize", which were developed by Marcuse (2008) for critical planning. Methods for example the case study play important roles in analysis and propose phases as a practical basement for understanding the urbanization influences and redefining the countryside. In order to build connections between theoretical and spatial research, layers



approach is more significant in following phases for guiding analysis and design through its analysis framework based on various perspectives. Besides, the mapping is another key method throughout the project, it offers a visualization method for information represent and could be used to answer both research and design questions combined with other methods.

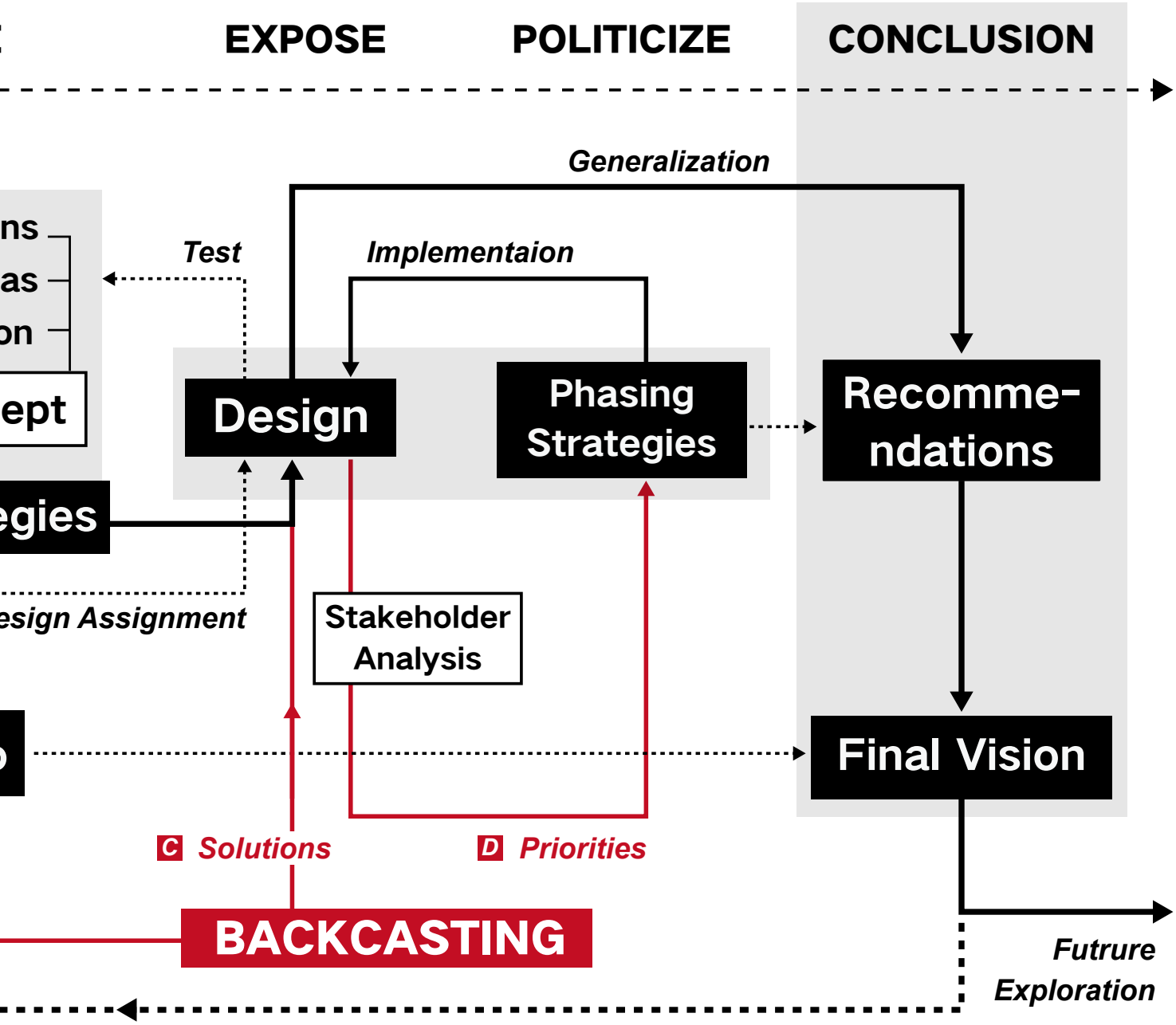


Fig. 31 Diagram of the Exploration Roadmap

Key Method

Research & Design Through Scales

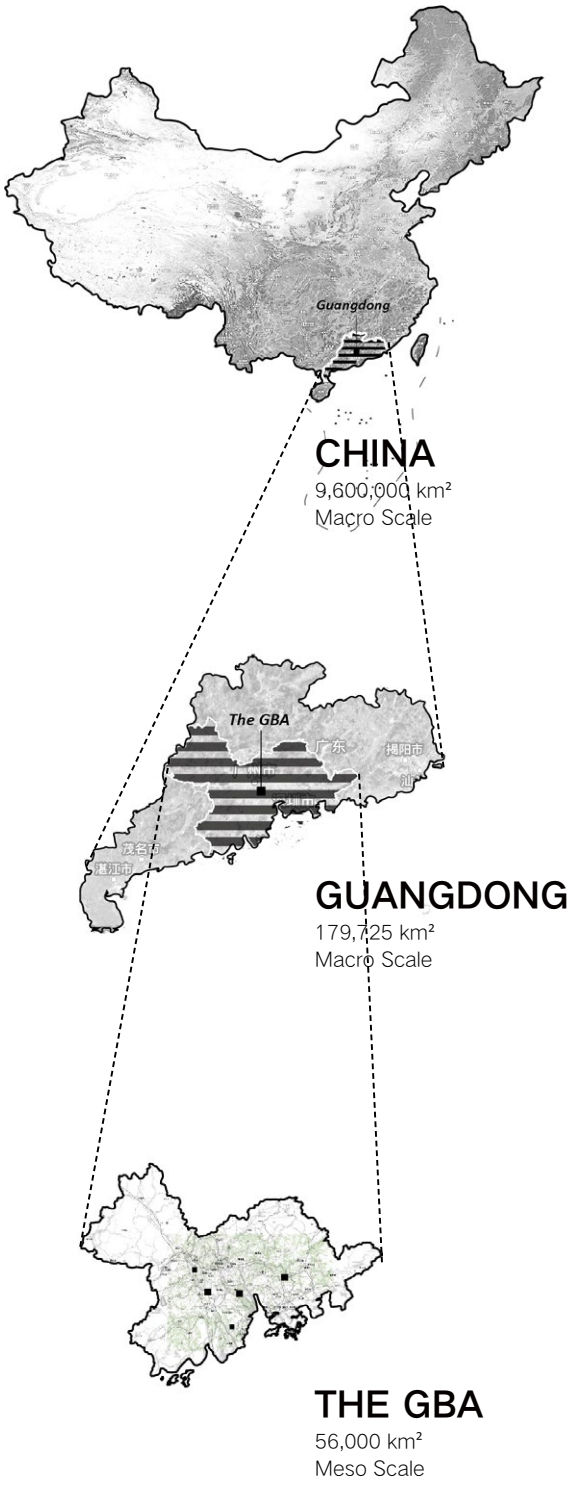


Fig.32 Analysis on Macro and Meso Scale

As a spatial planning project, the multi-scales thinking from the macro scale to the micro scale is significant during the exploration. The knowledge base for proposing the transition in the countryside within the GBA is understanding the system mechanism under the broad context of this international agglomeration area and combining it with the specific local phenomenon.

Dealing with the complexity of the spatial planning in the project, the focus scales are changed in the different phases related to aims in progressive steps instead of in a linear narrow down or bottom up logic. The output of analysis and design are complementary, for developing a systematic planning framework together with practical develop possibilities for selected cases.

Macro and Meso Scale

The particularity of the countryside in the GBA is the conflicts between the traditional agricultural sector and the modern urbanization level within this region. So the project starts from the Chinese scale and GBA scale to expose the situation and development stage of the objectives, urban-rural relation-ship and countryside, as a broad context for proposing the transition.

In the early design phase, scenarios comparing different development patterns on the regional scale would support the preliminary vision. And in the final step of the design phase, the elaborate design on micro scale would be reflected to regional scale for integrated network construction.

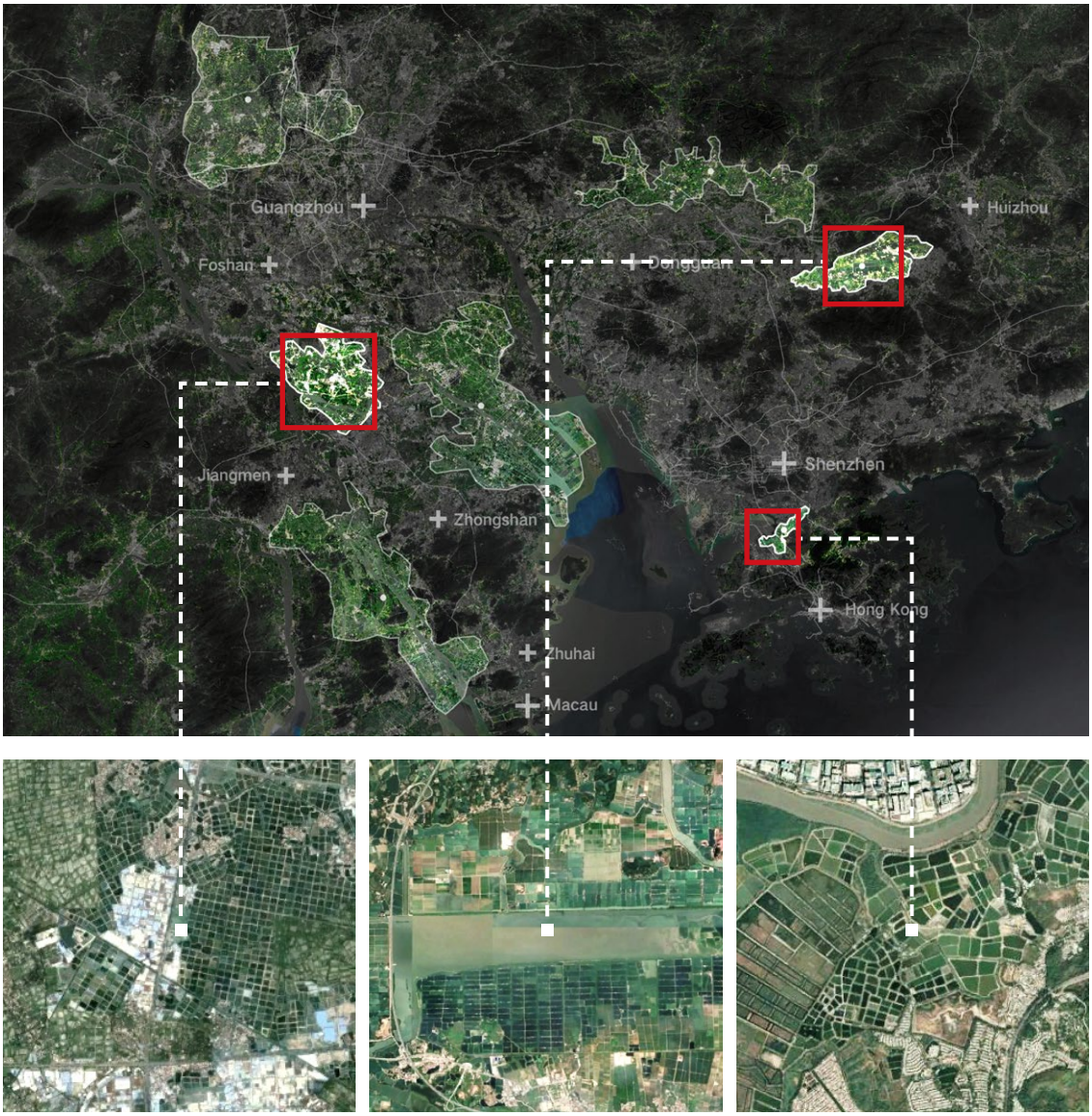


Fig. 33 Caes Selection for Exemplary Design on Micro Scale

Micro Scale

During the analysis phase, the research on the micro scale focused on the unique phenomenon happing on the agri-aquaculture land, the fact exposed the specific spatial conflicts in the GBA countryside and would be the start point for promoting the transition. In the design phase of the project, the exemplary design of the cases selected by meso scale analysis would show rehearsal developments under the guidance of the proposed planning framework.

Key Method

Layers Approaches

Description

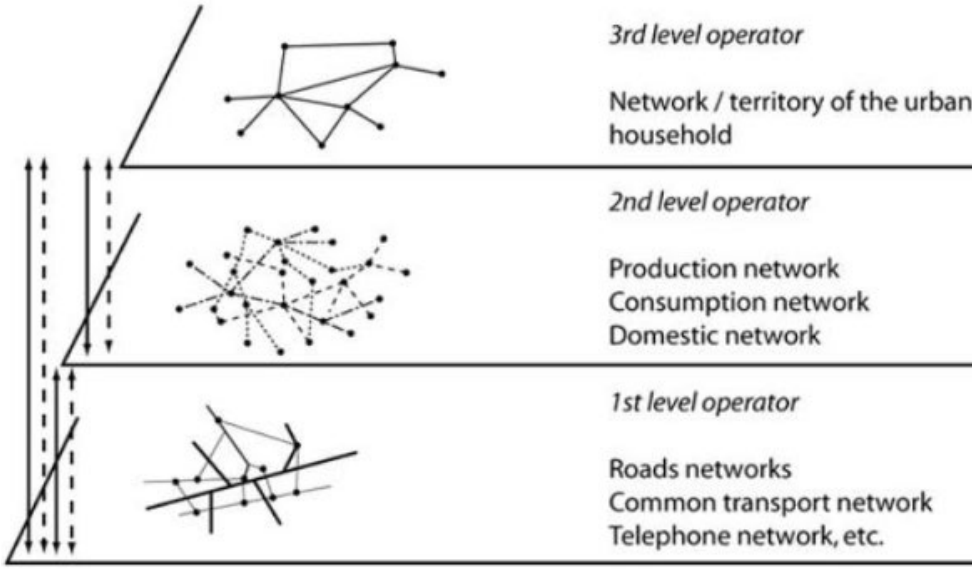


Fig. 34. Layers Approaches Proposed by Dupuy

The analysis process should separate a whole complex image into simper components and explore their interrelations (Kim W Todd, 1985, Nermeen Dalgamoni, 2014). Ian McHarg provided layers approach as an efficient tool for analysing spatial system influenced by composite elements in Design with Nature (McHarg, 1969).

Considering the complexity of spatial planning, the method is applied in the project to understand the iterative and multiscale interdisciplinary research object (Nijhuis, et.al.,2016). For example, in order to achieve the aim of reconstructing the human-land relationship based on the agriculture-productivity innovation, the sustainable development path within the region could be deconstructed into different perspectives including economic, environmental and social aspects. So that the theoretical elements defined in the conceptual framework could be transformed into specific spatial issues which are linked to these three aspects. The information on different layers could be detailed in the analysis and design process. Through overlapping, outcome of the methods is more than conclusion on each layer, but how could the sub-themes interact with each other and merge into the optimized integrated system.

Steps during Analysis:

1. Defining attribute layers through previous research
2. Elaborating details analysis and design on single attribute layer
3. Analysis interactive relationship between different layers through superimposition
4. Integrated analysis for the overall system

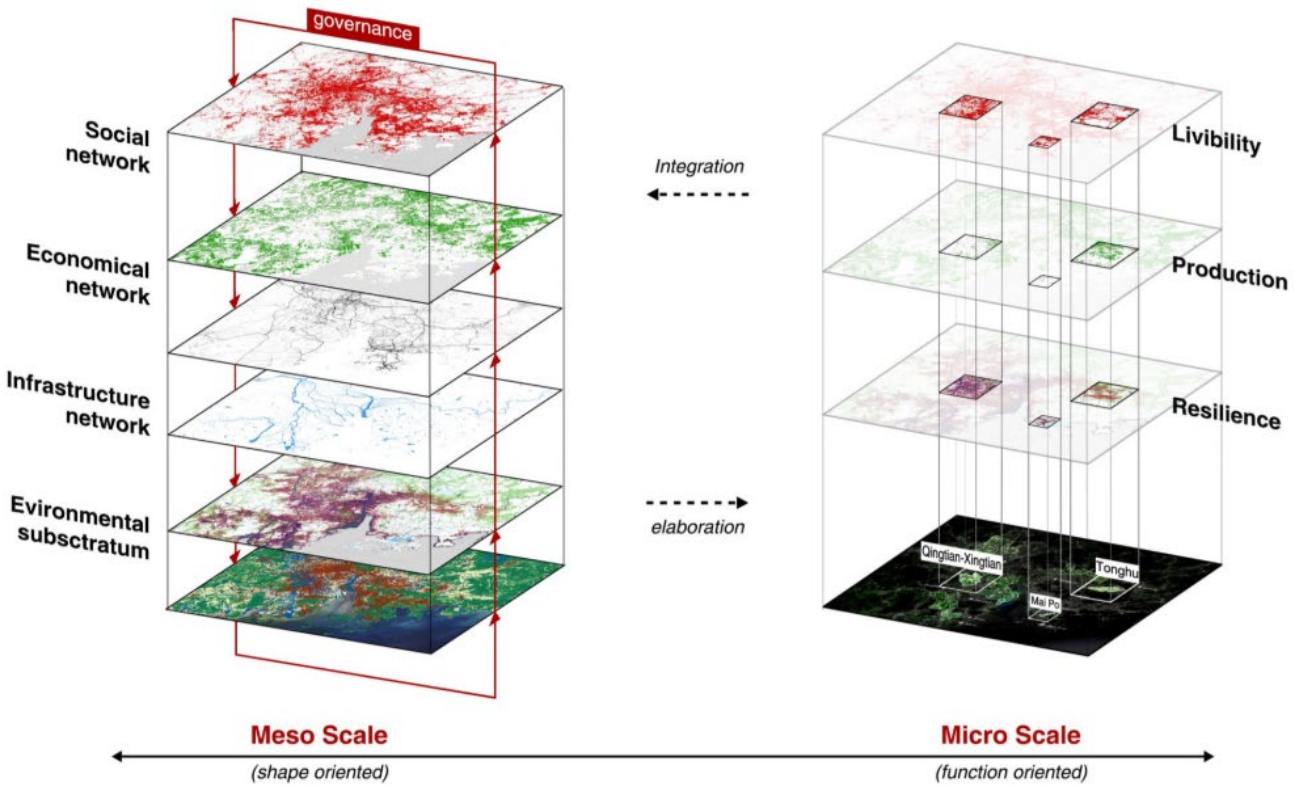


Fig. 35 Method Developing as an Analysis Framework

Layers based on the Project

The method provides flexibility for various projects, it is not only a method but also a practical logic for research. In past practices, though layered elements basically build on the "social-spatial network model" provided by Dupuy (1991), the content of layers could be adjusted to deal with various focus issues. Besides, the ordering of the layers defines the priority of the elements to a certain extent under the method framework.

Key Method

Mapping

Description

Mapping is a method combining observation and representation. Harley and Woodward (1987) described it as a process for understanding the research objects spatially. The tool could help with translating the source data into visual information and translating theoretical notions into elements for spatial analysis.

By creating maps, the data-translation process in Mapping provides significant and spatial based evi-dence for understanding mechanism of the GBA system. The method is implicated throughout analysis and design phases in my project. For example, the structure maps extract spatial information would be the analysis basis of the layers approach (fig.).

Steps during Analysis:

1. Defining analysis elements
2. Source data collecting
3. Analysis and translation
4. Information representation

Tools

GIS data Visualization

Mapping through GIS data visualization is an important method in spatial analysis, the analysis is based on the open data calculated by multi-institutions and the visualizing platform (QGIS). The graduation project is going to using open data in the GBA mainly provided by Openstreet Map and RESDC (Resources and Environment Science and Data Centre). The method is using for analyzing morphology and distribution of the elements in the research area. The limitation is that the data in Chinese rural area is incomplete and hard to access. Error and timeliness of the resources data might influence the accuracy of the analysis.

Spatial Representation

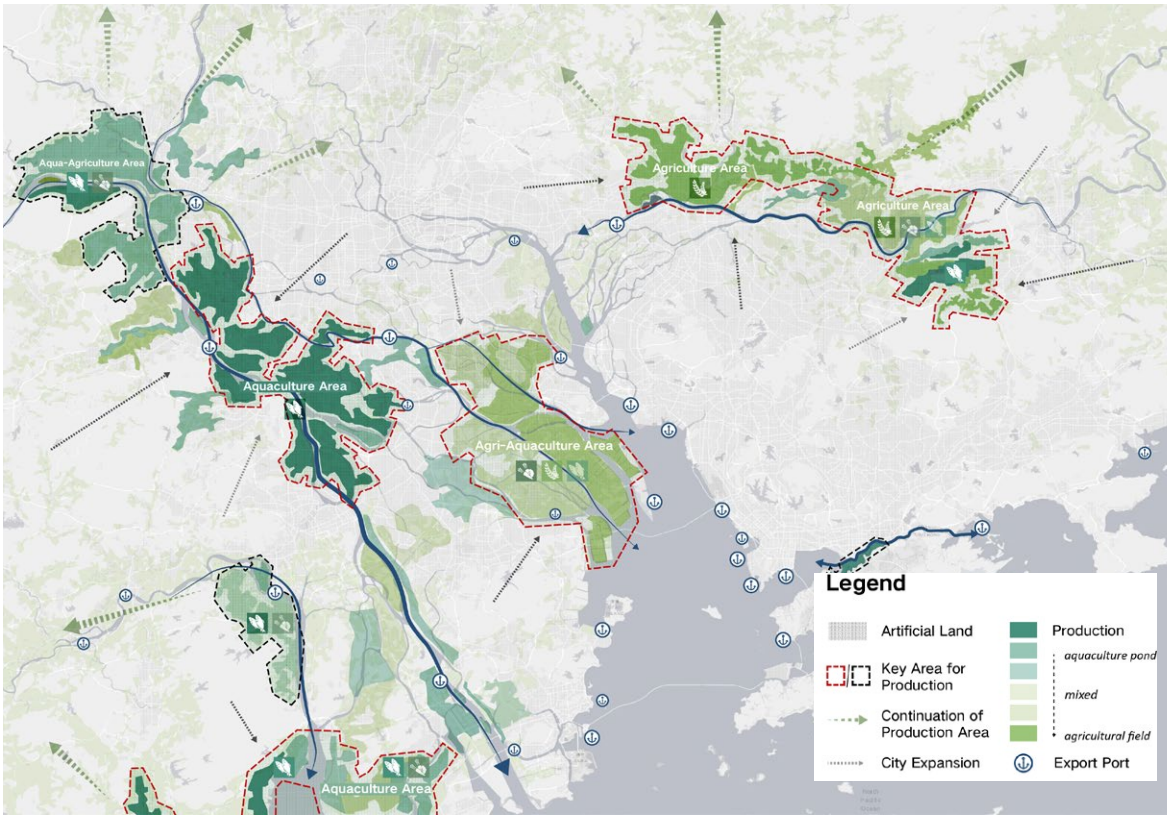


Fig.36 Represention of the Spatial Data
The stucture maps of agri-aquaculture analysis as an example

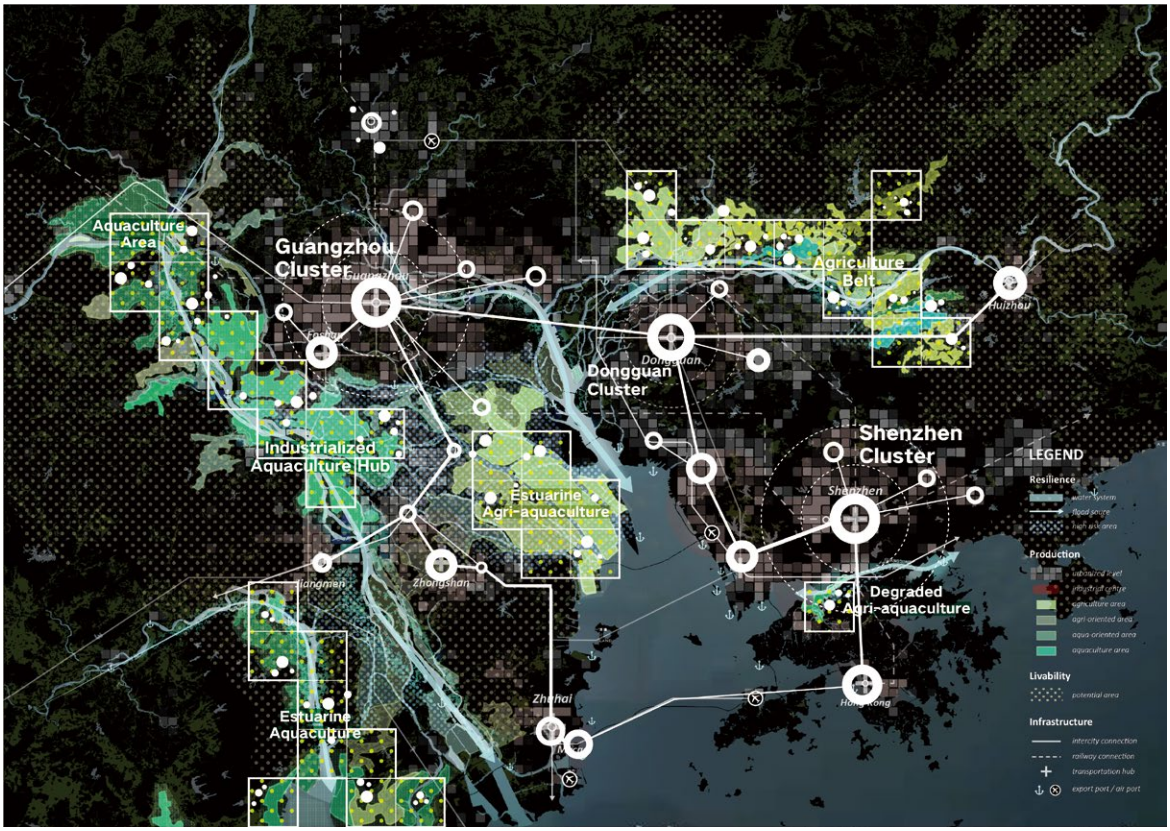
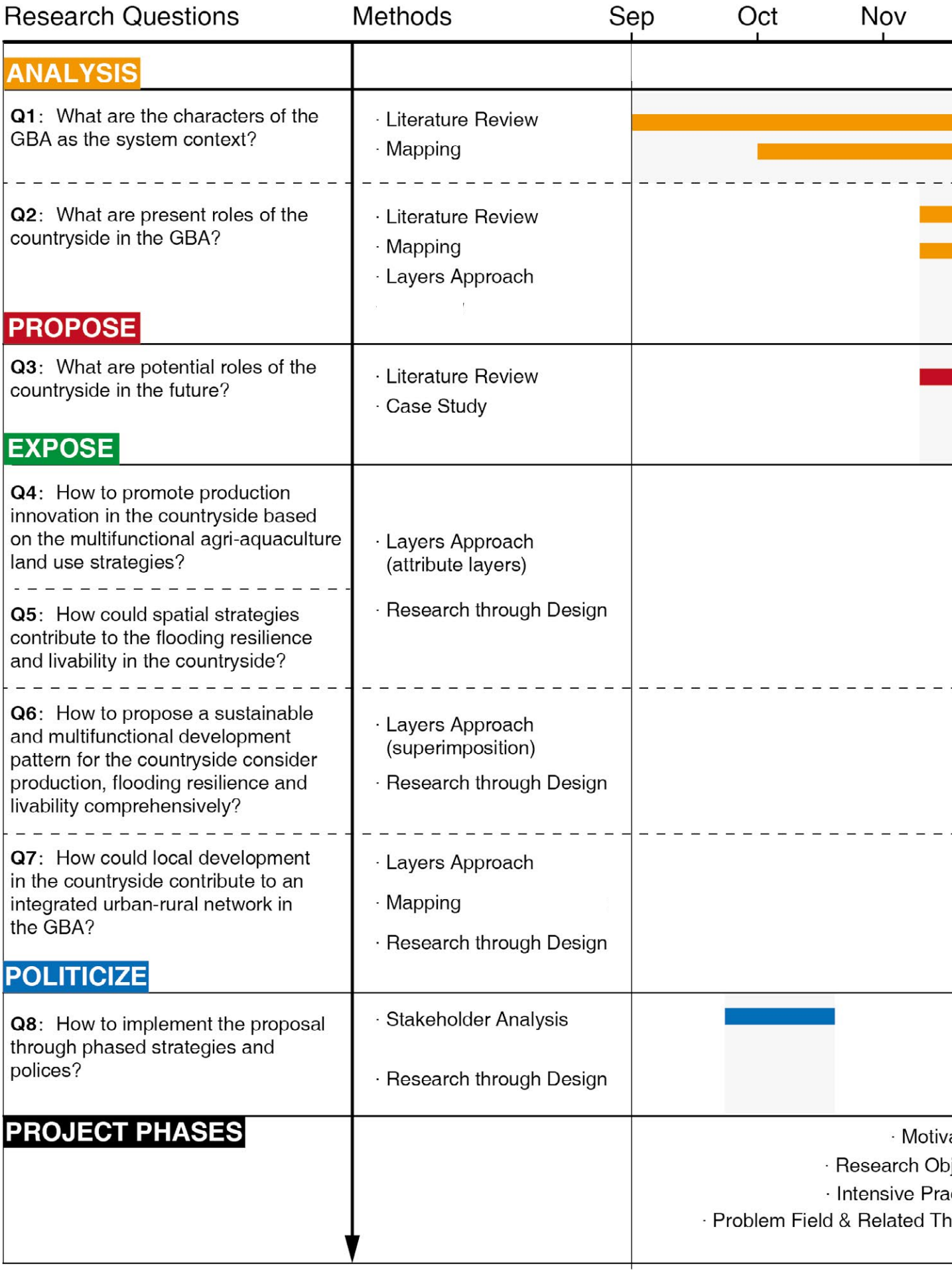


Fig. 37 Conceptual Structure Mapping
The abstract structure of the spatial relationship between cities and rural areas

Thesis Plan


Research Questions
Methods
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Oct
Nov
ANALYSIS
Q1: What are the characters of the GBA as the system context?
· Literature Review
· Mapping
Q2: What are present roles of the countryside in the GBA?
· Literature Review
· Mapping
· Layers Approach
PROPOSE
Q3: What are potential roles of the countryside in the future?
· Literature Review
· Case Study
EXPOSE
Q4: How to promote production innovation in the countryside based on the multifunctional agri-aquaculture land use strategies?
· Layers Approach (attribute layers)
Q5: How could spatial strategies contribute to the flooding resilience and livability in the countryside?
· Research through Design
Q6: How to propose a sustainable and multifunctional development pattern for the countryside consider production, flooding resilience and livability comprehensively?
· Layers Approach (superimposition)
· Research through Design
Q7: How could local development in the countryside contribute to an integrated urban-rural network in the GBA?
· Layers Approach
· Mapping
· Research through Design
POLITICIZE
Q8: How to implement the proposal through phased strategies and polices?
· Stakeholder Analysis
· Research through Design
PROJECT PHASES
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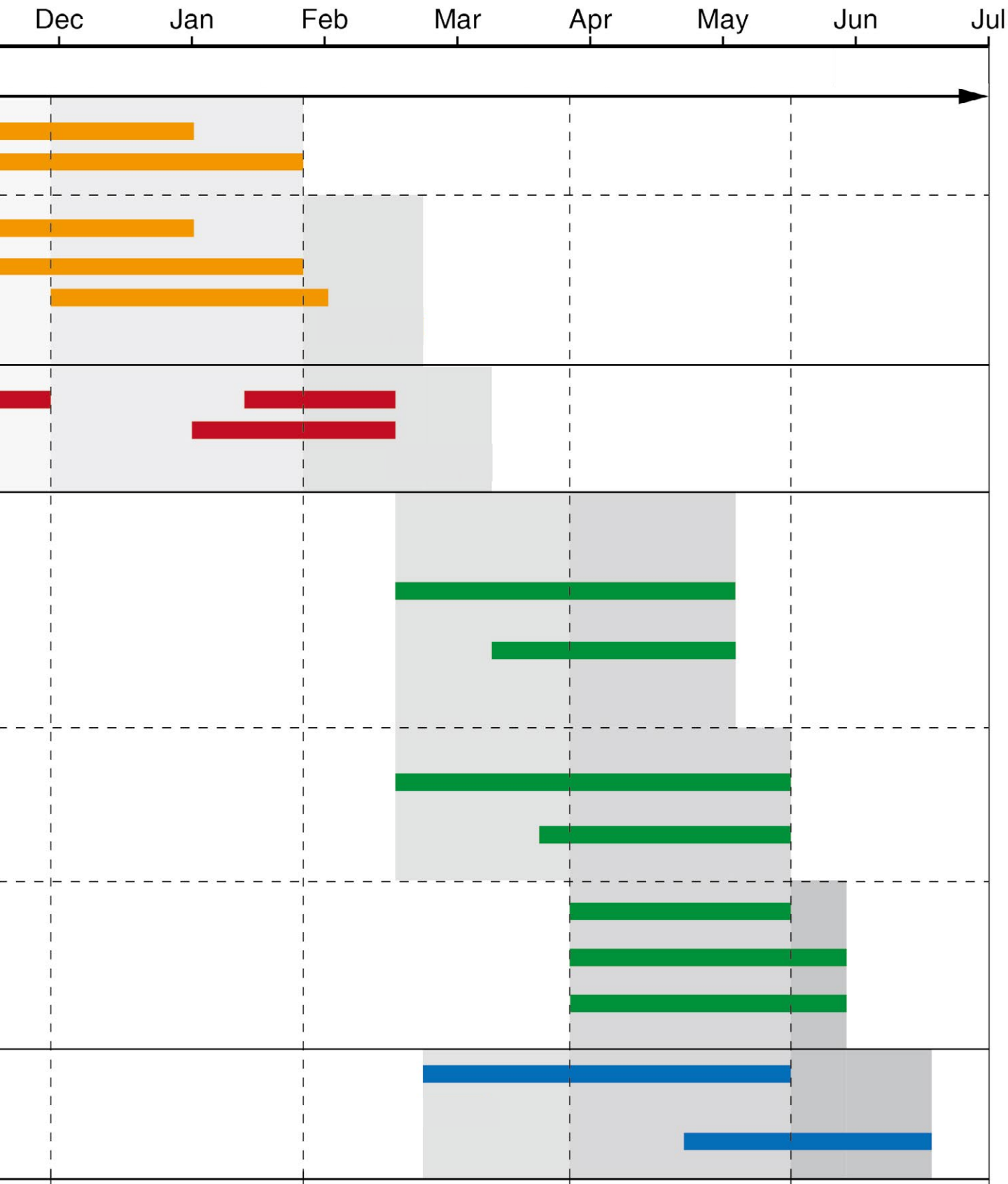
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· Problem Definition
· Research Framework
· Methodology
· Analysis
· Draft Vision
· Principles
· Elaborate Design
(micro scale)
· Preliminary Stakeholder Analysis
· Integration Design
(micro & meso scale)
· Approaches & Strategies
· Strategies
· Conclusion
· Reflection
· Production

Fig.38 Dike-Pond Landcape in Shunde

III ANALYSIS

During the past decades, the instruments of modernism planning played an important role in the transition of the rural areas in the GBA and emphasized specific positions of the countryside in city clusters through top-down interventions. Series of stimulating strategies have created new landscape textures of orderly efficiency, functional zoning and homogenous construction. As a result, separation, isolation and opposition correspondingly appeared in the traditional hybrid system, the interaction between the material layers was broken and the mechanism formed by people and land together in rural areas is degenerating.

On regional scale, the incomplete systems are transforming the countryside into carriers of city functions, and satellite areas highly depend on central cities. The losing independence of the countryside exacerbated the fragmentation of the rural area during the urban agglomeration, reinforced the city-centric polycentric structure in the GBA. Essentially, the development pattern which highly depends on regional cities exposes the external continuation of the linear urbanization.

Introduction

The Transition Context for the Countryside in the GBA

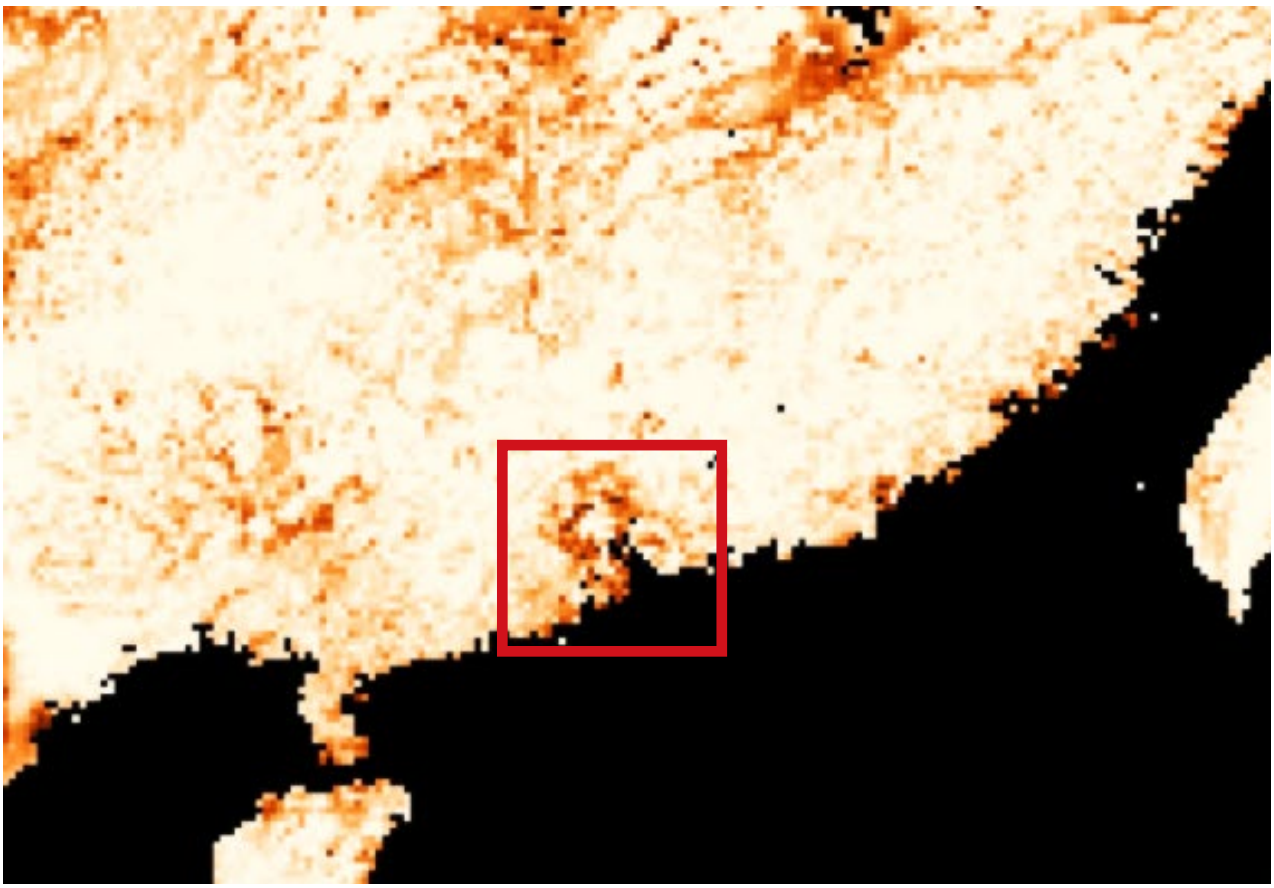


Fig.39 A Traditional Agriculture Region in South China

Historical Agri-Aquacultural Region in South China

The Pearl River Delta (PRD), located on China's southeastern coast, has vast estuarine plains and fertile soils that have nurtured prosperous agricultural and aquacultural production as well as the unique rural culture (Feng, et.al. 2017).

In the history, the PRD was one of the most affluent agricultural regions in China. Humans adapted the natural environment through digging ponds and polder reclamation, and created famous local economy based on the dike-pond landscape. The integrated and efficient production in the countryside of Guangdong, which combined sericulture with aquaculture, made the region well-known for its prosperous silk trade in the 16th century (Tian, 2019).

Fig.40 Comparison of urbanized area and rural landscape along the Shenzhen River

A Urbanized Innovation Metropolitan Area

After the reform and opening up, followed the implementation of the Special Economic Zone (SEZ) policy in Shenzhen, the positioning of the PRD in China shifted from a traditional agricultural production area to an experimental zone with external urbanization as the priority. In 2015, the "Greater Bay Area" concept portrayed an international bay area featuring technology and innovation industries, which reinforced the importance of agglomerative economies in cities. Today, the GBA is one of the most important hub for technology and innovation in China, and has grown high-tech enterprises such as Tencent and Huawei. The transition of the regional functions has changed the context of rural planning. On the one hand, the urbanization caused the decline of the countryside. On the other hand, the creativity of the region provides potential support for rural modernisation.

The Trandition

Historical Agri-Aquacultural Production Model

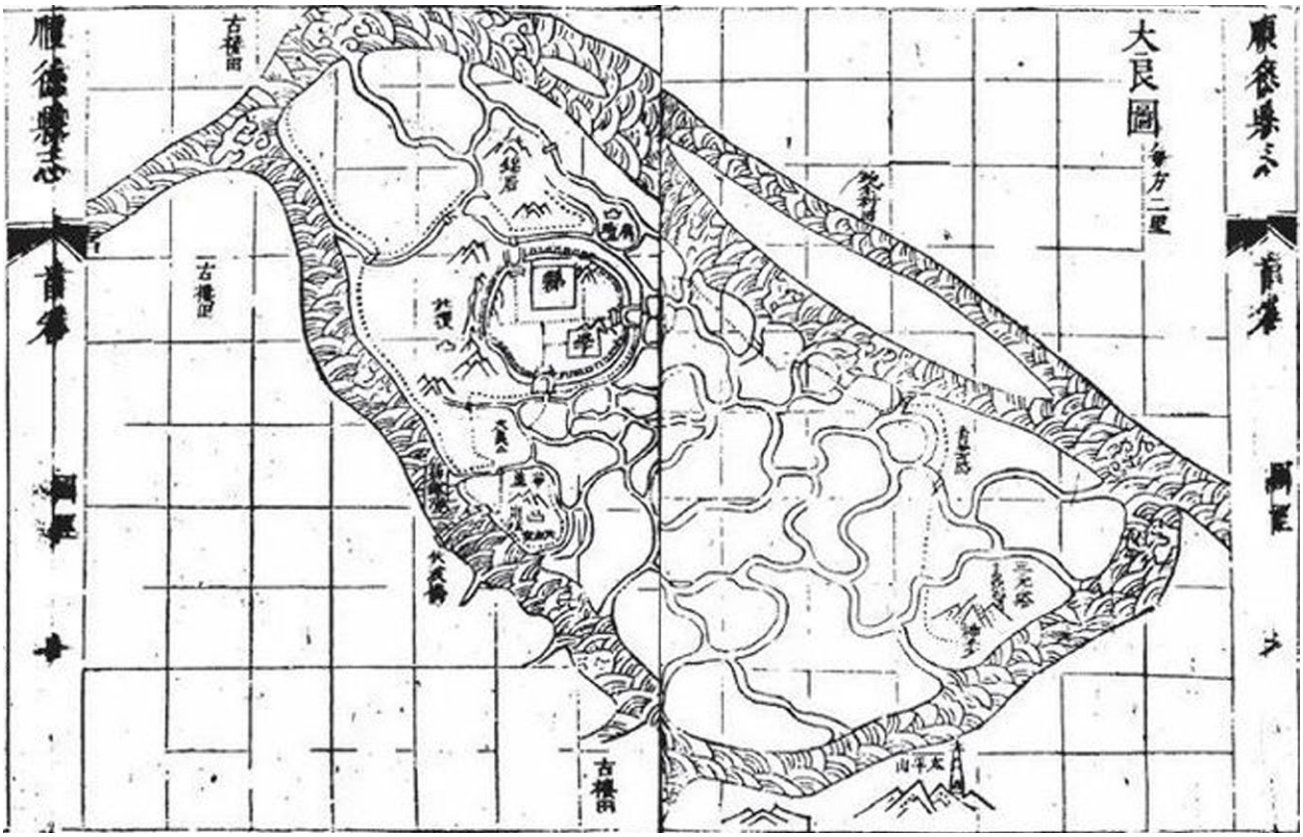


Fig.41 Dike-Pond System in Qing Dynasty

The well-known characteristic of the countryside in the GBA is the traditional circular economy, which was built on the dike-pond landscape. The agri-aquaculture pattern is a comprehensive system combining the agriculture and the aquaculture production. With the intervention of humans, the waste from agriculture and aquaculture could complement the needs of each other and form an organic circulation within the system.

Since the 16th century, the pattern was created to plant mulberry upon pond dikes under the prosperous silk trade, and the typical agri-aquaculture landscape is widely distributed on the west side of the Pearl River and along the Dongjiang River on the east (Sun, Nijhuis, 2019).

Function

The Well-known Dike-pond System in the Peral River Delta

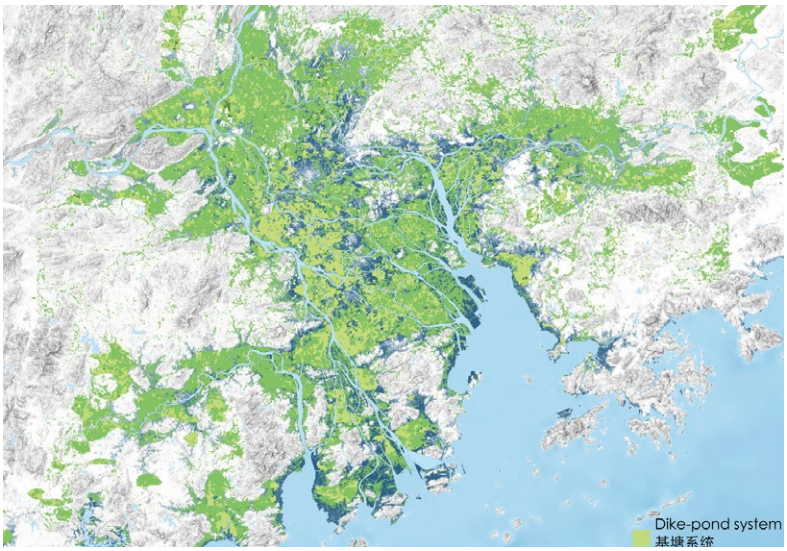


Fig.42 Dike-Pond System in GBA
Distribution of the traditional production landscape

Traditional agri-aquaculture landscapes are widely distributed within the Pearl River Delta. The existing dike-pond system is the result of human interventions for transforming the natural condition in order to support production activities.

At the same time, the dike-pond system is a multifunctional infrastructure highly considered the regional water network. Since the Ming Dynasty, this resilient landscape has played an important role in water management and flooding prevention at different scales.

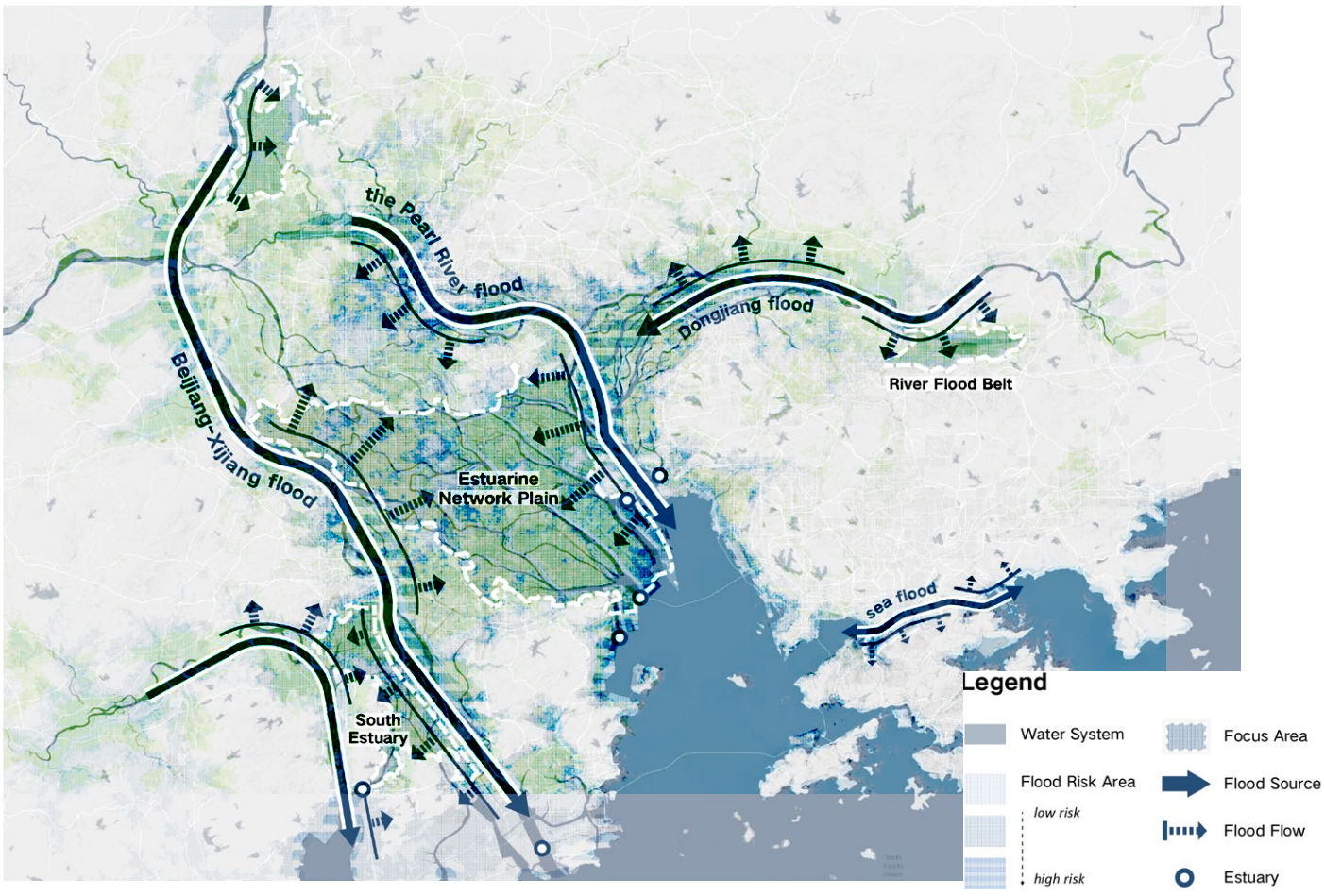


Fig.43 Agri-aquaculture Landscape as a Flooding Defence System

Shape

Organic and Multifunctional Agri-Aquacultural Landscape

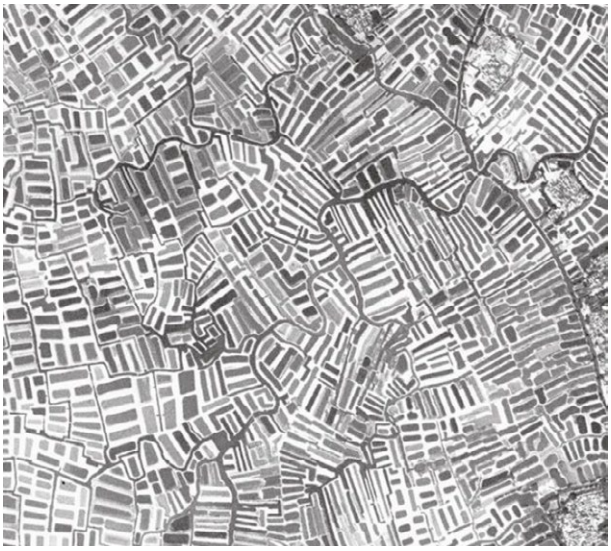


Fig.44 Dike Polder in Foshan, Guangdong

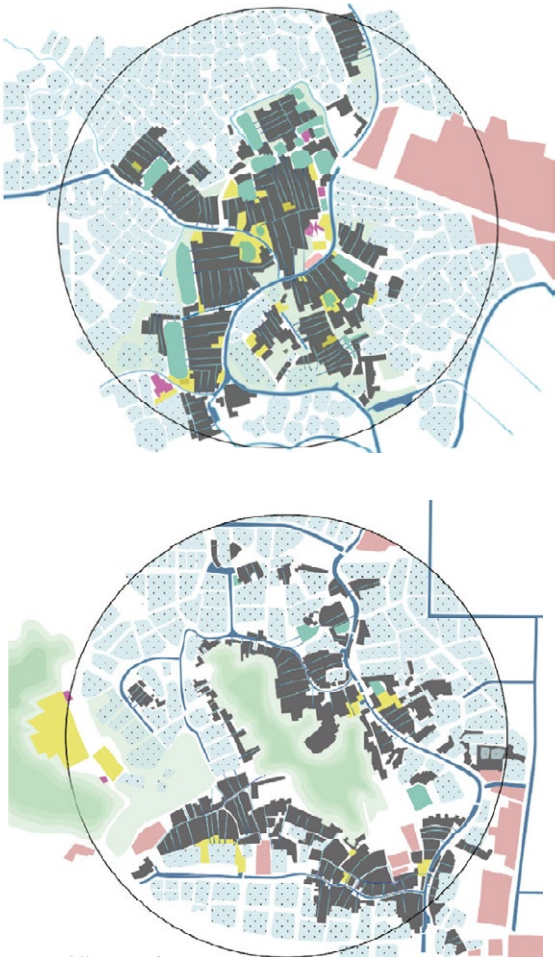


Fig.45
The Plain Village & The Mountain Village

Layouts echoes the Terrain

The agri-aquaculture system within the GBA was used to be an integrated landform containing multifunctions including production, water control, housing and culture (Tian M, 2019).

The traditional forms of agri-aquacultural land are organic and respond to the shape of the water system. Fishing ponds were divided by thick and curve soil dike (USGS,1969), where the mulberry and economic plants are planted. And the ponds would play a role of water retention during the flooding time. Besides, the products of the land are not fixed. Because of the climate in Guangdong Province, there are two chances for planting seeds per year. The fish ponds could be transformed into agricultural land beyond the flooding season. The rotation method enhanced the utilization efficiency of the agricultural land and the nutrition contained in the soil.

The organisation of the traditional morphology in the countryside echoes this organic agri-aquacultural landscape. Depending on the condition of the terrain, the layouts of the settlements can be categorised into two main forms, which are the plain village and the mountain village(Sun, 2019). These two forms combine the rural production, living, local culture together with public infrastructures into an iterative system in a low density and low natural impact way. They respond to the basis which is formed together by the natural and productive landscape in traditional rural areas.

Governance

Cooperative Production Organization Based on the “Clan”（宗族）

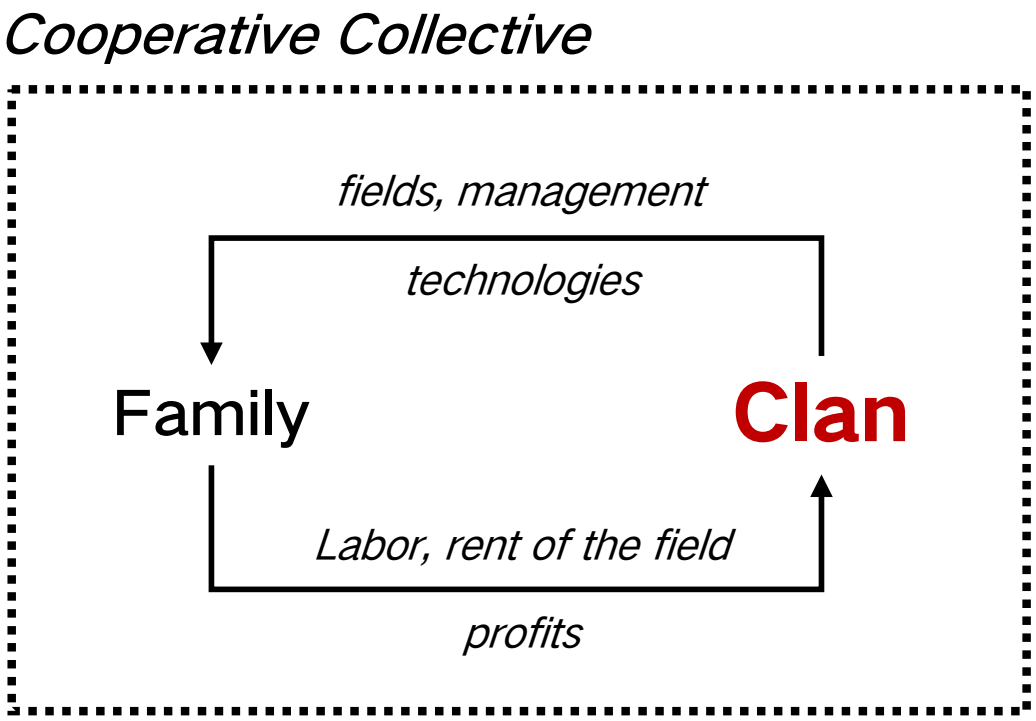
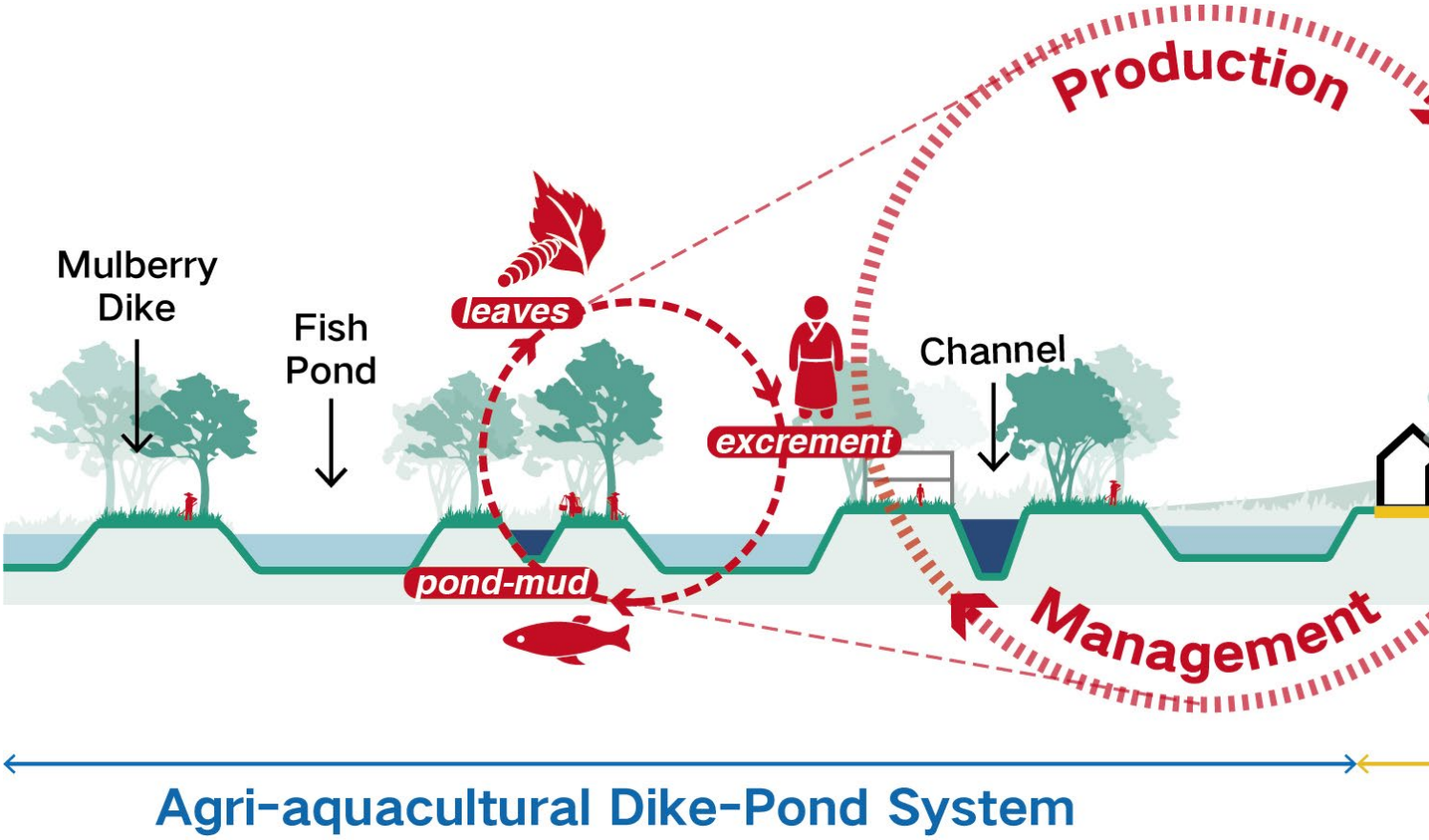


Fig.46 Tranditional Collective Cooperation in Rural Production

Traditional agricultural production in the GBA is organized through the social structure centred on 'clan' (Zong Zu). It was a cooperative mechanism integrated agriculture together with aquaculture, trade, and construction of public facilities. During the historical period of the rural prosperous within the research area, villages were built up on the family concept which is called 'clan'. The wealth of the village, the settlement of the clan, was dependent on the area and productivity of the clan fields. Thus, the production happened on the fields were relevant to the benefits of all villagers, and the common aim encouraged the formation of collective cooperation based on the efficient distribution of labours and materials. Additionally, wealthy households in the village would also invest in the development of the clan to which they belonged as the return(Zhou, et.al., 2018).

The Gene of the Rural Culture

Human-land Philosophy in the Tranditinoal Rural Production

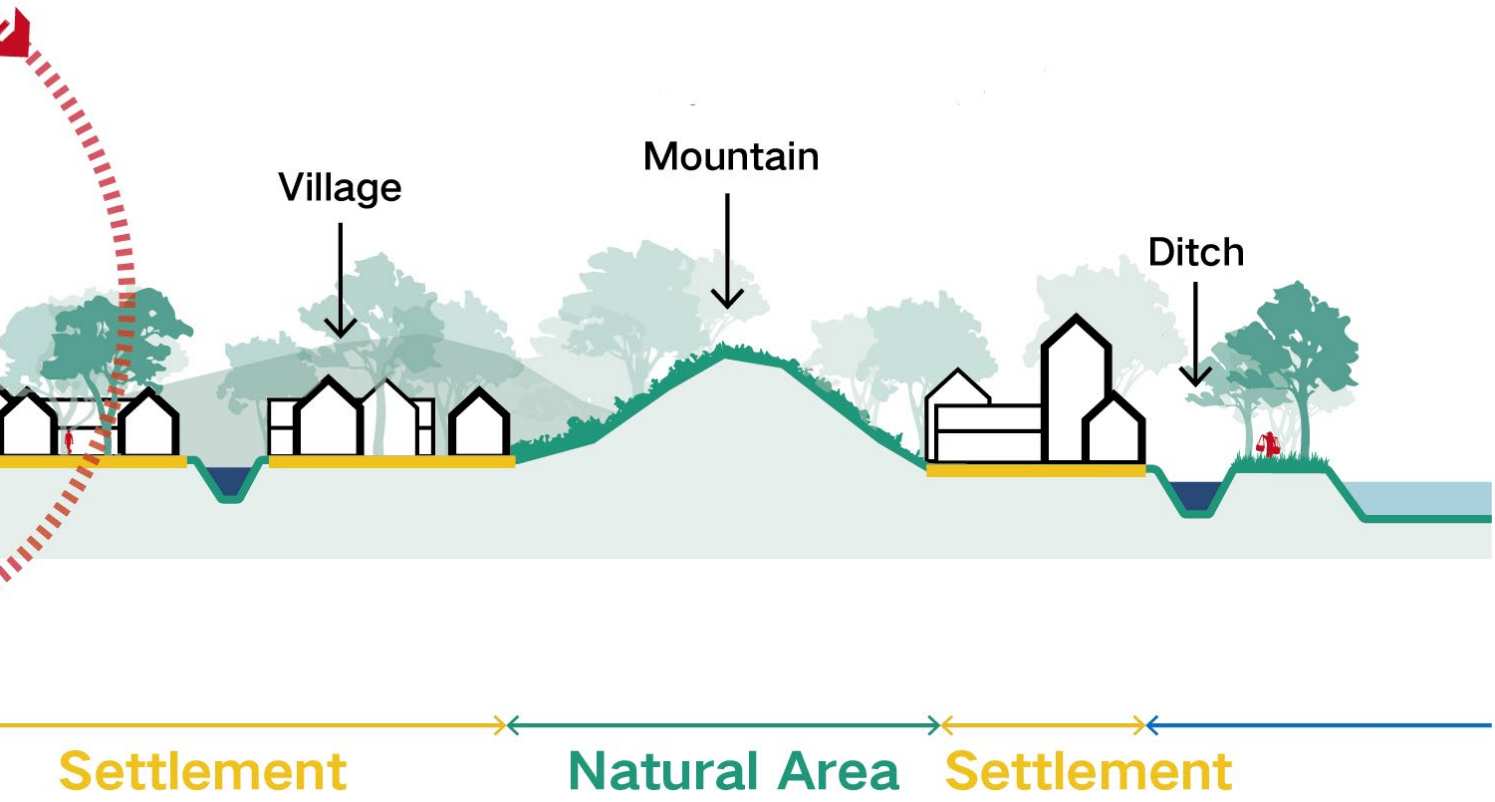


“夫稼，为之者人也，生之者地也，养之者天也”

“The crop is seeded by human, grown by land, and fed by weather”

《吕氏春秋・审时》

The Spring and Autumn of Lv (BC 239)



The traditional dike-pond system is not only a place for production, but also a social-spatial complex composed of environment, dwelling and production activities. Through the agri-aquaculture production happened on it, the system connectes different elements and iteratively organises them into the village as a settlement unit. It presents a harmonious human-land relationship in traditional Chinese philosophy.

In summary, the traditional dike-pond system has been inscribed into the genes of the countryside in the GBA. It grow a culture of the landscape which centred on the aquaponics productions.

A Self-sufficient System

Traditional Sustainable Complex with Insufficient Productivity

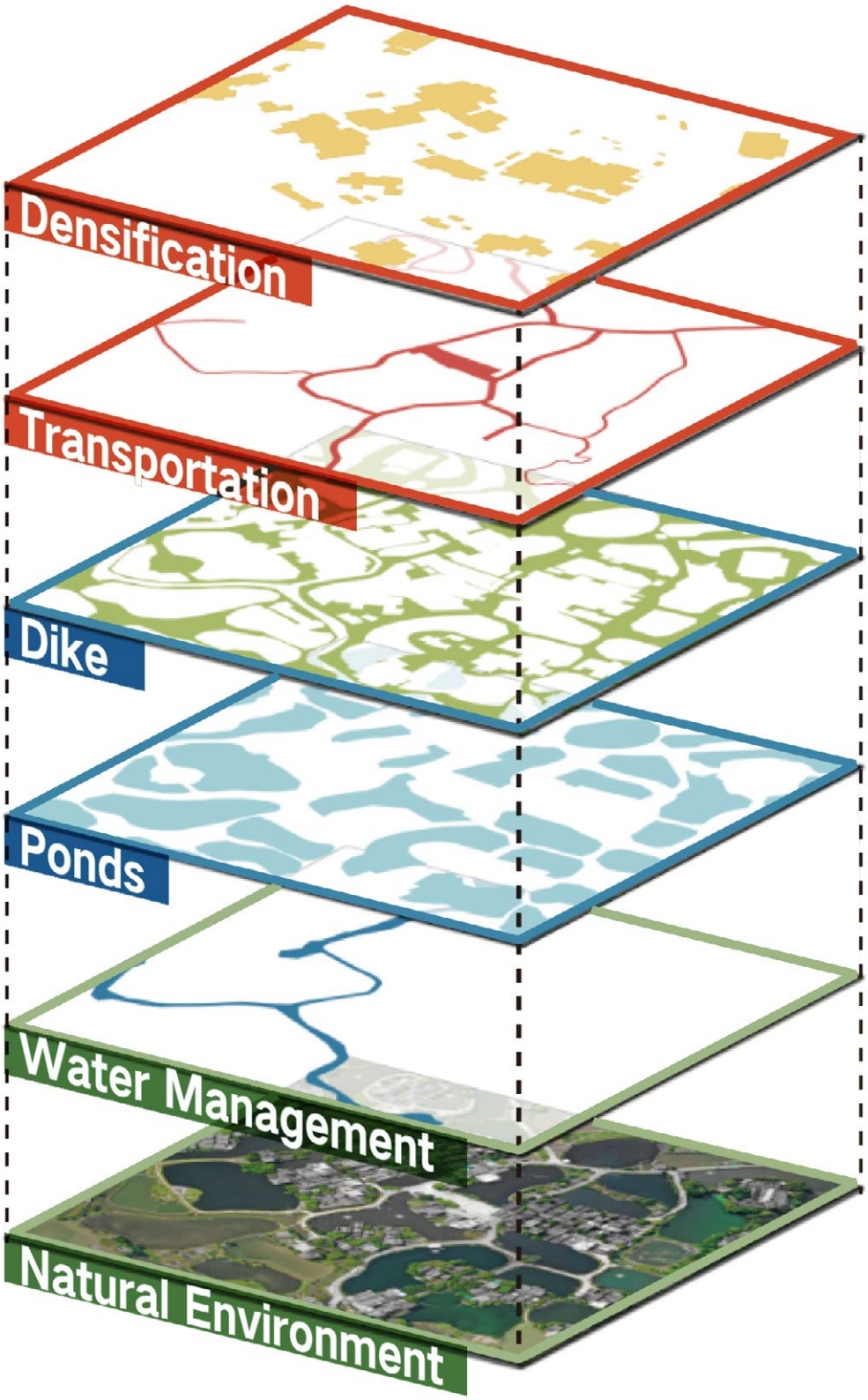


Fig.47 Complete Rural System with intergrated Element Layers

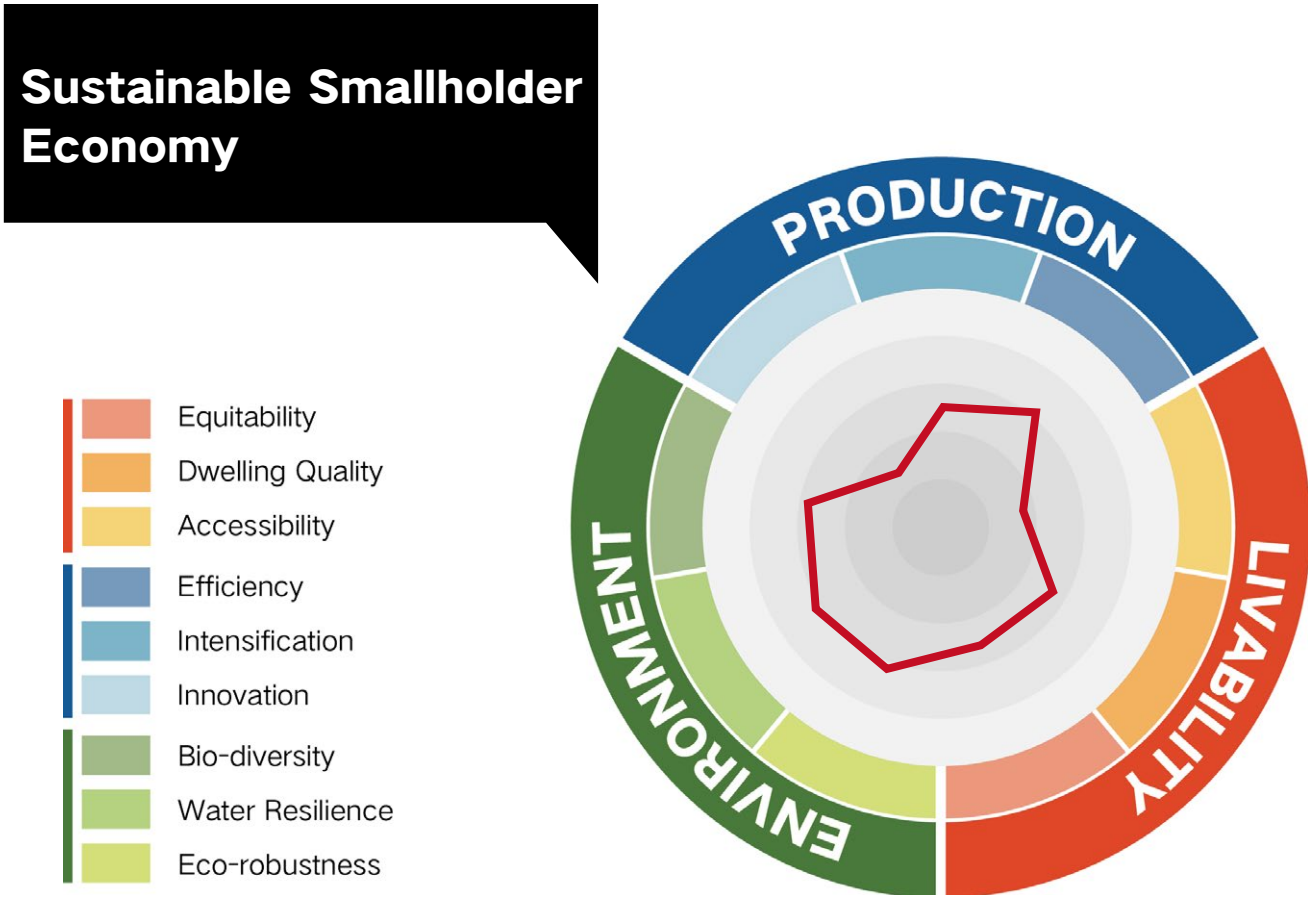


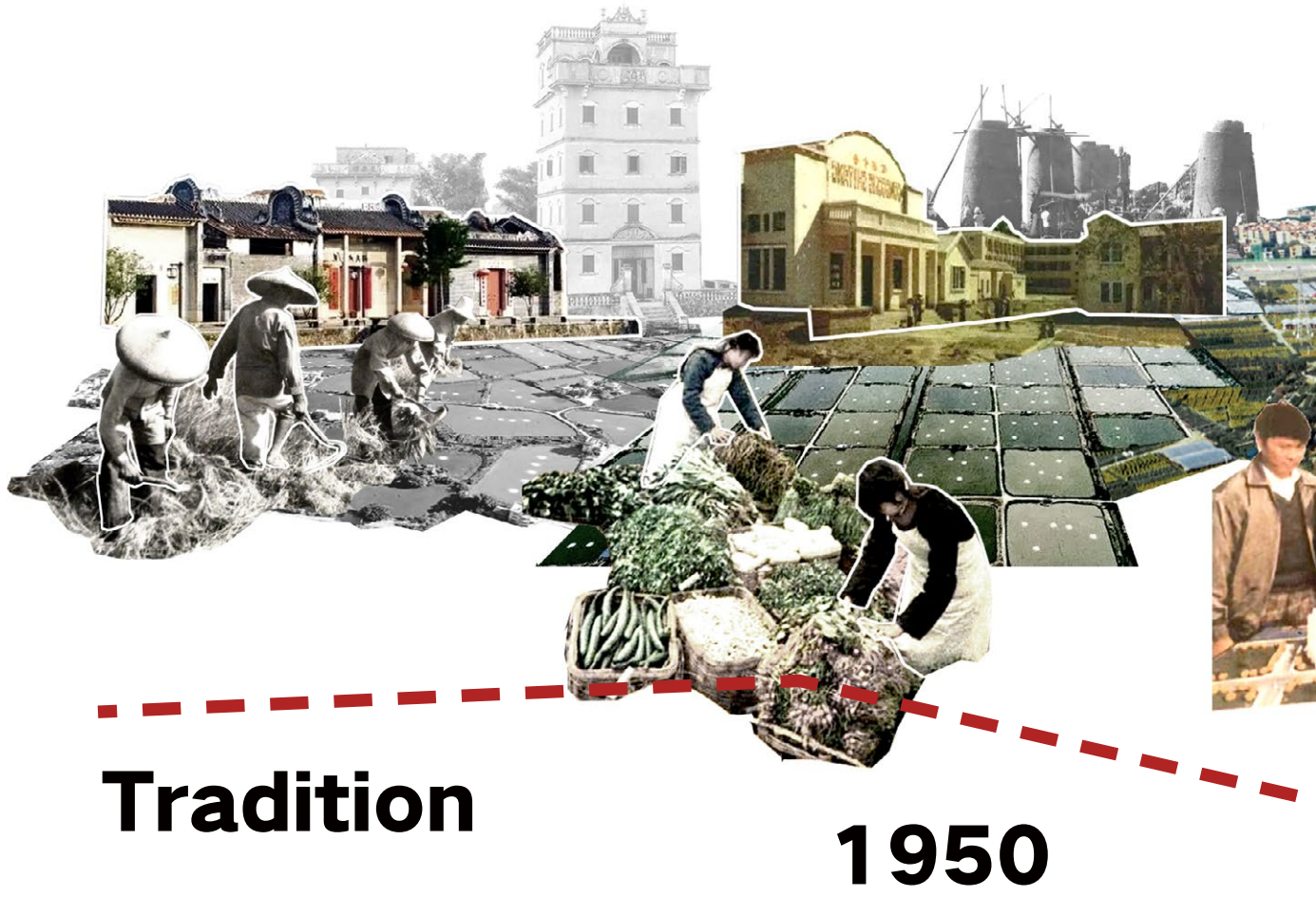
Fig.48 Assement of the Traditional Production Model in the Countryside

Traditional development of the countryside in the GBA presented a self-sufficient model structure together by multiple element layers and interactions between them. It formed a hybrid production culture that combined aquaponics business, water management and social organization based on the unique agri-aquaculture landscape. At the same time, the multifunctional mechanism, organic layout and cooperative society show that the historical development was a sustainable model.

However, the self-sufficient mechanism is no longer adequate for the open market in the modern economy due to limitations of traditional agricultural productivity (Y. Liu, 2018). It is urgent to innovate the small-scale economy in traditional rural production and encourage the village to be an inclusive and external system in the region.

Retrospective Analysis

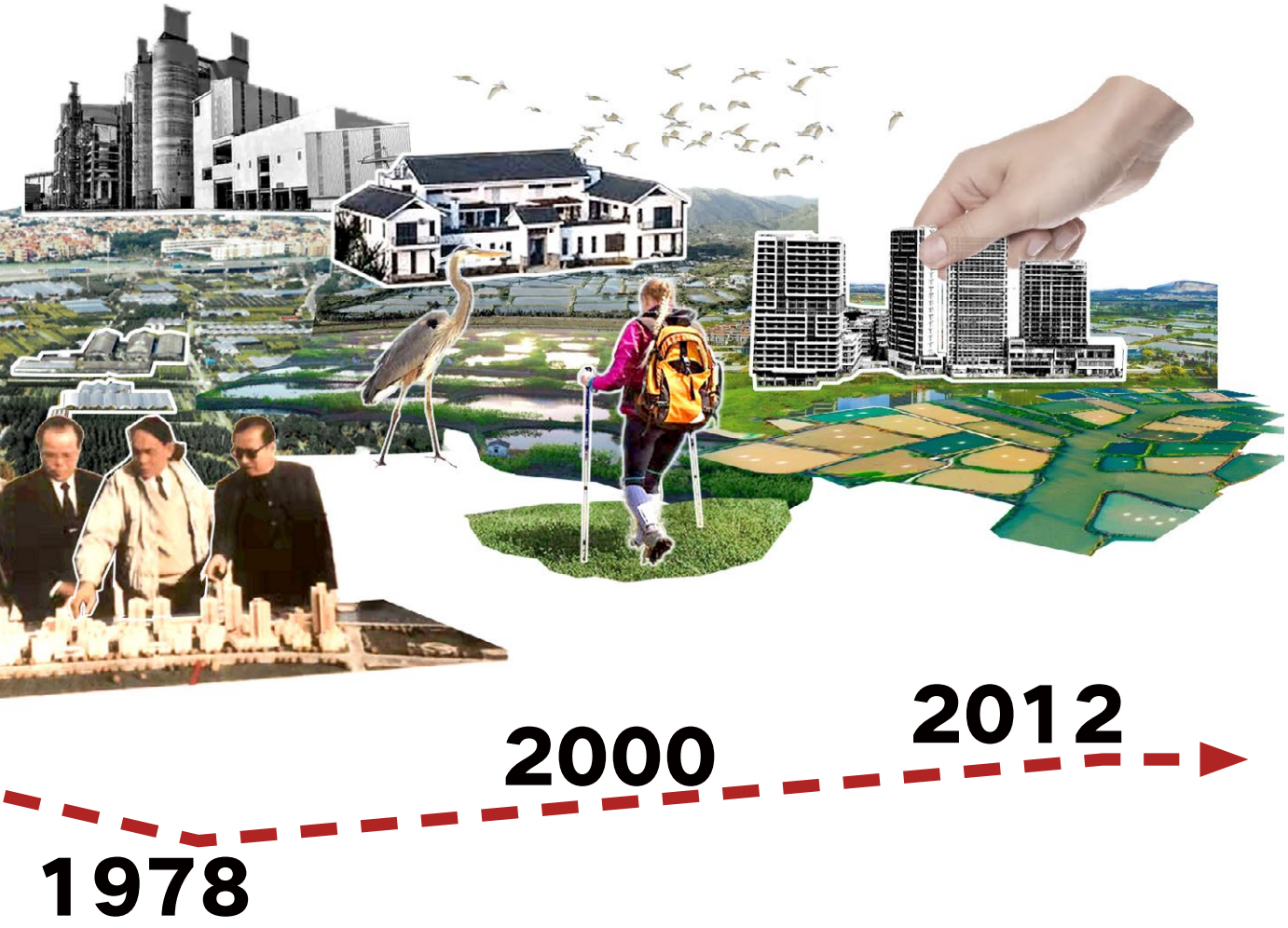
Modern Development Periods Improved the Rural Productivities



Artificial Agri-Aquacultural Standardization

Traditional agri-aquaculture in the GBA have shown a sustainable production pattern. However, the productivity limitations of the smallholder economy and the demands of the rapid development of the regional economy forced the countryside to explore new development values to stimulate the growth of the local economy. This modernisation process can be summarised in five phases that correspond to the evolution of national rural policies (explained in the challenge part).

During the period between 1950 and 1978, the large-scale urbanization of the PRD region had not yet begun and the region was



still an important agricultural product and export (domestic) area in China. The priority for rural development was to increase the productivity of agriculture and aquaculture for supporting provincial GDP growth (Riggs, 2005), thus the standardized dike-pond structure, which facilitated collective production, was promoted widely in rural areas. During this period, the cooperative replaced the clan as the new production organization. Although collective cooperation was being inherited, the governance build up on the local culture was changed thoroughly. At the same time, under the influence of the Great Leap Forward Movement (1957-1960), the labour force taken up by the iron and steel smelting industry led to abandon of significant agricultural fields. The contrast between the renewal and degradation of the dike-landscape revealed the conflict between local agriculture, the basis of the rural economy, and the demands of regional industrial development.

Retrospective Analysis

Modern Development Periods Improved the Rural Productivities

Booming Urbanization and Local Industries

After the reform and opening up (1978), the PRD has become an important economic region in China. Urbanization and the local industry become the primary objectives of regional development. As a result, the rapid urbanization has affected agriculture and transformed Guangdong Province into an import area for agricultural products.

During the period, the development of local industry was the main economic stimulus for the countryside. Rural land with low rent has attracted the widespread industrialization byond cities. With large amounts of arable land encroached upon by factories (Yu, et.al., 2020), the traditional dike-pond system have been irreversibly polluted and degraded. Furthermore, parts of the rural landscape was transformed into utopian leisure areas for serving citizens during the urbanization process. In Zhuhai, for example, the natural beauty of the rurual environment attracted a large number of estate developers who transformed the traditional countryside into high-end housing and golf courses to provide residential and recreational functions for investors from Shenzhen, Macau and Hong Kong.

In the past studies, some experts described this transformation as a trend from a lower to a higher level of industrial structure (Yang, Jia, 2013). However, urbanization at the expense of rural development has led to the rapid decline (2.1%, 2010) of agriculture, which is the basis of the economy. The regional industrial structure has shifted from a smallholder economy to an opposite extreme. As a result, the level of local economies in the GBA is now positively correlated with the degree of the urbanization (Chen, et.al., 2012), and the concept of the countryside is linked with the undeveloped economic situation.

Tentative Transition for Sustainable Demands

Following the national trend of coordinating urban-rural relationship and the requirements of sustainable development, from 2000 onwards the governments of the GBA suspended the occupation of rural areas by urbanization and started to explore the environmental value of the countryside and the agricultural landscapes.

The understanding and practices of the sustainability concept in this period were rather superficial. A large number of villages were transformed into tourist museums that attracted the surrounding citizens through " recreated traditional production ", and the image of the countryside was alienated into an ornamental landscape differernt from the hustle and bustle of the cities. However, what the stimulus brought was short-term economy growth, and the homogenized replication of the tourist model gradually made the 'characteristics' shared by increasing number of villages less attractive. And for long-lasting market competition, the economic value of local production has not been comprehensively enhanced. In one word, the concepts of the environment protection and the present manufacturing-driven economic development were not integrated, and the profits created through mono-functional landscape relying on tourism are limited for rural areas in the long-term.

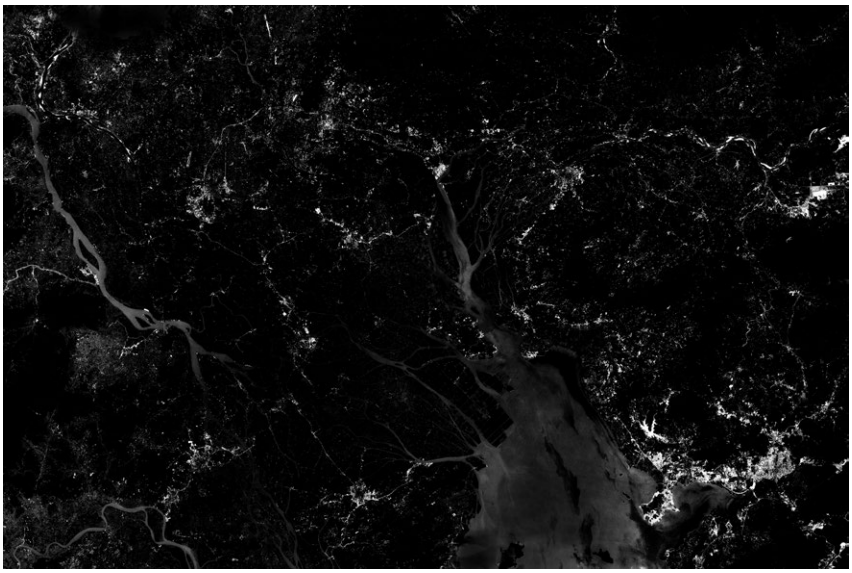
Encouraging Integration through the Urbanization

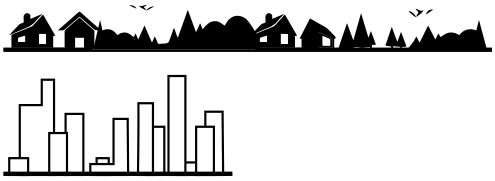
As the development of the sustainability concept, rural development policies in the GBA are continuely improved from limited environmental protection to constructing composite rural productivity. The Guangdong Planning in 2021 identified the modern urban-rural integration as one of the key objectives for the province development goals in 2035. Additionally, the adjustments of land ownership policies provide opportunities for future interactions between urban and rural elements: The separation of the land contracting right and the land management right ensures that local farmers could obtain profits from the land while encouraging the involvement of urban investments and technologies (Guangming Daily, 2018).

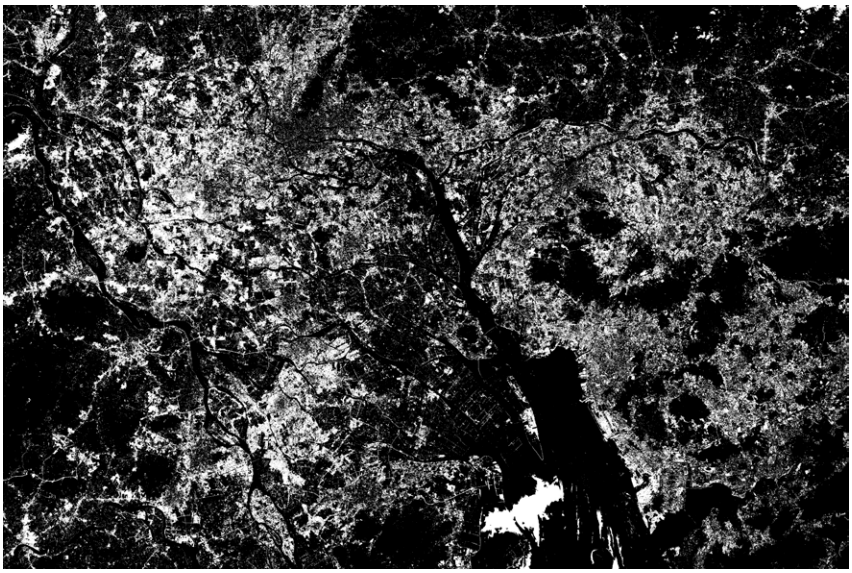
However, from the perspective of the entire current planning system, the development of rural areas is still only a marginal topic in regional development. Urbanization and the citizenship of villagers remain the main path of the regional integration process. Furthermore, despite the rapid development of the non-agricultural economy in rural areas, the present rural industrial structure is still detached from basic agricultural production. The stimulative economic strategiess are not sufficient to help the countryside to develop comprehensive and sustainable productivities in the long-term.

Transition

The “Figure and Ground” Inversion







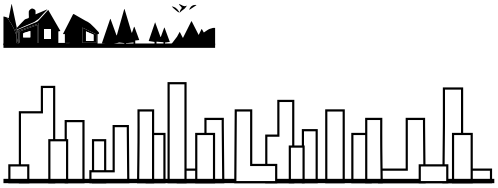


Fig. 49 Inverted "Figure And Ground " in the GBA

Under the urban-prioritized development strategy, the cities in the GBA have expanded rapidly over the past decades, the rate of urbanization increased from 25% to 80% in the period between 1978 and 2008.

Consequently, the figure and ground relationship between rural and urban areas changed inversely in the research region. The original continuous and extensive rural areas(black part in the figure) were compressed into isolated fragments todays.

Three Patterns

Metaphors of Existing Textures in the Countryside

"The Grid"

For maximizing the rural production efficiency from the shrinking agri-aquaculture lands, an industrial modernization is happening on agricultural fields in the GBA. The lands with organic shape and the sustainable product pattern were transformed into geometric ponds with thin dike and hard basement, which leads to the declining flooding resilience of the fields in the long term.

Fig.50 From Organic Hybrid to Industrial Grid

"The Blanket"

The traditional agri-aquaculture system is not only a sustainable production pattern but also an important natural resource within the GBA because of the wetlands provided by the dike-ponds. After realizing the importance of the ecology, the government designated several agricultural production areas as excluded natural reserves. However, without the intervention of agricultural activities, these hybrid eco-system based landscape is degrading today.

Fig.51 An Ecological Park as the Green Blanket

"The Volume"

Agri-aquaculture lands in peri-urban areas are still under threat of urbanization. Through applying functional zoning and urban design, govern-ments and investors plan to build these areas into quality resorts and innovation utopia for city consumers. The strategies using landscape resources could stimulate the local service economy in the short term, but will leads to the alienation of traditional agricultural production due to the separation between villagers and fields.

Fig.52 An Ambition of the International Resort

2022: Rural Production Areas

Agri-Aquacultural Fragements with Typical Landscape Partterns

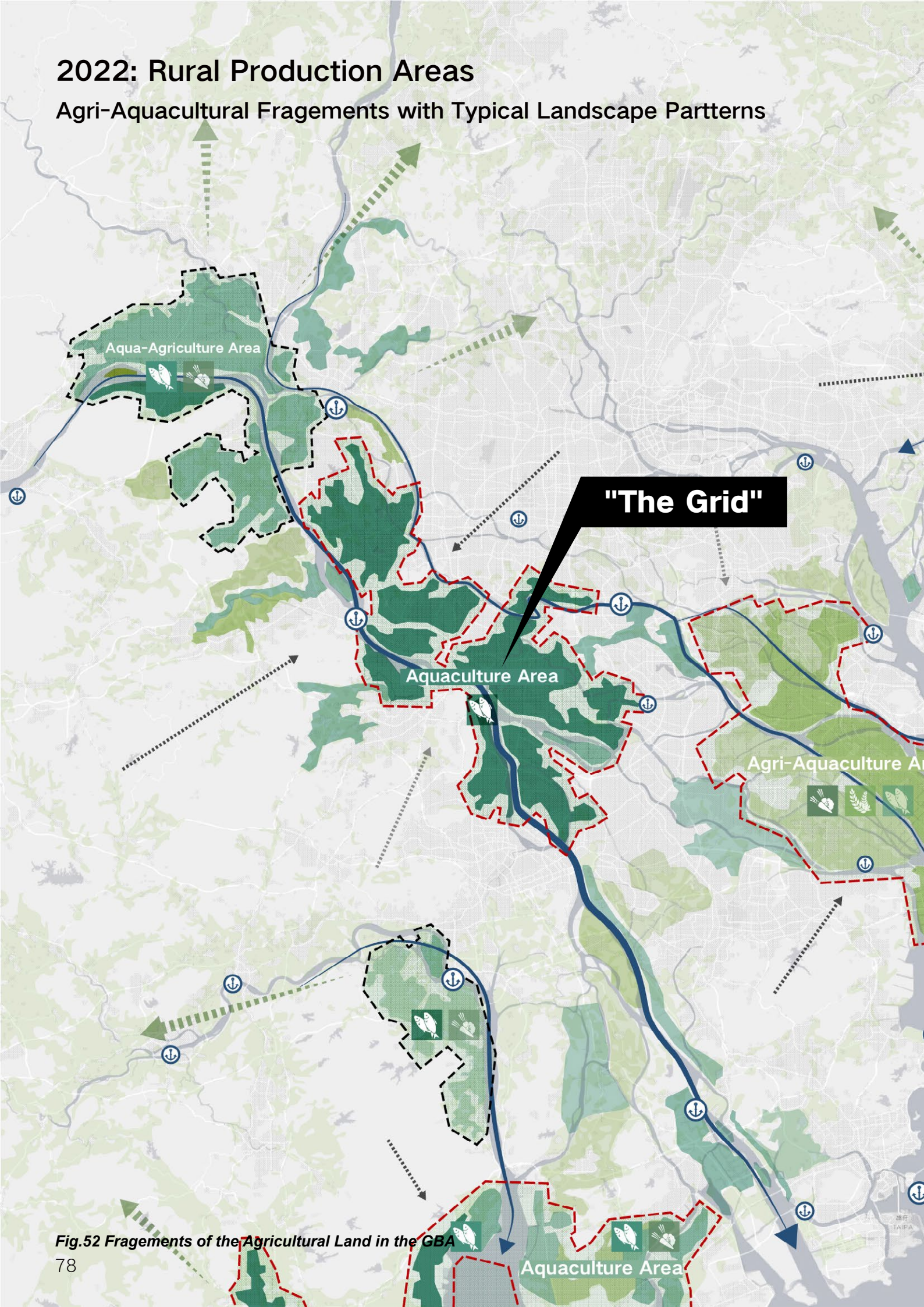
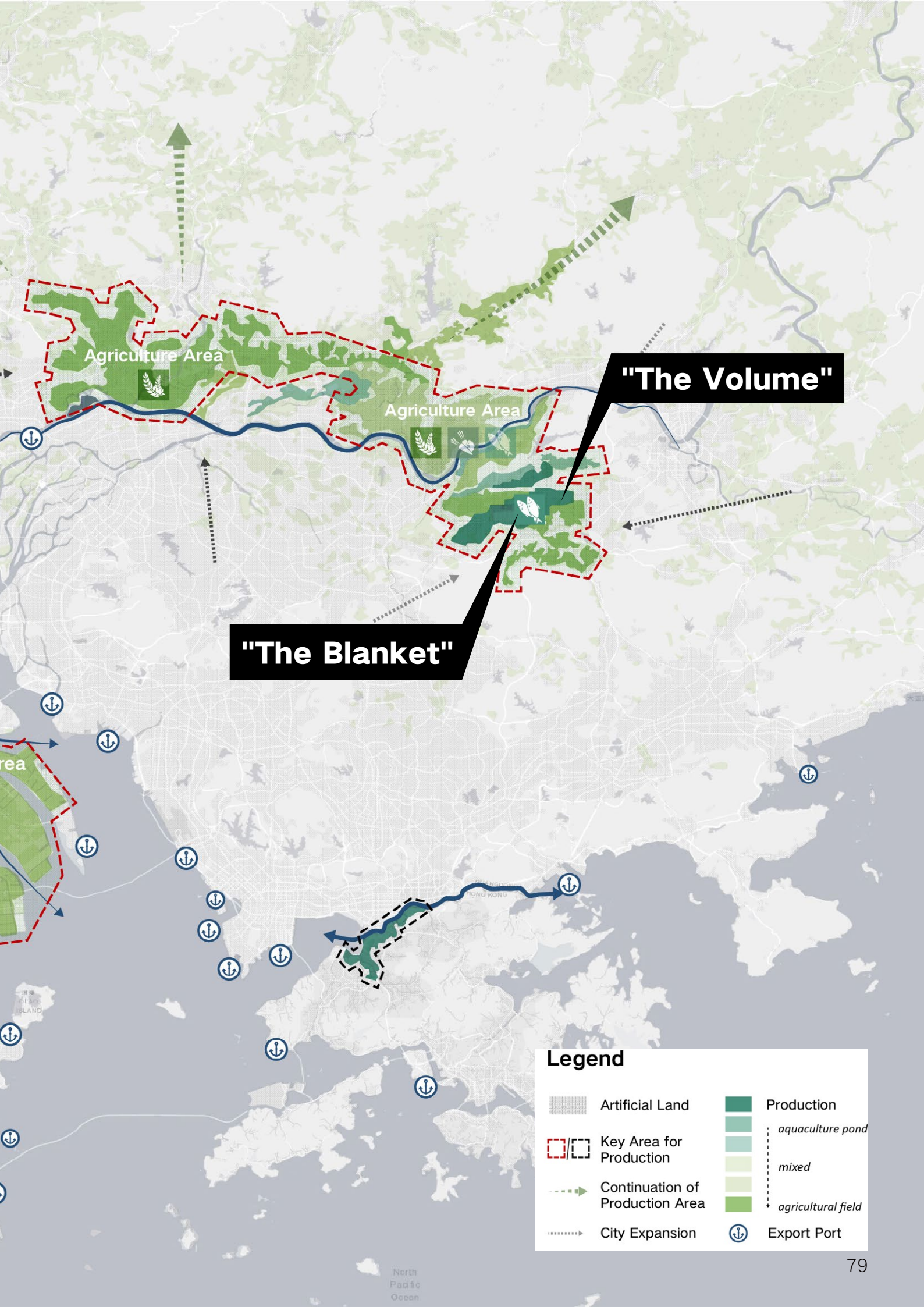


Fig.52 Fragements of the Agricultural Land in the GBA


Agriculture Area
Agriculture Area
"The Volume"
"The Blanket"
Legend
Artificial Land
Key Area for Production
Continuation of Production Area
City Expansion
Production
aquaculture pond
mixed
agricultural field
Export Port

"The Grid"

Pattern I: Production-driven Development in the Countryside

Fig.54 Simmillar "Grid" Texture in the Countryside and the City

The first type of "Theh Grid" texture appeared in the last century, and it was created to provide the economic basis for the regional modernisation in a short time through stimulating the primary sector. The geometric order reflects the artificial transformation of the local organic landscape by target-oriented modernism planning.

The analysis chapter selects the town of Xingtan as the research area, which is part of the Shunde, Foshan City. Rely on its history as a traditional fishing producing district, local aquaculture production was intensified during the period of feeding industry by agriculture for supporting urbanization within the Pearl River Delta. The fact reveals the limits of the mono-pursuit of efficiency in the modernisation process.

Function

Standardization for Improving Rural Produnctions

The 'Grid Model' of the dike-ponds system was created in the 1960s for improving the situation of 'broken dike, shallow ponds and unconvinient transporation' in rural areas. It was implemented as a public strategy to promote intensive aquacultural sector in the countryside and enhance the efficiency of the local production. The form was widely distributed in the west esturine of the Pearl River, especially in Shunde, Nansha and Zhuhai cities, which were main aqualculture areas in the GBA.

Standardization of the traditional dike-pond landscape replaced the organic rural layout. It created an artificial and geometric order in the countryside. During this process, the ponds were reshaped into standard rectangles of approximate an artificial and geometric order in the countryside. During this process, the ponds were reshaped into standard rectangles of approximately 70 by 70 metres, and the dikes were transformed into thin straight lines.

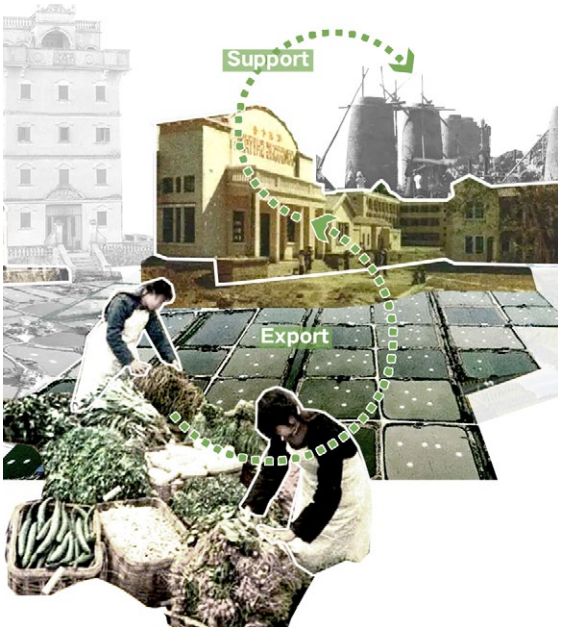


Fig.55 Standardization of the Landscape

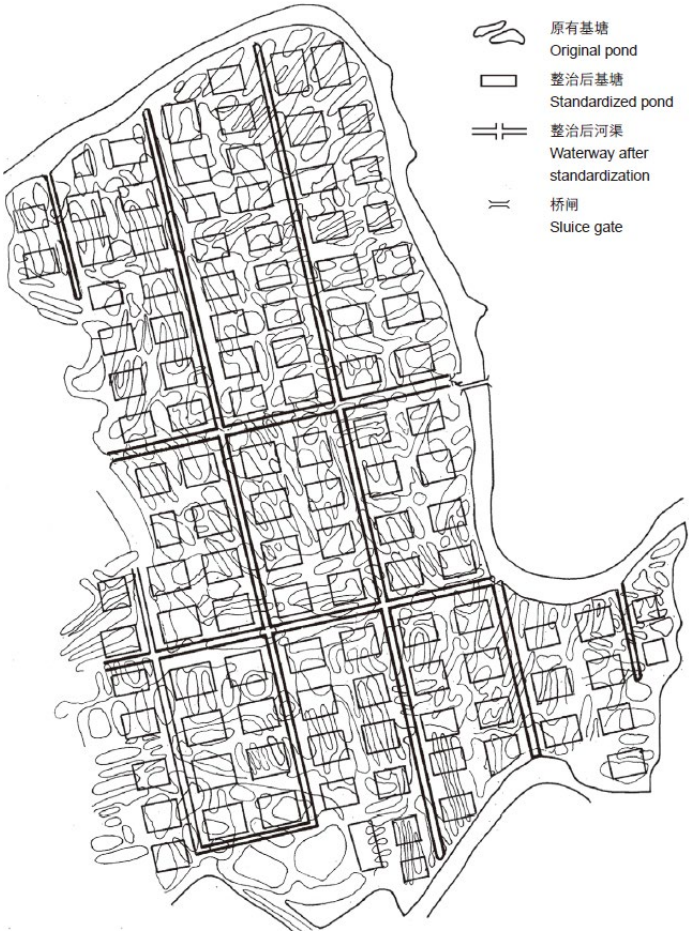


Fig.56 The Pond Standardization in Shunde, 1975

Besides, In some areas, cement was used for new pond construction, the hard material destroyed the ecological functions of the initial soil dike (Tian, 2019), and turned the unit, which was integrated with the natural system, into industrialized aquacultural machines. Today, this consolidation is continually being implemented in the planning of the Foshan Government.

Shape

"GRID": A City Language of the Modernism

Orderly Geometric

The grid form arose from the quest for production efficiency. After the countryside was defined as an aquaculture production zone, the well-organised and large-scale production units became a sign of the modernization. The artificial straight lines transformed the traditional organic layout into geometric textures with horizontal and vertical division, and the randomness of the natural substrate was replaced by the mechanism language.

In the standardized aquaculture landscape, the grid model is composed of roads, channels and dikes. These three lines together separate the field into pond units with common size and shape. Today the traditional agri-aquaculture landscape have disappeared and been replaced by aqual-factories show mechanical rationalism.

Efficient and Rationalistic Mechanism

The geometric aquaculture landscape in Xingtan Town reminds of the urban fabric simmilar in morphology. The most famous sample is the chessboard plan which created New York, the international metropolis, from a natural substrate. in 1932, Corbusier declared the beauty of the mechanism in ***Towards a New Architecture*** and applied the method of designing machines to systematic urban planning. Following the menifesto, the grid, together with the straight lines that form it, has become the most prevalent symbol within the modern cities: the direct connections represent efficiency, while the constantly repeated straight lines produce homogeneous spatial units efficiently.

In compact urban areas, the standardized grids encourage agglomeration as well as rapid expansion. However, the geometric design is a top-down process of creation. When this mechanistic tool is applied to the regeneration of the countryside, it ignores the organic systems that already exist in the rural area. Through rough replacement, the tool applied rational new mechanisms on the initial landscape. Yet in some ways, the new created system did not restore all advantages of the traditional system.

Fig.57 The Grid Agri-Aquaculture Land in Xiangtian County

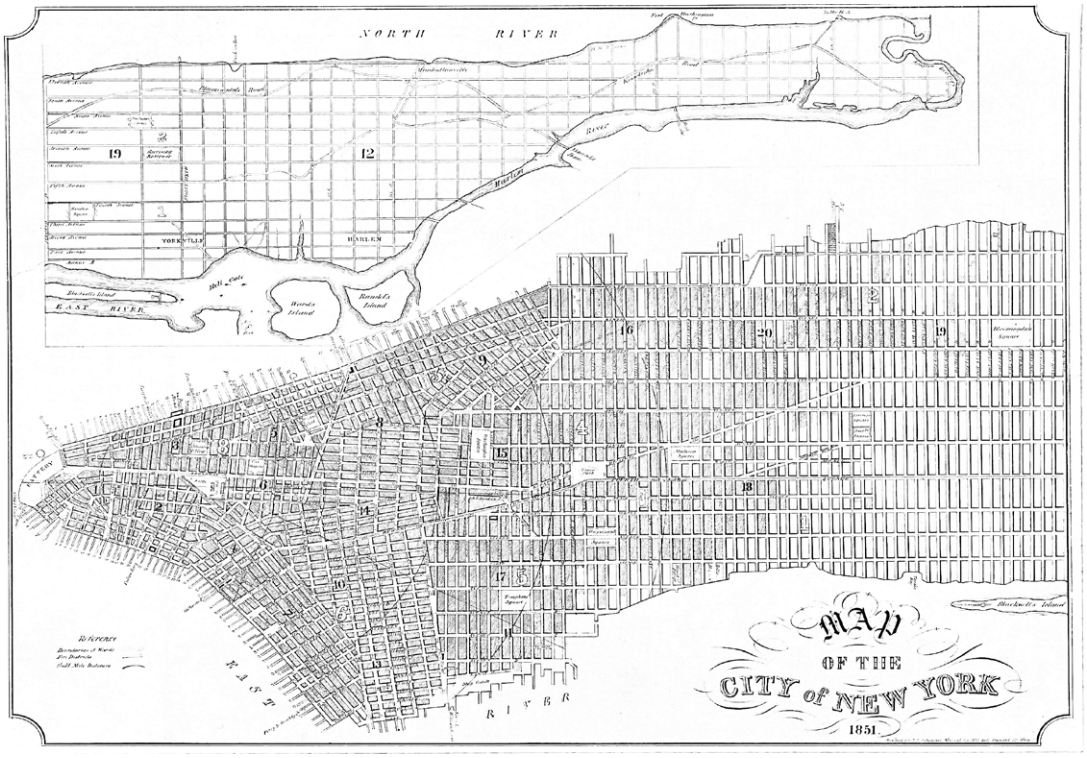


Fig.58 Proposal for Manhattan Grid

The Well-known Grid System for Metropolitains in the New York City

Shape

The Strength and Limitations of the Grid

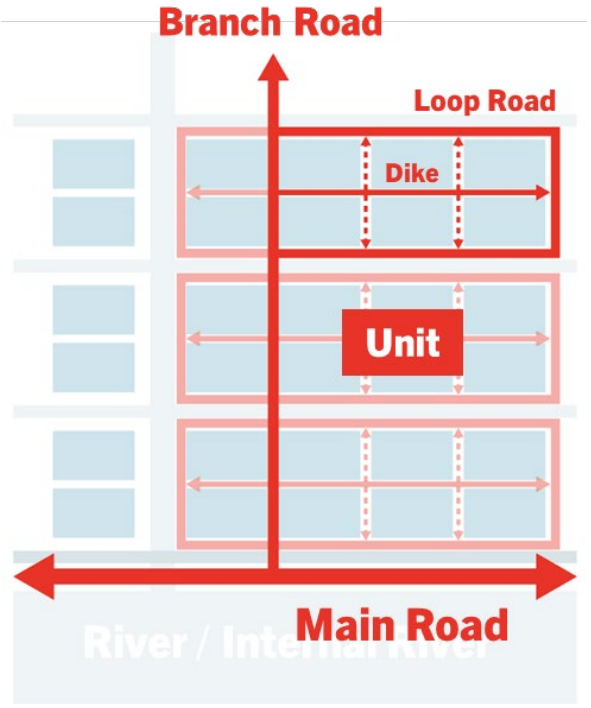


Fig.59 The Grid for Transportation

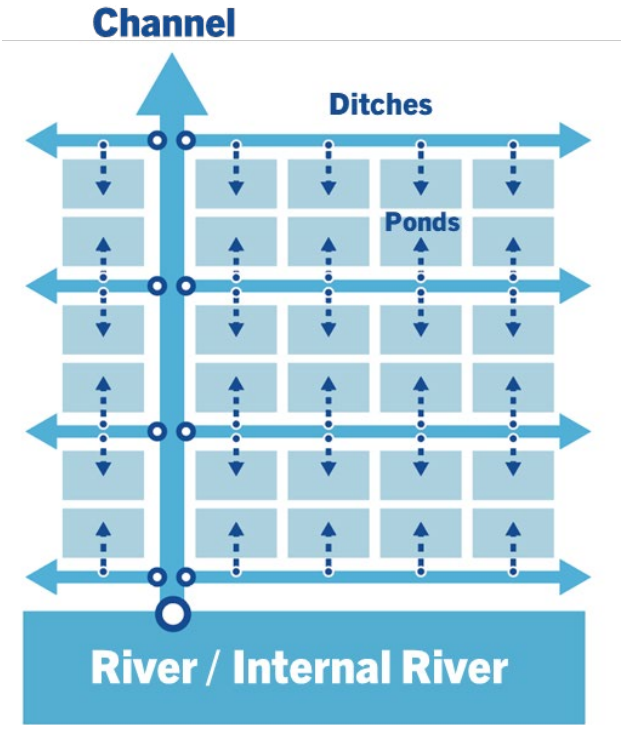


Fig.60 The Grid for Water Management

The Strength of the Grid

On the one hand, the geometric organization facilitated convenient transport and the product efficiency relyed on water managment. It was successful in the first years of application.

From the perspective of transport, the original zigzagging dike system was transformed into a network formed with straight lines, which makes the system adaptable to modern transportation taking vehicle mobility as the main consideration. From the perspective of water management, the pattern optimised the water management and improved the quality and quantity management of the water based on the traditional multi-level network("river-branch river-channel-ditch-pond). Additionally, the traditional irregular production units are replaced by uniform rectangles. The standardization encouraged the collective management and distribution of the production materials.

The Blindness of the Grid System

However, the existing standardised transformations are geometric combinations on the flat plan, where the scales of the elements within the system are blurred in the top-down planning. The abstraction of the elements in the form of the grid leads to the splitting of the integrated dike-pond system into the pond, which carries the production as the main function, and the monofunctional dike. The pond is the primary element for proprietors as the production unit. And the dike is understood as the line in two dimensions as a division boundary rather than a three-dimensional volume.

Consequently, the crops originally cultivated on the dike surface gradually disappeared and the traditional material cycle, in which the dike plays an important role, was broken.

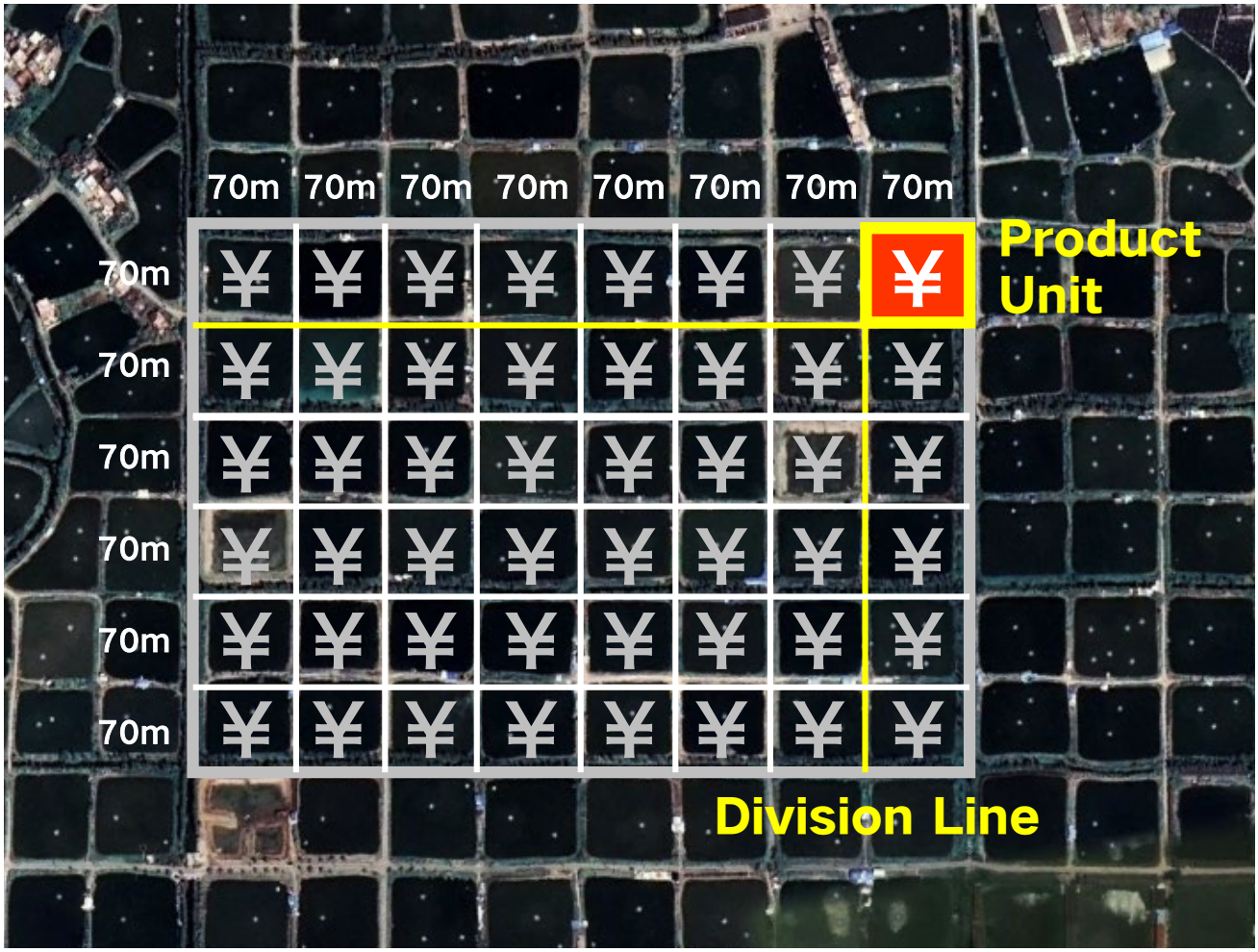


Fig.61 The Diagram of the Dike Ponds Division

Shape

Degeneration of the Mono-Pond System

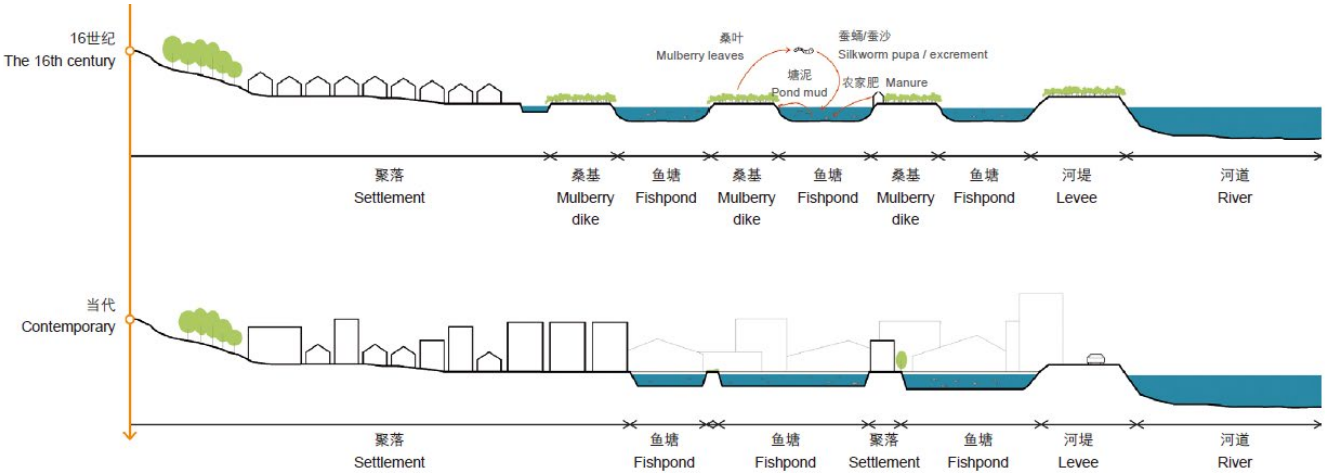


Fig.62 Contemporary Dike-Pond Landscape
Seeing from Above: Observation of Contemporary Dike-Pond Landscape

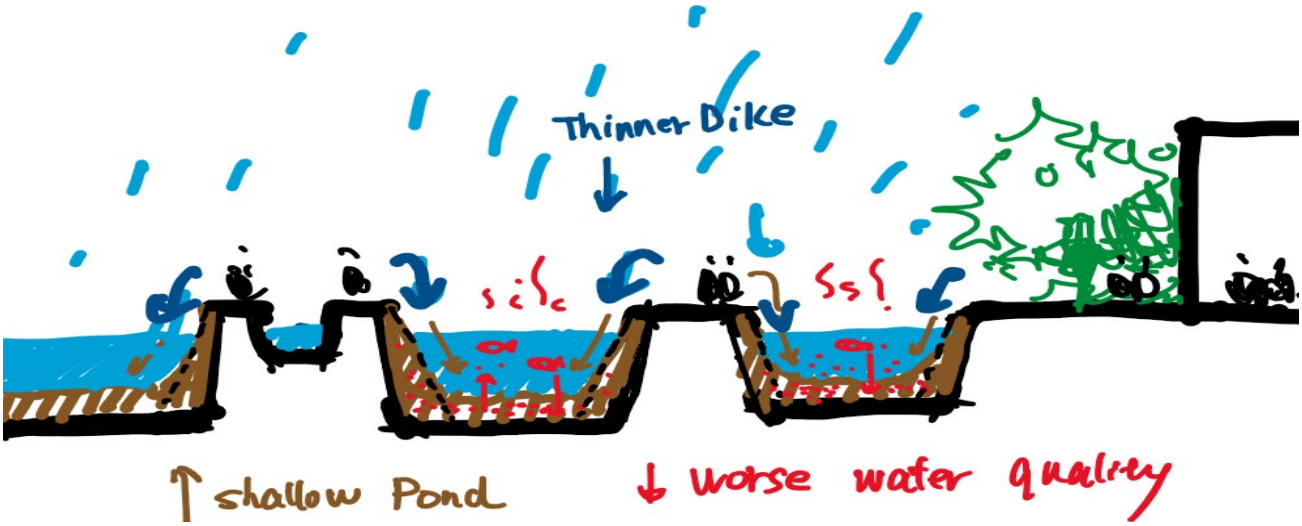


Fig.63 Degeneration of the Mono-Pond System

On the other hand, improved profits in the short term encourage villagers to expand their ponds, and the size of the dikes shrinks during the process. As a result, the resilience of dikes is weakened, which makes the pond system more vulnerable when facing flooding. At the same time, the soil stripped by rainwater would become silt at the bottom of the ponds and making them shallower, together with the broken circulation of the original material due to the dike cultivation disappearing, the capacity of the water purification is reduced gradually in the system(Tian, 2019). In the long term, the productivity of the pond will decrease.

Governance

Competitive Production Objectives within the Grid System

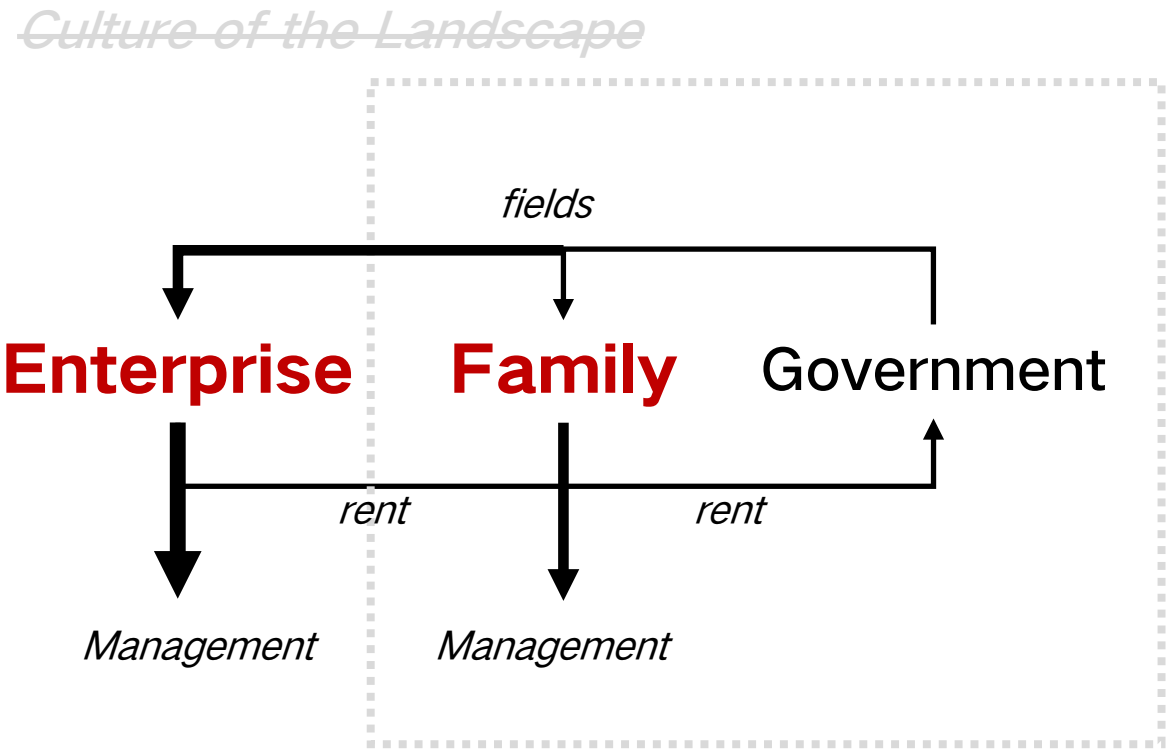


Fig.64 Competitive Governance Model in the "Grid" Development Pattern

After the disappearance of the traditional clan culture, rural production changed from a collective cooperative model to a competitive model between different stakeholders. The advantages of standardization were not fully exploited, and the form of intensification did not lead to an intensive management.

Currently, fish ponds are subcontracted to local takeholders through a competitive bidding process. During this process, the access of different players to the production materials is determined by the level of their current wealth. At the same time, the production competitions have exacerbated the wealth gap between villagers due to the wide disparities between the benefits gained from the crude cultivation.

Besides, standardization did not fundamentally improve the productivity of the aquaculture sector. In the market competition oriented by profits, significant amounts of agricultural lands were converted to industrial land for higher income, and the countryside has become the carrier of spillover city industries.

Indicate: Separation

Separation of the Dike and Pond System

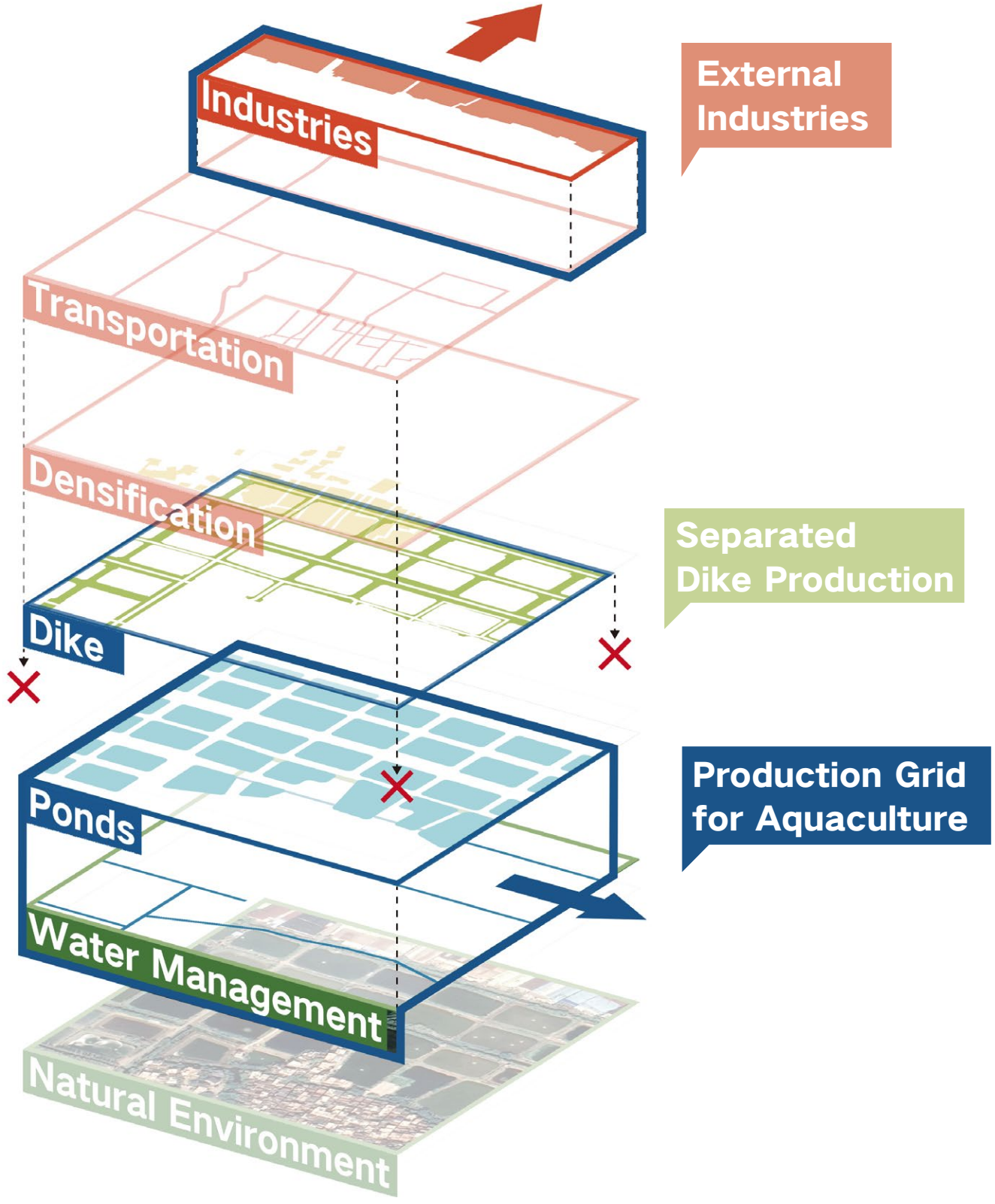


Fig.65 Incomplete Rural System with Separeted Dike and Pond Layers

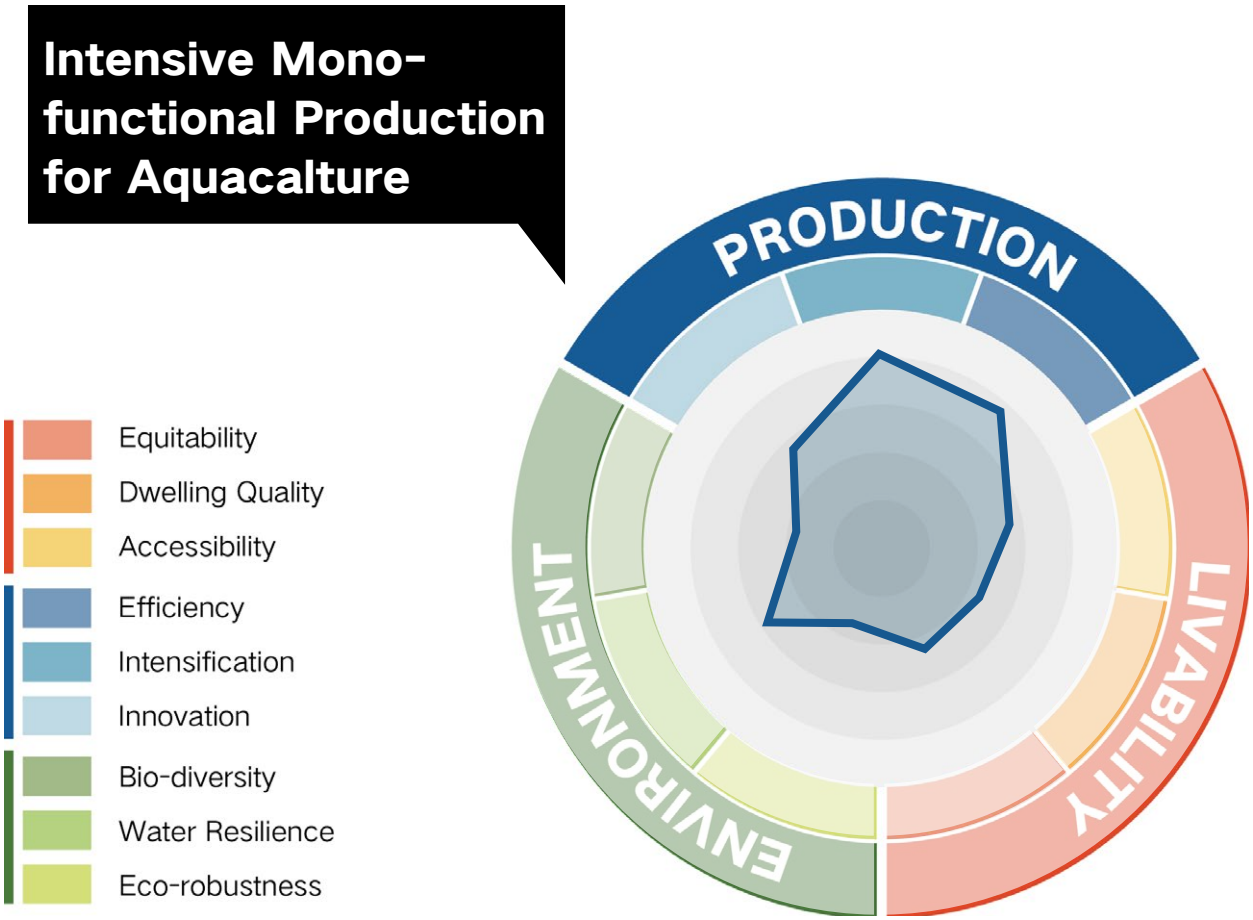


Fig.66 Assement of the Countryside under "the Grid" Model

The separation has been created through the standardization of the rural landscape-oriented toward an intensive aquacultural production. The standardization weakened the productive and ecological function of the dike and transformed the dike-pond system into monofunctional pond units. The social management and trade organized with the traditional agri-aquacultural landscape have faded away.

Under top-down planning, the specific functional position results in the monofunctional approach to production efficiency. Somehow, the standardization of the agricultural landscape facilitated the scaling up of production and economic growth. However, in the long term, modernisation is not complete. The improvement of the productivity still focused on the yield of a single product, and the disrupted social-production balance limited the systemic productivity of the countryside as a composite settlement. At the same time, orderly industrialization undermined the ecological considerations in traditional production and increased the input requirements to maintain material circulation. Although the model is an invention of the specific historical context, the growth of short-term return allows this strategy to be applied continually in the old way. There is potential to promote intensification of the existing context in a more sustainable method.

"The Blanket"

Pattern II: Environment-driven Development in the Countryside

Fig.67 Simmillar "Blanket" Texture in the Countryside and the City

The second texture, 'the Blanket', is a remedial measure for the industrial pollution of the urbanization. Through top-down functional zoning, the government planed to transform the rural fragments into mono-functional nature reserve, where human activities are minimised for ecological restoration.

The analysis chapter selects the plan of the Tonghu Wetland Park proposed by the Huizhou government as the object of the research. It analysis the reasons behind the failure to implement this mega-scale infrastructure design as a green utopia. It also reveals the nature of this simplified countryside is a creation of elitism and an exhibit among cities.

Function

A Huge Natural Reserve among Cities

After decades of urbanization, the planners and governments started to realise the environmental damage caused by urbanization and industrialization. Considering that most of the land is already occupied by urban development, the remaining rural areas together with its organic landscape were regarded as experimental sites for implementing the goal for environment reparing.

Fig.68
Sustainable Goal under the Urbanization

The Tonghu area has the largest inland freshwater lake wetland in Guangdong province. Rich ecological resources made it a bio-diverse habitat as well as a seasonal cultivation district in the history. However, after military reclamation and boom of the local industries, the environmental quality within the area deteriorated significantly. In 2010, the concept of the Green Tonghu was proposed by the

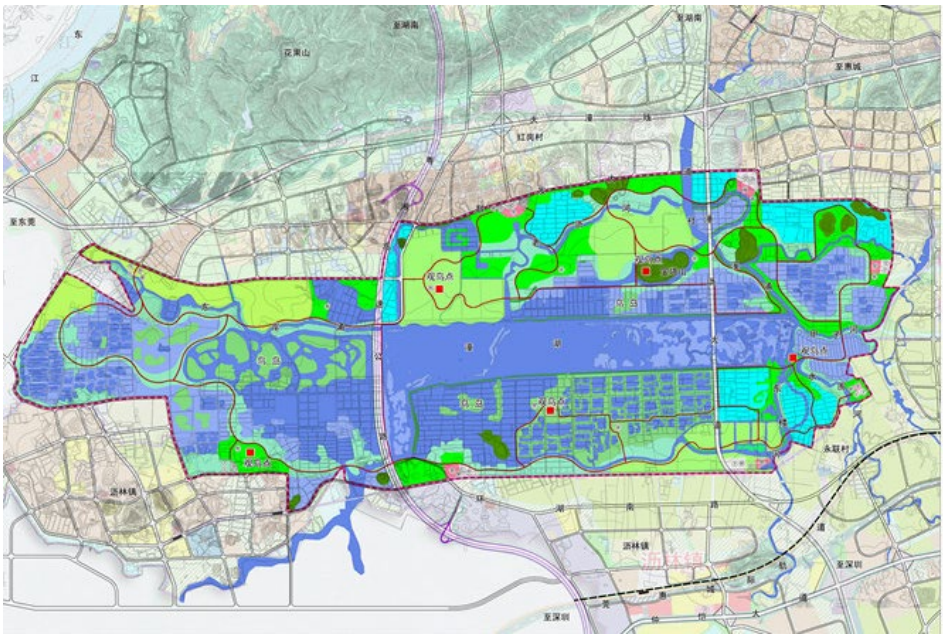


Fig.69 Proposal for Wetland Park

province government, the lake together with surrounding landscape was established as a nature conservation area.

The proposal for the Tonghu Wetland Park separated green areas from constructed areas through clear boundaries, the wetland area was radically expanded, the original constructions on the site were removed and tourism became limited human activity in site. It imagined a huge ecological infrastructure which transformed the area into a natural utopia.

Shape

A City Beautiful Movement Against Urbanization

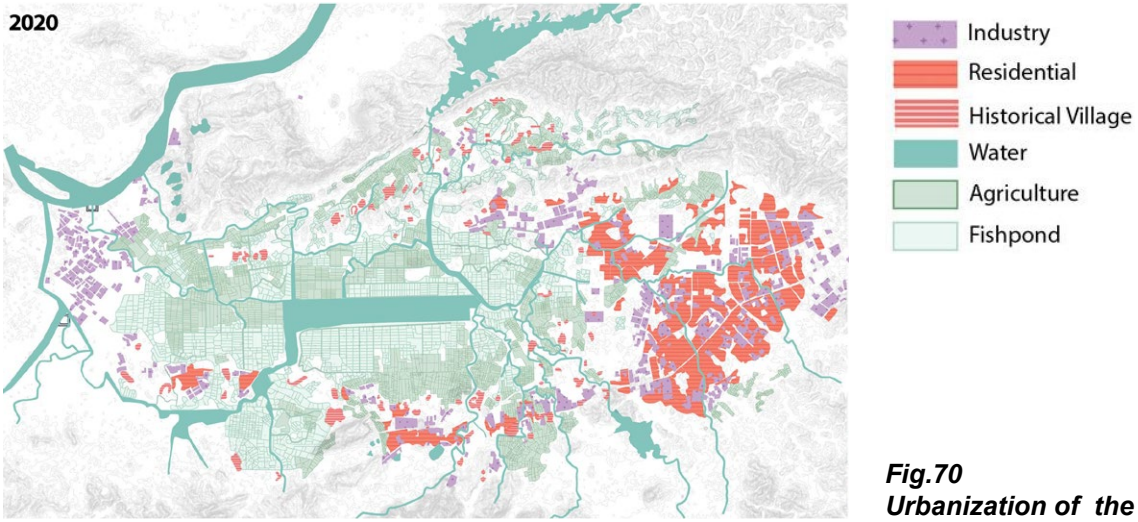


Fig.70
Urbanization of the Tonghu Area

Fig.71
A Green Blanket Between Cities

A Super-scale Green Carpet for Ecology

The wetland park is a super-sized public green space four times larger than New York Central Park, and surrounded by urban fabrics. Although this conserved ecological zone is not entirely artificial, the similarities between the ecological park and the central park are revealed by segeration boundaroes and mono-functional transformation of existing environment.

The nature of the Tonghu Ecological Park is a top-down "city beautification movement", and a simulacrum of the rural landscape in the elitist imagination.

Governance

A Deportation Order for Villagers Leaded to the Failed Planning

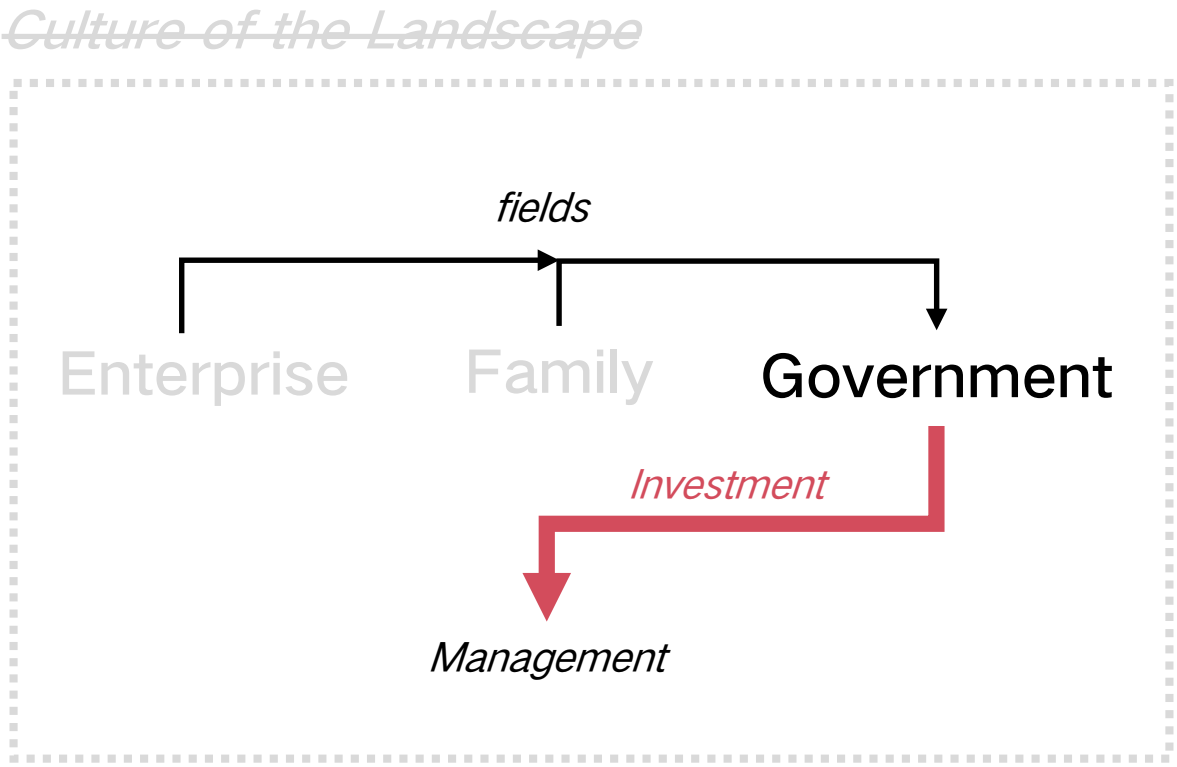


Fig. 72 Deportation Governance Model in the "Blanket" Development Pattern

The mono-functional wetland park defines the sustainable ecosystem as a completely natural landscape system free from human intervention. In the Park planning, the original villages within the site boundaries would be transformed into recreational nodes and the fields formed by the tideland enclosure are degenerated into a more natural landscape. The result is that the government have become the single stakeholder within the artificial boundary and the rest of the stakeholders will be deported to the outside of the zone.

However, mono-functional zoning ignored the fact that existing rural wetlands are integrated ecosystems for both farmers, crops, fish and other species. The intervention of agricultural activities plays an important role in maternal circulation, and the existing energy chain would be broken without the coordination of people. The government, as the sponsor, has to invest in maintaining the disrupted circulation in the long term. Nobody is a winner in this painstakingly designed transition.

Indicate: Isolation

Erased Layers and the Monofunctional Ecological Consider

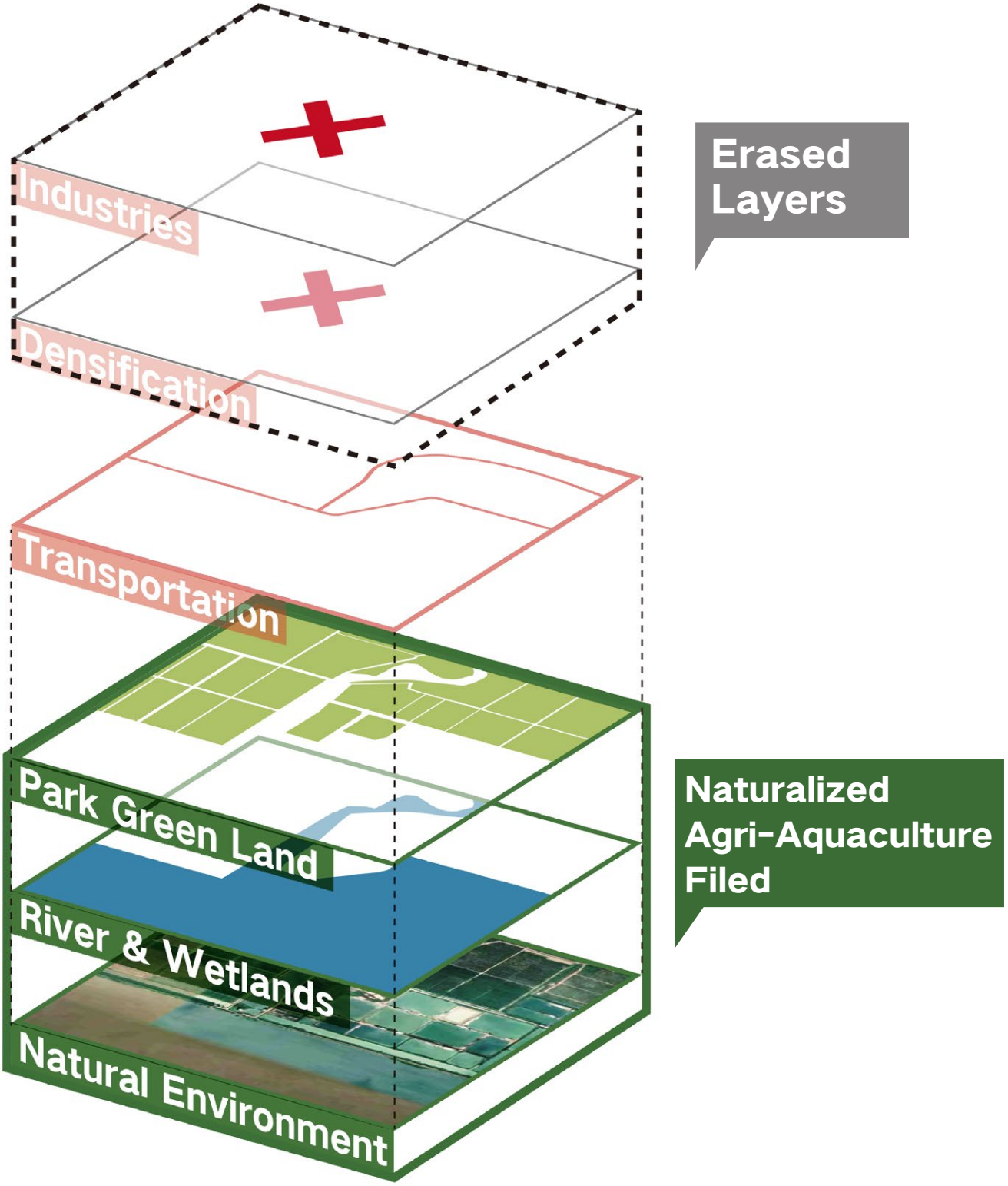


Fig.73 Incomplete Rural System with Monofunctional Environmental Layer

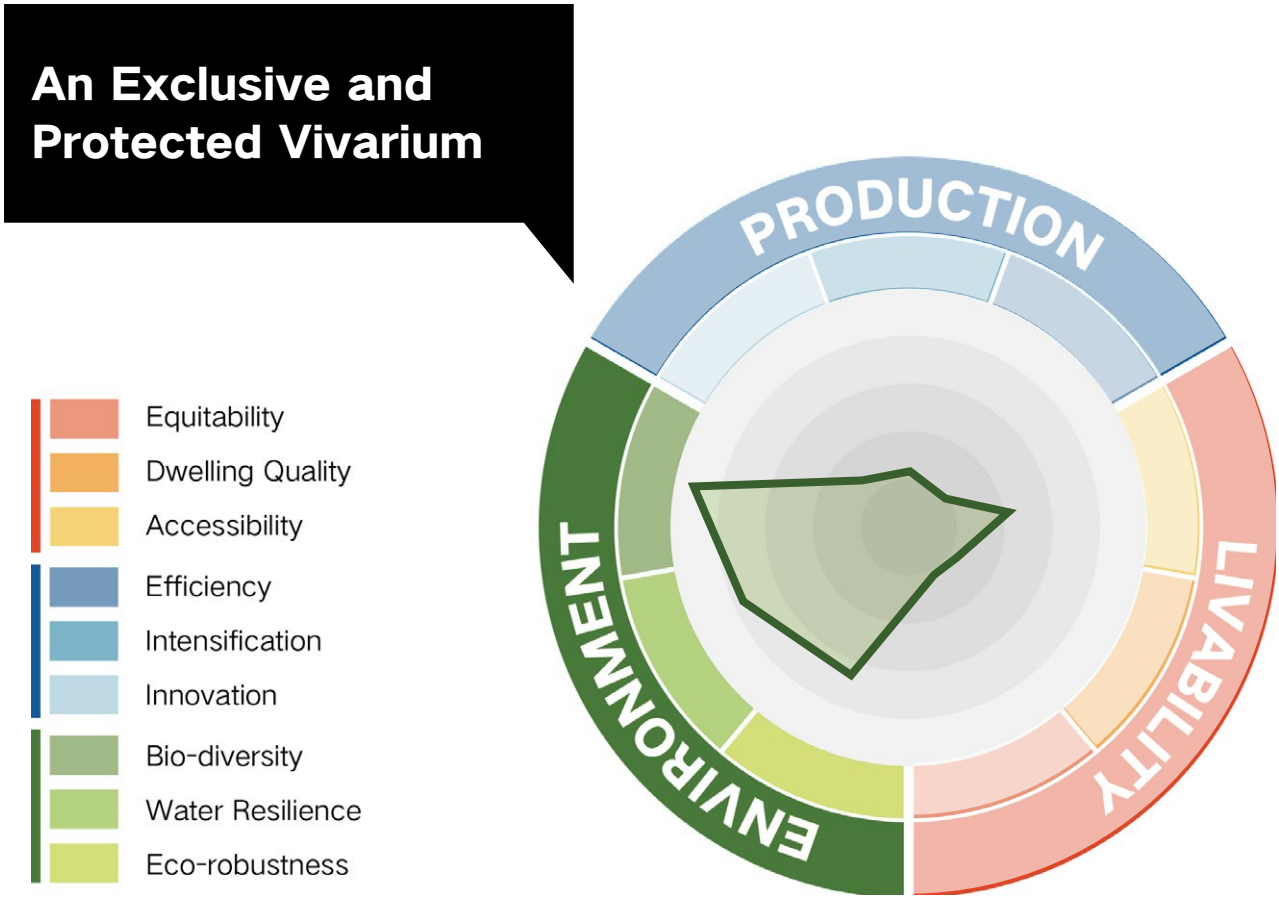


Fig.74 Assement of the Countryside under "the Blanket" Model

The single-functional 'beautification' of the super-scale zone simplified the hybrids rural area into an isolated natural carpet. Within the boundaries of the park, the top-down imagination attempted to erase the human activities and the artificial constructions in order to create an ideal natural utopia. Excursions were made to be the only human activity, while other elements faced an order of deportation.

The planning done by elites detached from reality finally failed under the protest of the deportees. Predictably, the controlling mega-scale public facilities would transform the countryside into an exclusive vivarium for surrounding cities, rather than a production-dwelling system belonging to villagers. The large green carpet is expensive and lacks the vividness of life.

"The Volume"

Pattern III: Urbanization-driven Development in the Countryside

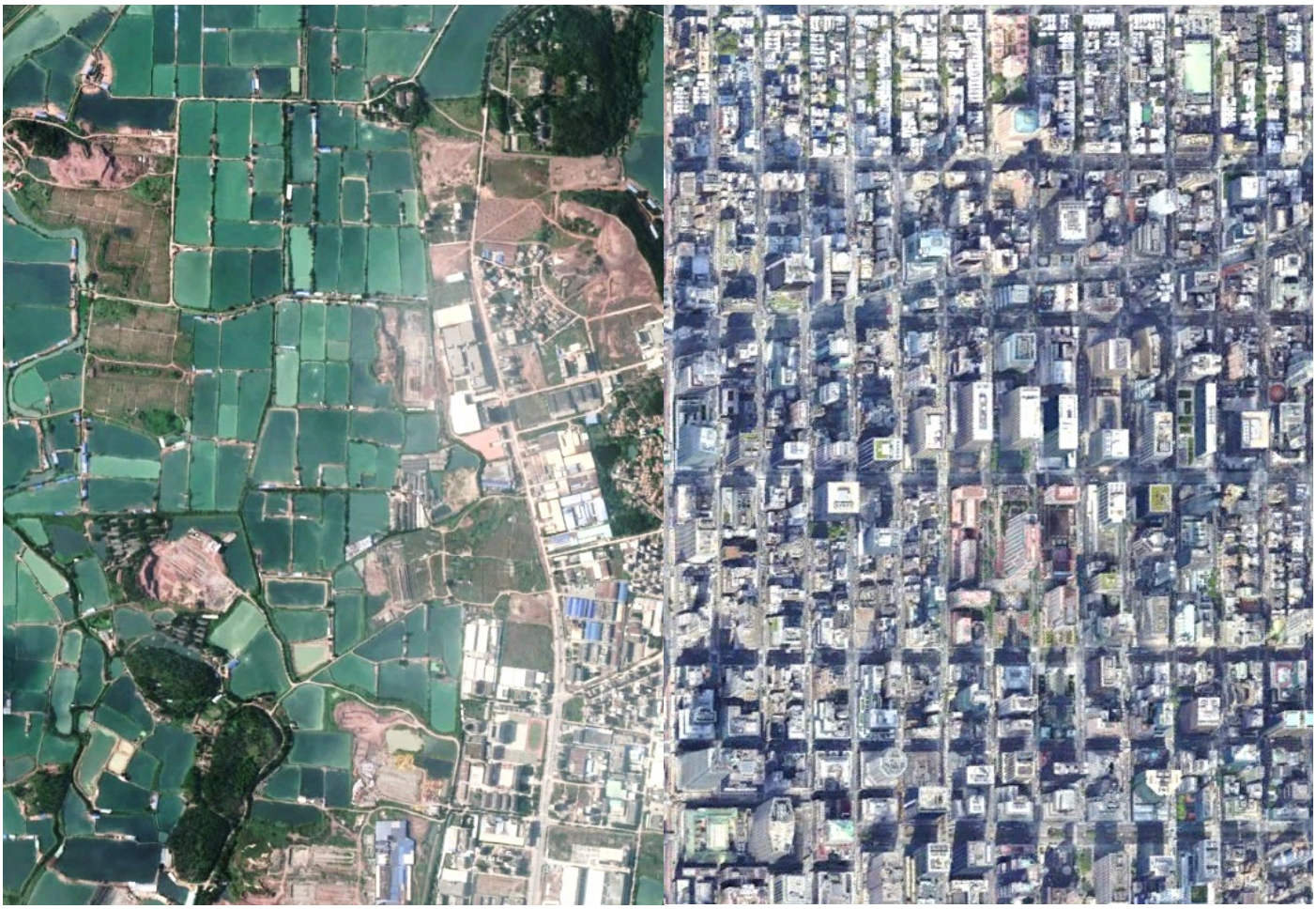


Fig.75 Simmillar "Volume" Texture in the Countryside and the City

The third texture 'the Volume' is a tool of the urbanization happening in the peri-urban countryside. Guided by controlling plan, the homogenized city volumes are inserted overlying on the traditional rural landscape. Unlike the expansion on the urban fringe, the copying and pasting of the urban fabric is intended to transform the countryside into a new satellite city carrying specific functions.

The analysis chapter selects the current Tonghu Creative Park proposal proposed by the Huizhou government as the object of research. The chapter analyses how the current implementation of this ambition emphasized the boundaries between rural and urban areas systematically and spatially through top-down planning. It exposed that transforming into an urban area is not the best path for the countryside development.

Function

An Urbnaization Choice for Development in the New Plan

After the failed attempt to establish a mega nature reserve, the government chose the urbanization path for Tonghu area to maximise its location advantage for greater economic value. An ambition of creating "Silicon Valley in Guangdong" was proposed to establish a laboratory testing ideal city. In the declaration of the ambition, the experimental zone is planned to contain a US$600 billion industrial cluster, attract high-tech industries from the entire GBA even international enterprises. The radical position hinted that it was necessary to create more space in this area to accommodate targeted modern activities, for this reason towers began to appear on the traditional agri-aquaculture landscape as the empirical carriers of the agglomeration.

Fig.76
Towers as a Carrier of the Agglomeration

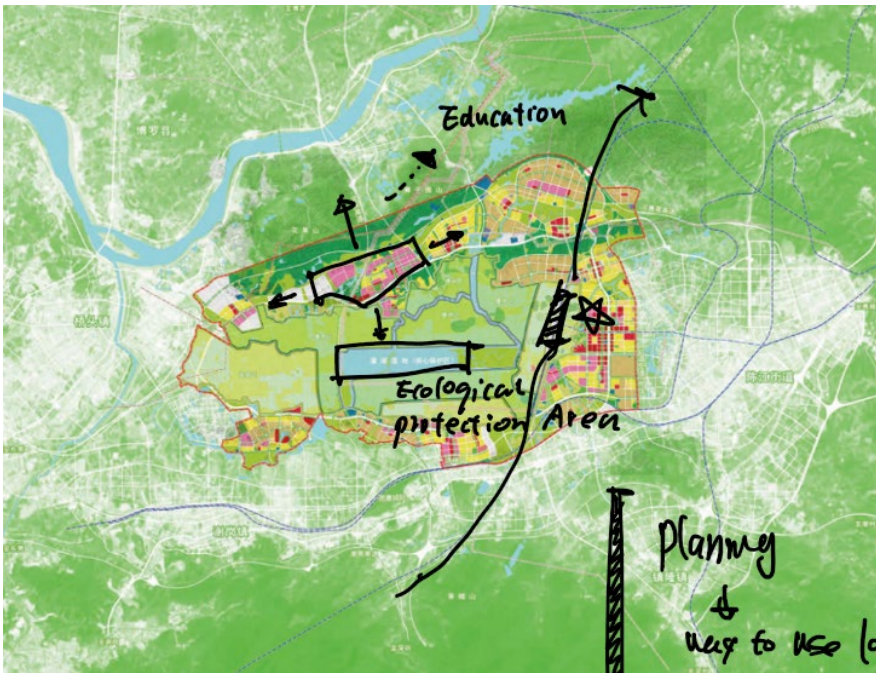


Fig.77
Proposal for Tonghu Innovation Park

The Tonghu Innovation Park proposal retained the wetlznds protection in the previous plan and designed a more natural layout. However, high density construction remains the priority of the new plan, and the proposal still shows a strong functional aim: the historic settlement would be replaced by large-scale educational and research facilities serving the whole area. The hypothetical future makes the site a container for the functions from the surrounding city, rather than a settlement for the locals.

Shape

Utopian Devices above the Tranditional Organic Landscape

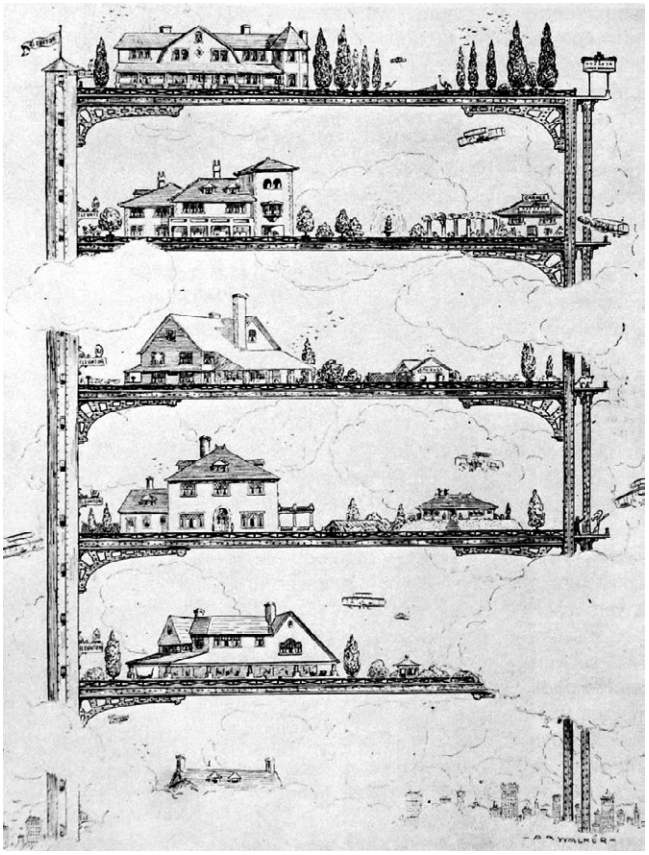


Fig.78
1909 theorem: the Skyscraper as Utopia Device

City Volume: Utopian Devices

Modernization has revolutionised the paradigm of urban architecture. In order to create room for urban activities more efficiently, volumes in cities have gradually shifted towards scales far beyond the scale for human beings. Vertically, the towers create folded spaces on a limited urban plot through constantly repeated planes. Behind the facades, the activities contained by the volume are no longer limited by the condition of the ground. The tower is a self-organising utopian device and an essential component of the agglomerated metropolis.

Colony of Two Types of Volumes

The urbanization of the region has led to a gradual invasion of the countryside by volumes belonging to high-density cities. Currently, two kinds of volumes form by different reasons, bottum-up rural industrilization and top-down planning, in the GBA.

Fig.79 Local Industiral Factories

Fig.80 New Built Official Towers

The first type is the industrial factory and warehouse. This type of block appeared in the 1970s and was built by local enterprises after the reform and opening up. It provided the soil for development of secondary industry in the countryside during the specific period (Qu, 2021). The towers, as a second type of the volume, were inserted under the latest ambition of creating an experimental zone. 200 metres official towers are appearing on the traditional organica agri-aquacultural land, and declaring the colonization of the urban culture.

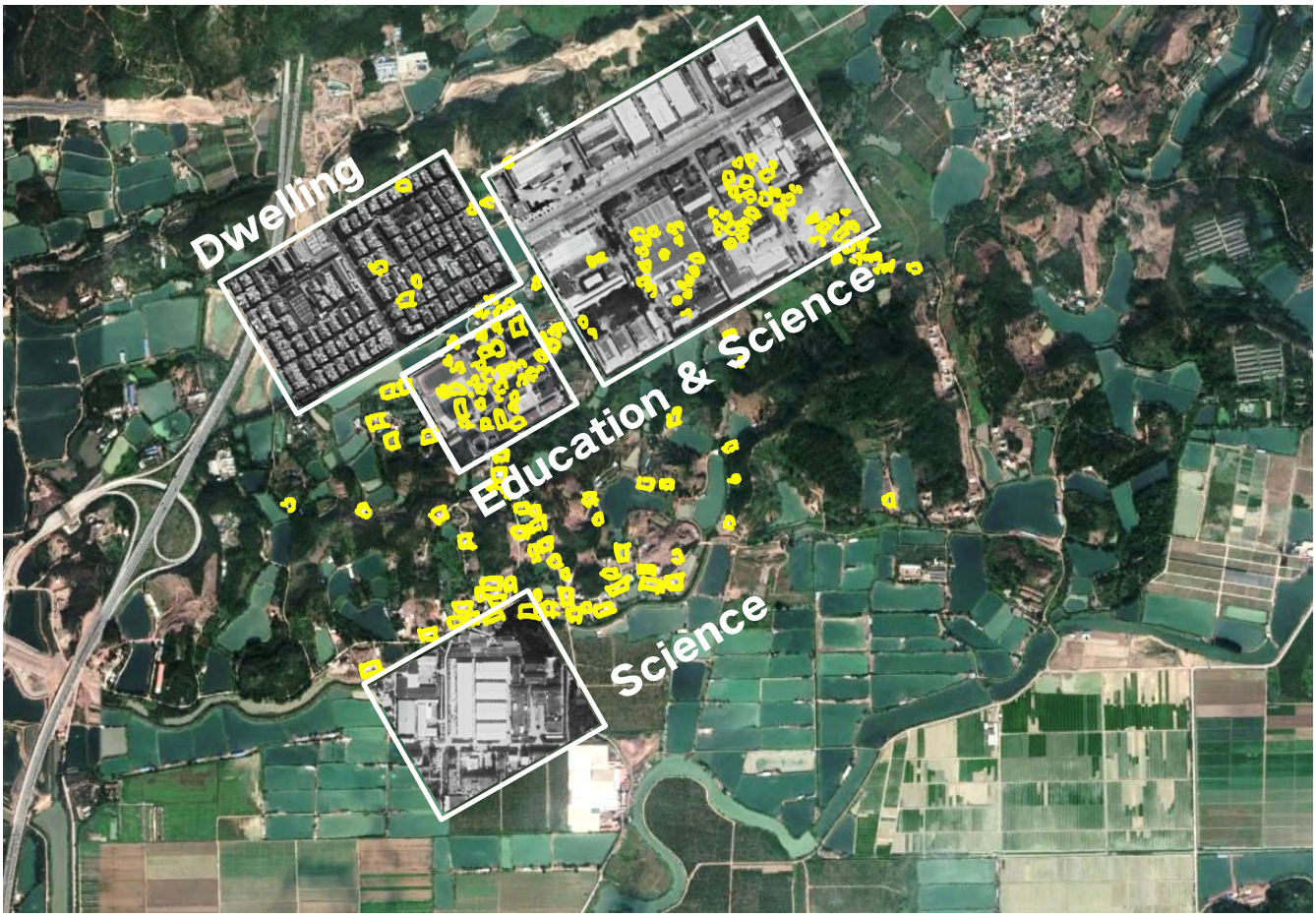


Fig.81 Texture Conflicts due to the Top-down Planning

The texture conflicts exist between the inserted city devices and the traditional rural landscape. The nature of the utopia allows the volumes to create an independent system away from the substrate. In this way, it is no longer necessary for activities within the volumes to take the agri-aquacultural surface into account. As a consequence, the organic fabric is being replaced by large scale volumes that is efficient, homogenous and belong to the city. The overlay supported by top-down planning is a successful colonisation of the rural landscape by the urban fabric.

Shape

Self-Organized Systems Lift from Production Landscape

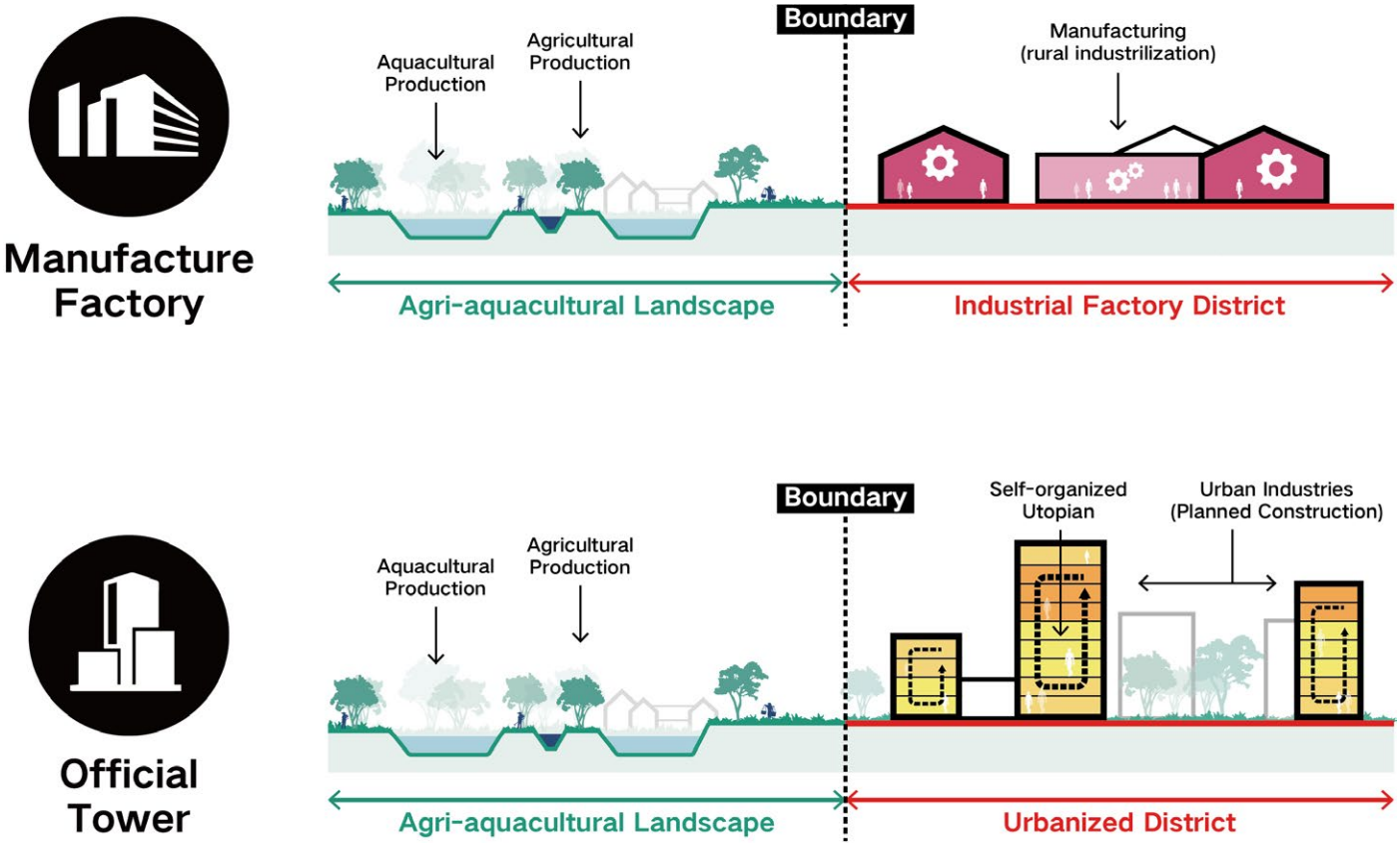


Fig.82 Activities Conflicts Brought by "Volumes"

Broken Relationship with the Surface

The insertion of the mentioned Volume in the countryside changed the human-land production relationship built upon the traditional agri-aquacultural landscape. The manufacturing factories and official towers, as carriers of secondary and tertiary industries, are establishing self-organized and independent systems in the rural areas. Because the functions inside the building are not restricted by the conditions of the base anymore, new activities within the industrial and constructed areas no longer need to echo the local agri-aquacultural production. As a result, visible and invisible boundaries are born simultaneously through these city devices.

This type of the urbanization in rural areas was defined by Zhou Y.X. as "urban-rural integration" (Qu, 2021). However, although being placed in the same space, the original rural system and the inserted city system are opposite from the function perspective.

Governance

Top-down Plan Leading to the Human-Land Separation

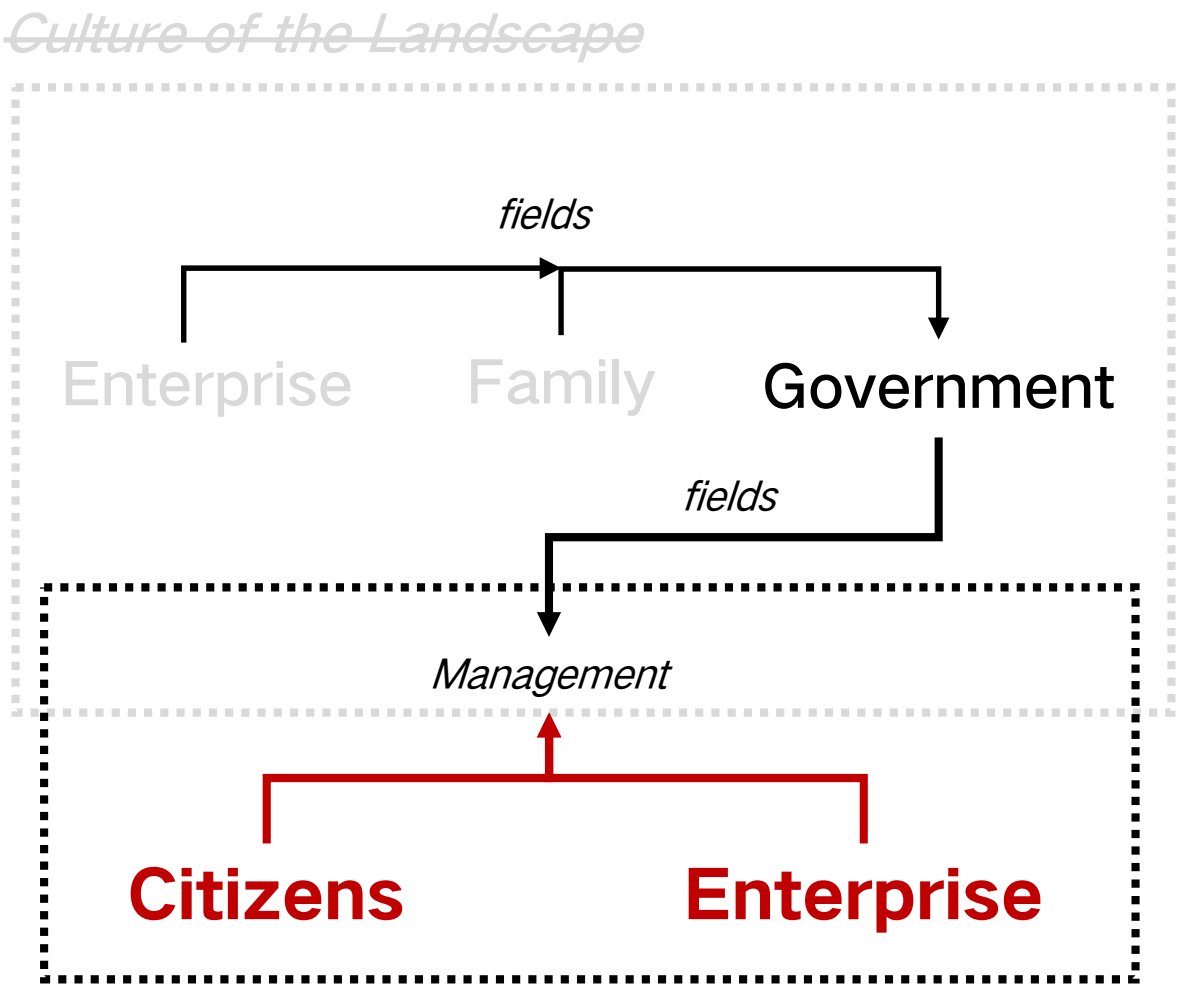


Fig.83 Human-land Separation Model in Urbanized Countryside

The development option of urbanization, which makes densification primarily aimed at creating space for urban activities, has implanted a series of independent systems in the countryside with limited relevance to the agricultural landscape in a top-down way. During this transition, the profits of the local stakeholders are placed behind extraneous citizens and city capitals. Although villagers could still benefit from renting lands, the traditional agricultural production field is replaced by homogenous urban functional zones under the market demands, further benefits generated on zones are also no longer relevant to the leaseholders. The communication between human and land is dispearing in the countryside, and leads to irreversible identity transformation of the agricultural labours as an effect of the linear urbanisation.

Indicate: Opposition

Opposite Urban-Rural Elements within A Unified Space

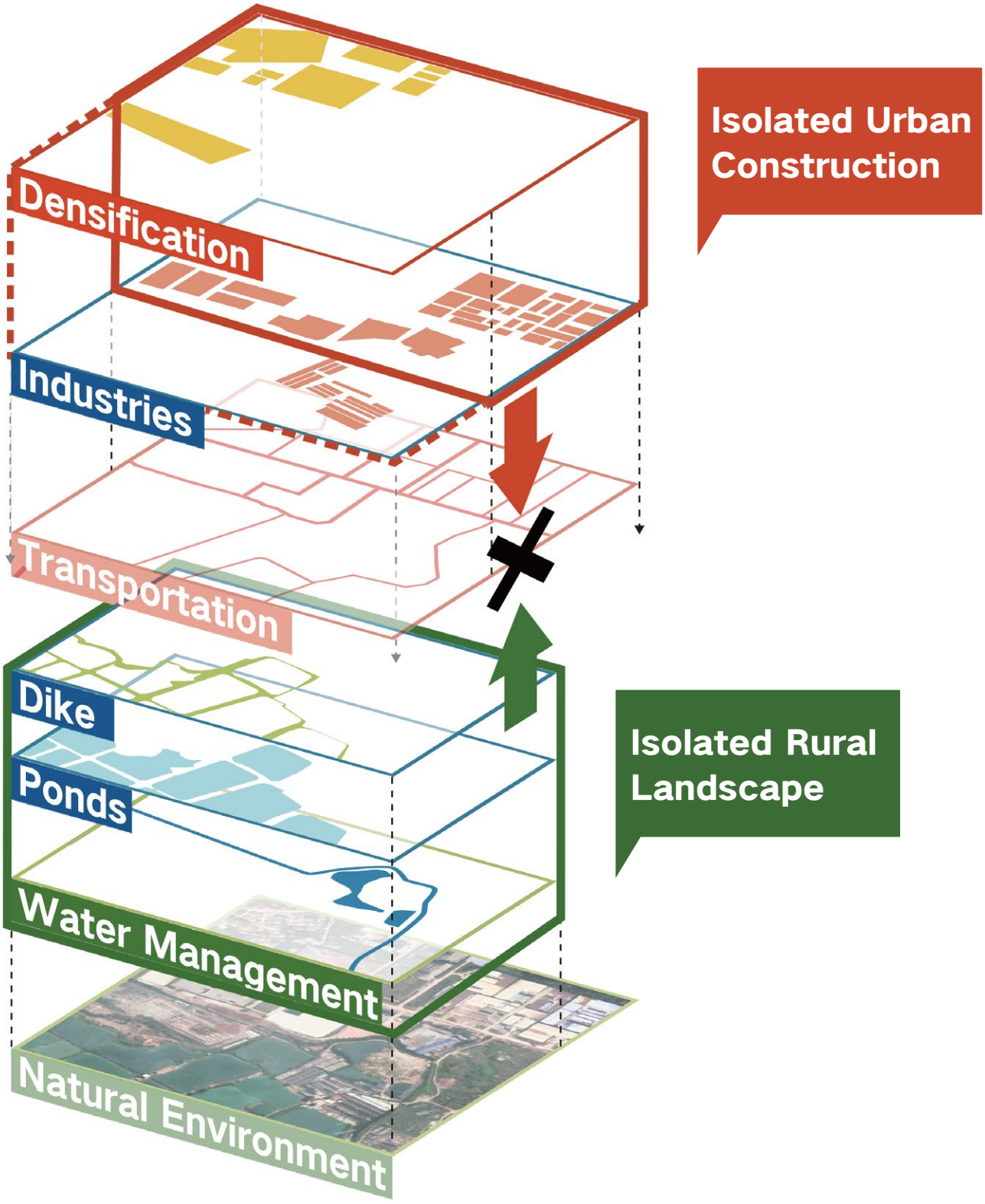


Fig.84 Incomplete Rural System with Separeted Urban and Rural Systems

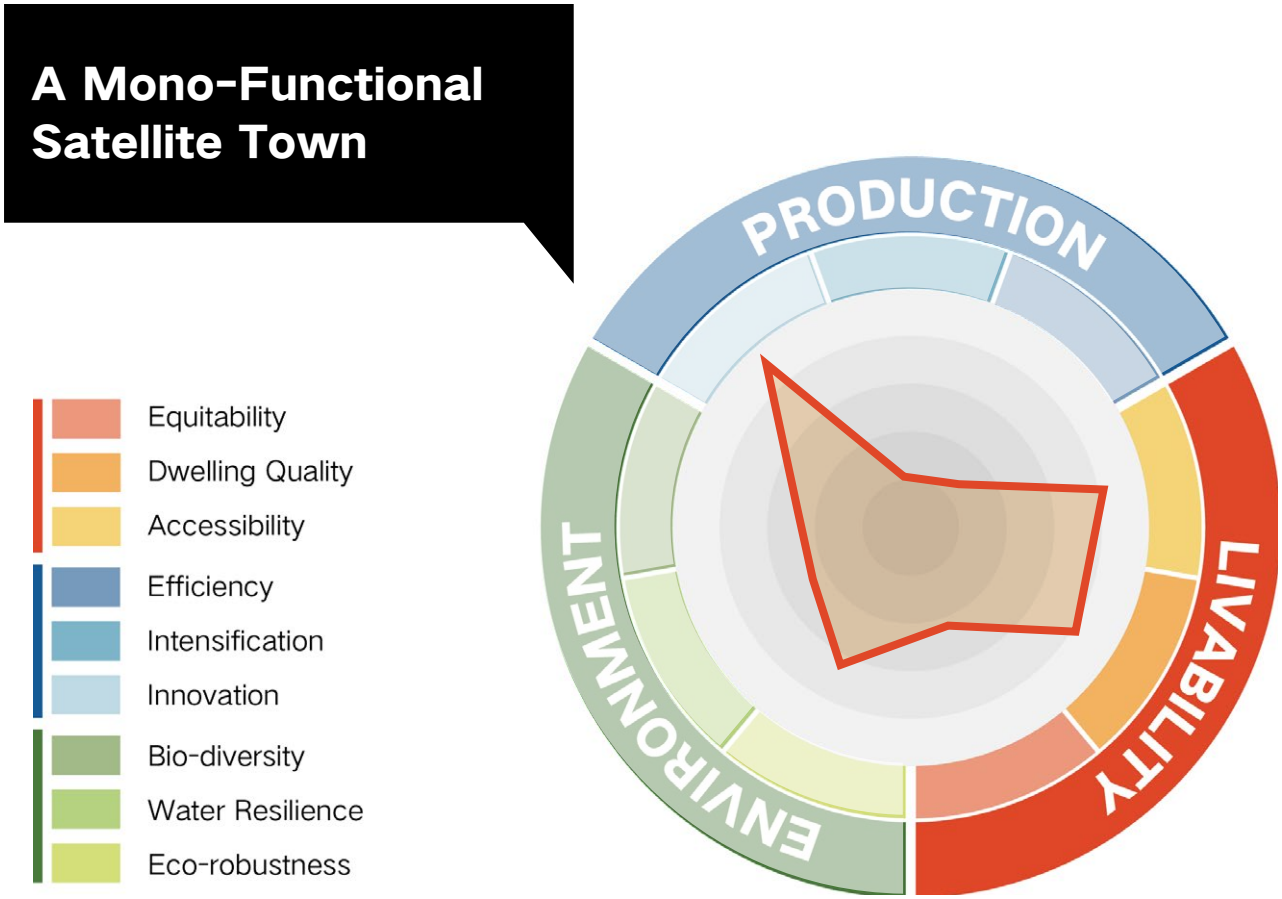


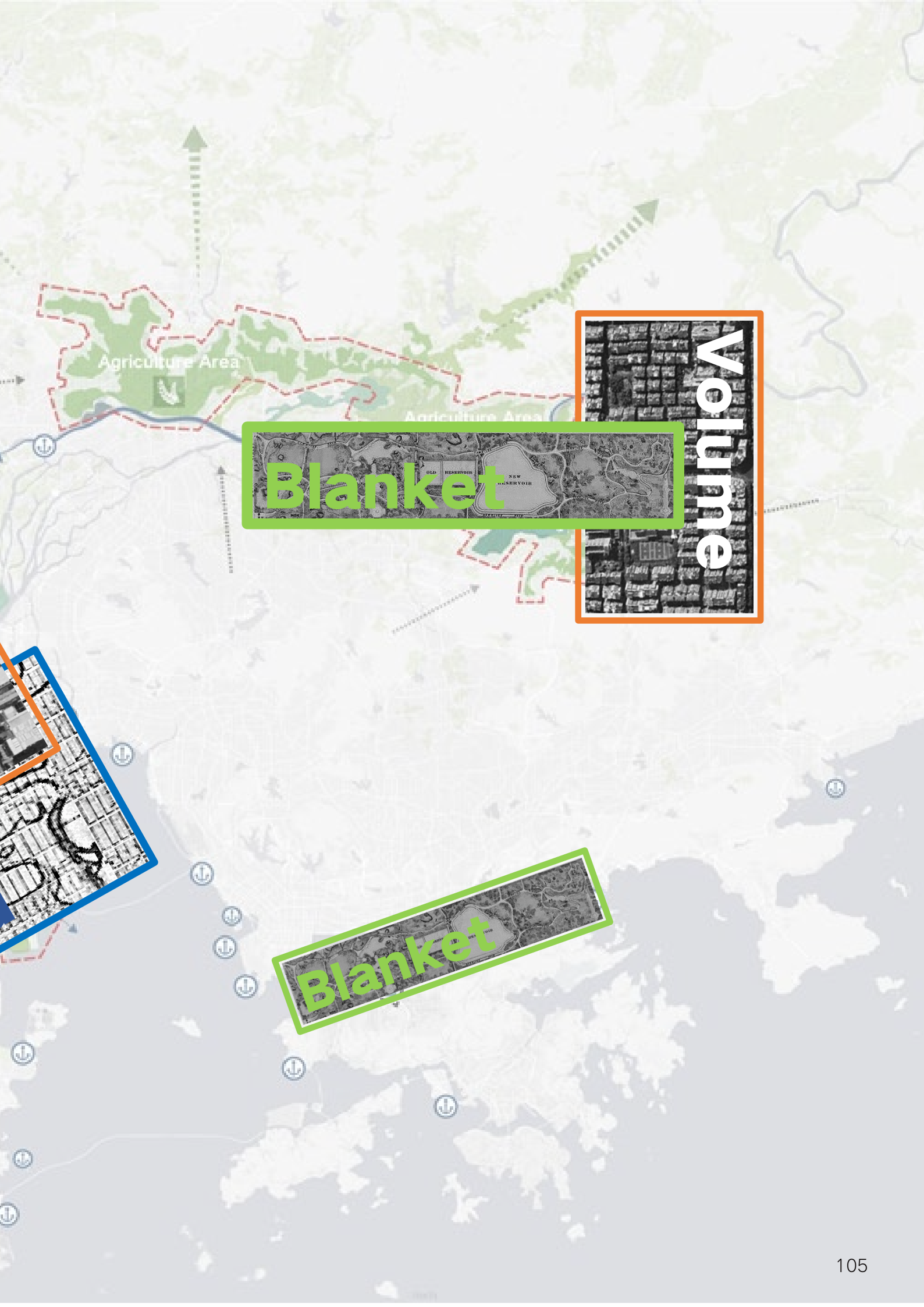
Fig.85 Assement of the Countryside under "the Volume" Model

The opposition model gradually occupied by the urban volume shows the contradiction between urban construction and rural landscape in the same local area. The planned colonisation of the city textures and activities is a rough overlay of the traditional rural layout. It divided the complete countryside system into two opposite parts, the artificial space and the landscape basis. On the one hand, the secondary and tertiary sectors are growing rapidly in the urban part. On the other hand, the low productivity of the traditional agriculture sector has not been optimised on the basis, which has resulted in increasing transformation of agricultural field into non-agricultural land. The countryside and villagers are subliminally transformed by this urbanization process.

As a development option, rural urbanization is not a problem itself. However, is it worth to ignore the profits of villagers and the ecological landscape? And does it have to be the fate of the countryside to an homogenised city?

Conclusion Deconstructed Urban Components

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


Agriculture Area
Agriculture Area
Blanket
Volume
Blanket

Conclusion: Mono-Functional

Impact of Modernism Urbanization on Rural Development

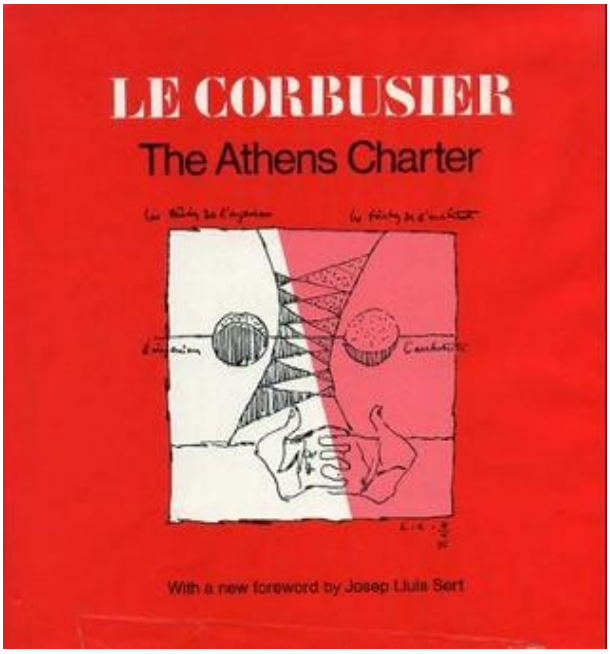


Fig.86 The Athens Charter, published in 1933

" 76. The four keys to urban planning are the four functions of the city.

77. The city plan should determine the internal structure and the interrelated positions in the city of each sector of the four key functions."

IV C.I.A.M. (1933)

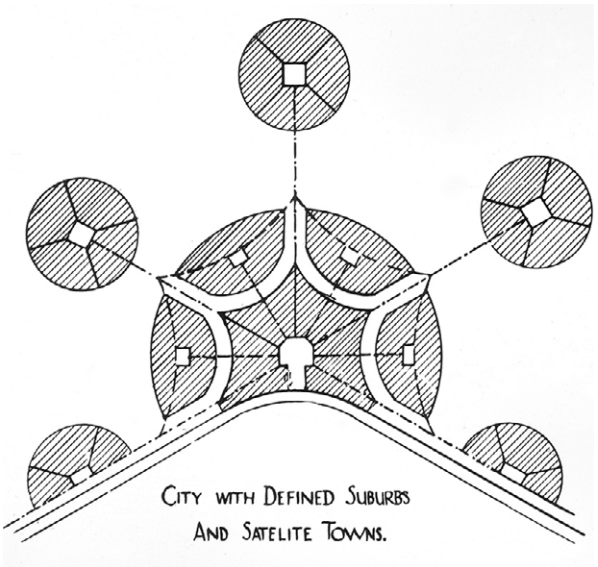


Fig.87 Spatial Concept of the Satellite Towns

Athens Charter(CIAM, 1930) is a framework for function-oriented rationalism planning. It advocates the spatial division and the allocation of positions in planning through "functional zoning". It imagined a mechanical rationalism mechanism, where the different zones were regarded as individual components of the whole machine.

As a result, the hierachy of settlements is defined by controlled founctional positioning. The concept of the satellite city(Purdom, 1922) was created to ecourage suburb areas taking on specific functions to support the central city development.

On the one hand, planning theories of the Modernism established order in the chaotic historical development. On the other hand, this elitist intervention and clear boundaries between mono-functional zones ignored the complexity of regions as socio-spatial systems. The theories have limitations of their time.

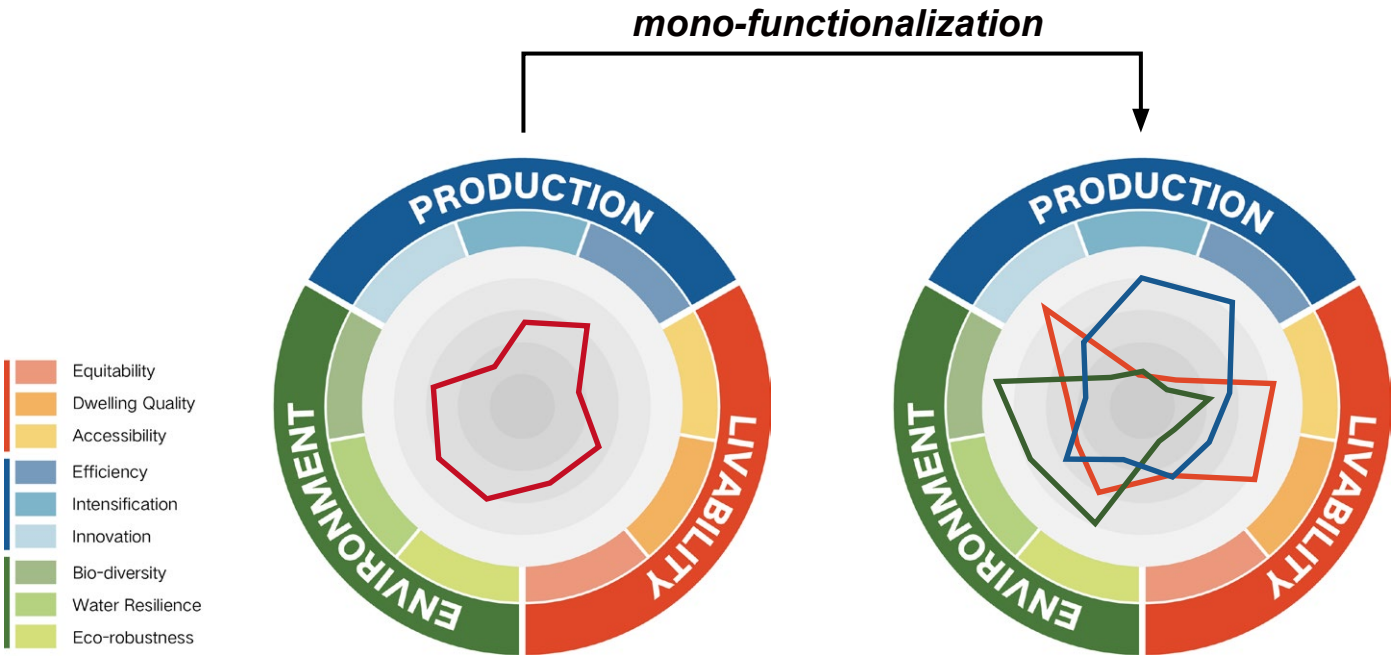


Fig.88 Transition of the Rural Features under Monofunctional Planning

From Self-sufficient Model to Monofunctional Model

Existing rural planning that reinforces specific functions reveals that the top-down functional zoning is continually influencing regional development of the GBA. The limitations of this tool are reflected in the degradation of the countryside from comprehensively multi-functional to uncomplete monofunctional model.

At the same time, function-oriented strategies have developed the countryside to into subordinate area of the cities. The intensification of target functions has resulted in three different development patterns in the rural areas, with the aim of carrying specific functions and industries overflowing from the cities. Additionaly, the administrative hierarchy reinforced the functional division between the city and the village, and transformed the countryside from a traditional self-sufficient system to unblanced system rely on the central cities.

Conclusion: Limitation

Orderly Plan and Ignored Interactions between Layers

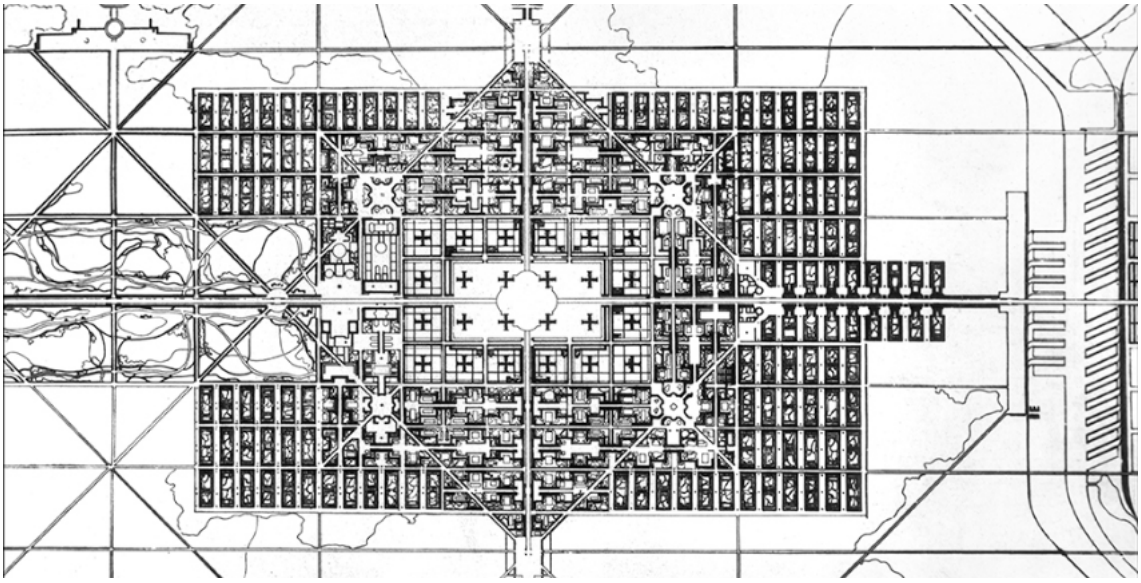


Fig.89 The Plan of La Ville Radieuse, Le Corbusier (1930)

The geometric plan is the expression of the modernism planning as a design language. It aims at organizing the functional zones division rationally, and pursuing the operational efficiency of the entire mechanism. The grids of straight lines, the blocks within the artificial boundaries and the homogeneous construction volumes make the planning project an efficient machine.

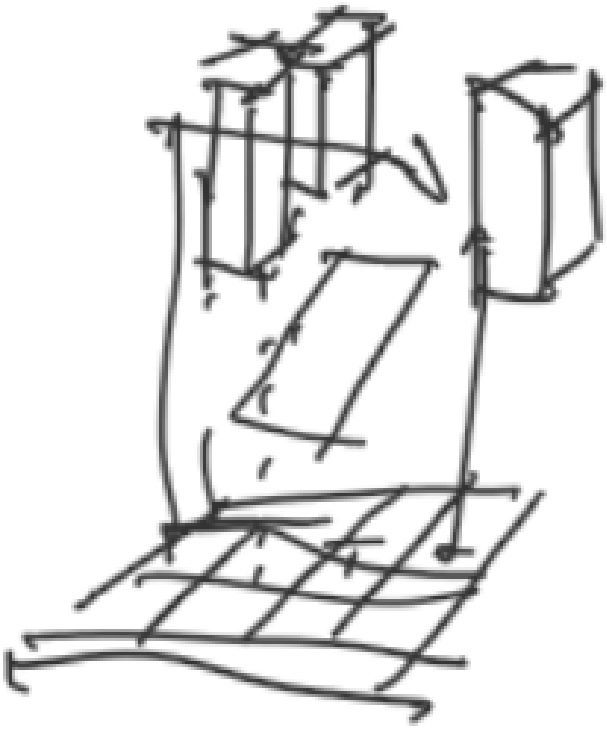


Fig.90 System of the Metropolis

However, the mechanised design paradigm from the city is not appropriate for rural development. The language of geometry declared the artificial modification of nature, which is inconsistent with the organic and low-density morphology that echos the natural environment in the countryside. Furthermore, within the compact urban systems, three-dimensional transportation could connect "separate volumes" together with "monofunctional blocks" efficiently through "grids", and provide soil for "the Culture of the Crowd". However, in the low-density villages, the monofunctional segments are scaled up by functional zoning and lead to the interaction broken between hybrid

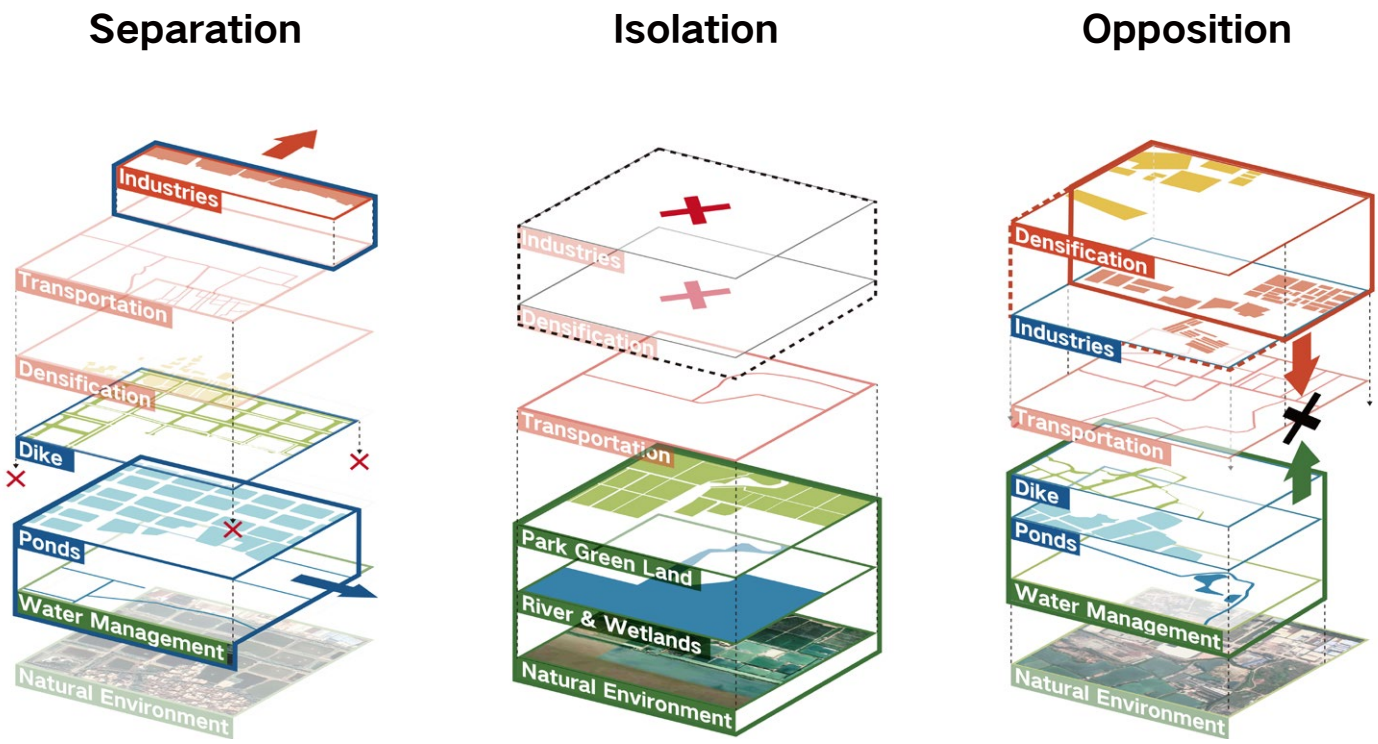


Fig.91 Three Imcomplete System in the Current Countryside

elements. On the regional scale, the countryside was transformed into isolated fragments with incomplete mechanisms and limited connections among them.

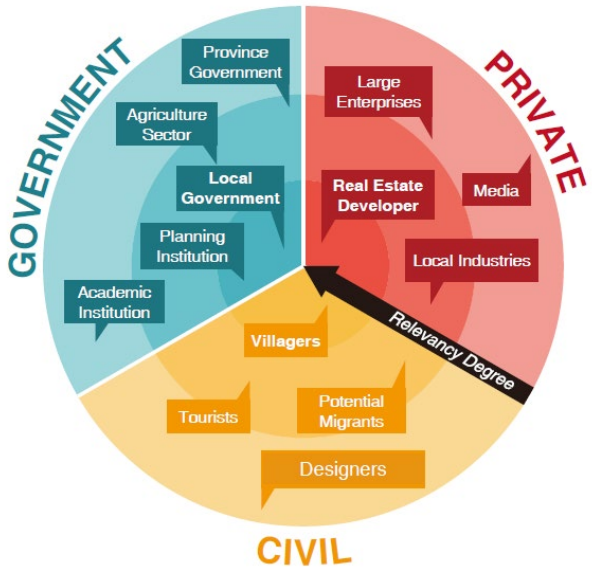
Incomplete System with Broken Interaction

The geometric spatial abstraction simplifies the complexity of the rural area as a social-spatial system. Under restrictions of the defined function, existing rural planning focuses on the organisation of specific elements on the layout. Elements that are not relevant to the objective are ignored or erased. The top-down decision destroys the complexity of the integrated rural systems, and the interactions between different element layers are broken.

The neglect of the interactions leads to the degenerating independency in the countryside. The incomplete systems weaken the rural competitiveness within the region and increased the dependence of the villages on central cities. The geometric order and functional zoning are external continuations of the linear urbanisation.

Conclusion: Winner & Loser

Competition and Human-land Separation after Collapse of the Clan



Tree Sectors in Post Clan Time

Different from the traditional internal-oriented villages organized by clans, the present countryside in the GBA has broader relevance with diverse stakeholders.

The local villagers still should be considered as the prior stakeholders, and the character of them has changed from a clan collective into individual families. At the same time, the investment of urban capital, the intervention of planning institutions and government regulation from the whole megacity region are also important for rural development.

Fig.92 Proximity Radar Map for Stakeholders

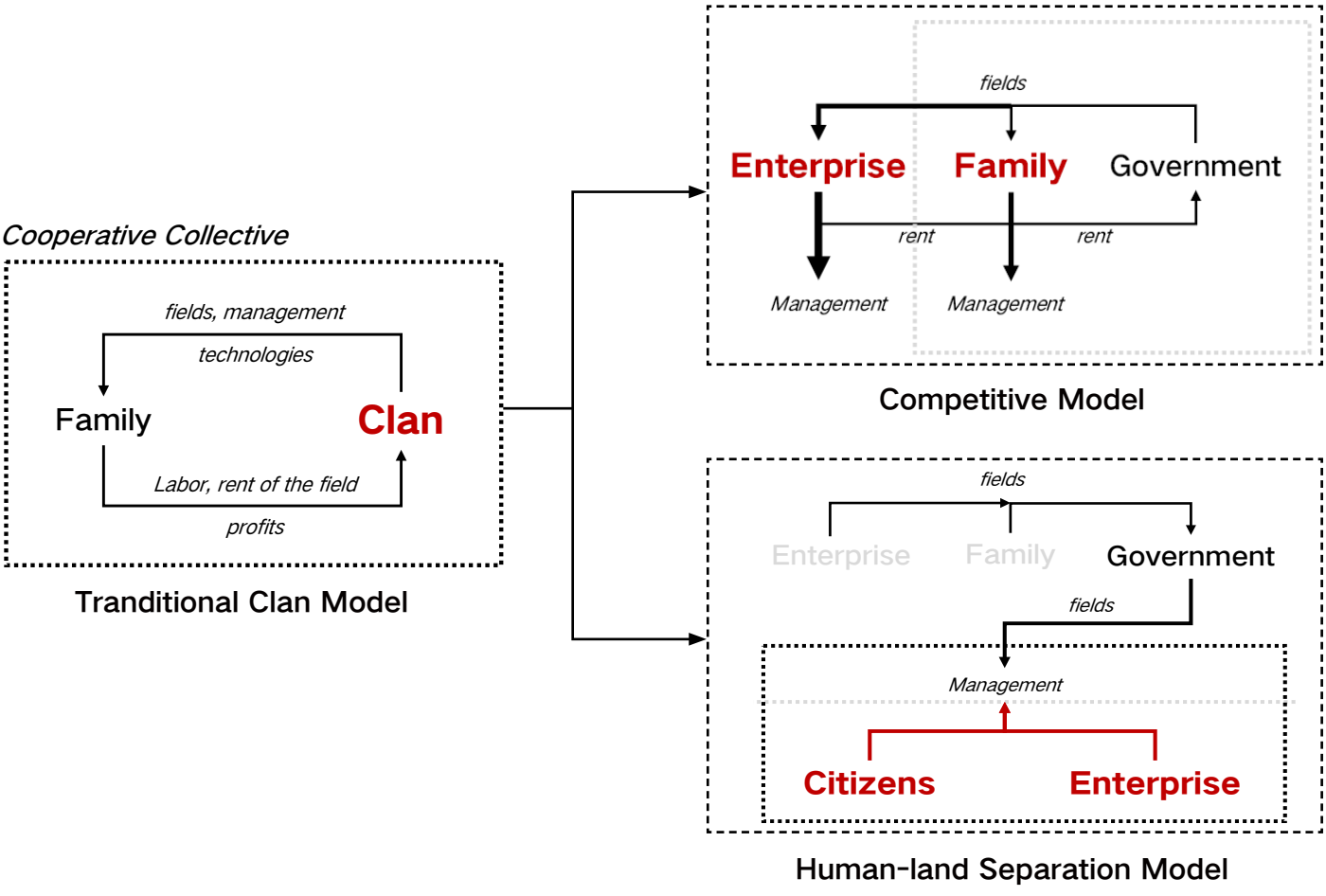


Fig.93 Transition Governance Model in the Countryside

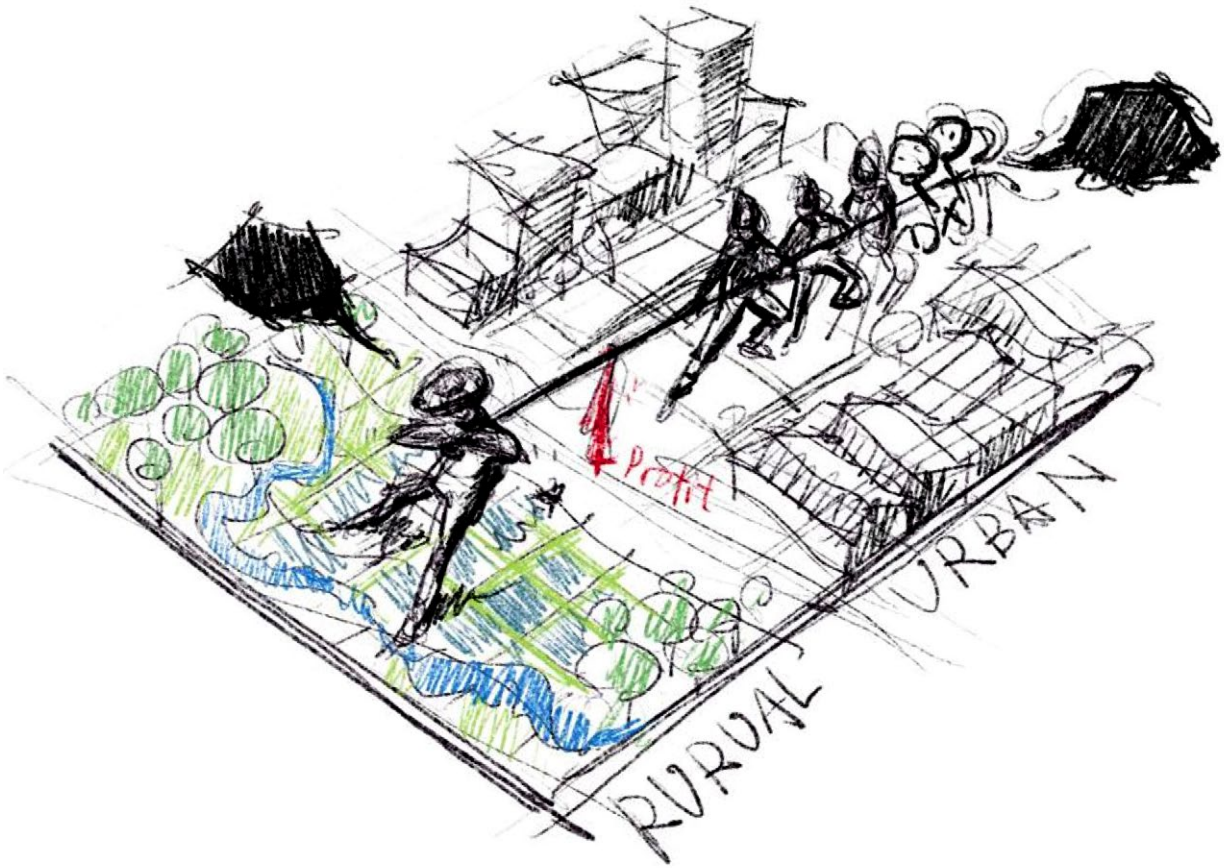


Fig.94 Comic: Conflicting Interest between Villagers and Other Stakeholders

Profits Deference between Stakeholders

After the collapse of the traditional social structure structured on clans, the production cooperations with same basis were also destroyed in the 1950s (Wang, et.al. 2009). The top-down planning pushed the rural governance into two major models. Both models abandoned the social collaborations in collective agricultural production. With limited agricultural productivity, the villagers who operate individual small-scale production are more likely to be the losers in the competitive market. The crisis prompted increasing numbers of villagers to engage, actively or passively, in industries that were unrelated to the local agri-aquacultural landscape. Their identities are guadually changed during the process of urbanisation.

In summary, top-down planning and functional zoning have failed to restore the production collaborations founded on the local landscape and have led to conflicting interests and wealth disparities between villagers and other stakeholders in the production competition.

Conclusion: Poly-Centric Structure

Regional Connections Prioritizing Diverse Central Cities

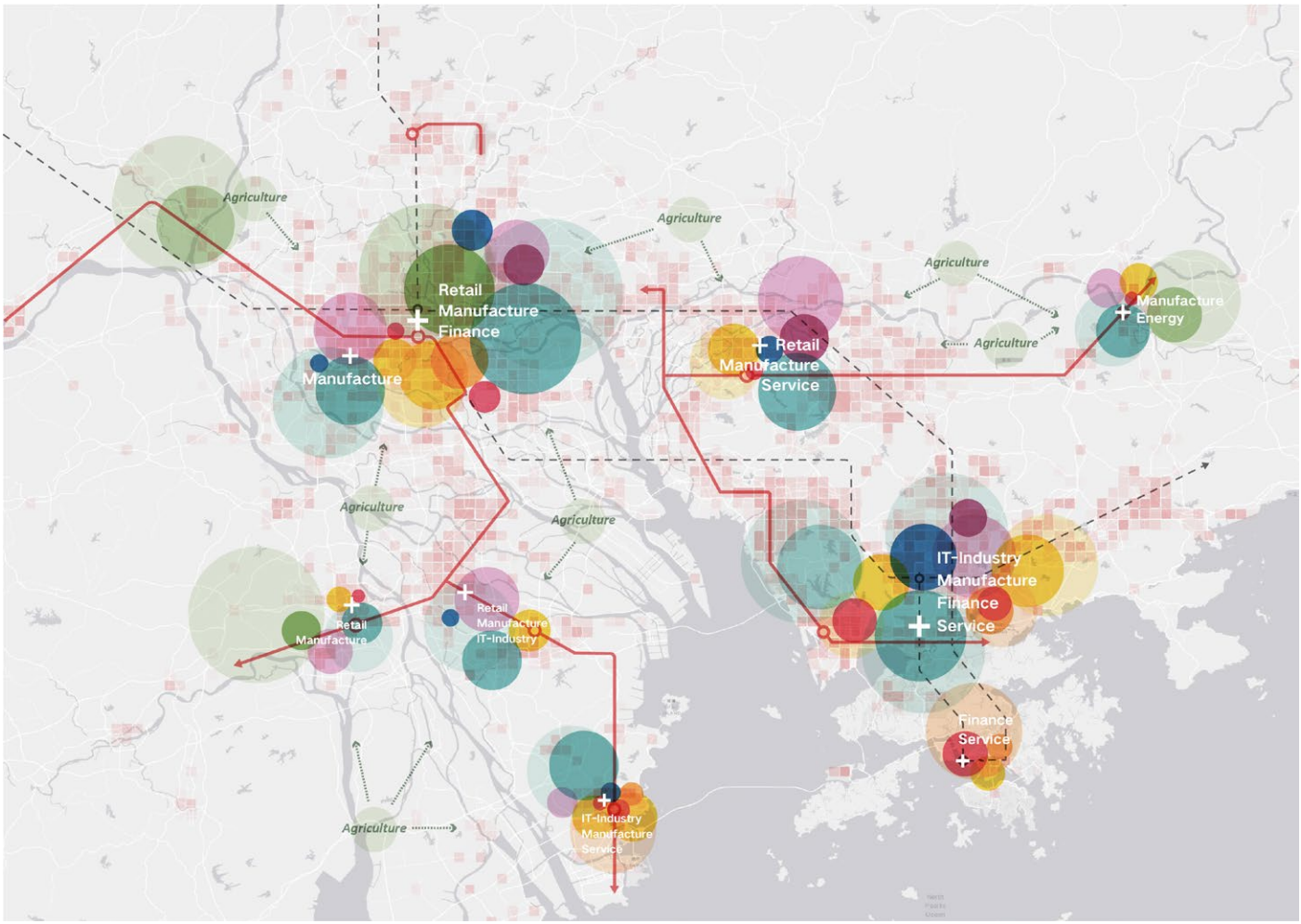
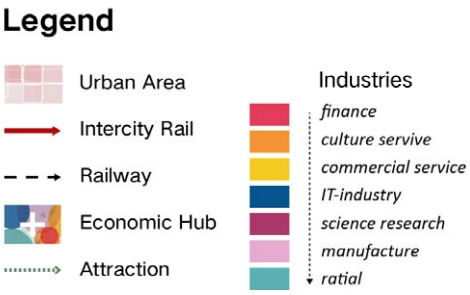


Fig.95 Well Connected Cities with Various Identities



The current GBA is more like a metropolitan area rather than an integrated urban-rural network. Within the region, cities are independent systems with compositive industries and show different identities based on their advantages. These diverse nodes are linked by infrastructure around the Pearl Rive and form a complementary cooperative ring for metropolitan business. Oppositely, the countryside is becoming monofunctional and incomplete system influenced by functional zoning, which transforms them into satellite areas highly dependent on the central city rather than acting as independent nodes in the regional structure.

At the same time, the existing infrastructure also designed for the urban system within the GBA. The intercity transportation provides convenient conne-

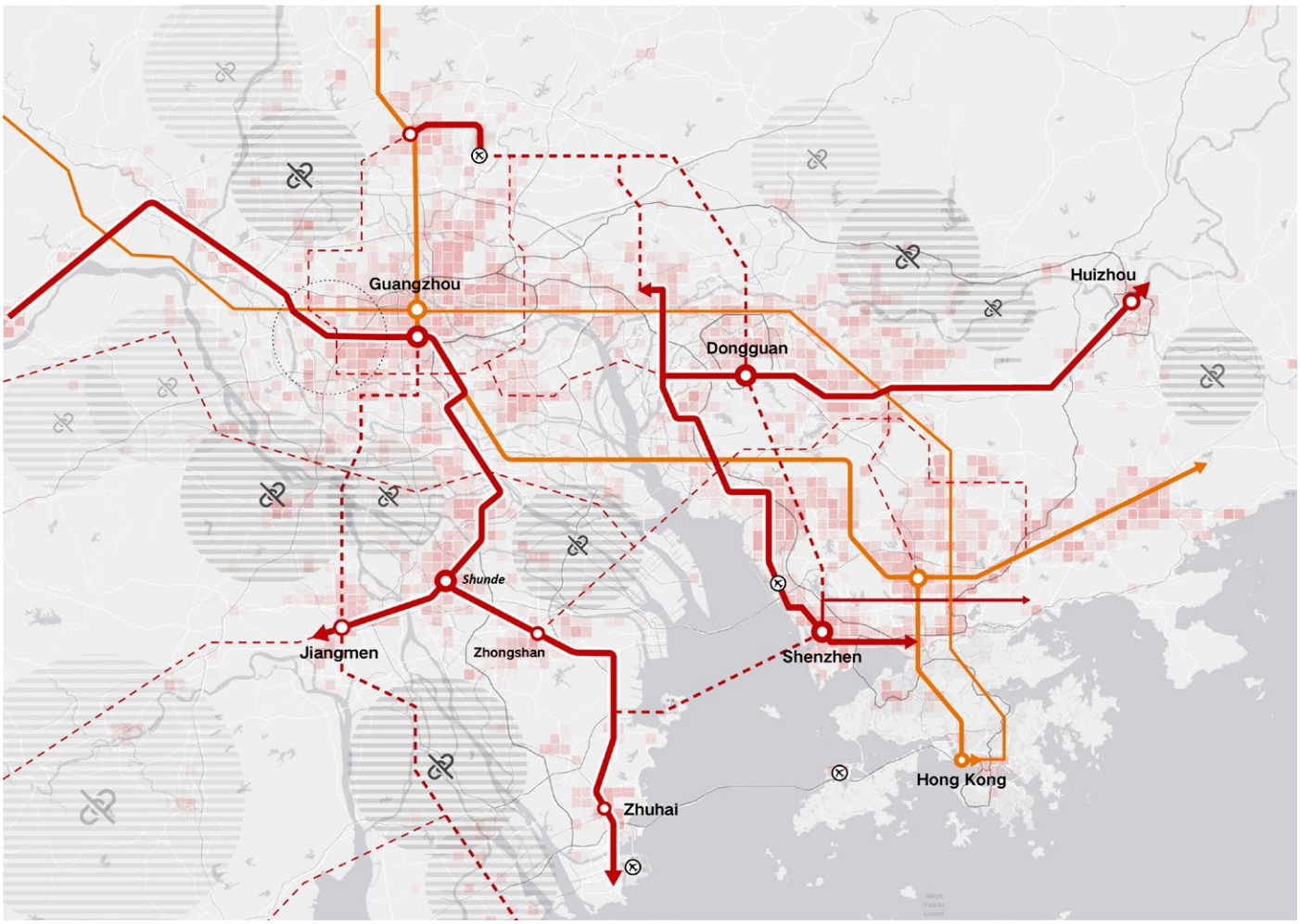
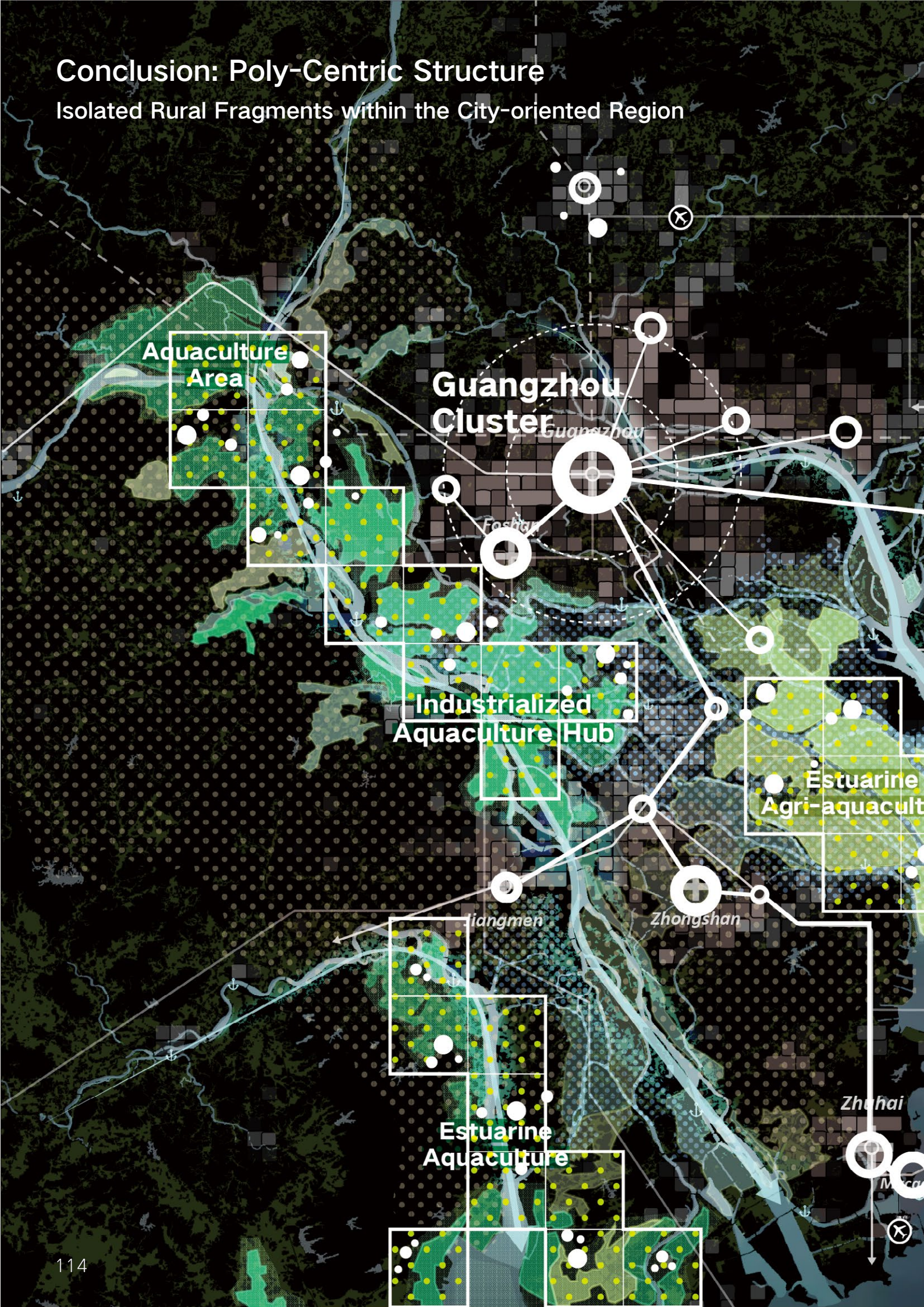


Fig.96 Regional Infrastructure for City System

ctions between cities, however, rural areas benefit from this limited. Lying in the blind area of the entire system, roads remain the only option for most villages to reach destinations within the region. Optimistically, this situation will be improved in the future with the renewal of infrastructure system, and regional accessibility provides opportunities for the rural development as a spatial basis. In the process, short-term and long-term needs should be balanced and networks connecting different settlements should be constructed gradually. Besides, the regional intercity rails should be combined with various transport modes to create coherent accessibility at different scales.

Conclusion: Poly-Centric Structure

Isolated Rural Fragments within the City-oriented Region



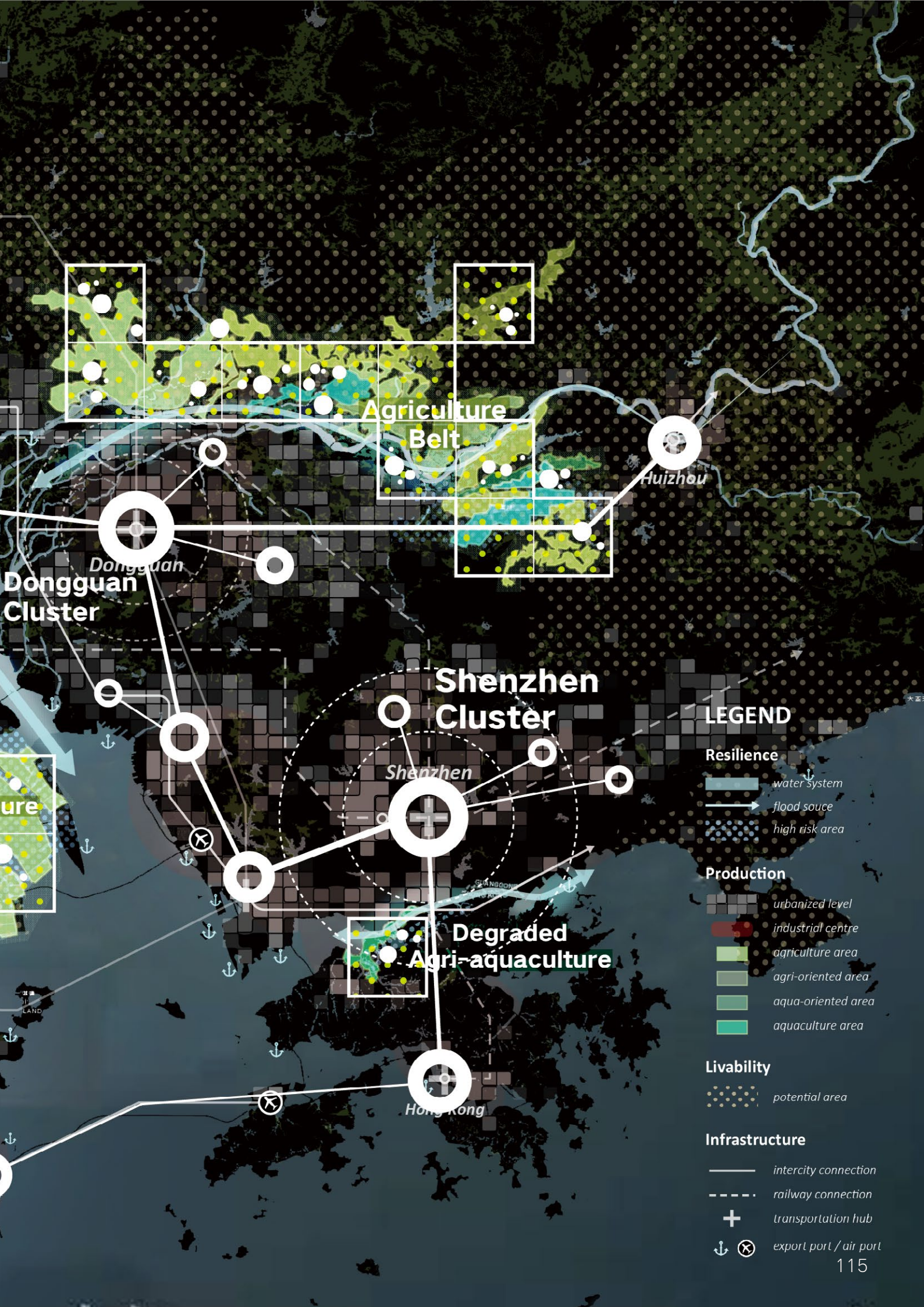

Agriculture Belt
Huizhou
Dongguan
Dongguan Cluster
Shenzhen Cluster
Shenzhen
Degraded Agri-aquaculture
Hong Kong
LEGEND
Resilience
water system
flood souce
high risk area
Production
urbanized level
industrial centre
agriculture area
agri-oriented area
aqua-oriented area
aquaculture area
Livability
potential area
Infrastructure
intercity connection
railway connection
transportation hub
export port / air port

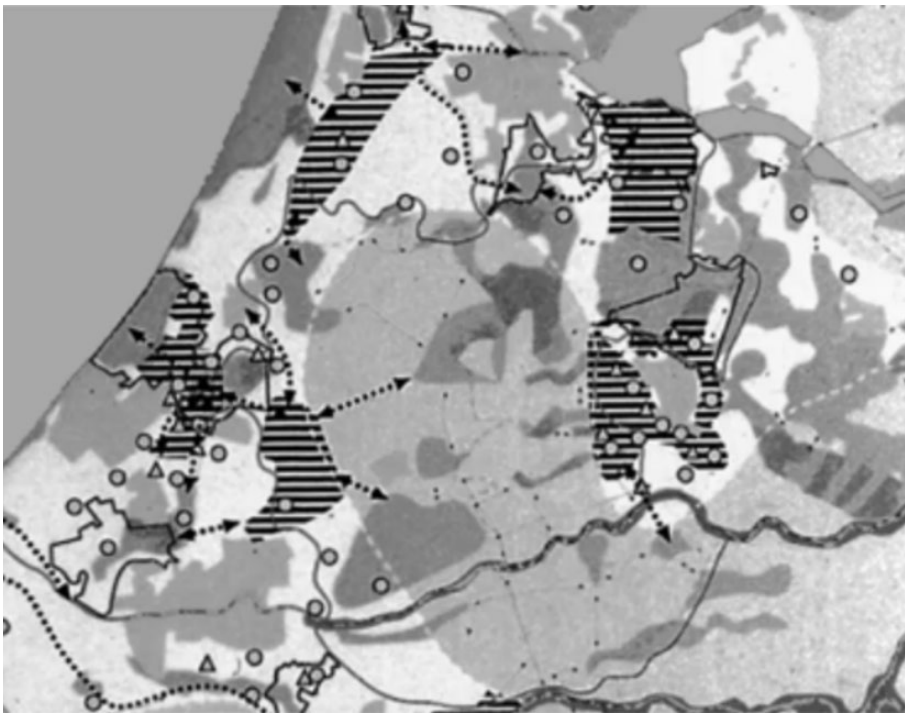
Fig.97 The View of the Countryside in Guangdong

IV PROPOSAL

The analysis shows that the key to alleviating conflicts in rural development lies in encouraging local industries grow on the agricultural landscape, and the sustainable value of composite productivity. Thus, enhancing the independence of the countryside as a hybrid human-land system, reducing urban-rural disparities and facilitating the transition of the regional structure from polycentric to cooperative network.For this purpose, the project proposes a spatial concept called "Landscape Productivity Belt". Under this vision, the specific agendas are constructed on taking the three existing mono-functionalization as local characters and restoring connections among broken layers.

Case Study

The Countryside in Randstad Spatial Planning



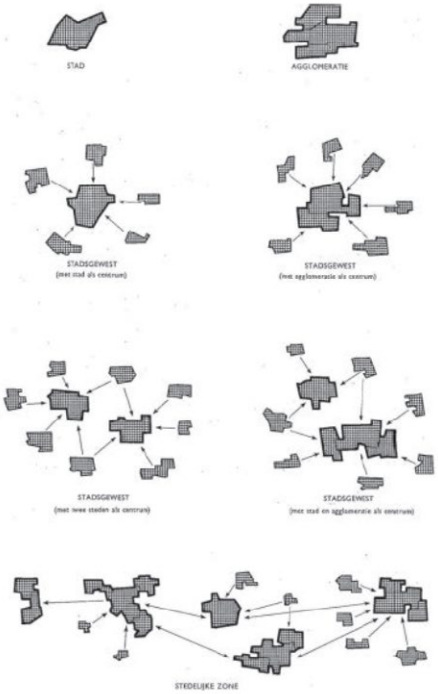


Fig.98 Structure of the Green Heart in the Netherlands (Left)
Fig.99 Brief Explanation about the City Region (Right)

From "Compact Cities" to "Network Cities"

Randstad is a metropolitan area located in the west of the Netherlands. Compare to the GBA, both regions are composed of dispersed central cities and small settlements in-between areas. Although some studies refer to the regional structure of the Randstad as a polycentric structure (Zhang, et.al., 2019), such a description is not accurate and the regional form is more likely to be an integrated network.

This network was gradually formed on the spatial concept of the green heart. In the early period, the “compact city” strategy strictly protected the rural landscape as a monofunctional open green land by limiting the urban boundary. The strategy is similar to the existing planning of the countryside in the GBA, which also failed to gain the support of local stakeholders due to top-down control. As a result, the strategy shifted towards a 'network city' to coordinate cooperation between different regions and actors through building a common vision. In the process of balancing interests, the concept of the green heart is updated into a flexible framework and allows rural areas to develop together with the region.

Fig.100
Poster for Land Consolidation in Rural Area

From the common experience of Randstad and the GBA, it can be concluded that standardization is an important strategy in the modernization of the agriculture sector. However, standardization under controlling planning tends to ignore the complexity of local systems. It replaces original elements unrelated to production with homogeneous production units and deprives the systemic resilience of the countryside.

Regional standardization should be used as a guiding principle rather than a detailed design, which could be extended to diverse and complex models derived from local characters.

Land Consolidation

The polder is the iconic agricultural landscape of the Netherlands. Traditionally, the polders were organically shaped strips of land and divided by natural rivers into dense, small-scale production fields. However, the random fragmentation of agriculture is not suitable for modern mechanical farming and the fragmentation has made land ownership confusing. In 1924, the land consolidation was rapidly introduced as a policy by act. New polders became complete, easy for dividing ownership, and interact with water management networks as well as infrastructure networks. Intensive production quickly stimulated the development of Dutch agriculture. However, influenced by functional zoning, "clearance planning" undermined the traditional landscape character in rural areas (Guo, Hou, 2016).

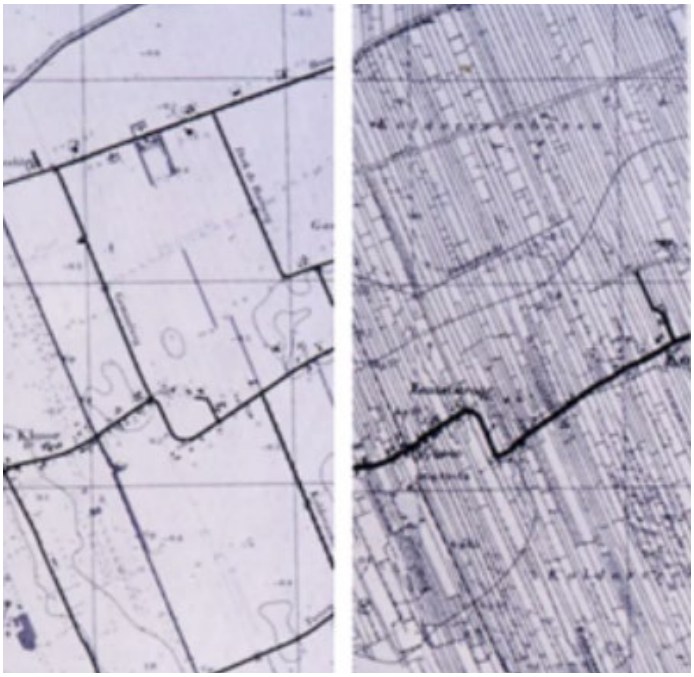


Fig.101 Transition Texture during the Consolidation

Case Study

Modern Rural Productivity in Randstad

Fig.102 Scaled Greenhouse CItivation in the Netherlands

Technical Scaled Modern Agriculture

The Netherlands has the least amount of arable land per capita in the EU. Dramatically, it is the second-largest exporter of agricultural products in the world (US$94 billion, 2016). The reason behind the contrast is the ever-advancing agricultural technology, which has created the most advanced controlled environment agriculture inner greenhouses around the world. The most famous greenhouse production area is the Green Hub in Randstad. It is worth noting that the negative effects of greenhouses on the environment have always been criticised. The continuous structure of glass and steel becomes a cover upon the organic landscape. However, sustainability shortcomings are being addressed with technological innovation, including reducing the amount of electricity and water consumed in the production and recycling the waste generated by cultivation.

Deng Xiaoping pointed out that "science and technology are the first productive forces" (1988). However, the high-tech strengths of the GBA have not fully contributed to the growth of the agri-aquaculture industries. Learning from the Dutch experience, the agglomeration of knowledge contains the potential to increase rural productivity, and the innovation advantage in the GBA should be combined with the industrial upgrading of agriculture in the future.

Fig.103
Enterprise as A Cooperative Platform

Fig.104
Agriculture Expert in the Greenhouse

Fig.105
Composite Industries in Rural Areas

Full Production Chain through Cooperation Platform

Cooperative production in the Randstad has a history of around two hundred years. Unlike collective production in the PRD, which was based on clans, the earliest forms of agricultural cooperation in the Netherlands were cooperatives formed by farmers on their own initiative. Friesland, for example, is a large dairy enterprise dating back to 1871. Today, it offers a wide range of goods such as snacks, beverage even pharmaceuticals, besides dairy products. By covering the entire chain of production including processing, R&D and marketing, the company has organised a production platform consisting of diverse groups of stakeholders, which forms the foundation for the innovative development.

The modern enterprise model, made up of actors in the extended production chain, can be a reference for the establishment of productive cooperation in the post-clan period in the countryside within the GBA.

Beyond the Agricultural Sector

The agricultural sector growing on the polders forms a major part of the regional rural economy. Beyond this, the productive landscape containss broader values. With ancient history, the polder has become the symbol of the rural culture in the Netherlands today. The shared landscape has attracted numerous visitors and contributes to the prosperity of the tourism business. Additionally, the polder also plays an important role in regional water management. The multifunctional hybrid maximises the economic value of the land.

Strategy Structure

Backcasting Approach on Cohenrence Scales

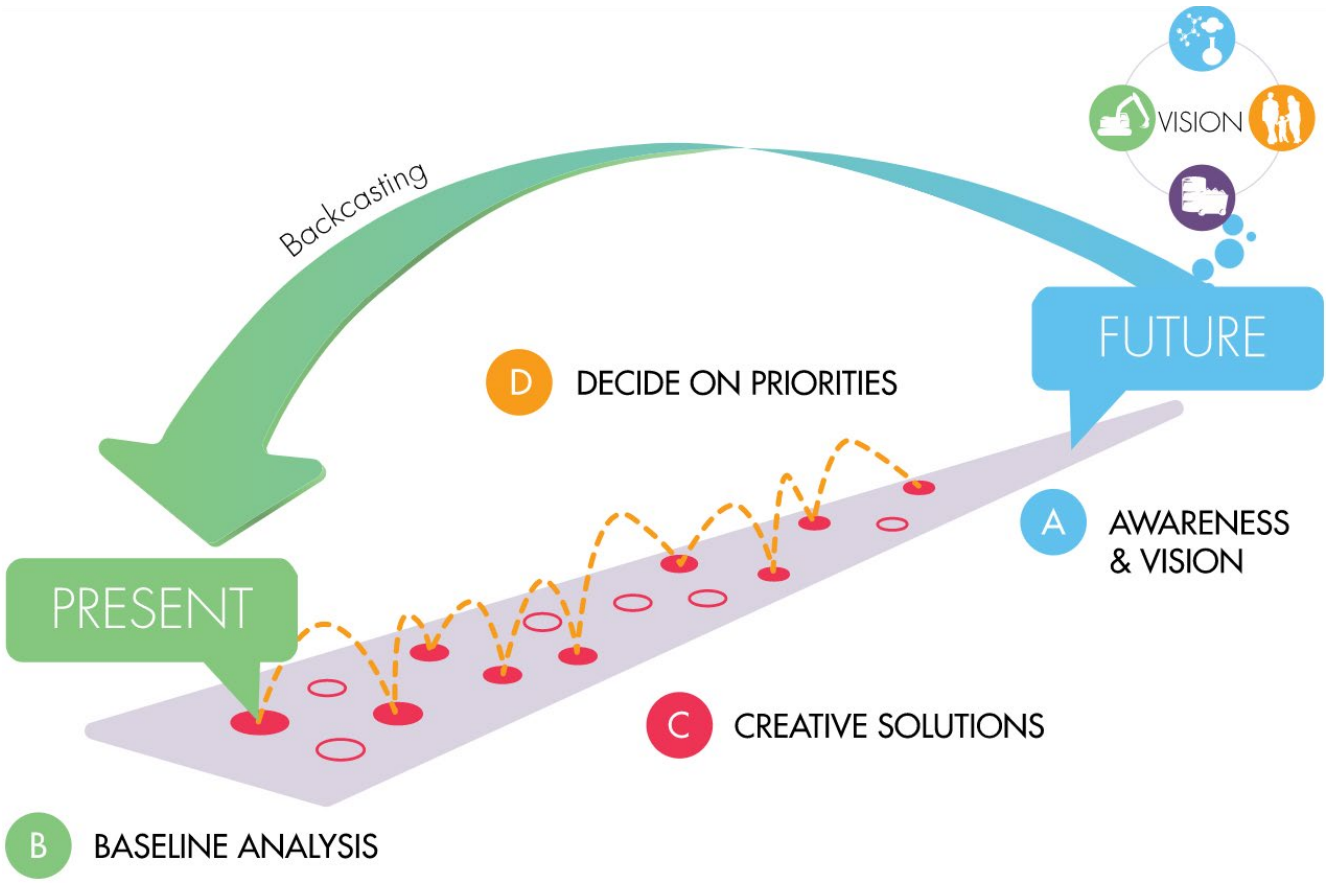


Fig.106 The Backcasting Approach

“Backcasting” in Strategic Planning

In the proposing and design part, Backcasting was the main approach used in the project. The path was first presented by John Robinson in 1982 and is a model that has been widely adopted in developing sustainable spatial strategies. For the project, the key startpoint is imaging an ideal vision for the countryside. Through the ABCD method, the model can help to clearly define the gap between the future and the existing situation, and to develop practical steps that is necessary for the transition.

The backcasting approach could help to combine top-down coordination policies with bottom-up spatial interventions to form coherent application scenarios with a common goal. Through this strategy structure, a clear 'pathway-to-impact' diagram can be simulated and the efforts needed by different takeholders could be pointed. This process is elaborately explained in the implementation part of the Design Case I.

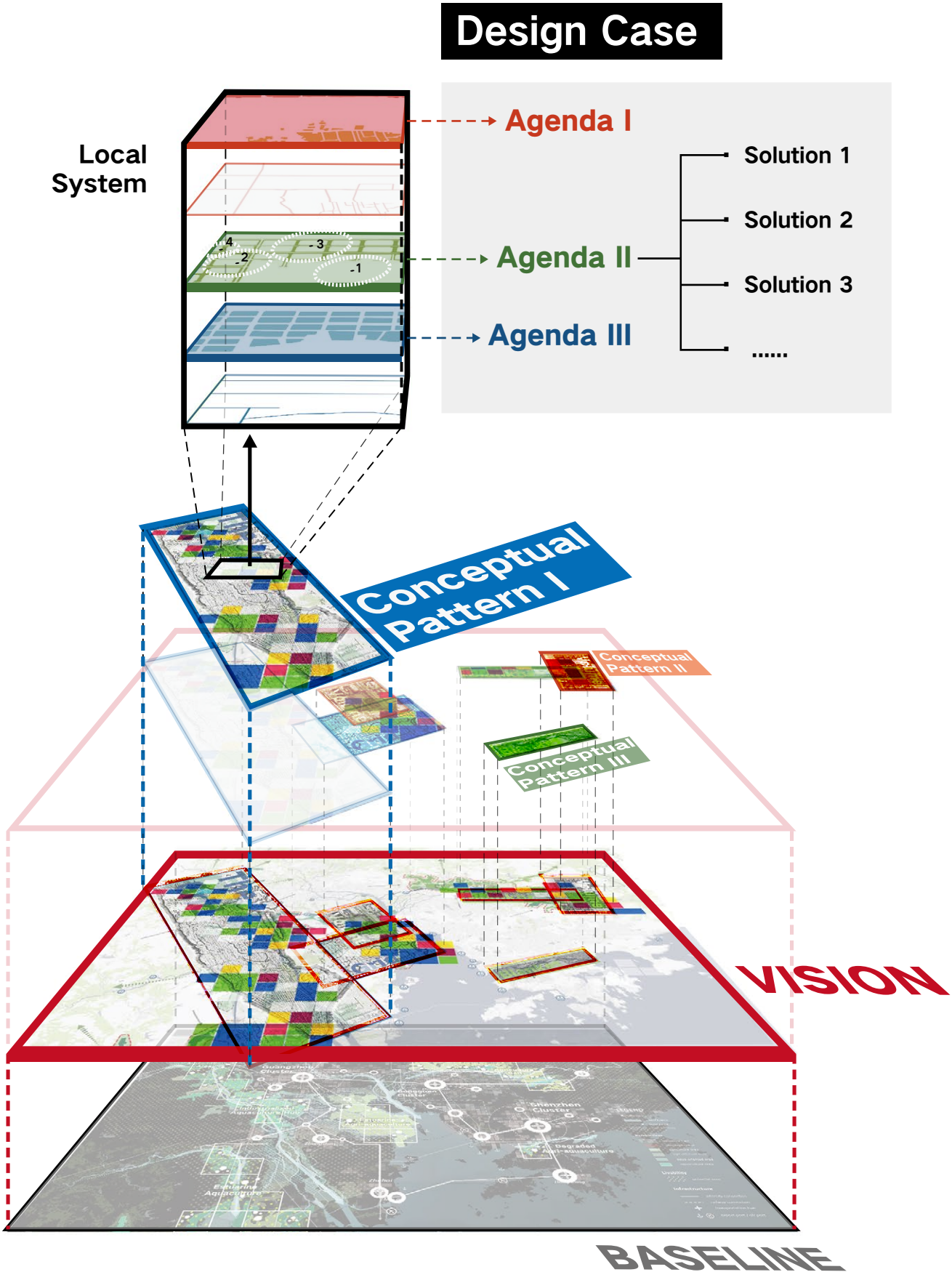


Fig.107 Project Approach across Different Scales

Vision: "Xiangcun"

A Menifesto of the The Landscape Productivites

The glorious history created by the countryside reveals that urbanization is not the only choice for the settlement development. The agricultural landscape base founded on natural conditions offers a highly recognizable potential for sustainable development. Distinguished from the traditional villages with smallholder economy as the main production method, the future rural areas within the Greater Bay Area can be multifunctional independent systems based on efficient and ecological modern agriculture as the production basis, integrating multiple industries and provi-

ding an eco-based environment for production and living. The future countryside, which called "Xiangcun", will emphasize cooperative production at multiple scales, become a development option complementary with urban areas rather than a development phase in the linear urbanization process. It will contribute to the formation of a diverse and decentred regional structure of this international mega-metropolitan area.

Landscape Productivity Belt

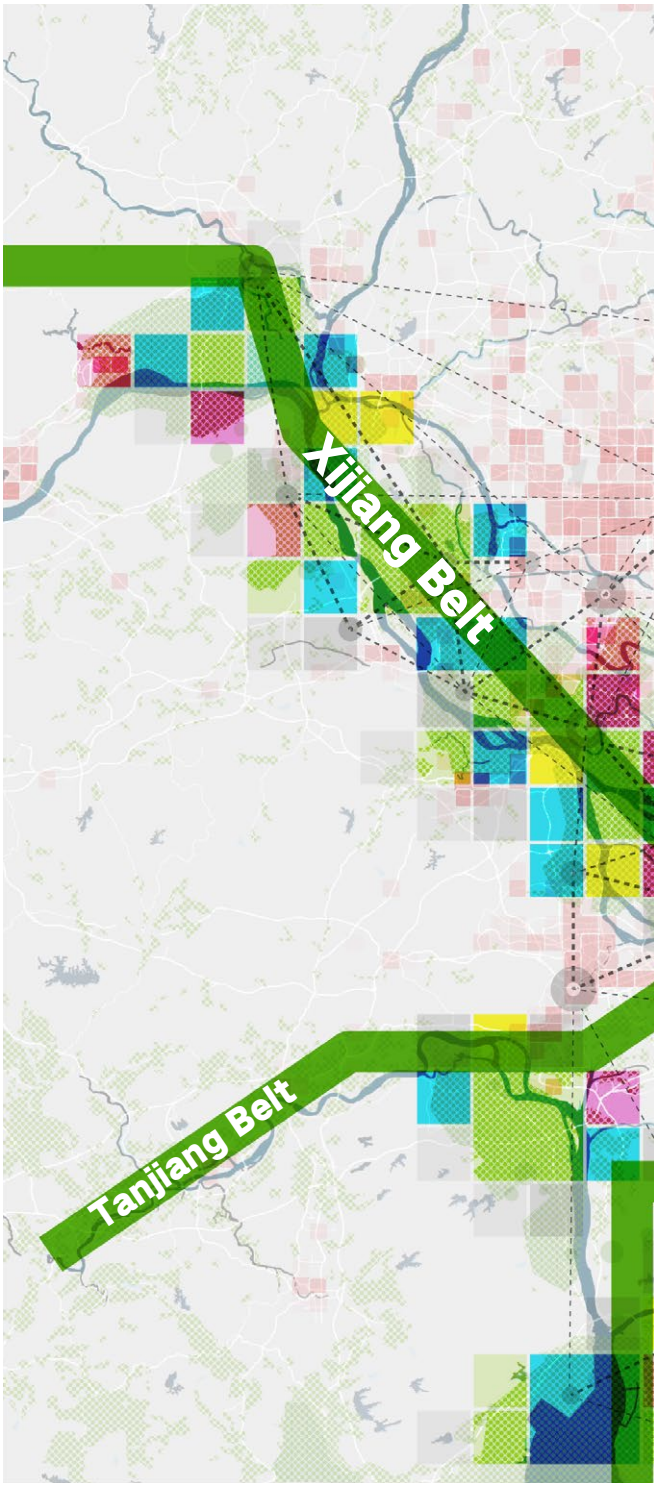
The Spatial Concept for Countryside Development in GBA

Under the argument, the project proposes a spatial concept called "Landscape Productivity Belt" to encourage identified aquaponics production within a cooperative GBA network. The spatial proposal contains three core considerations:

· On the local scale, encouraging diverse rural settlements with local agri-aquacultural production. The concept promotes modern and sustainable aquaponics as the basic industry in the countryside, together with secondary and tertiary industries based on the dike-pond landscape for industries upgrading. It aims to alleviate the socio-spatial conflicts caused by historical industrialization and urbanization. Besides, the existing mono-functional land use would be treated as the specific advantage which could be transformed into the identity of a more complete rural system in the future.

· Connecting diverse countryside through developed infrastructure network, recovering material exchange and productive cooperation between the agriculture and aquaculture sector among separated rural areas.

· Constructing cooperation from the local to the regional scale through the joint participation of stakeholders from rural and urban areas in the production chain. The project aims to form productive clusters consisting of both cities and villages, thus contributing to a decentralized regional network for urban-rural integration.



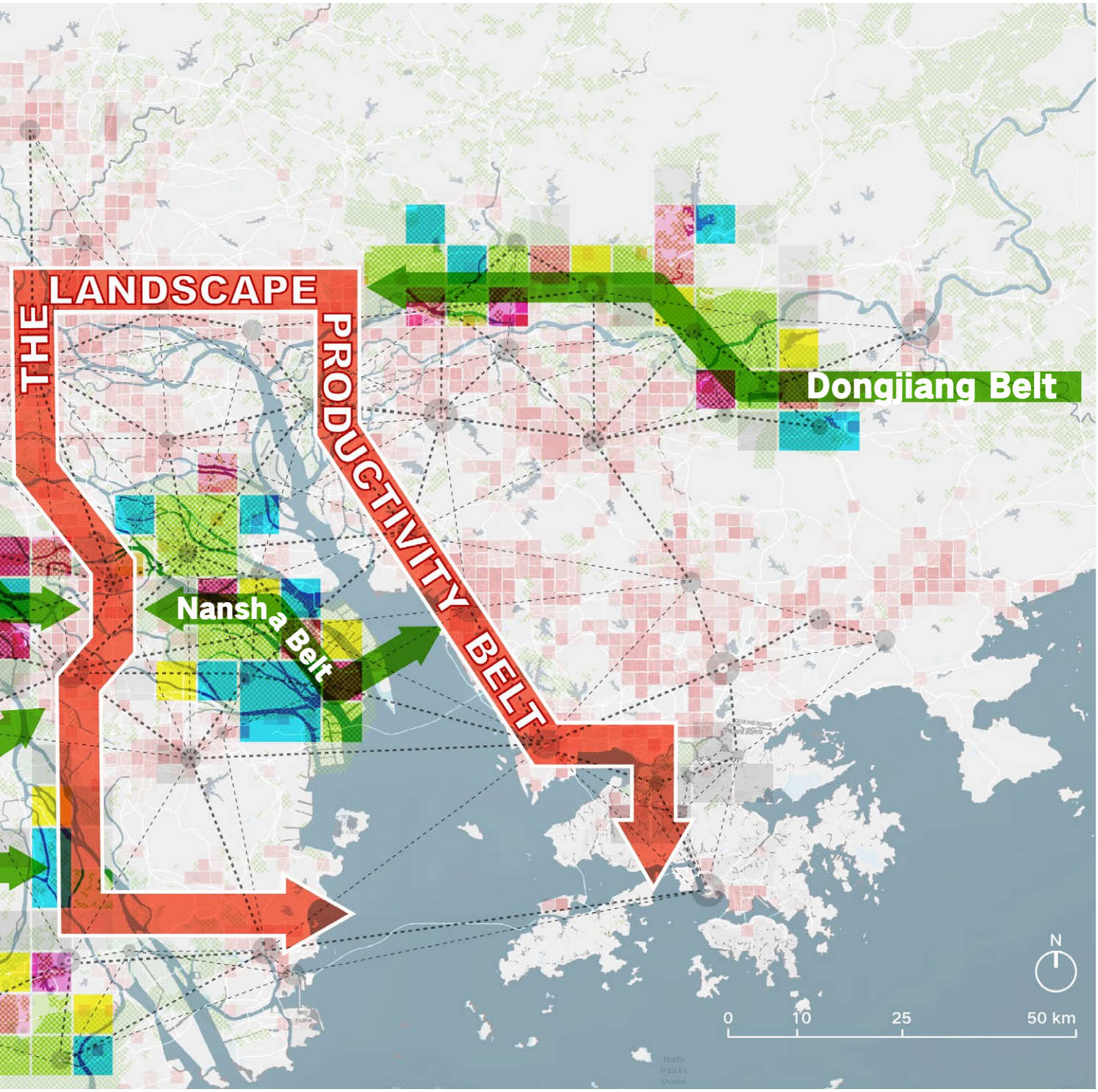
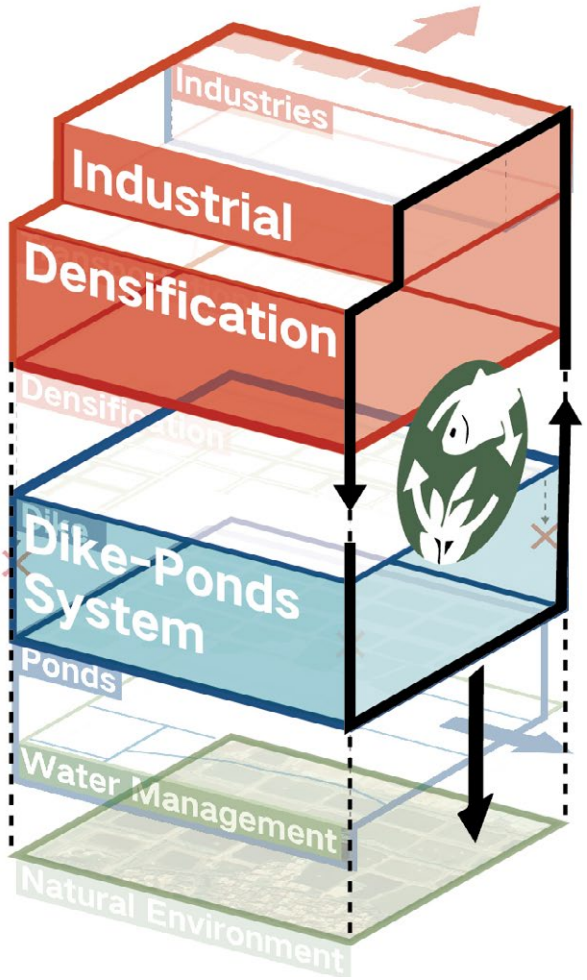
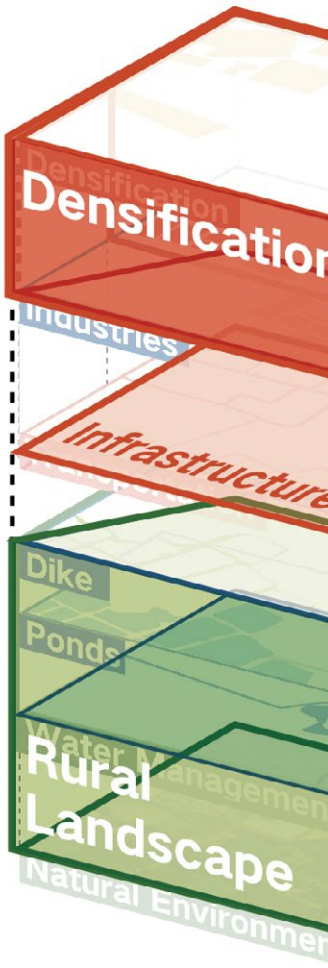


Fig.108 Spatial Concept: The "Landscape Productivity Belt"

Conceptual Patterns

Priority Layers and Design Assignments of Three Concepts





Pattern I

The Innovation Grid

The priority of the conceptual pattern "the Innovation Grid" is promoting an industrial regeneration based on aquaponics production and the existing landscape. Related assignments include rebuilding the integrated dike-pond system, regenerating industrial constructions for landscape-oriented productions and organizing a cooperative platform for agricultural sector.

Patte

The Composit

The priority of the conce
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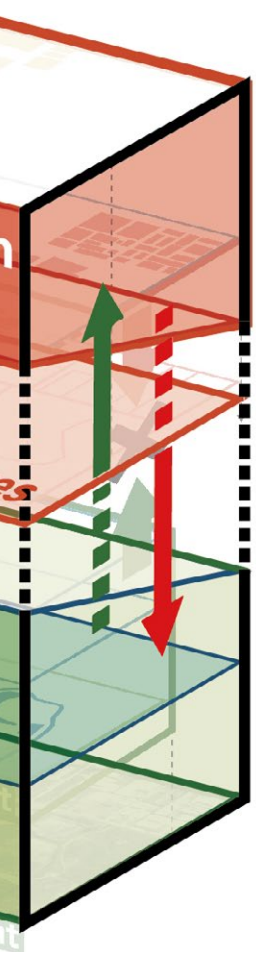
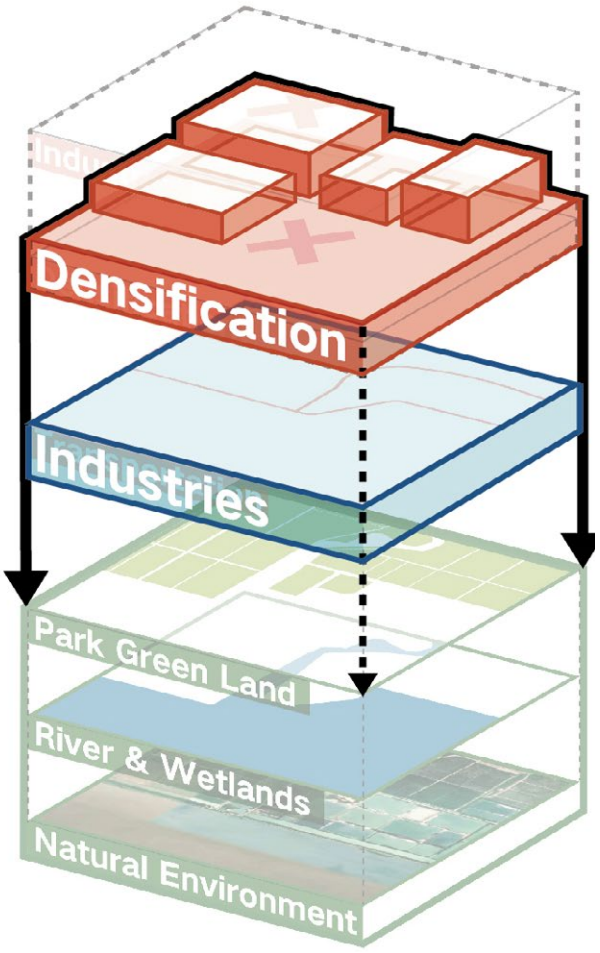




ern II

te Community

eptual pattern "the Eco-
" is merging the texture
between urbanized parts
elated assignments are
is hybrid with aquaponics
s transportation infrastr-

Pattern III

The Hybrid Habitats

The priority of the conceptual pattern "The Hybrid Habitats" is rebuilding the comprehensive human-land system with a low environmental impact way. Related assignments are developing ecological densification for dwelling and potential industries upon the common habitat for diverse species.

Agendas

Priorities for Rural Development in the GBA

Modern Aquaponics Production

As the economic basis, the modernization of agriculture should be regarded as the primary principle of future rural development. The agriculture sector in the GBA can be subdivided into the cultivation and the aquaculture, and these two types should be integrated in order to increase the efficiency of land use.

Fig.109

Technic Innovation of Local Industries

Cities in the GBA could be regarded as an advantage for agricultural development. Knowledge and creative vitalities they carry should be combined with the agricultural modernization. The industrial innovation would radically enhance the position of the agricultural productivity in existing economic structure.

Fig.110

Smart Mixed-Use Neighbourhoods

Rural settlements should declare an agglomeration model distinguished from cities. The model should be achieved through low-density and organic clusters of neighbourhoods to echo the landscape. The neighbourhood should be multifunctional and intelligent allowing efficient interaction between rural elements.

Fig.111

Shared Productive Landscape

The agricultural landscape should act as inclusive shared green space in rural areas while serving as the means of production. Unlike traditional manufacturing, agricultural land has unique natural values beyond production. The value should be maximized and integrated with other industries.


Fig.112

Governance with Shared Profits

Power of the countryside should be strengthened and the benefits farmers gain from the strategies should be taken into account. The decision should be developed on the common vision to combine regional coordination with flexibilities of local development. It should be a multilaterally profitable process.


Fig.113

Comprehensive Accessibility

Infrastructure could combine distributed rural elements into a compact system and work as physical connections between different settlements within the region. The system should integrate diverse transport modes and create coherent accessibility at different scales.


Fig.114

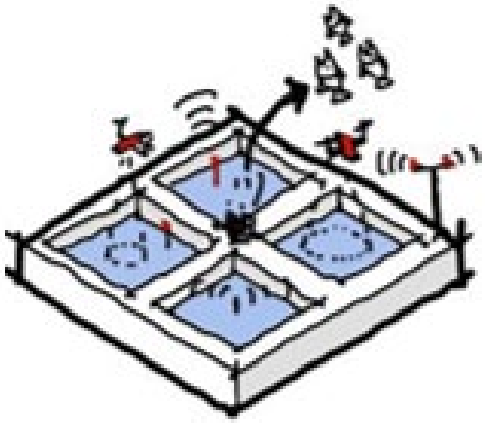
Possible Solutions

Tool Box for Spatial Interventions on the Local Scale

Compared to the vision and the guidance agendas, the specific solution is a bottom-up instrument within the Backcasting Approach. A series of spatial strategies are developed under the framework constructed by the main principles.

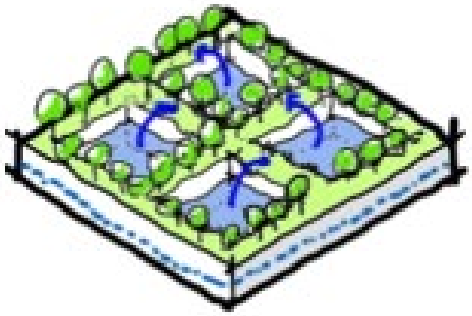
The development of the solutions should be organized through an engaging knowledge tank, where ideas would be contributed together by diverse stakeholders. This means it would contain the potential to integrate knowledge from different perspectives and coordinate the profits of people from different groups. The progress could help with solving problems belonging to multiple fields on the local scale. In the end, these ideas will be translated into practical spatial interventions.

The design toolbox, as a cluster of the solution, would grow through time and create flexibility based on the coherent arguments, in order to deal with dynamic spatial and social issues. The proposal chapter presents several possible solutions under the different agendas.



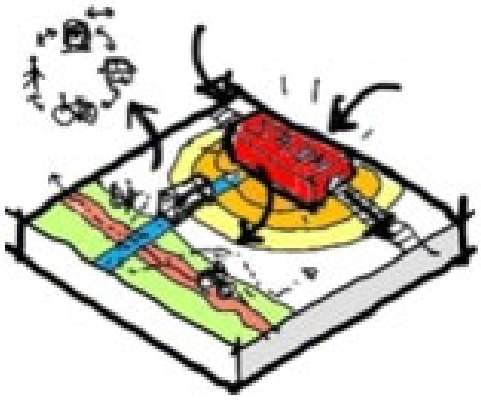
Productive Tech-Units

Hybri



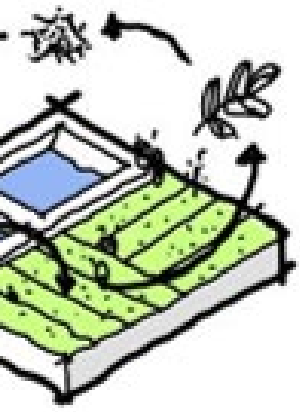
Circular Metabolism

Wate

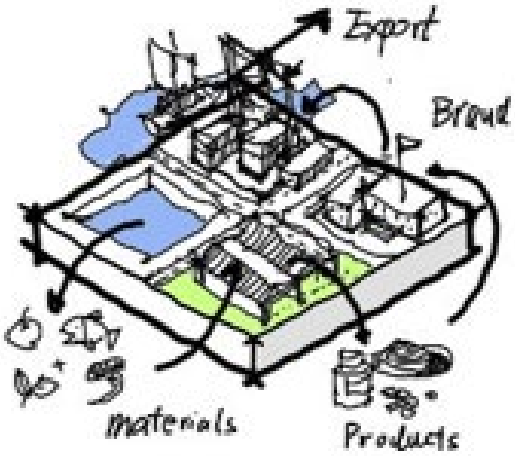


Multitransport Accessibility

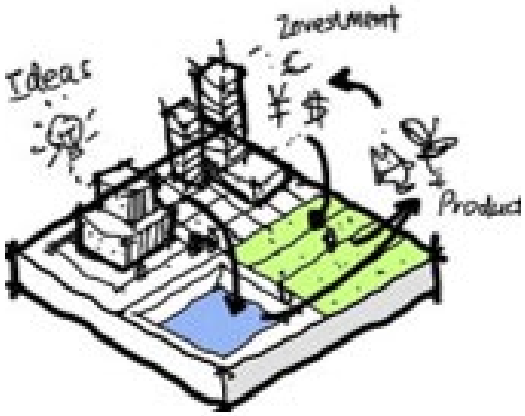
Sharin



d Aquaponics

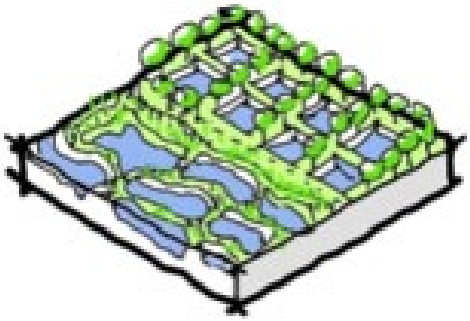


Complete Production Chain

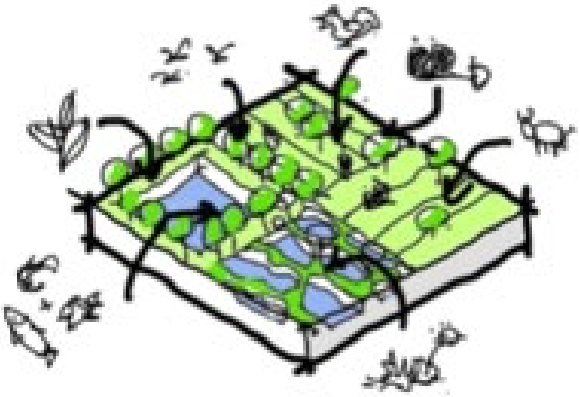


Cooperative Platform

r Purifucation

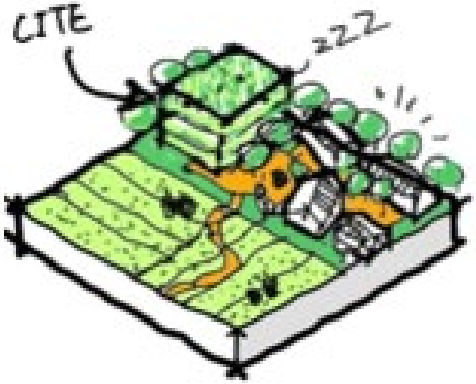


Aquaponics Wetlands



Aquaponics Habitats

ng Landscape



Eco-densification

Equitable Employments

Fig.115 Rural Revitalization through Industries

V DESIGN

Taking priority design assignments in the three conceptual patterns, the design part rehearses the implementation of the project proposal in the GBA. Distinguished from urban design projects, design in the project is used as a tool focuses on structural organisation of the target layers and interaction of elements within the system. It aims to provide a spatial foundation for the proposed mechanism based on aquaponics landscape, rather than a controlling detailed design. Thereby allowing flexibility for engaging and bottom-up development while implementing guidance interventions.

Design Cases for Testing

Concptual Pattern implemented in Three Typical Sites

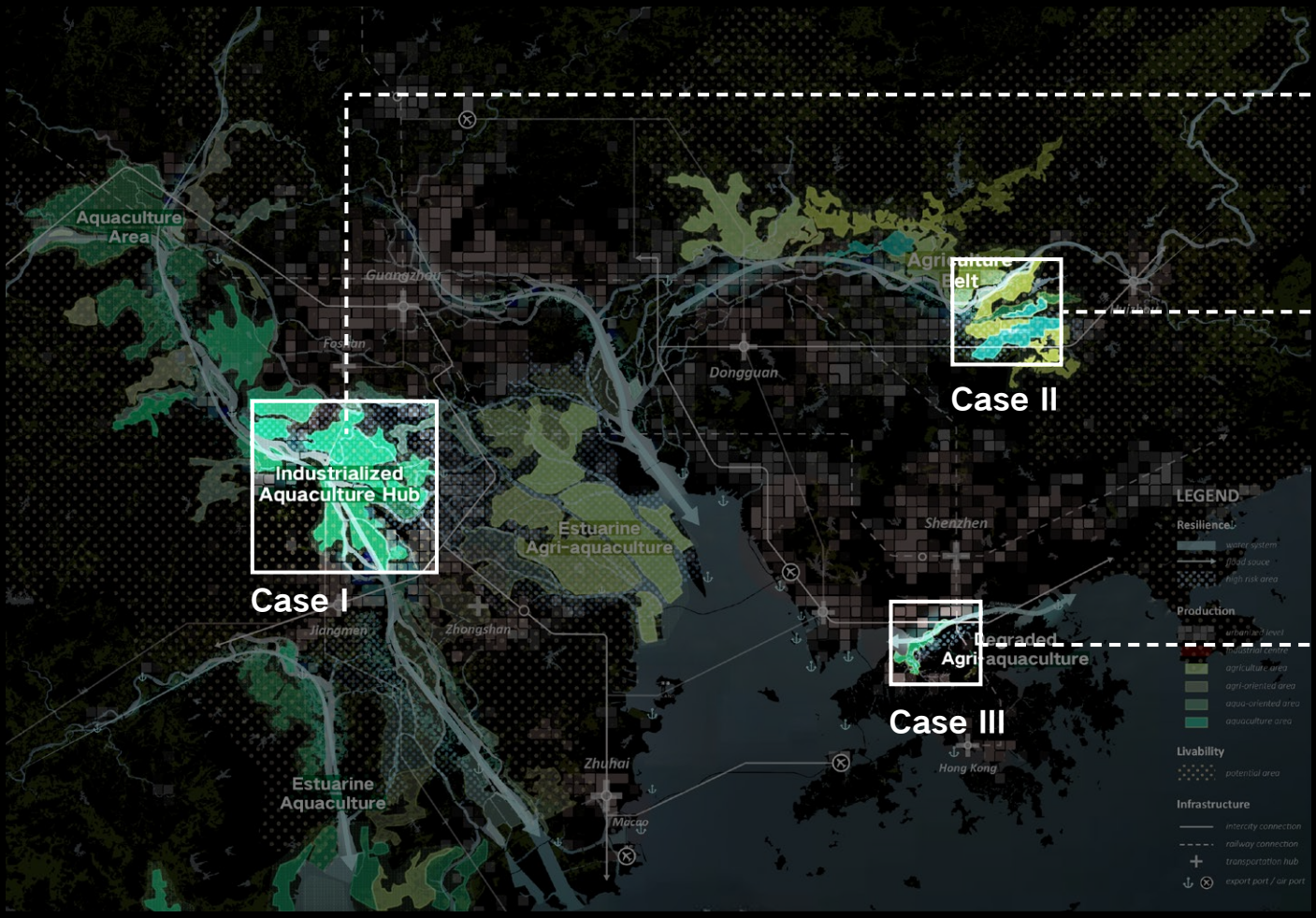


Fig.116 Site Selection for Design Cases

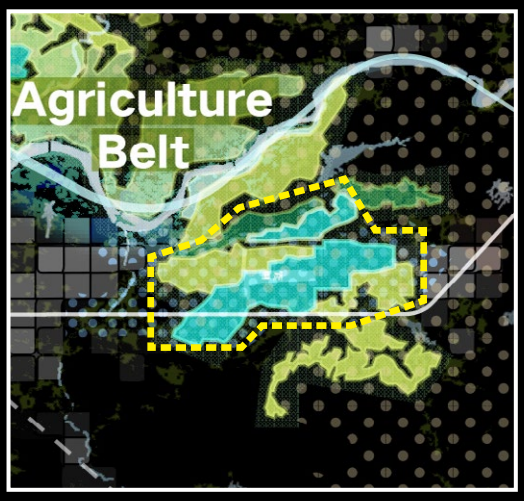
Taking the design as a test progress, three sites with typical characters are chosen to rehearse the proposed mechanism in the countryside. Each site is linked to a specific conceptual pattern, which practie different priorities based on urgent problems in corresponding conceptual pattern.

The designs in three cases explain how the priority agendas could be implemented through possible interventions, and organize cooperative industries relative to the local agri-aquaculture landscape. Each case should be regarded as an example of the concept and referenced by other villages with simmilar characters.

Case I: Xingtan Town

From "The Separate Grid" towards "The Innovation Grids"

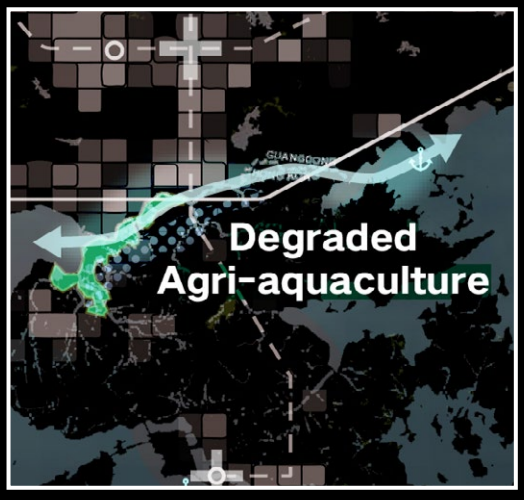
Qiangtian area is a typical scaled aquaculture area experienced industrialization in the GBA. Located in downstream with high flooding risk, monofunctional agriculture form contains challenges and possibilities at the sametime.



Case II: Tonghu Area

From "The Opposite Volume" towards "The Composite Community"

Tonghu area is a hybrid rural region mixing mono agriculture and aquaculture lands, and a west inland threatened by floods with a decreasing lake. Besides, between two developing cities, the area is highly influenced by urbanization.



Case III: Mai Po Area

From "The Isolate Blanket" towards "The Hybrid Habitats"

The Mai Po area is typical because of its environmental-protected method. Lying on the buffer between metropolitans, an inclusive and multifunctional development pattern is significant with the dissolution of the boundary for this area.

DESIGN CASE I

The Innovation G

rid


Scan code collection
ID: 0204142
Fish welfare
Lice counting
Customer details

Case Site

Intensified Aquacultural Area in Xingtan Town

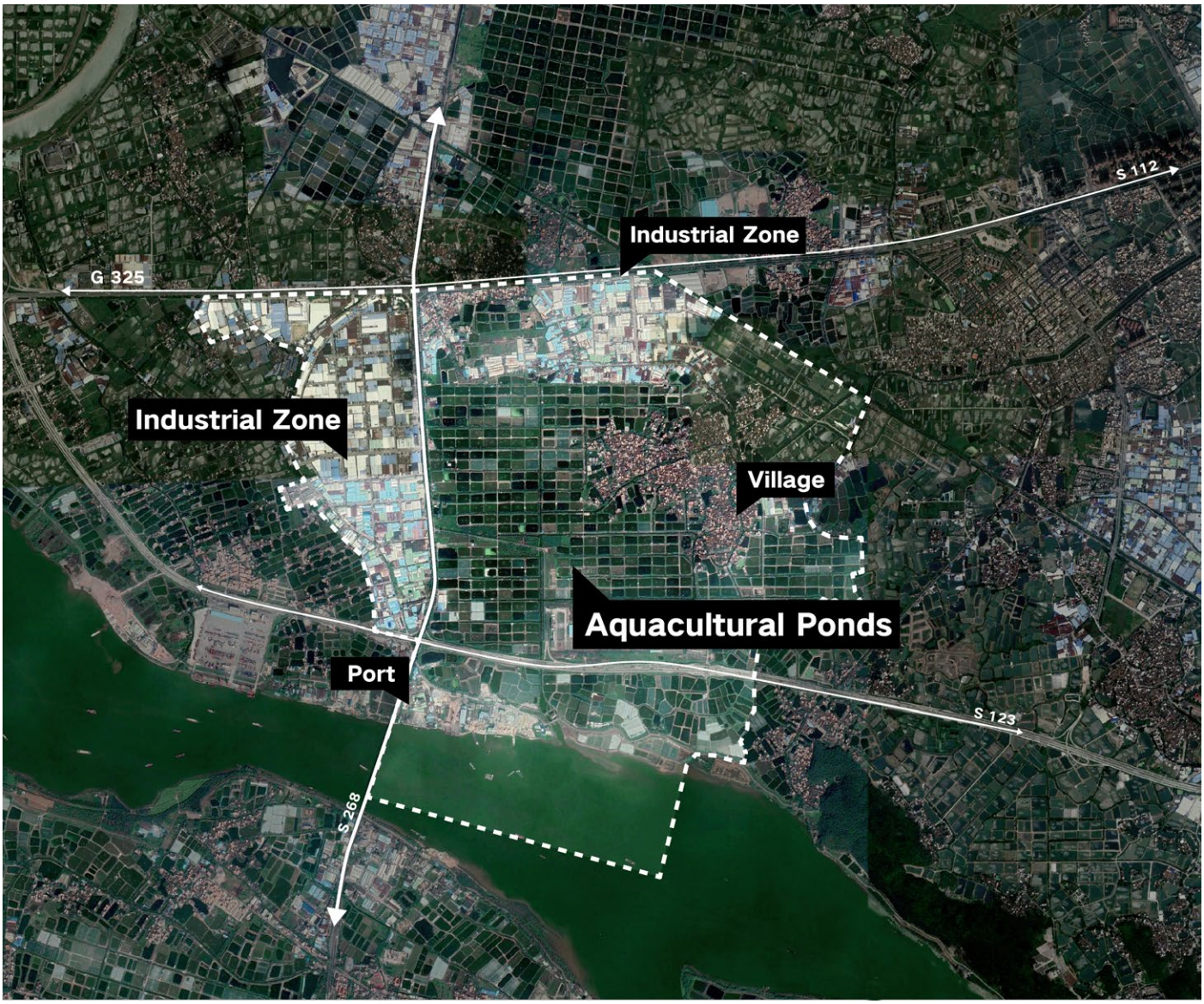


Fig.117 Range of the Selected Site in Xiantan Town

The first case is an application of the pattern "The Innovation Grids" . It proposes a modern production mechanism based on the dike-pond landscape, and provided serious of solutions for side-effects of the standardized mono-functional fish pond system in Xiangtan Town. It aims to show a poteintial developent transforming the unbalanced fish factory into an innovation area for aquaponic productions.

Part of the case site is selected as a sample area to display the development of agendas under the concept, including how they are translated into specific spatial interventions, work together through interactions and are integrated into a complete system.

Priorities

Competitive Production Objectives within the Grid System

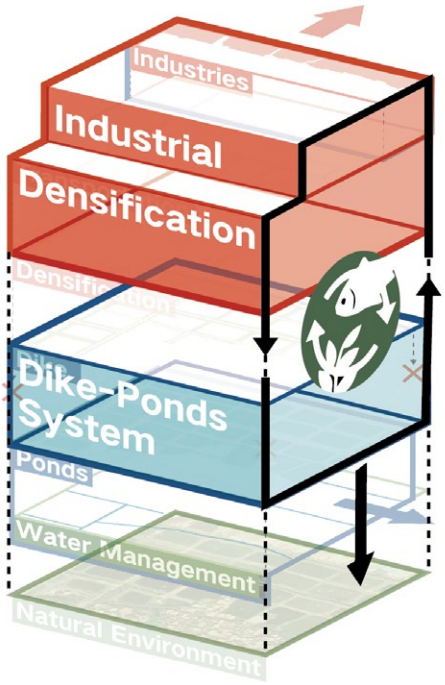


Fig.118
Model of the Concept "The Innovation Grid"

Dike-Ponds Rebuild

Considering that the incompleteness of the local system is caused by separation of the dike-pond system, the first priority is to enhance the ignored role of the dike within the system and to re-establish collaborations between dikes and ponds. Due to shifted market demands, it is no longer realistic to rehabilitate the traditional mulberry agri-aquaculture. Therefore the design focuses on the multifunctionalisation of the dike and the restoration of its ecological function, thus transforms it into the bridge between different components of the system.

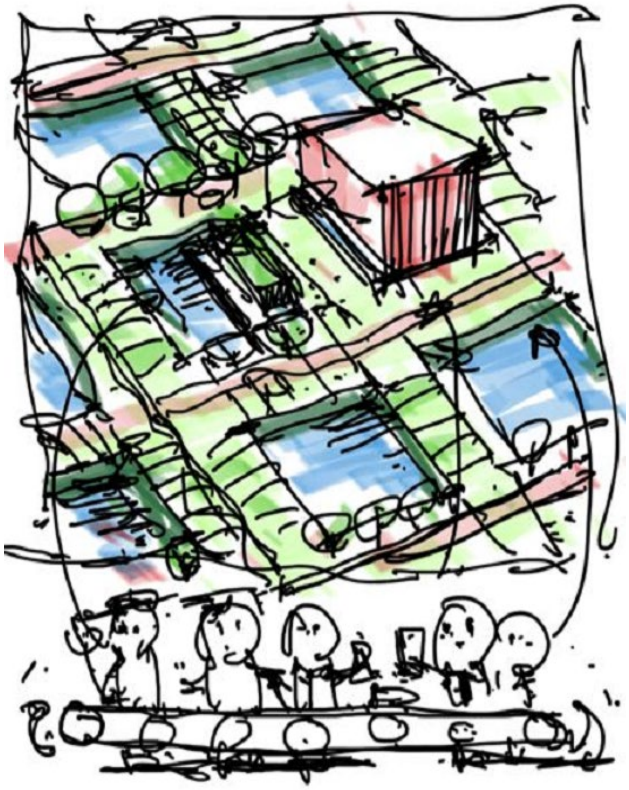


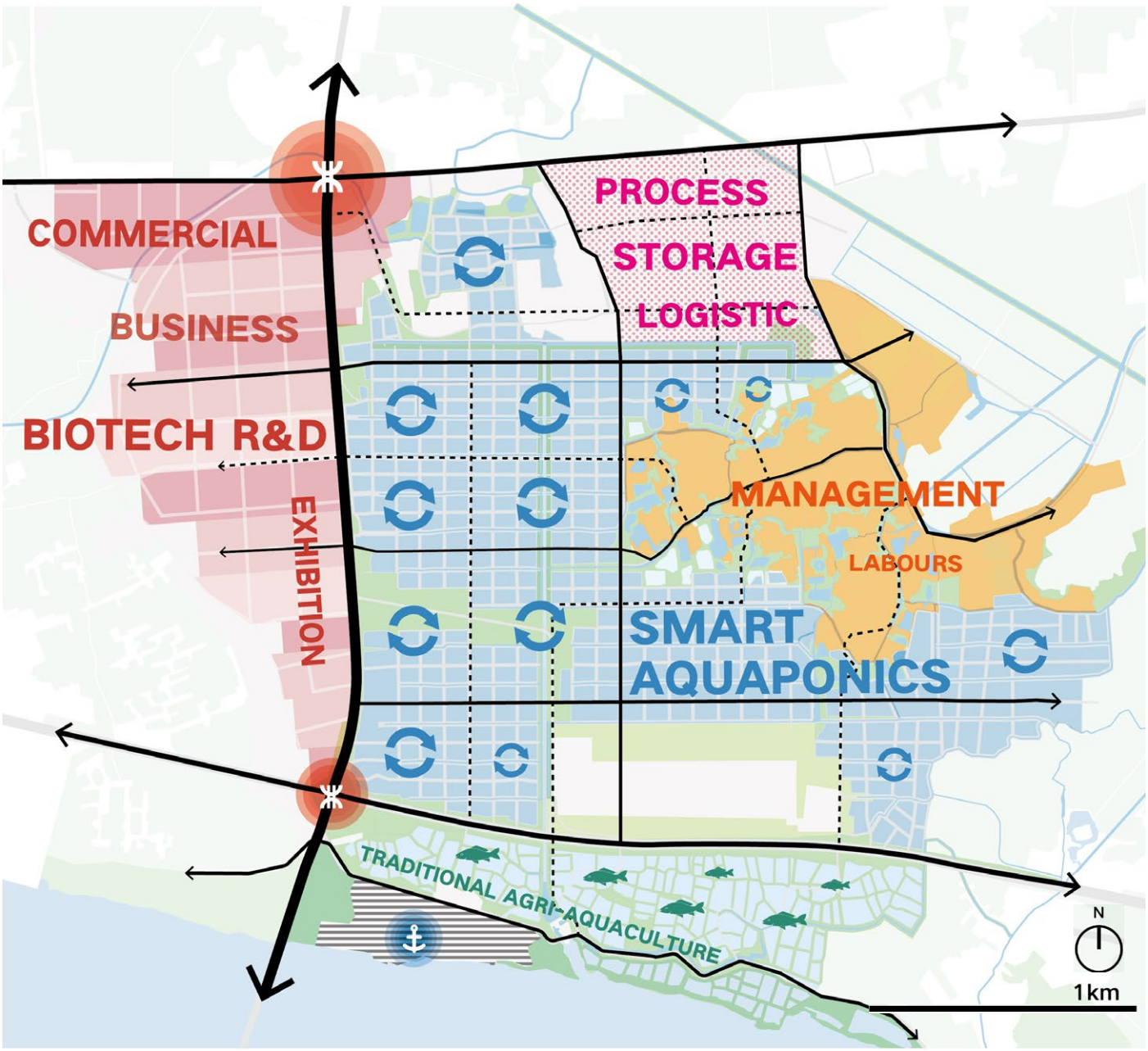
Fig.119
Cooperative Production Align Stakeholders

Cooperative Aquaponics

Another reason for the decline of the rural system is the separation of the industries from the agricultural landscape under local industrialisation. The industrial innovation based on productive landscapes is proposed to create modern local industries that are more tightly related to aquaponics. The design encourages the development of organic and efficient agri-aquacultural production on existing aquacultural industries, while extending the production chain to create a cooperative platform. The involvement of the different sktake-holders would contribute to the future integration of local aquaponics industries with secondary and tertiary industries, as well as comprehensive productivity of the countryside.

Agenda: Modern Aquaponics Production

Entire-chain Upgrading based on Informationalized Production Units



The spatial framework for industrial innovation is a prerequisite for transition. The local industry in the future could be an informationalized aquaponic system with full production chain:

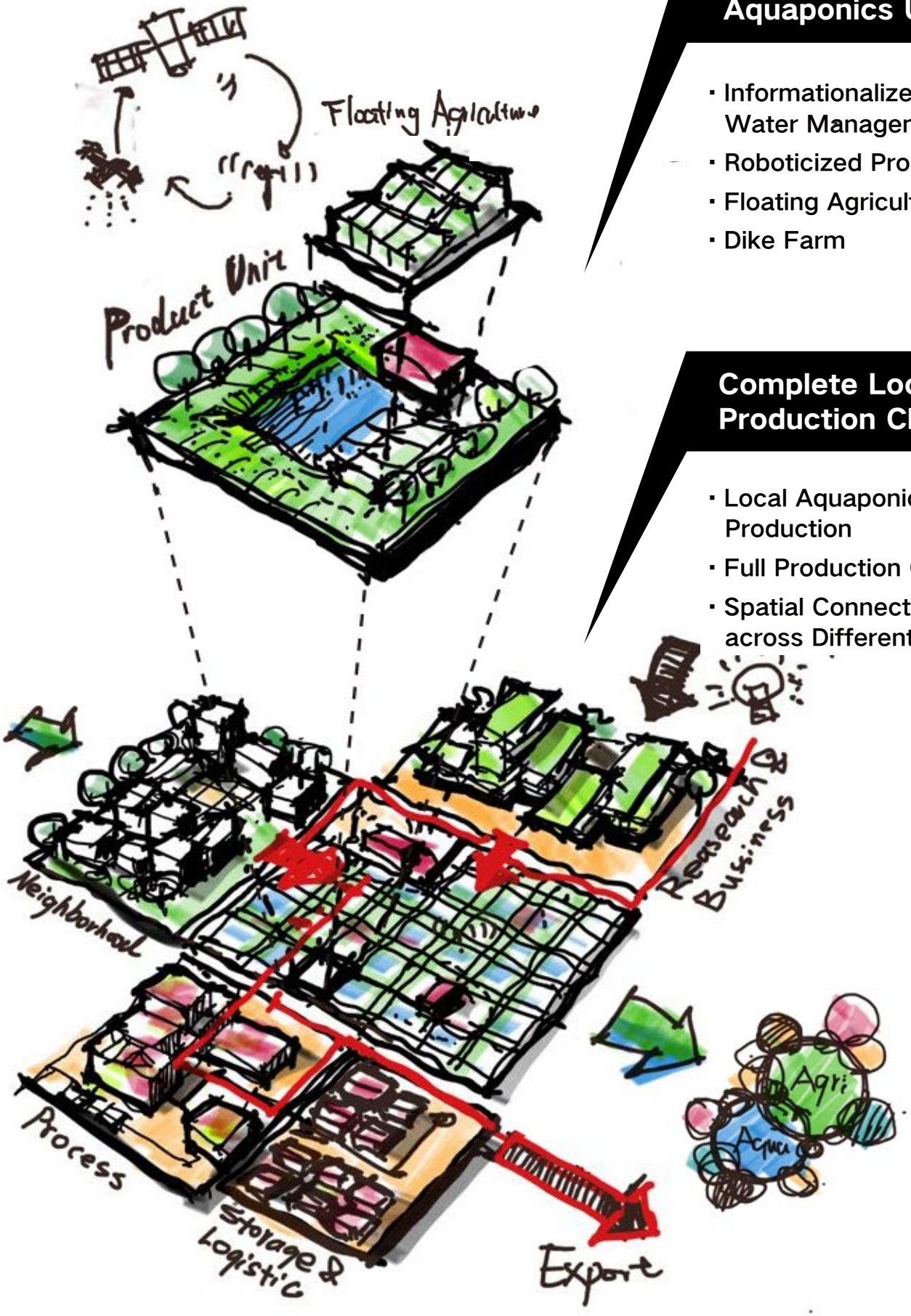
- Increasing efficiency of the production units. Expanding the division of the production unit into composite dike-pond system, recovering the combined agriculture and aquaculture in a three-dimensions, and applying informational production techniques.
- Encourage the extension of the production chain and the division of labour at local level. Connecting separate areas through infrastructures and providing spatial conditions for proposed cooperation.

Smart Aquaponics Unit

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

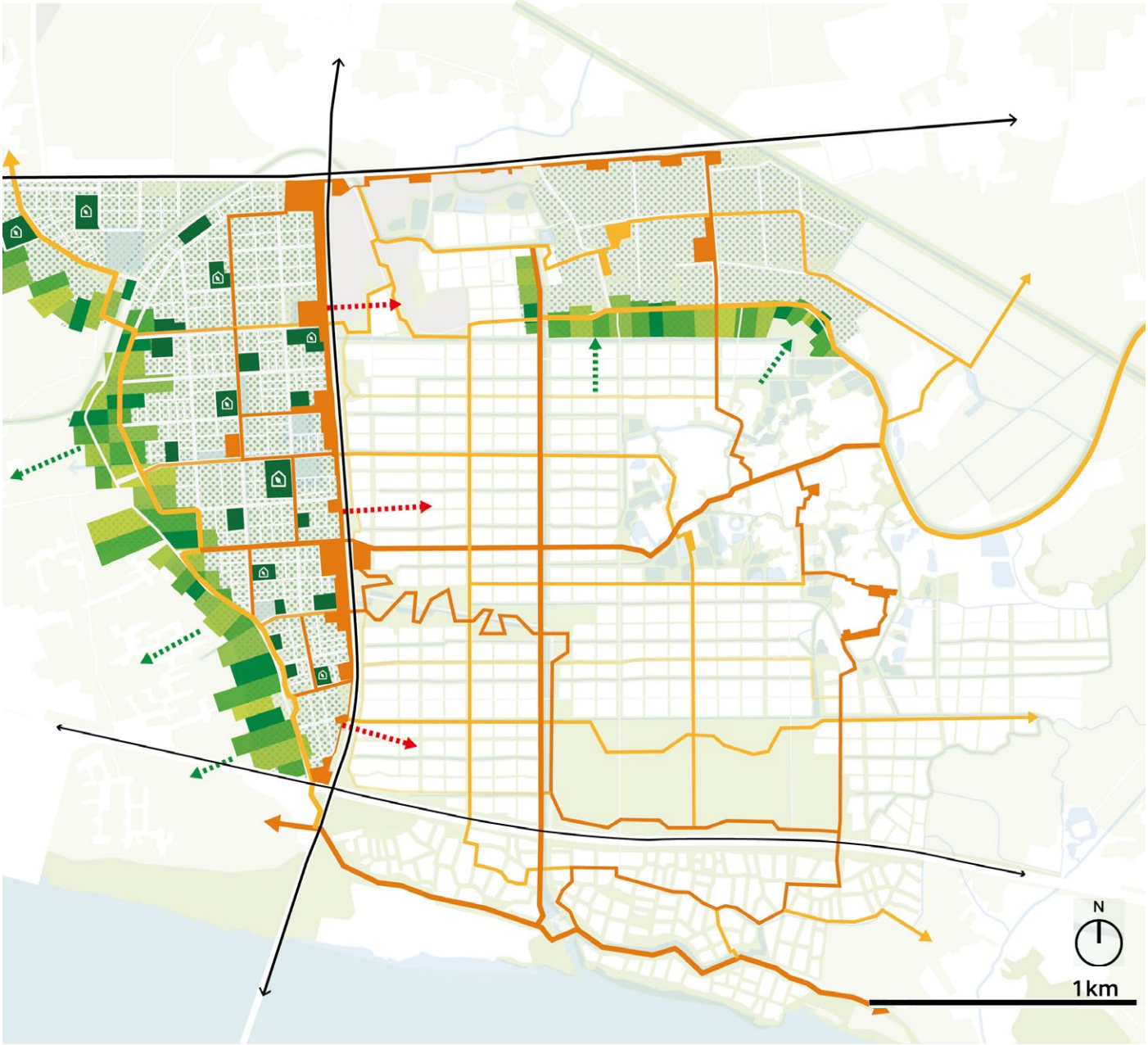
Complete Local Production Chain

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



Agenda: Organic Densification

From Manufactory Factories to Aquaponics Innovation Hub



The industrial renovation could be taken as an opportunity for regenerating existing industrial factories into organic constructions integrated into the local landscape:

- Transforming existing factories into sustainable buildings, creating space for research, processing, business and logistics that serve aquaponics production.
- Connecting the artificial landscape in the densification area to the surrounding blue-green network, encouraging three-dimensional greenery as well as sponge facilities at public nodes.
- Replacing the boundary between the industrial area and the surrounding dike-pond landscape with experimental agricultural belts and linear public spaces which have interacted interface.

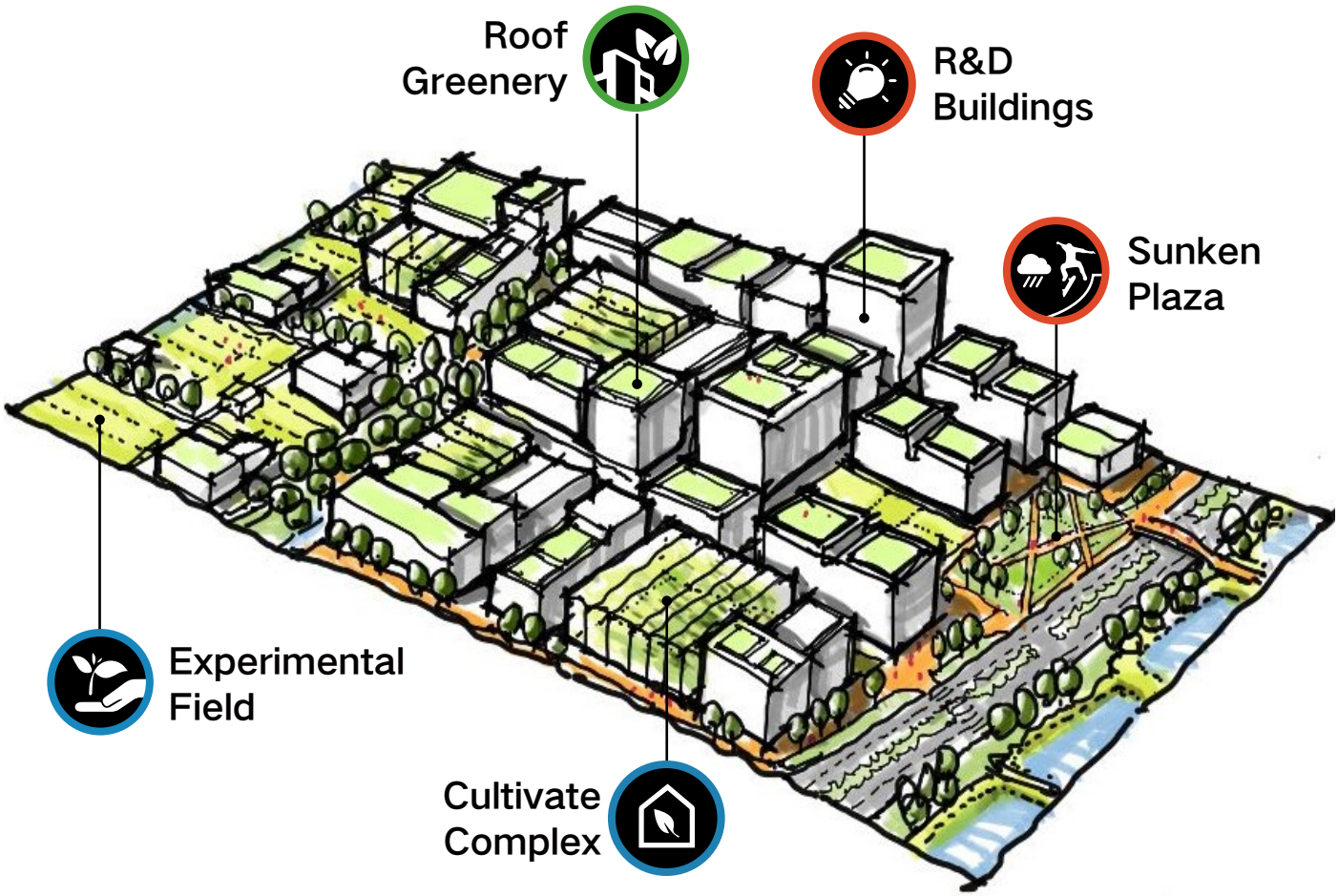
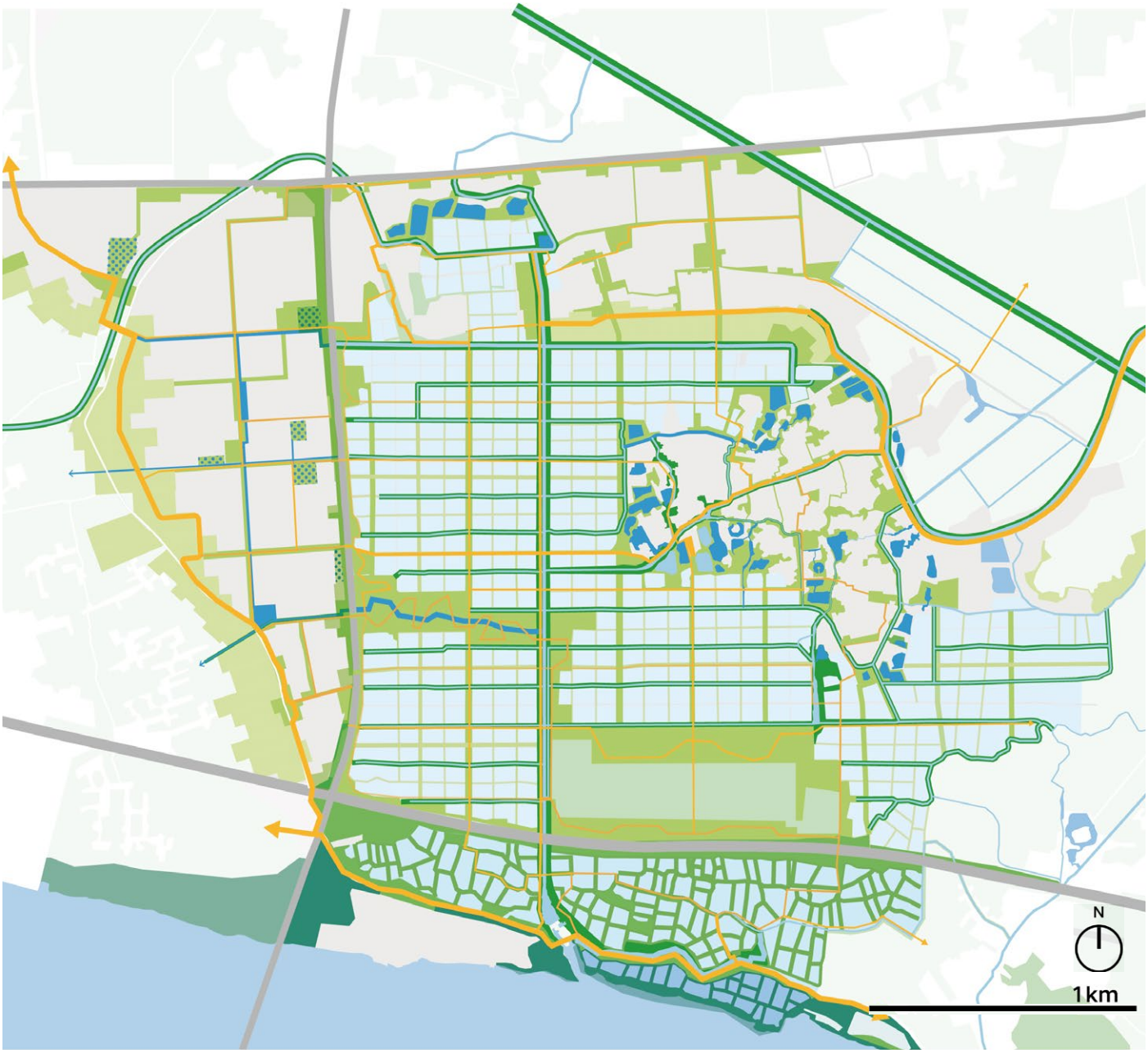


Fig.120 Regenration of the Local Industrial Area

Agenda: Sharing Production Landscape

Dike-Ponds System as Multifunctional Green-blue Infrastructure



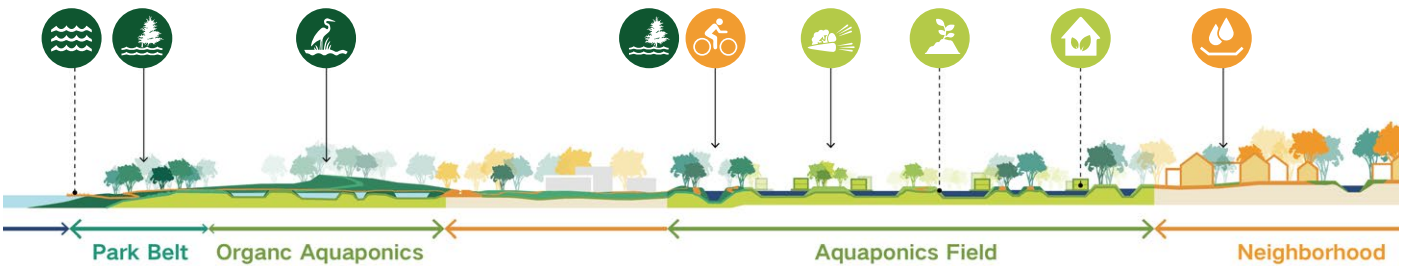
The restored dik-pond landscape could take on multiple functions beyond production and be integrated into a continuous landscape network:

· Regarding ecological aquaponics landscape as part of the blue-green infrastructure. Developing a multi-level water resilience system covering the entire area on the basis of this Landscape.

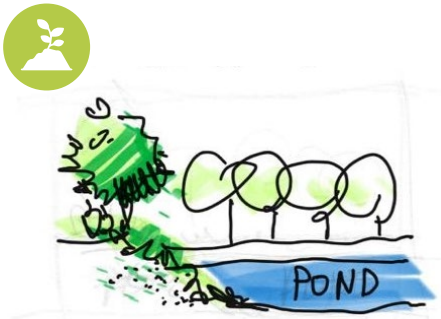
· Combining the dike-pond landscape with slow transportation for a shared productive landscape.

· Blurring the boundaries between the construction area and the aquaponics landscape through softened interface.

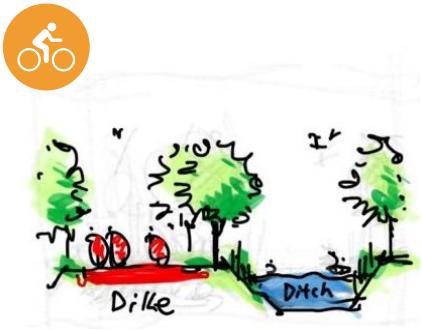
Nature | Production | Activities



Hydrophilic Bank



Soft Slope



Leisure Dike Lane

Aquaponic Wetland

Dike Cultivate

Eco-Regeneration

Green-blue Corridor

Vertical Aquaponics

Sponge Plaza

Fig.121 Selected Spatial Interventions in the Landscape Framework

Structure Plan

An Integrated Spatial Condition for Comprehensive Production

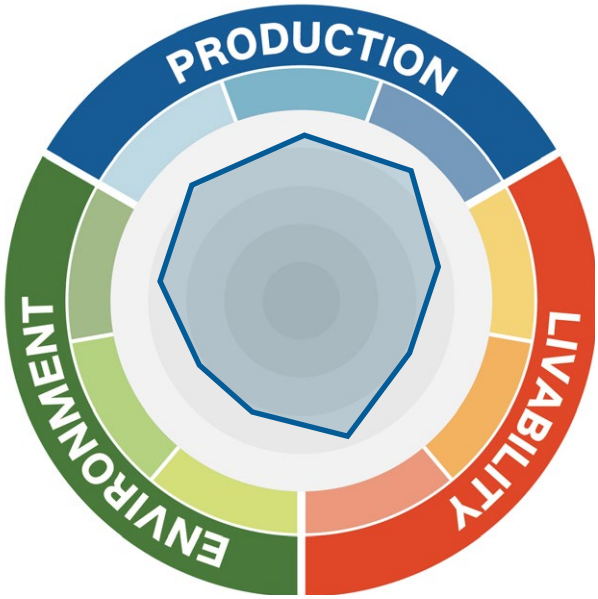
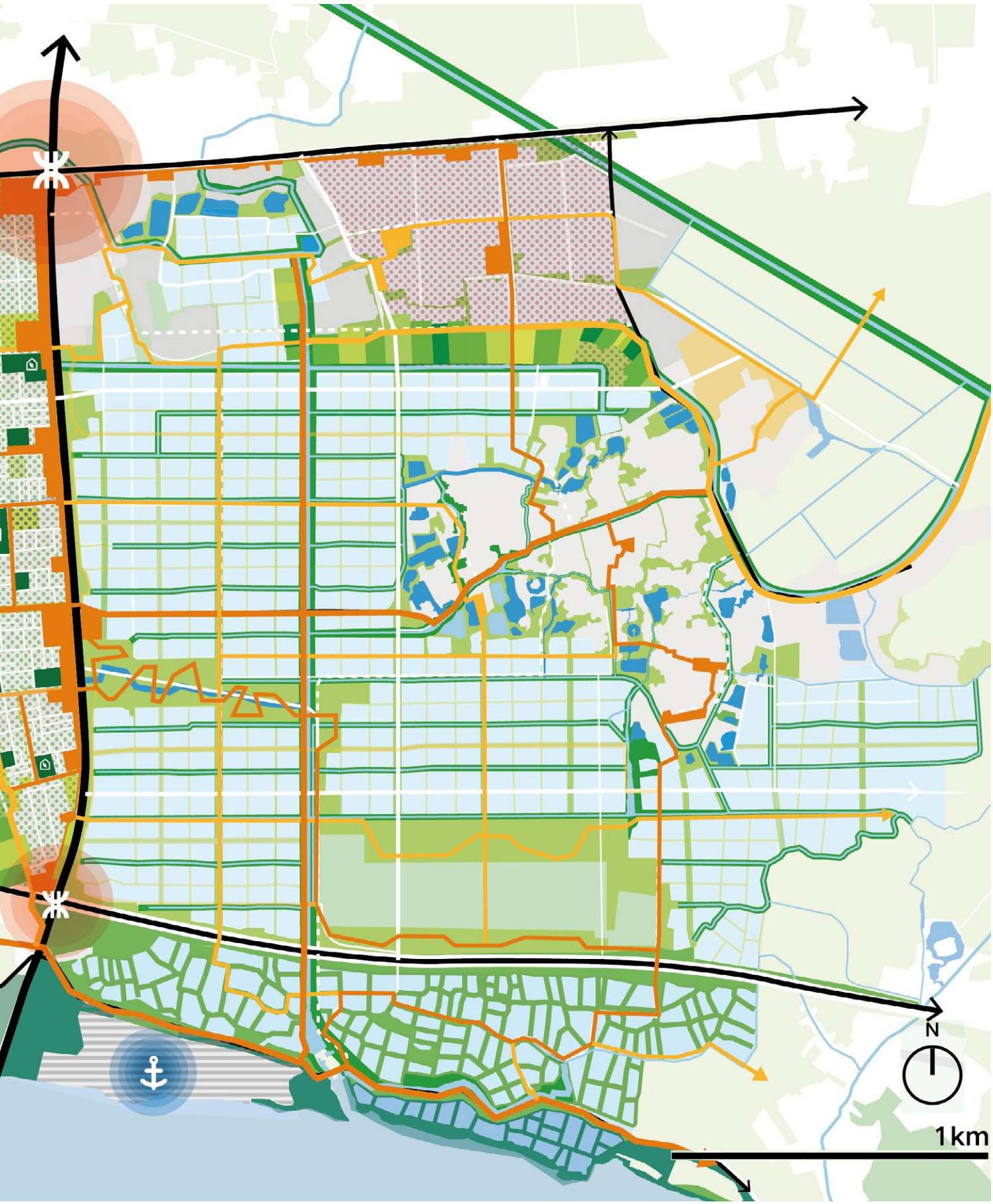


Fig.122
A Balance Model with Identified Productivity

The combined structural plan shows the iterations of aquaponics production, ecological networks, transport infrastructure and organic densification within the same territory. Comparing with the detailed urban design project, the plan creates a framework guided by agendas and provides a continuous landcape basis for local agriculture modernization. The repaired dike-pond landscape is seen as the skeleton of the entire system, and the multifunctional regeneration makes it a spatial and systemic connection between the fragmented zones.

"The Innovation Grid" transforms the production-oriented development into a multifunctional system with a aquaponics identity. Modern productivity, cooperative social structures and shared ecological quality will grow upon the local agri-aquaculture landscape.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Agenda: Cooperative Platform

Stratigic Approaching through Balancing Stakeholder Structure

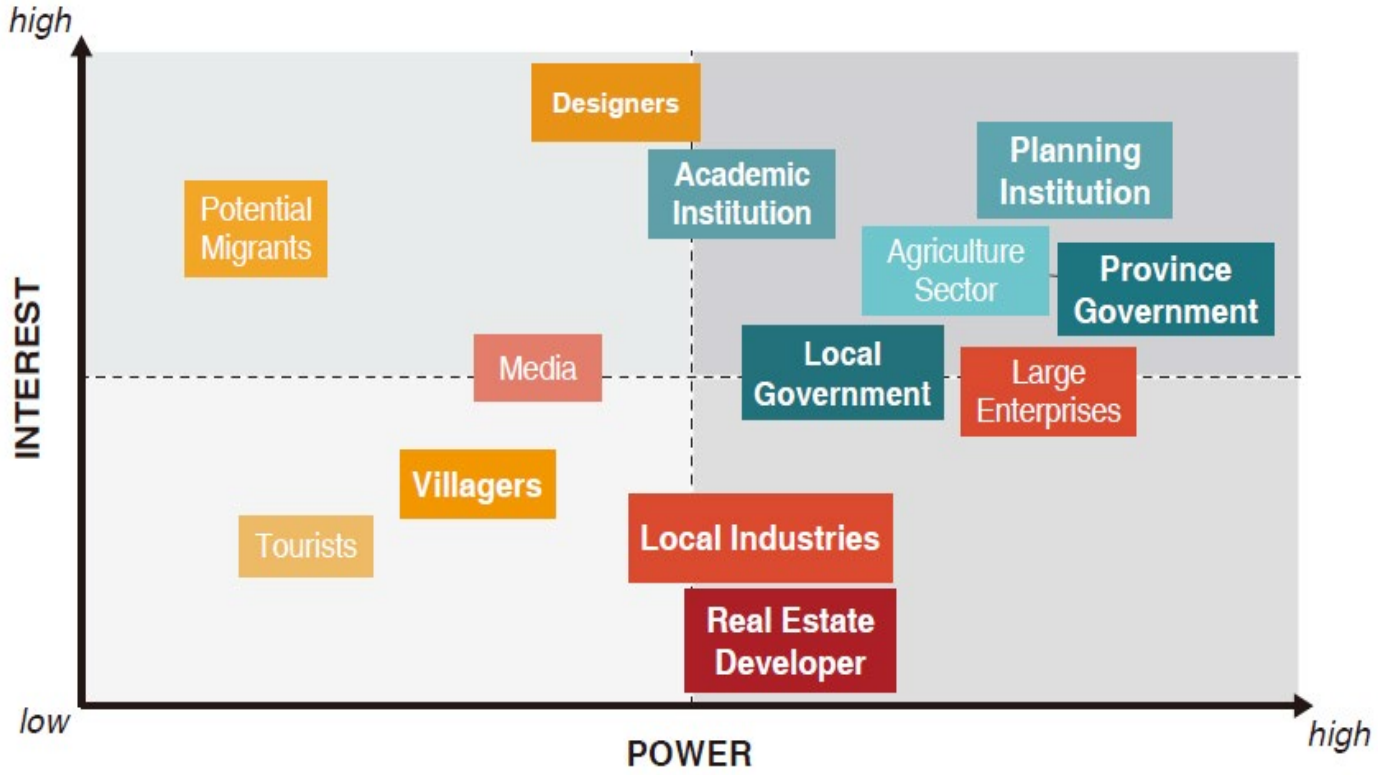


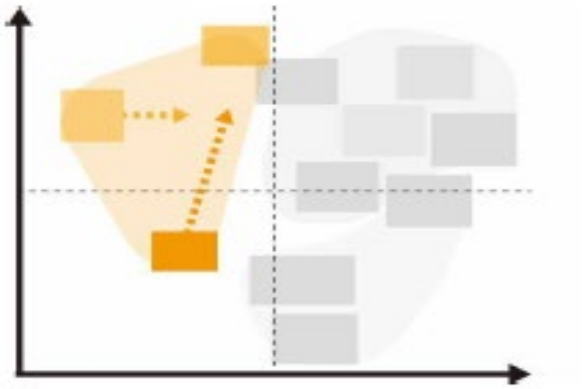
Fig.123 Interst-power Matrix for Related Stakeholders

Stakeholder Structure in the Participate Approach

The limitations of the top-down planning have been discussed in the analysis section. Therefore it is necessary to choose a participate approach while implementing the strategies, and co-decide a practical plan through negotiation between diverse stakeholders.

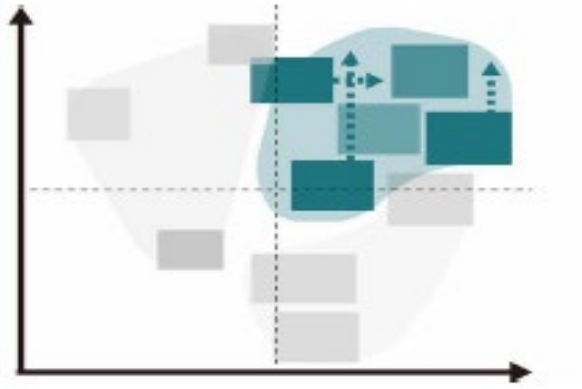
The matrix illustrates the current influence of rural stakeholders on the vision. The interest and power of different groups could be classified as four types. The situation could be optimized based on common interests. It is worth to notice that the COVID has made it difficult to have a real dialogue, so the conclusion shown in the case is a rough result based on the collated information. However, the process can be applied in practice as the sample case.

Furthermore, short-term profits could be distinguished from long-term profits through the urgency of the demand, and a phasing strategy could be developed accordingly. The entire approach is a combination of guiding coordination and social practices under the common interest.



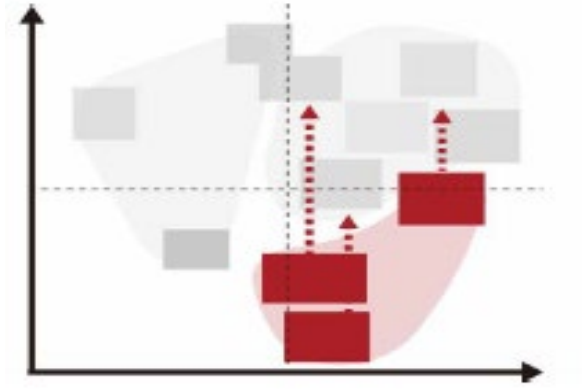
Strengthening Civil Sector

Local villagers in the GBA regard land as their main source of income and have a close connection to their land. (Qiu Ye, 2018) However, the conservation also leads to their indifferent attitude toward the innovations.



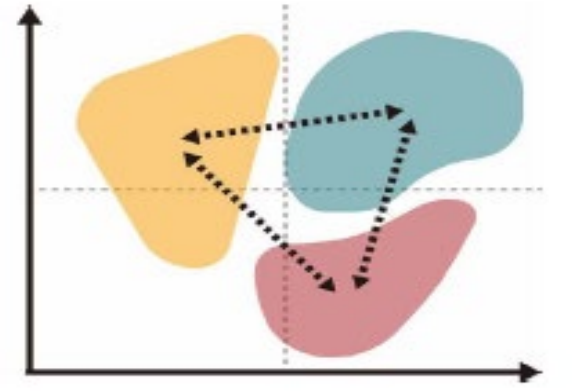
Coordinating by Public Sector

Under the national policy of rejuvenating the countryside, governments at all levels have positive motivation towards the rural problems. However, the path dependence is always existing and make the process hard.



Engaging Private Sector

Most enterprises, especially real estate developers, choose the most efficient development model instead of a long term sustainable model under the fierce market competition environment.



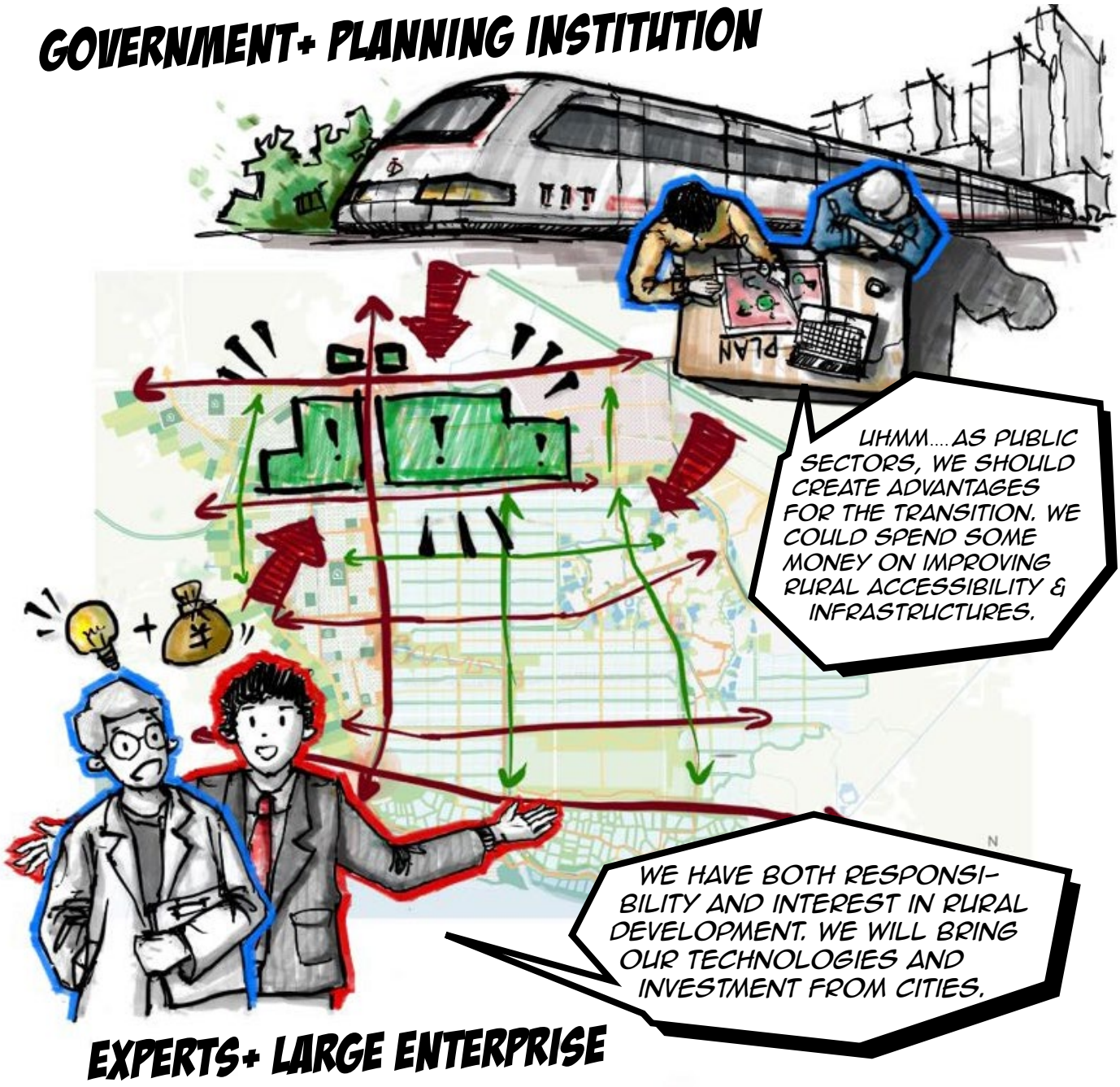
Aligning Through Cooperation

Due to the diversity of problems, it is significant important to build an inclusive and co-creative relationship between stakeholders. The common value and understand could be the bridge between different stakeholders.

Fig.124 Strategies for Stakeholdes Influence Models

Implementation

From Stakeholders to Actors



Phase I: Condition

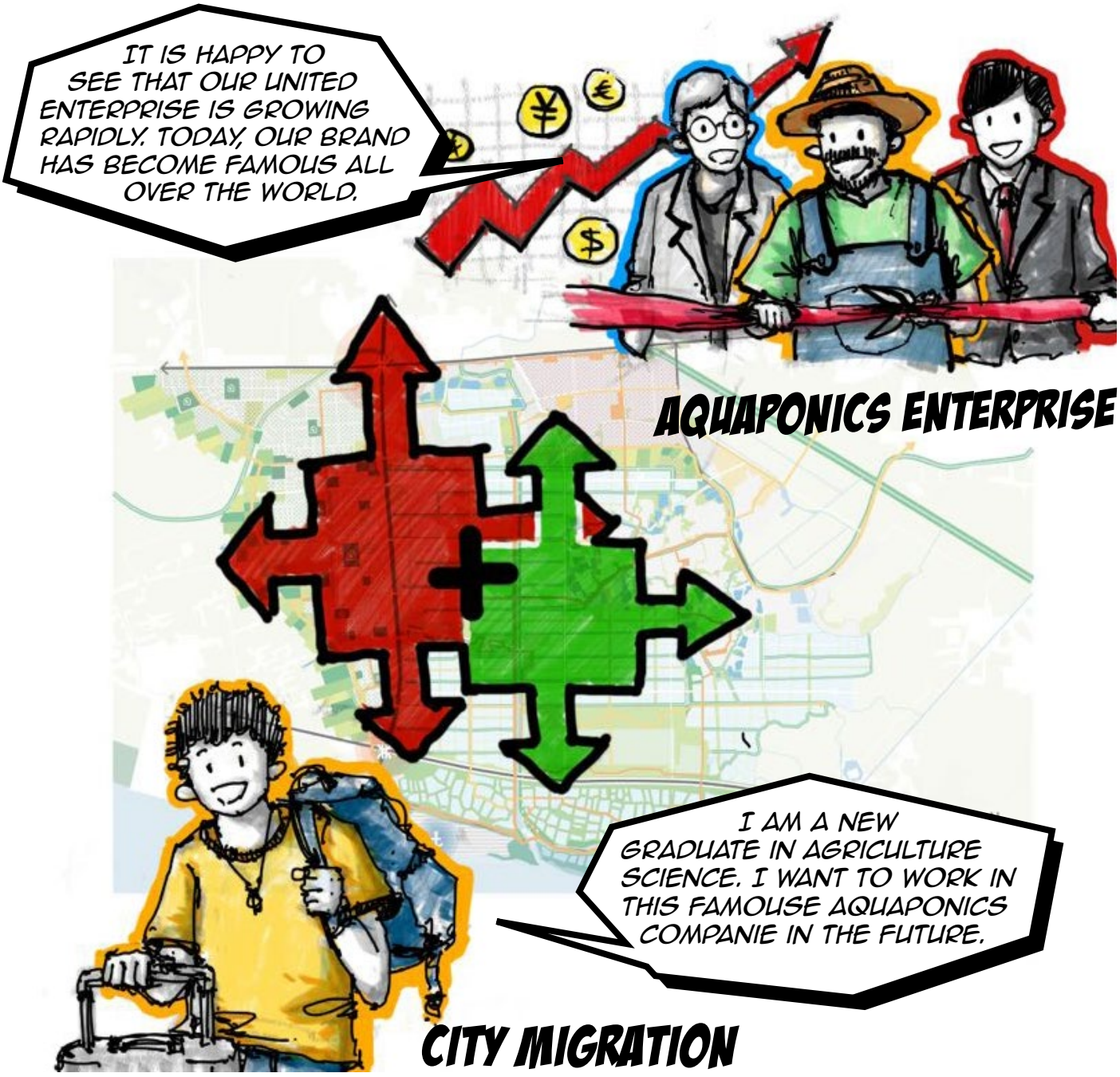
- Led by government and planning institution, infrastructures should be developed firstly as the skeleton of the spatial condition.
- Large enterprises are encouraged to build demonstration base for modern agriculture through renting lands from the locals.

Phase II: Innovation

- Attracting local enterprises for industrial innovation related to aquaponics production, and providing employment for local labour forces.
- Encouraging forming of the cooperatives and promoting scaled regeneration of the dike-pond system gradually. Completing business chain together with enterprises.

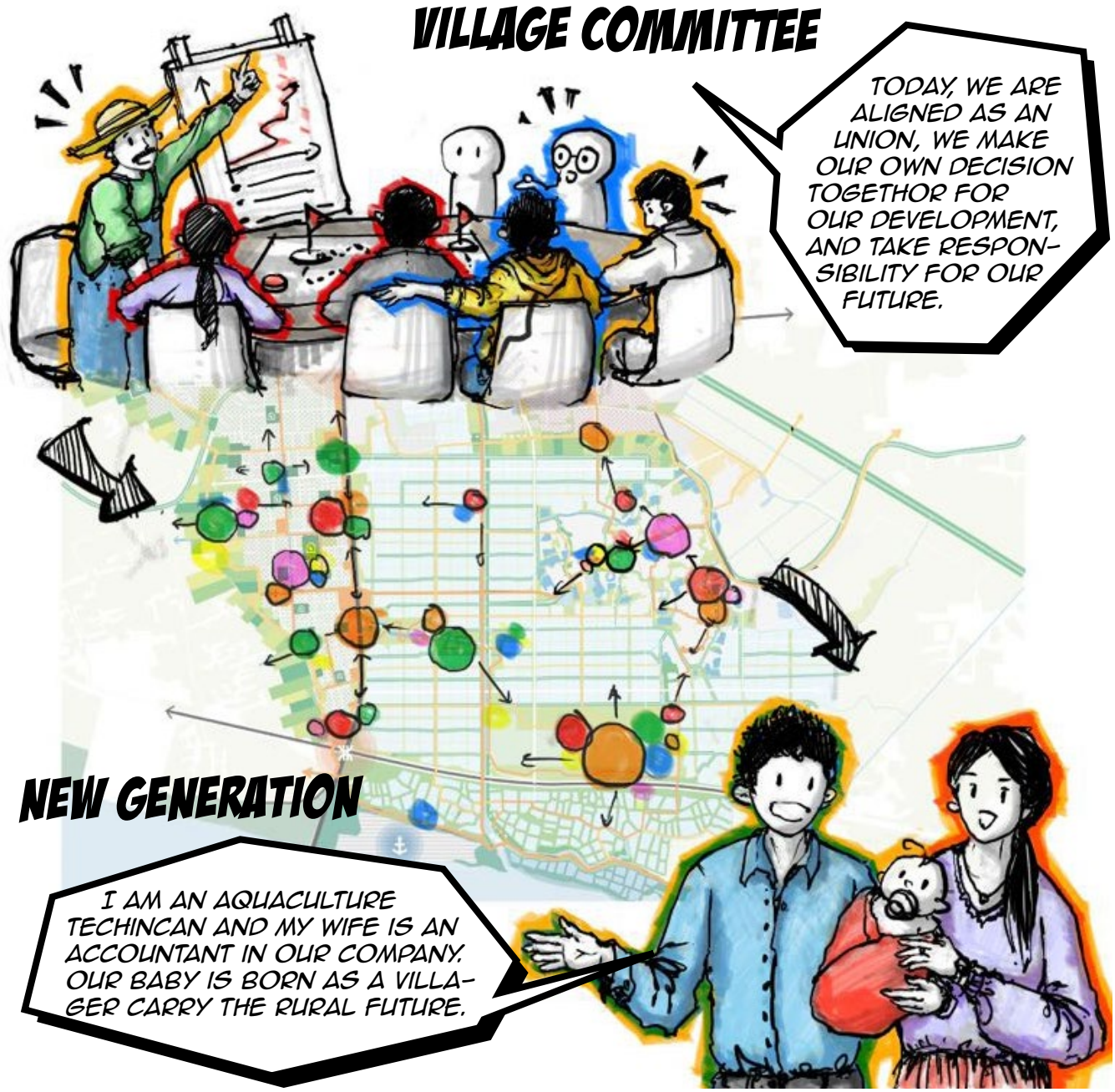
Implementation

From Stakeholders to Actors



Phase III: Engaging

- Expanding enterprises through acquisitions to engage more companies joining the cooperation. Developing local brands and the trade scale of the aquaponics.
- The growth of modern aquaponics industries would become a local attraction, providing diverse employment opportunities for young people in the region.



Phase IV: Cooperating

- Upon the overall spatial framework, spatial interventions would turn to be bottom-up micro-regeneration for improving spatial quality.
- The cooperation mechanism between different stakeholders would be completed gradually. The village would be a hybrid settlement for both work and dwelling.

New Villagers

Backcasting Approach in Post Clan Age

BASELINE

TOP-DOWN PLANNING

Starting Transition

Coordination from public sectors should act as the catalyst for transition, and publish the practical vision for future developement.

Interest in Rural Development

The strong influence of policies on Chinese national enterprises would be an advantage, and tax relief could be a condition for negotiation.

I CONDITION

Benefits from Innovation

The regeneration of local industries should not be compulsory. Success cases and subsidies for specific production could boost motivation.

Path Dependence

Business plans and technical supports provided by governments and enterprises could benefit the development of cooperatives and improve raw material production.

II INNOVATION

III ENGAGING

Maket Competition

Reasonable market competition should be encouraged and the benefits of the acquirees should be guaranteed by law.

Employment Choice

Enterprises should cooperate with regional knowlage institutions and provide diverse employments with career guidance.

IV COOPERATION

Social Responsibility

Participation for improving public qualities would be attractive when development could benefit most of the stakeholders. Transforming economic profits into public welfare could help to improve belonging consciousness of the locals.

VISION

COORDINATION + BOTTUM-UP

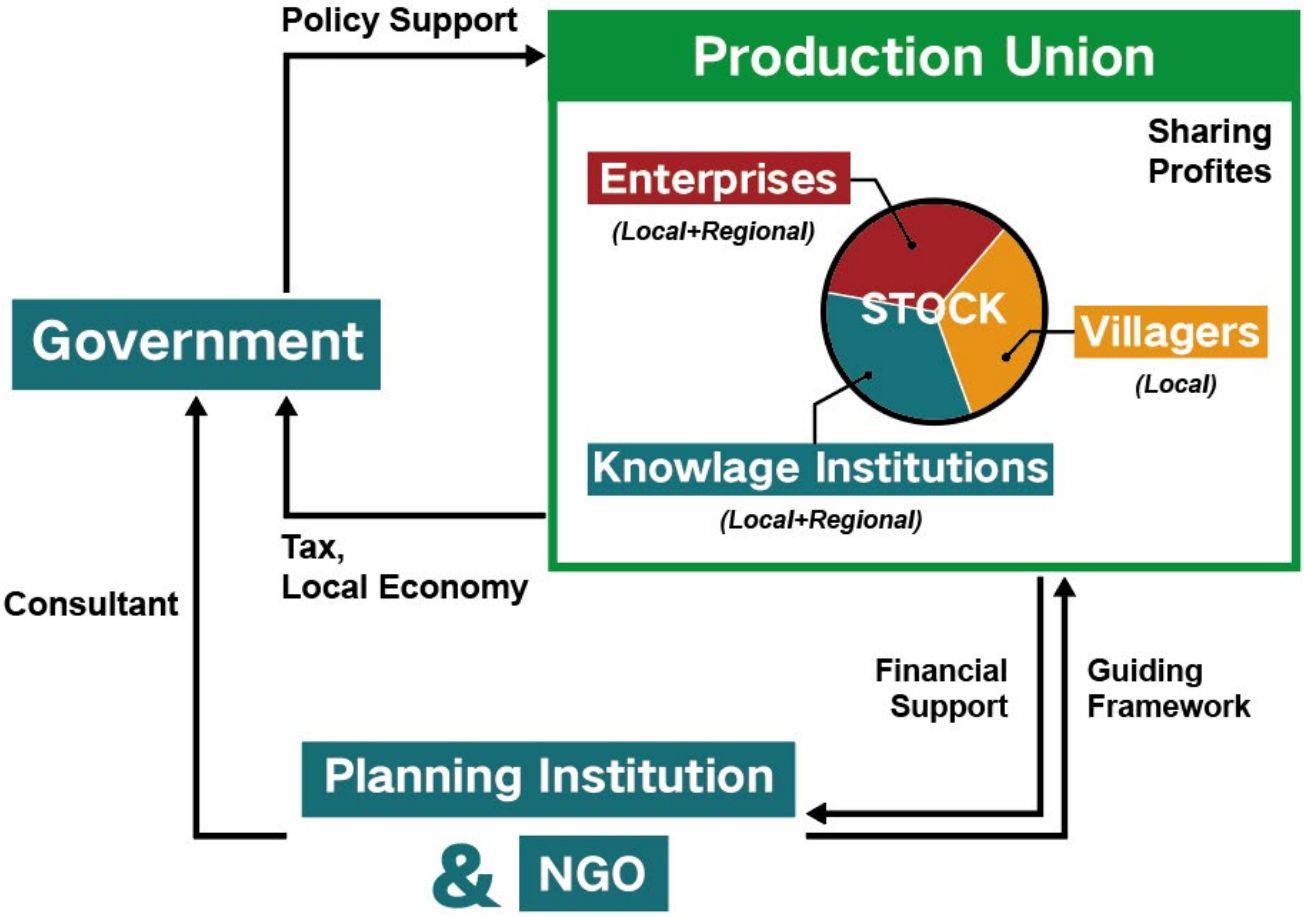


Fig.125 Governance Model: Production Union form by diverse Stakeholders

A Profit Sharing Platform

Through industrial upgrading, stakholders with different interests are united into cooperative unions through constructing industrial chains related to local agri-aquacultural production. Within the production process, different stakeh-olders contribute different materials, take on different responsibilities and share the benefits in the form of shares.

the profits of farmers are mainly concentrated in the primary production stage of agricultural products (AMO, 2020). The benefits from the rough agricultural products are only limited. The proposed cooperative production platform emph-asizes the synergy between different stakeholders involved in production, researching, processing and marketing. At the same time, the benefit model for farmers will move to a more equitable model of economic organization which allows them sharing profits from the whole economic chain.

DESIGN CASE II

The Composite C

ommunity

Conceptual Pattern in CASE II

Opposite Urban-rural Textures in Tonghu Area

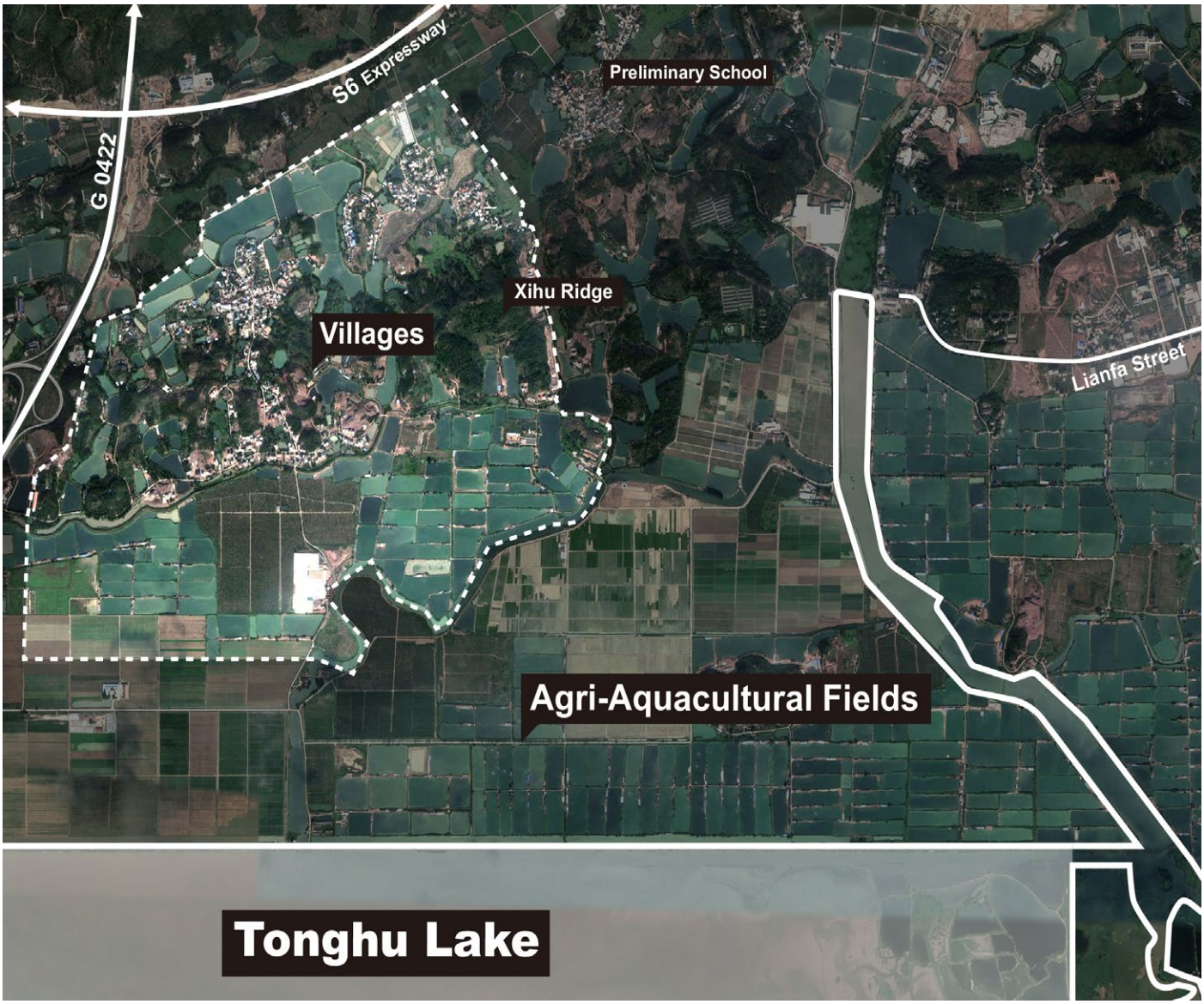


Fig.126 Range of the Selected Site in Tonghu Area

The second design case is an application of the Pattern "The Composite Community". It proposes a densification scenario distinguished from the typical urban fabric. It aims to explain an organic and low-density agglomeration model, which integrates with the treasured natural and agricultural landscape in rural areas, and promotes the countryside settlement to turn into a modern community with identifiable spatial qualities.

The chosen site is a sample point which presents the conflicts between the existing planning and the rural landscape in Tonghu Area. It elaborates on how to regard the landscape in the countryside as a spatial condition, and develop multifunctional constructions as well as facilities gradually in the future.

Priorities

Rural Community with Connected and Mix-use Neighbourhoods

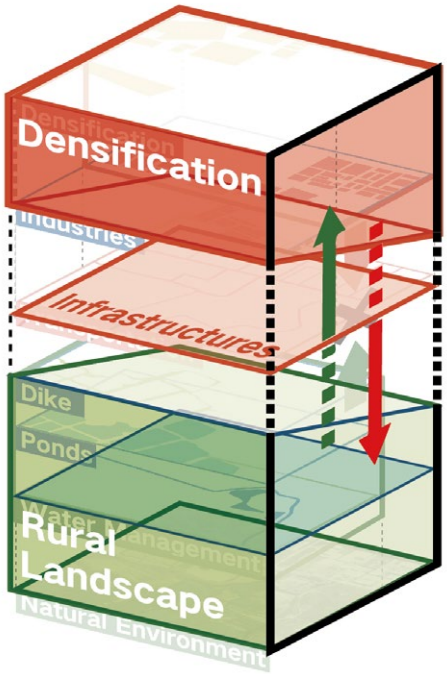


Fig.127
Model of "The Composite Community"

Interactive Boundary

By building interactions and iterations between the constructed area and the agri-aquacultural landscape in the countryside. The priority of the second design case is to blur the obvious boundaries and textural conflicts in the existing plan. By considering the integrations between different elements, the rural settlement could explore a densification model with low environmental impact, and operate as a comprehensive mechanism for both working and dwelling.

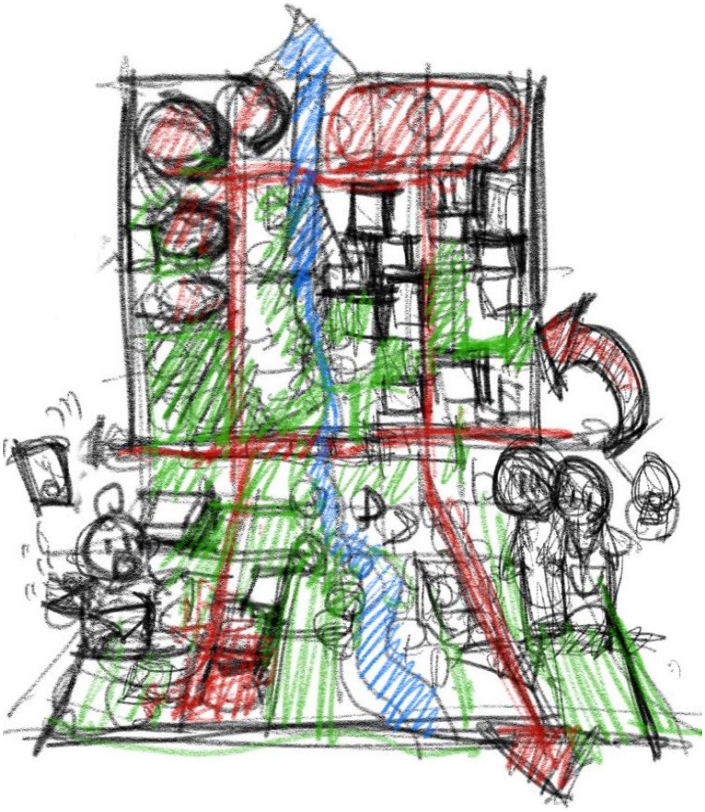


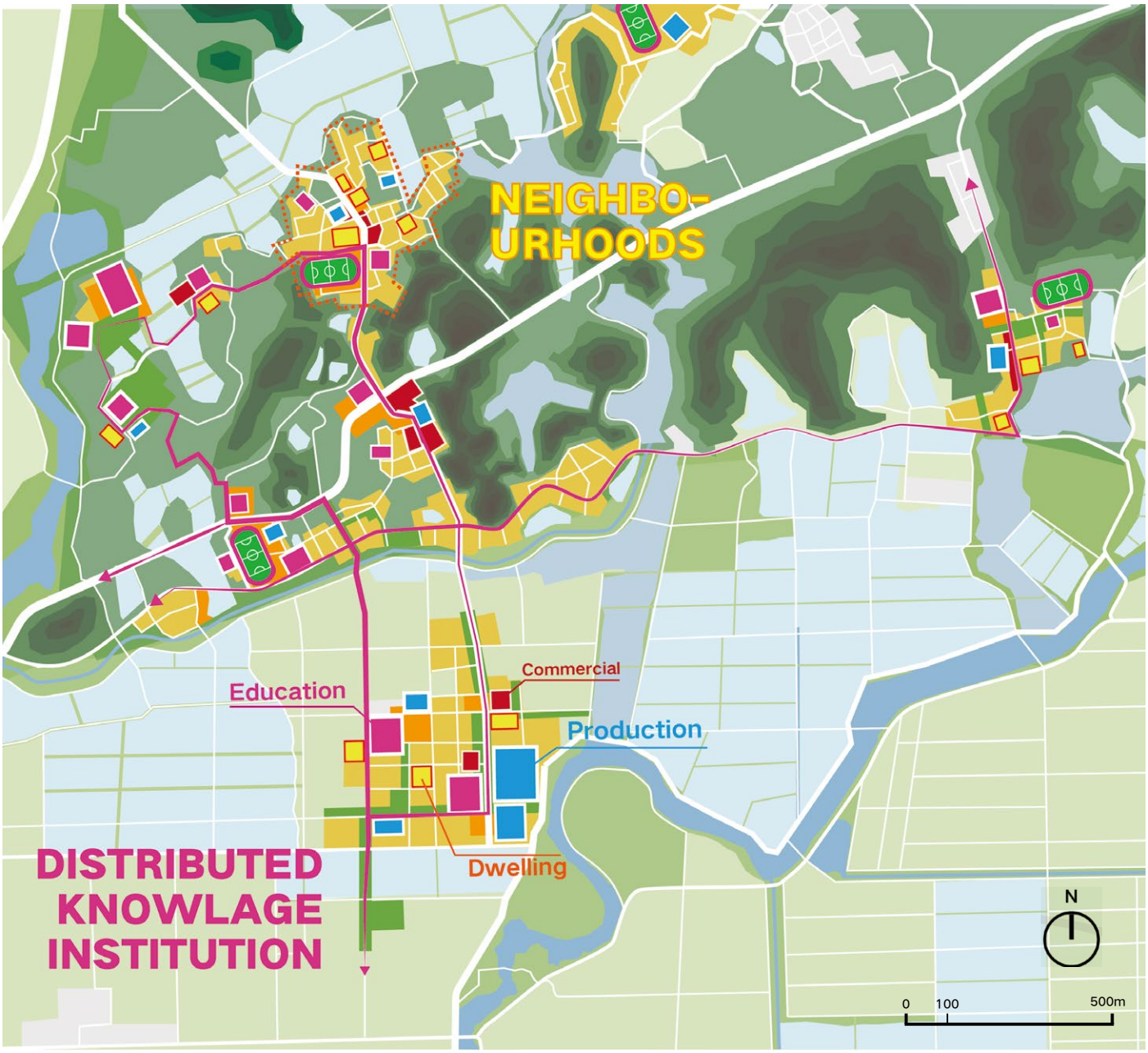
Fig.128
Rural Community with Mixed-use Neighbourhood

Accessible Composite

The project encourages a low-density and distributed organic layout pattern. In this model, an independent work-life settlement in the countryside should be composed of distributed neighbourhood units that echo the local landscape. "Composite" means that each neighbourhood is an efficient combination of education, research, production and dwelling functions. " Accessible" means that the different neighbourhoods would be connected together into a complete community cluster by various local transport methods, and integrated into the regional network by intercity transport.

Agenda: Mixed-Use Neighbourhoods

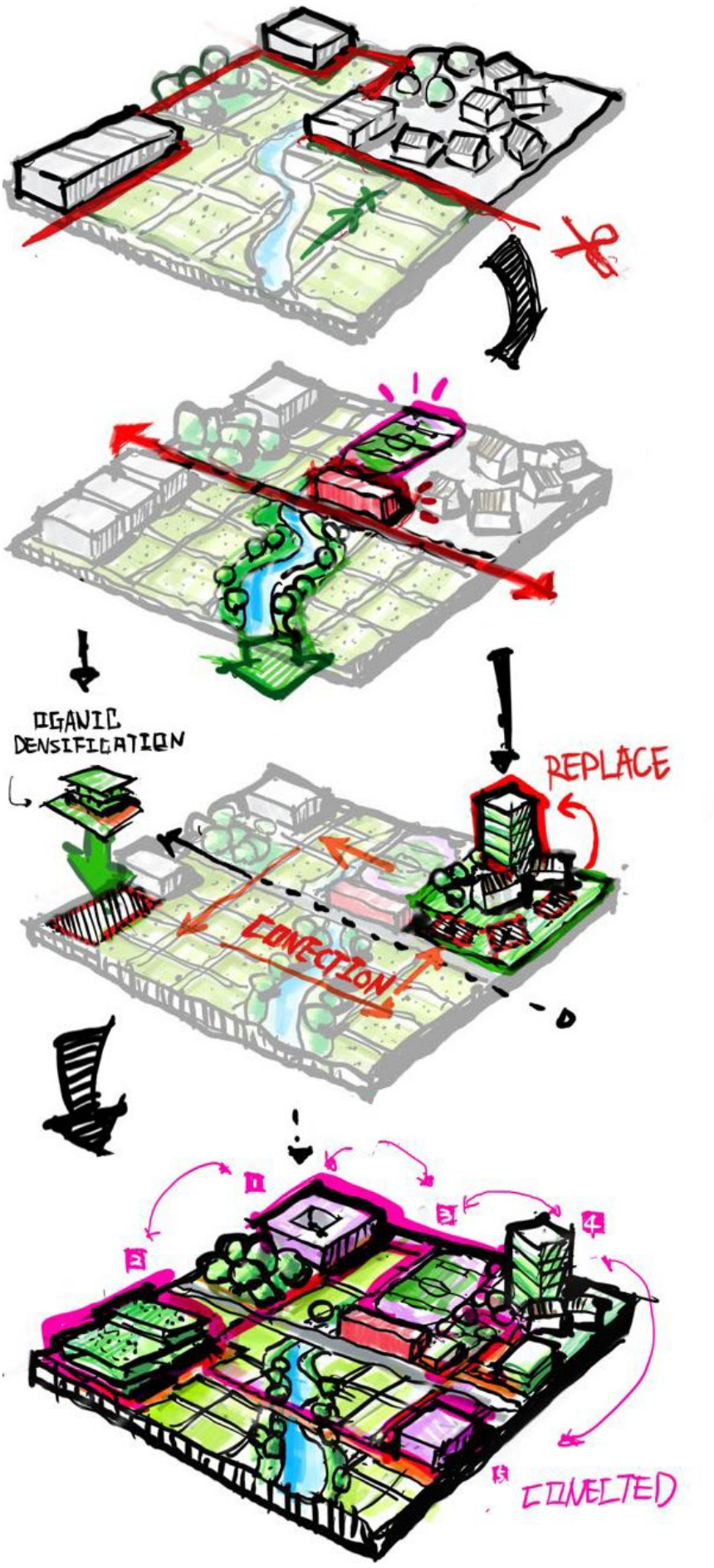
Distributed Work-Live Composite for Low Density Agglomeration



Low density and distributed densification could take advantage of the quality environment and create recognizable settlement charactors in the countryside:

- The morphology of constructions in densification should be organic and considered to integrate with the local landscape. Neighbourhood agriculture, as the extention of the landscape network, could blur existing boundaries and create public space.

- As the subsystems, neighbourhoods should be encouraged to developed mixed functions. The planned educational and industrial volumes could be deconstructed and combined with different neighbourhoods, and share facilities with the locals.



Boundary

Existing Situation

Boundary between the rual landscape and the constructed area

Shared Facilities

Infrastructures Basis

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

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

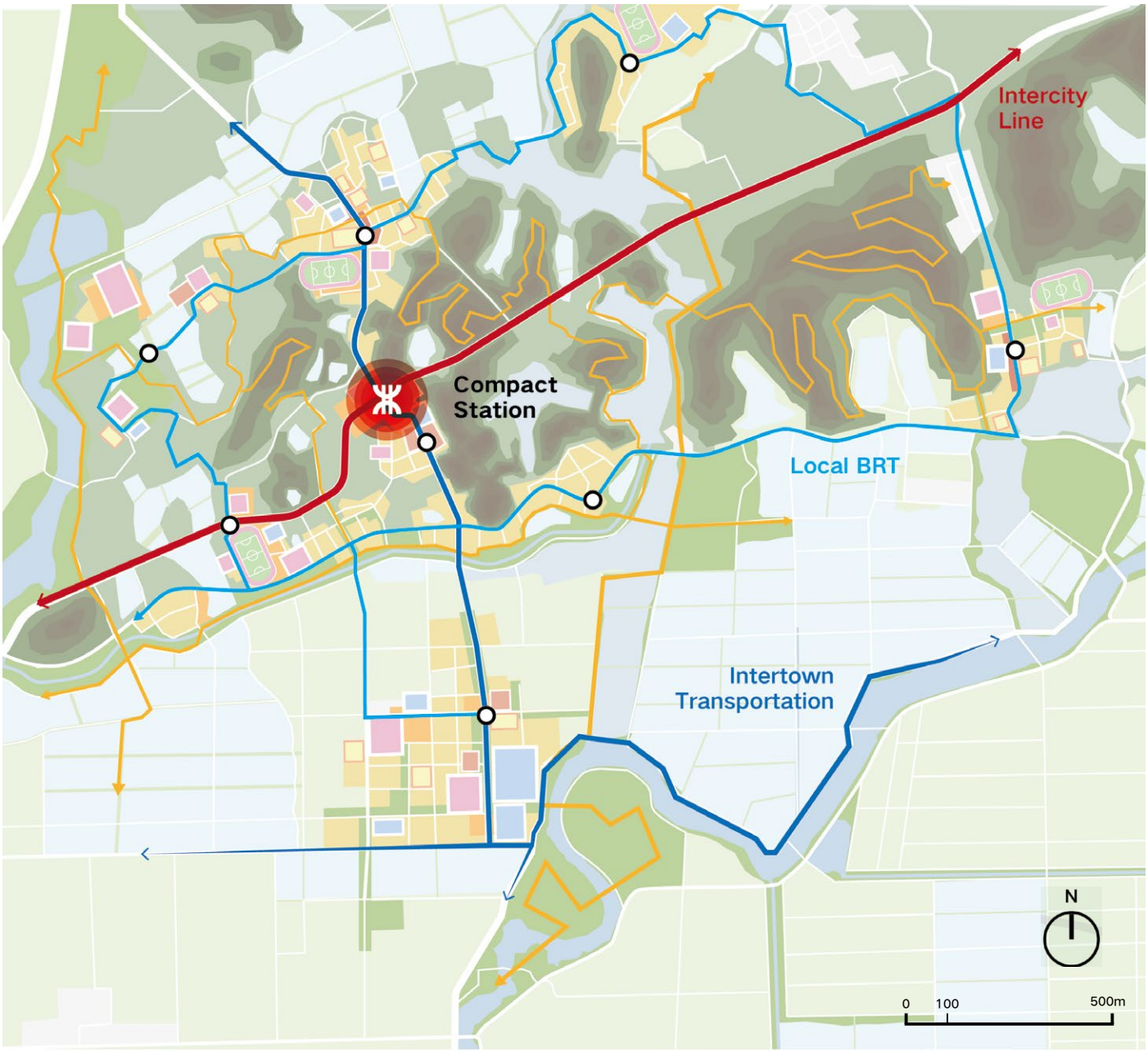
Industries

Mixed Development

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

Agenda: Comprehensive Accessibility

Multi-modal Transporta System as A Coherent Network



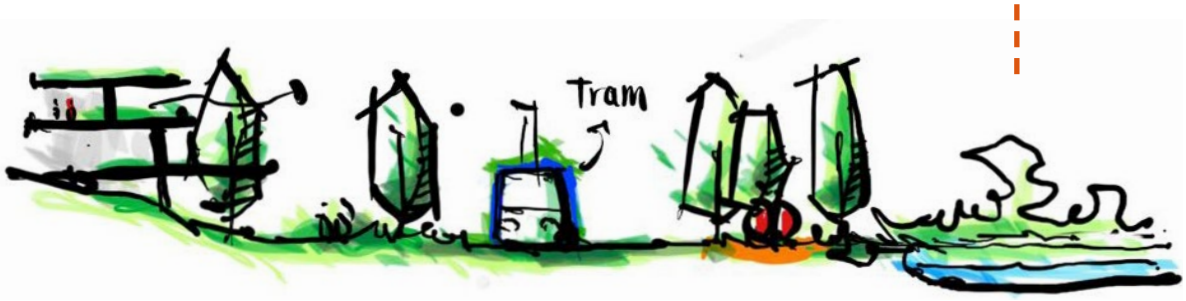
The rural community should formed by several neighbouhoods connected through multi-model transport system. Comprehensive accessibility is the basis of the distributed agglomeration:

- The main hub with multi-functions should integrate various transport infrastructures, and provide a connecting point between the regional network and the site.

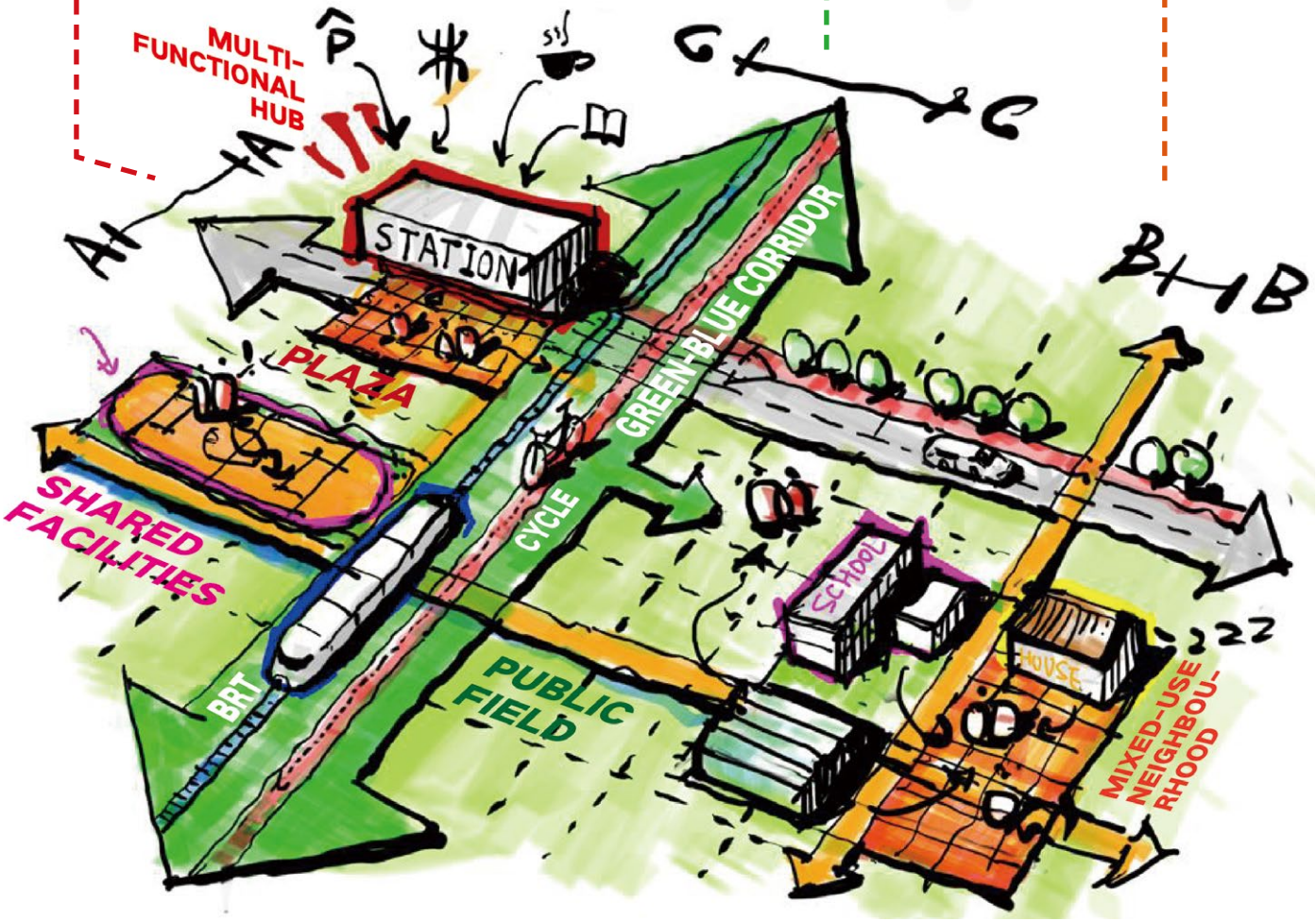
- The local transport system should be divided into different levels and create connections between neighbourhoods. The BRT system and slow mobility should be integrated with the landscape network.

A-A: Multifunctional hub + Vehicle Lane

B-B: Neighbourhood



C-C: Organic Densification + Eco-BRT + Green-Blue Corridor



Structure Plan

An Integrated Spatial Condition for Comprehensive Livability

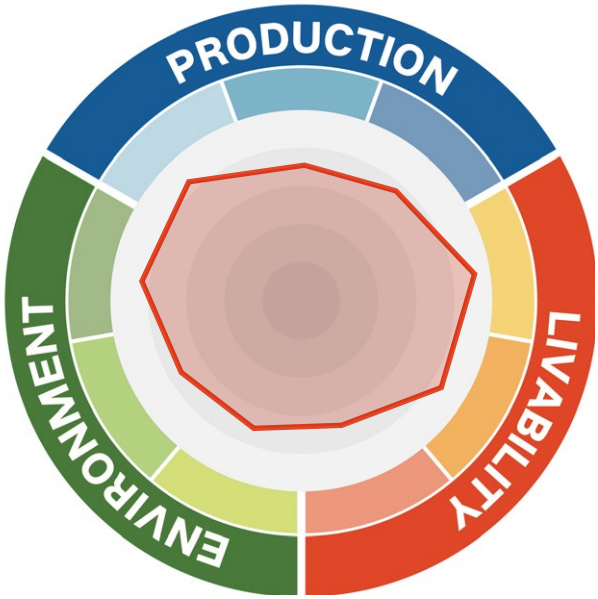
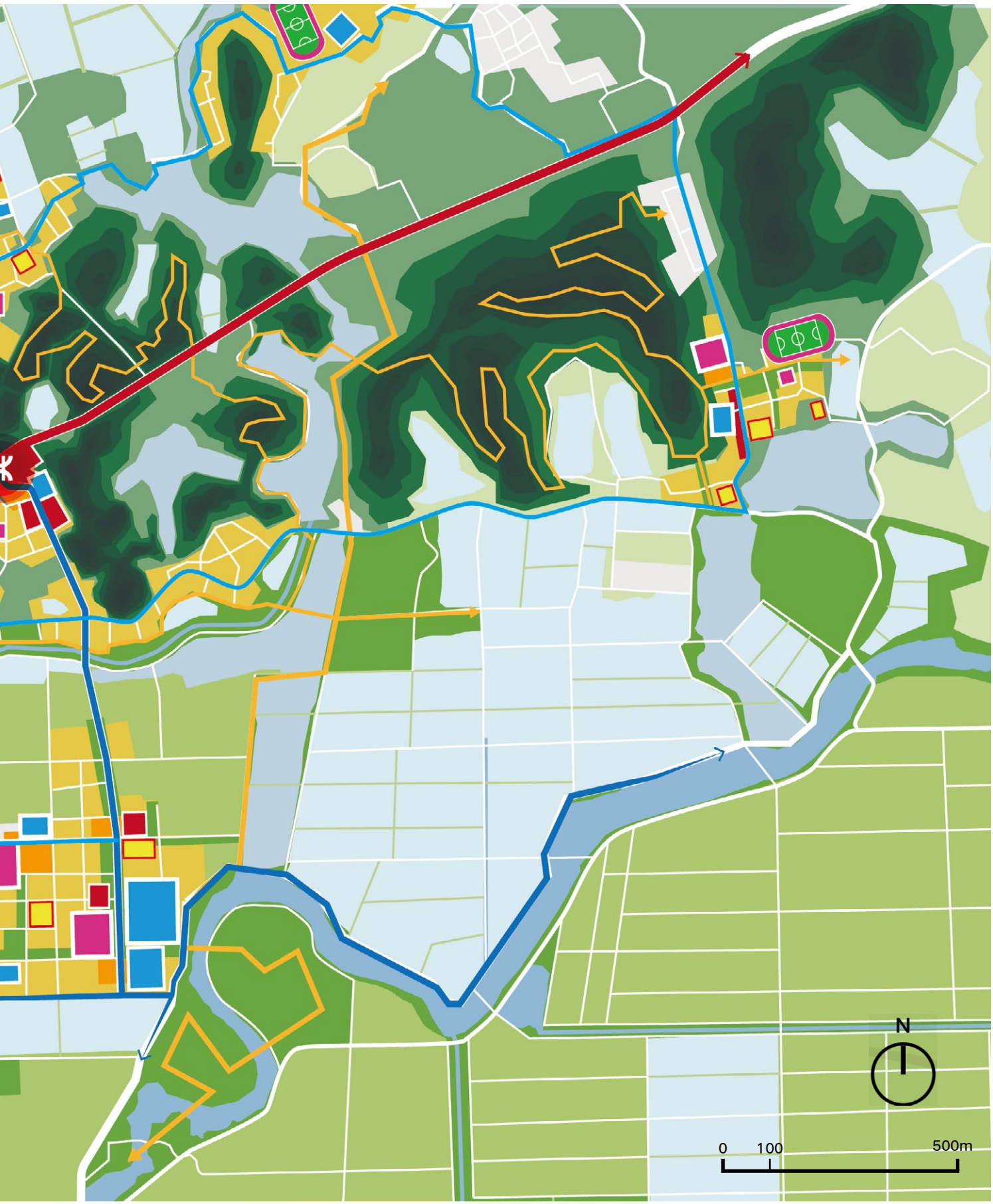


Fig.128
A Balance Model with Identified Livability

The combined structural plan presents an agglomeration model consisting of mixed-use neighbourhoods and composite connections. The case also proposes a flexible spatial framework rather than a certain detailed design. The framework retains the educational and industrial functions introduced by the existing plan and considers the demand for densification for future development. At the same time, the proposed pattern takes the recognisable rural landscape as a continuous spatial basis for developing possible constructions and achieving the integration goal of the local system.

"The Composite Community" transforms city construction-oriented development into a comprehensive live-work system that takes the local landscape into account. It offers guidance that is different from the traditional urbanisation paths in the countryside.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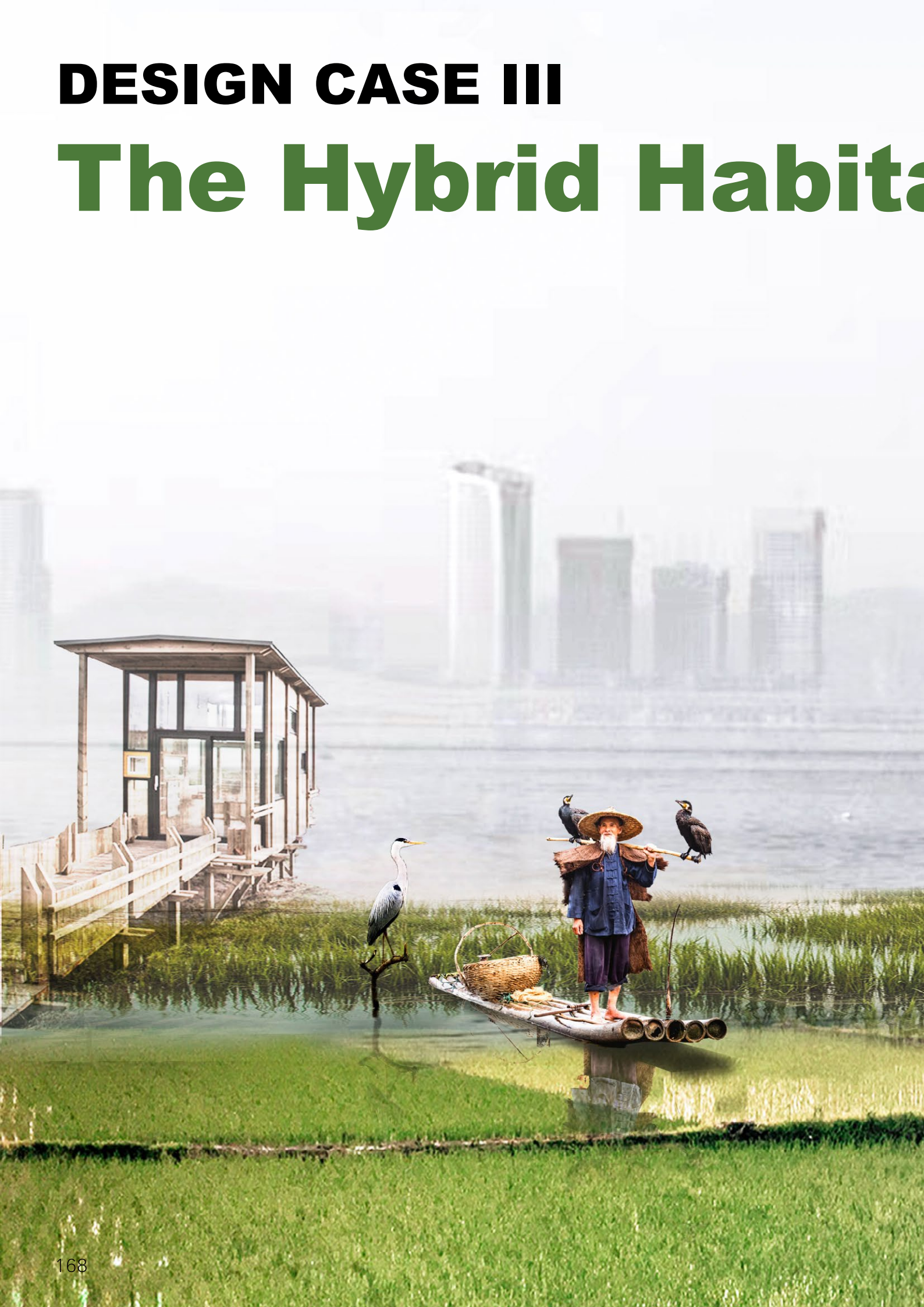
DESIGN CASE III

The Hybrid Habita



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Conceptual Pattern in CASE III

Agri-aqualcutural Buffer beside the Maipo Nature Reserve

Fig.129 Imagine of the Conceptual Pattern: "the Innovation Grids"

The third design example is an application of the pattern 'The hybrid habitat'. It proposes a multifunctional regeneration of the existing agricultural landscape blanket next to the Maipo area, aiming to transform this historical political and environmental buffer into a public corridor bridging the rural area on the Hong Kong side and the urban area on the Shenzhen side in the future.

The design part selects an area along the Shenzhen River as a sample site, which extends into the urban and rural areas on both sides. The case explains how the productive and public functions of this area could be re-established inheriting the environmental considerations. In the future, this mono-functional ecological buffer zone would be proposed to become a shared habitat for both native species and humans.

Priorities

An Inclusive Landscape Corridor shared by Human and Nature

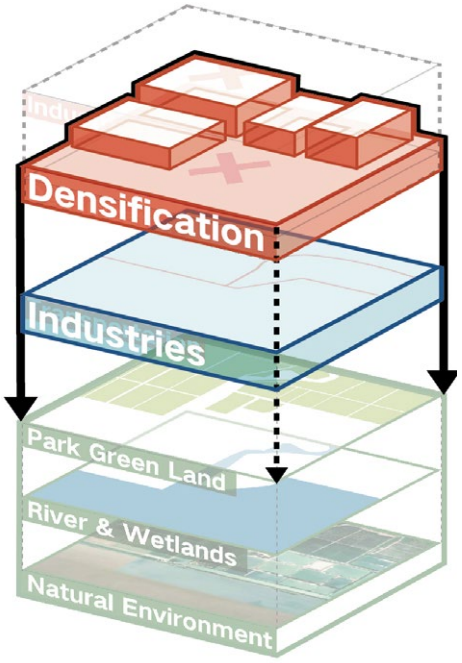


Fig.130
Model of the Concept "The Hybrid Habitats"

Corridor for Connection

The background of the case has a specific feature. Under a specific historical context, the motivation that transformed the site into a mono-functional landscape buffer was to create a spatial boundary between Shenzhen and Hong Kong. After the cancle of the political segeration, the buffer should be regenerated for contributing to the new concept of connecting. With this transformation, the spatial framework provided by the proposal should consider strengthening the potential of the existing landscape as a public corridor.

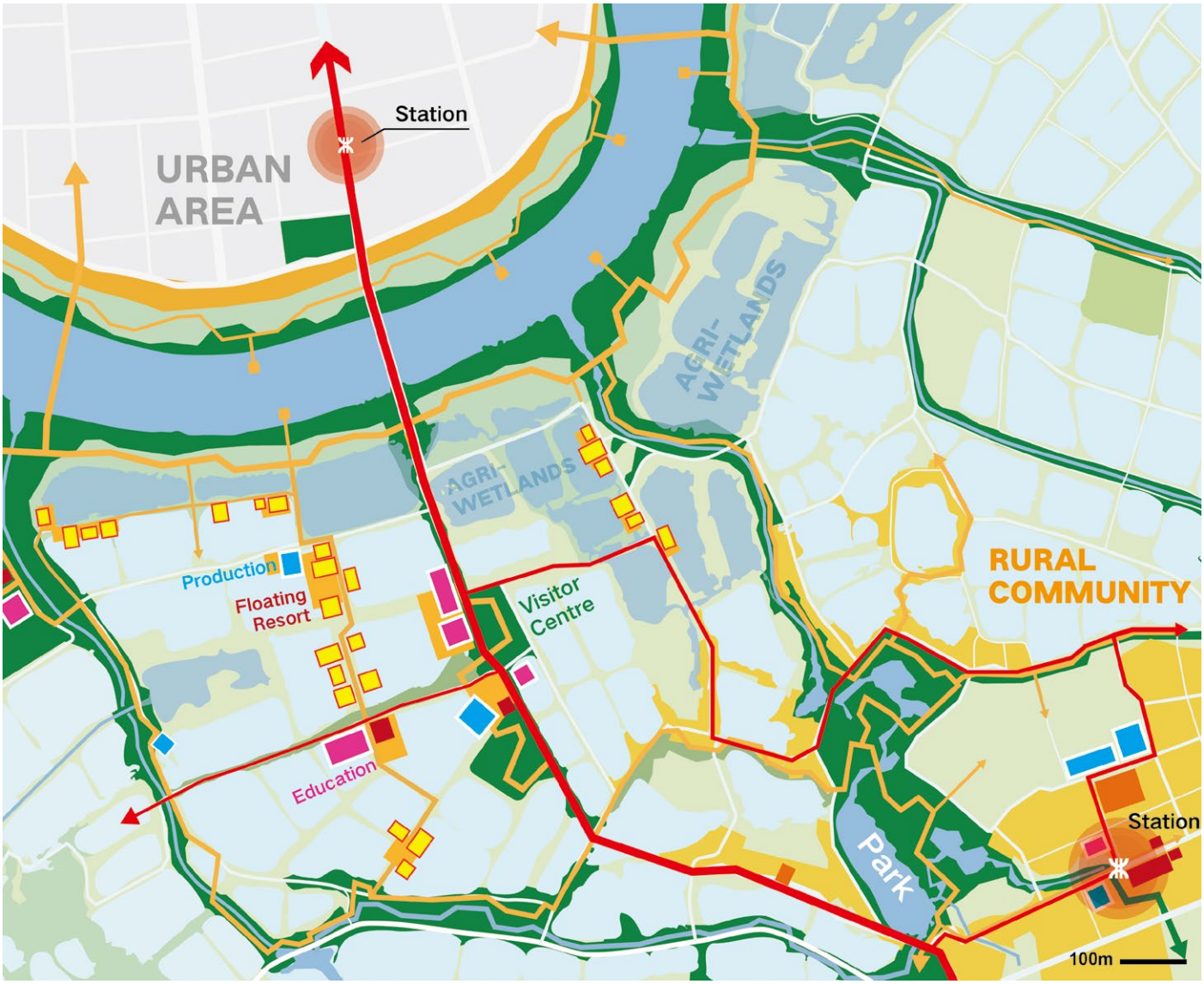
Fig.131
Inclusive Landscape Corridor for Diverse Species

Iterated Human Activities

In traditional rural systems, agricultural production activities of humans played an important role in the complete ecological circulation. The case should encourage low-impact production and activities based on the existing mono-functional landscape in order to rebuild this human-land relationship that has been removed artificially. Furthermore, the design case should take into account the public principles that the site would shoulder as a inclusive landscape corridor in the future while developing various functions.

Agenda: Shared Productive Landscape

An Integrated Spatial Condition for Comprehensive Environment



Iterated constructions should be integrated with the organic landscape substrates and create diverse habitats for different species.

- Combining traditional production activities with cultural, research and recreational industries to enhance the land use efficiency and economic value of the existing agri-aquacultural landscape.

- Creating connections between the countryside in Hongkong and the urban areas in Shen zhen through public transport routes, mainly slow moving, thus improving the public character of the inclusive corridor.

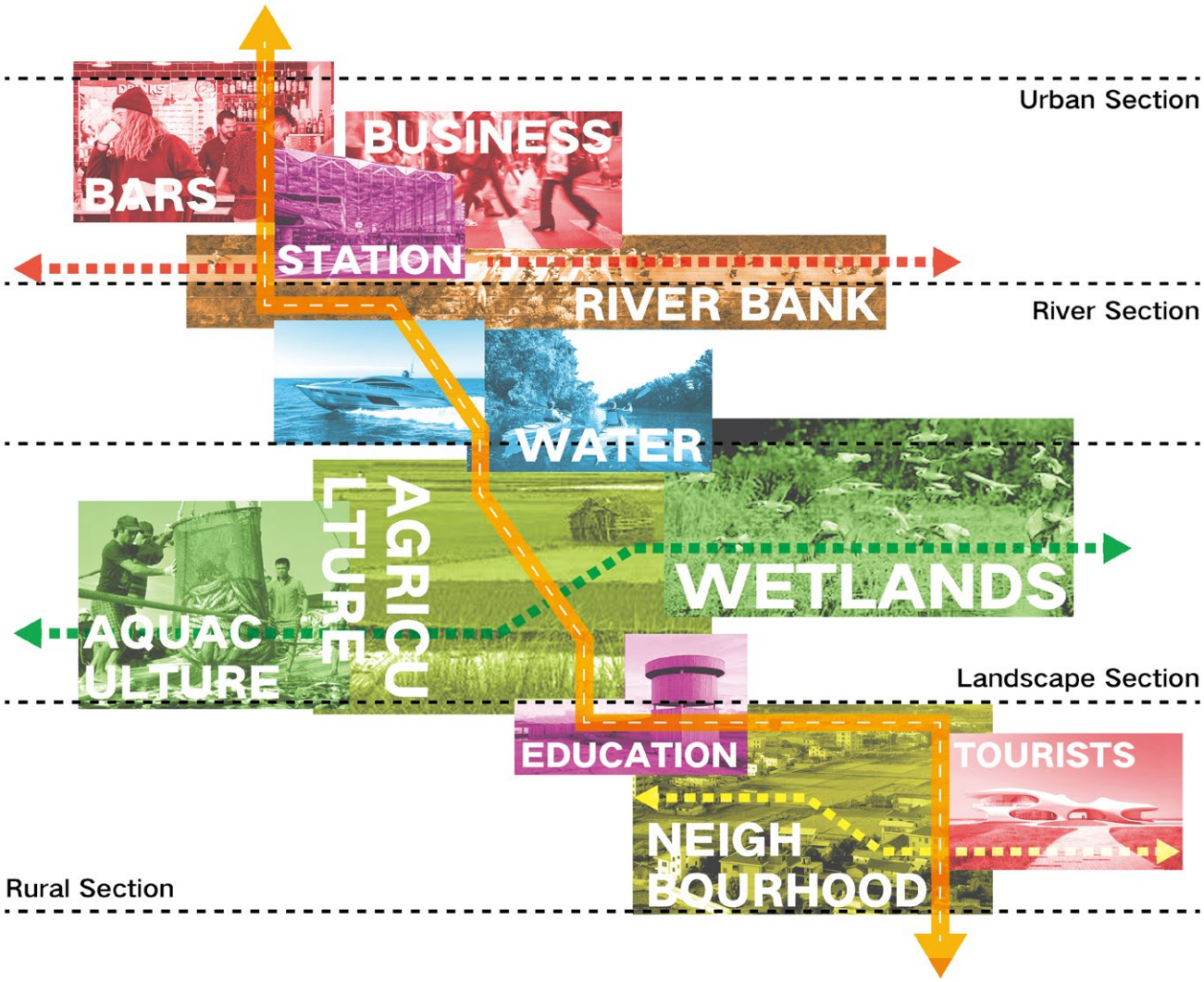


Fig.132 Mixed Funtional Habitats in Four Sections within the Designed Site

Comparing to the governance model sustained by investments from governments and NGOs, the integration of diverse activities on the limit-functional landscape condition could associate the interests of more stakeholders with the goals of local development. Together they will share the initial public responsibility and become an advantageous factor for economic growth in the future.

The principles related to "The Hybrid Habitat" are more flexible than the other two patterns. The spatial framework based on this concept takes the rural landscape itself, which is the basis for development, as the main identification. It could offer the regeneration possibilities for uncertainties in the future development.

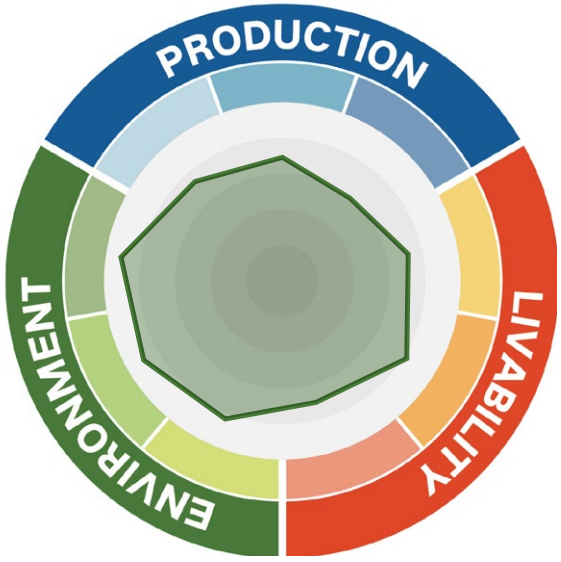


Fig.133
A Balance Model with Identified Environment

Fig. 133 The Beautiful Countryside

VI CONCLUSION

The chapter is a summary of my entire graduation project. It responds to the research questions in the Research Foundation chapter and points out the influence of the proposed transition from function, shape and governance. In the end, it completes the regional spatial vision based on the possibilities in future development rehearsed by the design cases, and evaluates the potential of the project in the broader context. Additionally, the Reflection chapter is also an important critique discussion reviewing the harvest, the challenges and the future expectation I have experienced in my graduation exploration.

Conclusion

Recommendations Respoding the Research Questions

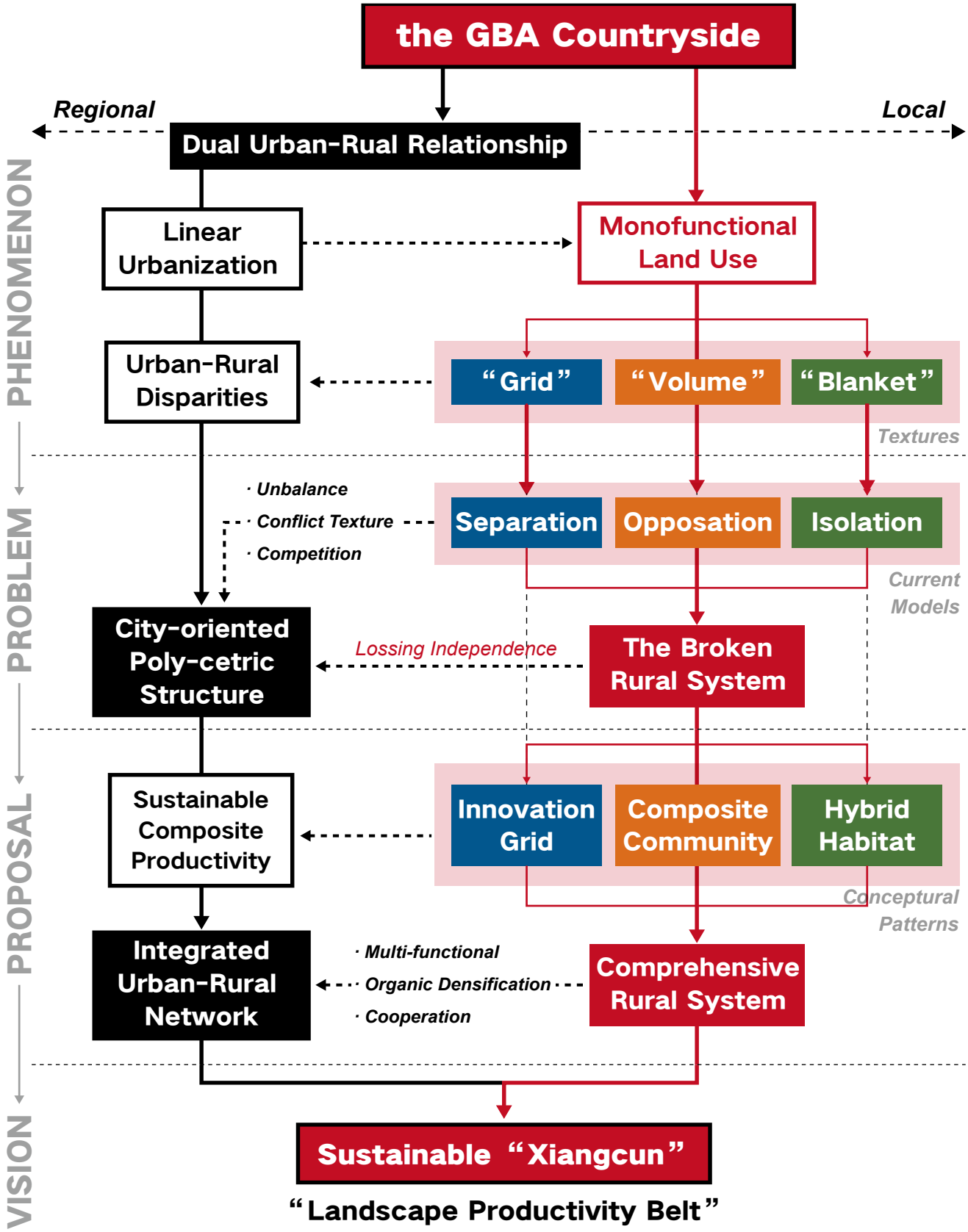


Fig.134 A Summarizing Framework of the Project Exploration

"Xiangcun", An Independent Settlement System

Influenced by the historical dual urban-rural relationship, the result of the linear urbanization in China is that the countryside would become mono-functional satellite areas relying on the central city, or be incorporated into the urban sprawl and become a homogenous part of the city.

The project proposes that the countryside should be redefined as an independent and comprehensive settlement different from cities. The three design cases all contribute to explaining a common vision: As an important rural identity, the agri-aquacultural landscape should provide a continuous spatial condition and development framework for modern activities and nurtures local agriculture-based industries supporting the growth of the economy. This is the connotation of the landscape productivity and reveals the potential future of the countryside to develop diverse economic values as an integrated system.

Comprehensive Agglomeration with Agri-aquaculture Basis

The sustainable development of rural areas is manifested as an organic agglomeration model that is distinguished from typical urbanization. Different from the land use in modernism urban design, which uses functional zoning as the main tool, planning strategies for the countryside should focus on the interactions between various elements and consider the settlement as an iterative mechanism:

· From the function perspective, the development of the countryside should take the aquaponics production, which is based on the rural landscape, as the basic industry. Rebuilding the broken human-land relationship by combining diverse local industries with the agricultural sector.

· From the shape perspective, the project proposes a low-density and connected densification model, which echos the existing landscape. The productive field should be regarded as a complete layer as well as public green-blue infrastructures, and integrated into the comprehensive spatial framework with blur boundaries.

· From the governance perspective, cooperation throughout the production chain could unite different stakeholders into a profit-sharing platform and promote the regeneration of the villager group. In this process, the power and

benefits of the farmers, who sacrificed during the historical urbanization, should be protected.

In the future, the countryside in the GBA would develop into integrated complex social-spatial systems for multifunctions including working and dwelling.

Diverse and Cooperative Urban-rural Network

The existing city-dominated polycentric structure of the GBA should be encouraged to transform into an inclusive and integrated urban-rural network. The basis for this transition is sustainable and independent rural development at the local scale. Under this condition, rural settlements would become diverse nodes in the regional structure, complementing the urban system and together contributing to the long-term development of the GBA.

The integration can be expressed in two aspects. First, in spatial terms, the construction of multi-level infrastructures can strengthen the direct connections between villages and cities. At the same time, The repair of the rural system can merge local elements into the broader spatial framework, for instance, the shared agricultural landscape in villages can be integrated into the regional blue-green network. Secondly, the integration would be reflected in social production activities, which will be explained in detail in the next point.

The Agri-Aqualcultural Innovation as The Key Strategy

The promotion of agri-aquaculture modernization, which is highly relevant to the rural agricultural landscape, is a core priority for the proposed vision. For local development, rural production activities will be combined with efficient use of the local landscape. The upgrading of the productivity will increase the economic efficiency of the agricultural sector and change the current industrial structure that is dominated by manufacturing. At the same time, mechanical continuity between villages and the region would be achieved through collaboration in production chains: the progressive growth in the agricultural

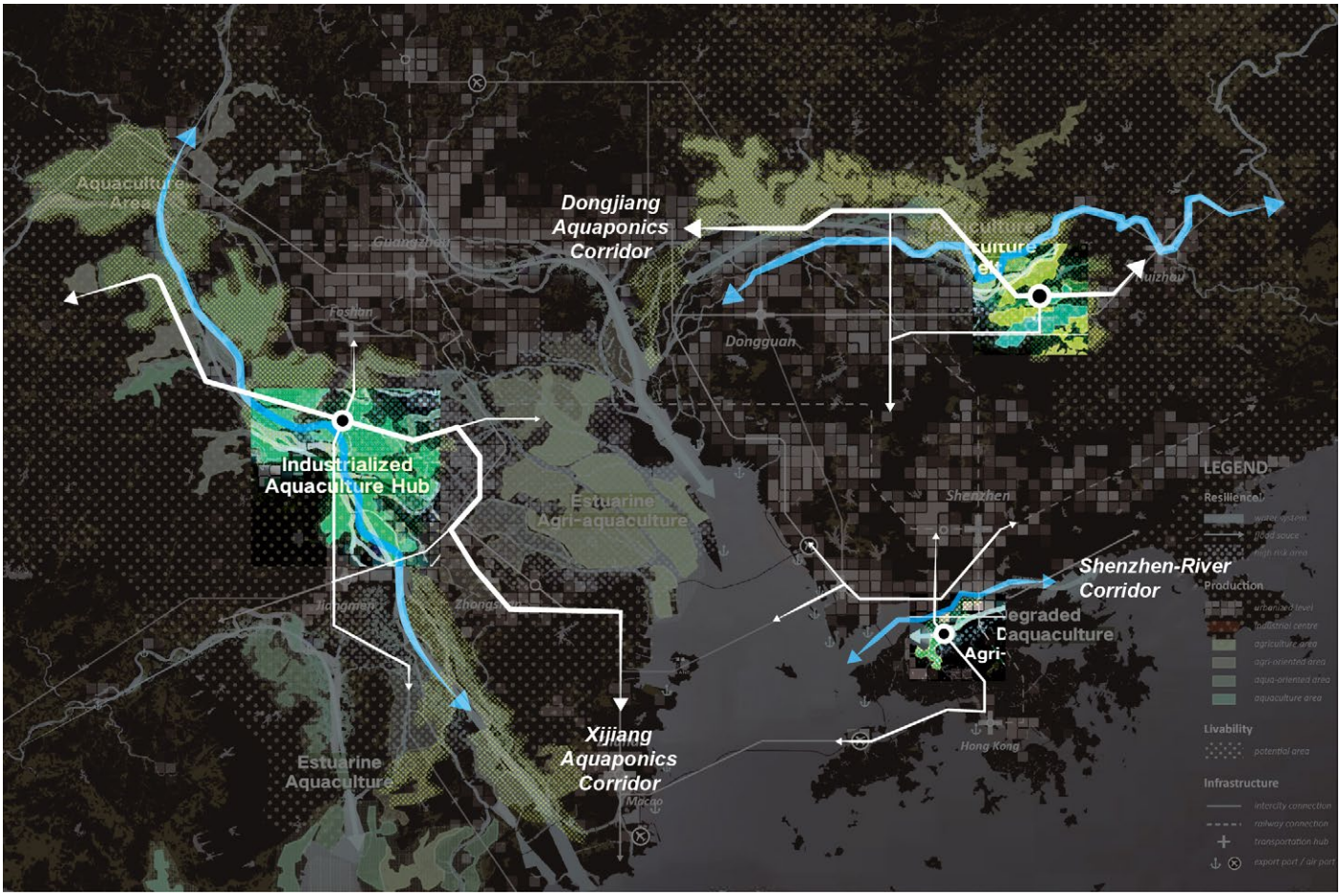


Fig.135 Sustainable Development of the Rural Area Contribute to the Regional Structure

industry scale would create demands for cooperation across scales, and also define work division between urban and rural factors of production in the same business, and bidirectional flows throughout the GBA.

Furthermore, agri-aquaculture innovation could help to encourage a diversification of the future villager composition. High-level and modern agricultural industries would be a recognisable attraction of the countryside in the region, and offer inclusive local employment for interested stakeholders. In the future, the definition of villagers in the GBA will be redefined. They will not only be farmers but also scientists, businessmen, students and other people who contribute to the local construction. They will work and live upon the captivating rural landscape and create a promising future in intergenerational iteration.

Conclusion

Sustainable and Composite Productivity in the Countryside

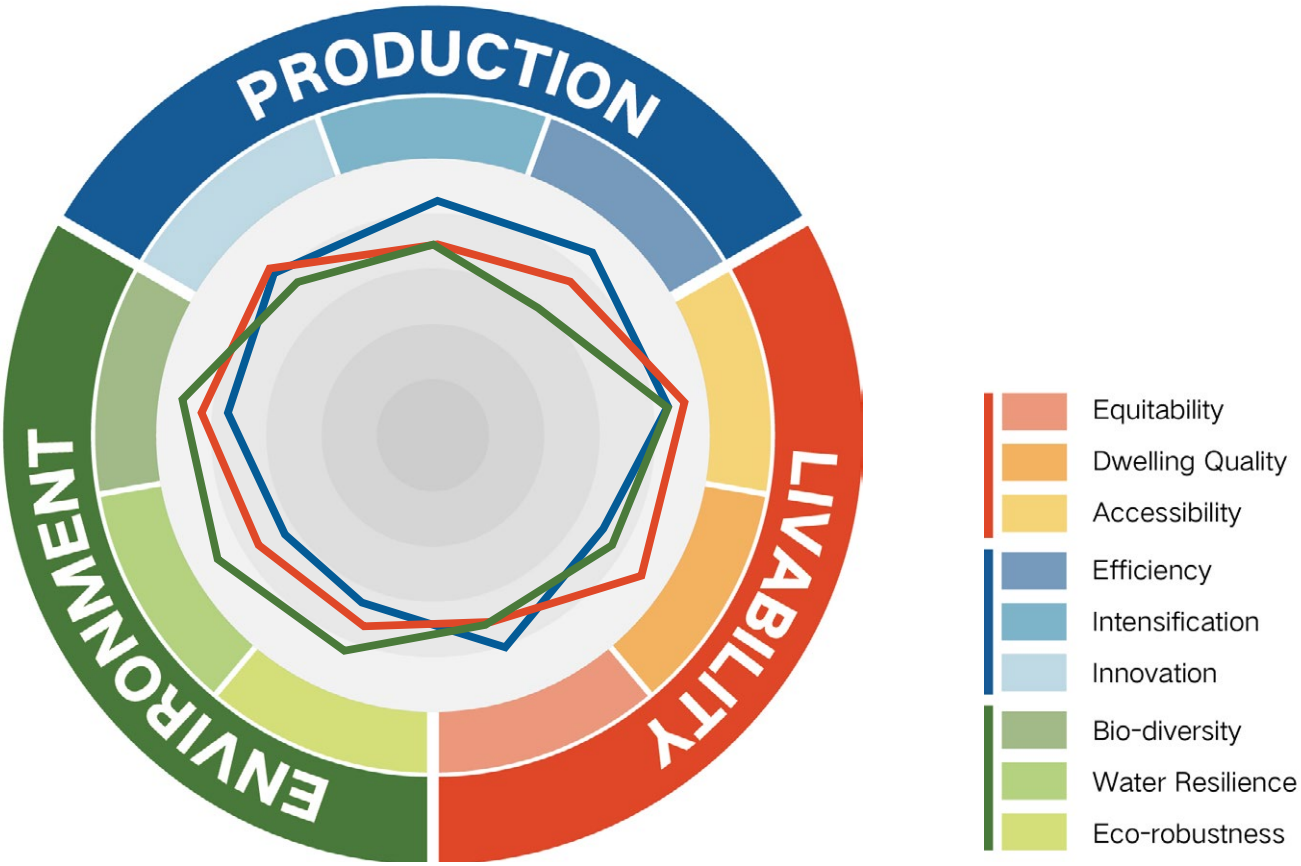


Fig.136 Balance Development Model with Composite Productivity in Future Countryside

The proposed independent model integrates multiple functions, presents balanced and sustainable comp-osite rural productivity, and help to reduce disparities in regional development.

The future countryside will be regenerated con-sidering elements of production, livability and environment, taking existing conditions as local advantages and promoting identifiable productions as well as economic values. After integrating the local framework into the regional structure, the model will bring positive transitions to the GBA with its composite productivity. The countryside has the potential to enrich the diversity of industries as a productive area, to provide quality environments for living as communities and to complete the productive blue-green network as environmental areas.

Production

The integration of various industries on the basis of modern agricultural production should be encouraged to create an attractive and diverse industrial structure in the countryside, composite productivity related to local landscape, and economic values meeting the demands of regional development.

Livability

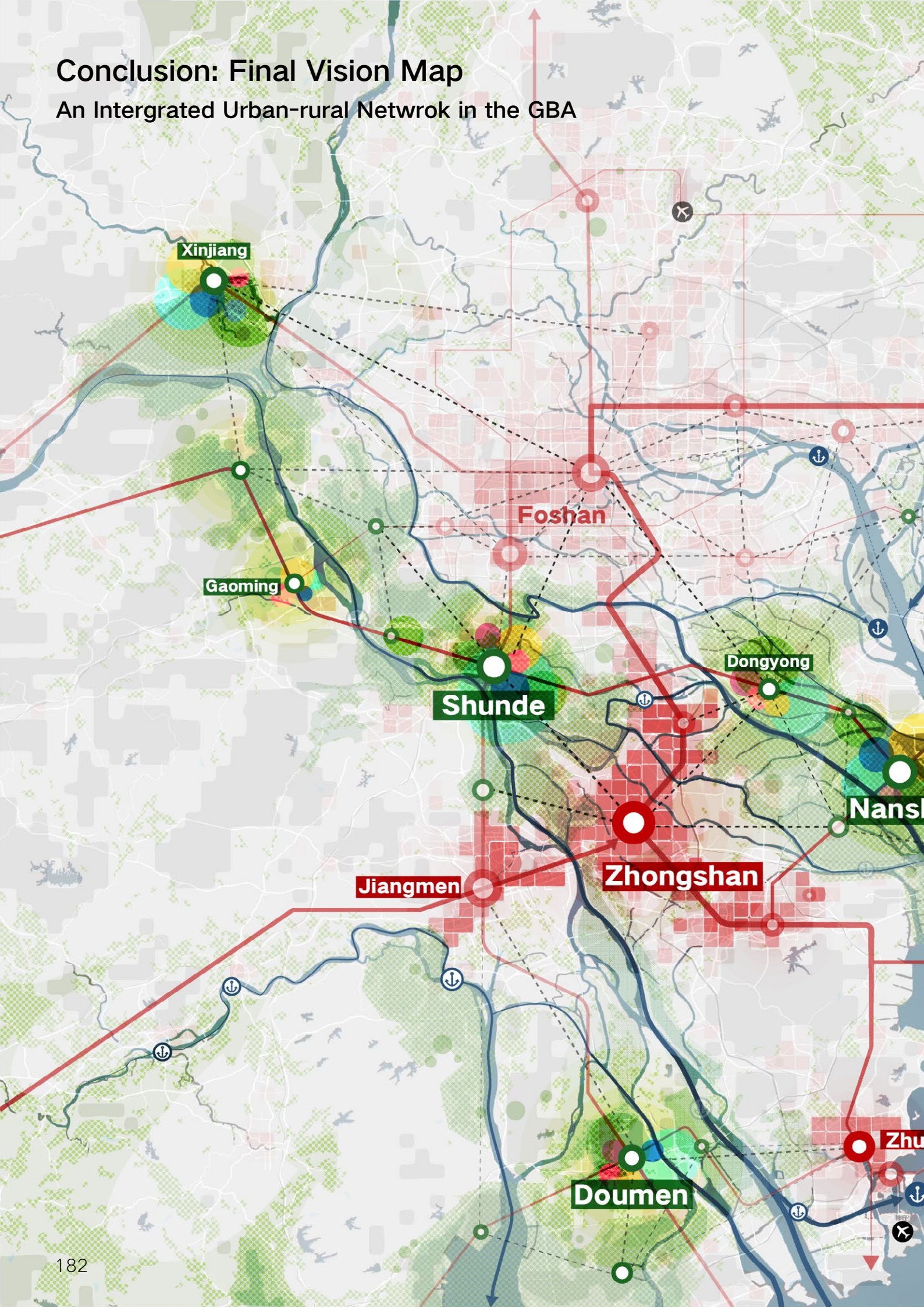
In the future, the countryside will become optional work-life settlements. Local comprehensive industries will provide diverse opportunities, attract different groups of the regional workforce and grow vibrant rural generation. The rural communities will provide them liveable environment with accessible, modern, and eco-friendly characters.

Environment

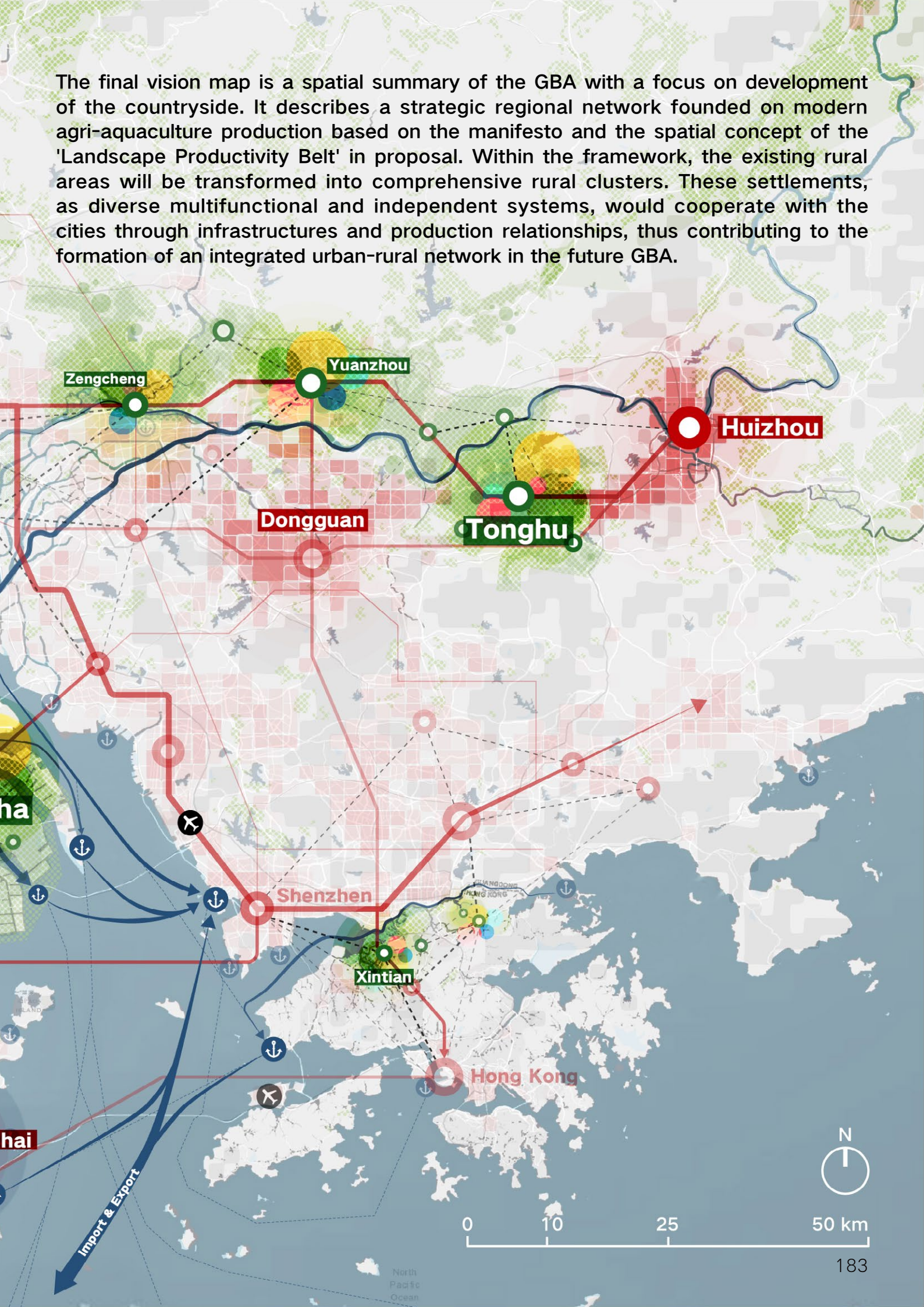
Rural landscapes do not only perform ecological conservation and recreational functions. As an important characteristic productive resource in the countryside, the local agricultural landscape can also provide comprehensive spatial conditions for multiple industries including production, education, culture and science. It would grow ecological economic value as hybrid habitats.

Conclusion: Final Vision Map

An Intergrated Urban-rural Netwrok in the GBA



The final vision map is a spatial summary of the GBA with a focus on development of the countryside. It describes a strategic regional network founded on modern agri-aquaculture production based on the manifesto and the spatial concept of the 'Landscape Productivity Belt' in proposal. Within the framework, the existing rural areas will be transformed into comprehensive rural clusters. These settlements, as diverse multifunctional and independent systems, would cooperate with the cities through infrastructures and production relationships, thus contributing to the formation of an integrated urban-rural network in the future GBA.



Conclusion

Relevance between the Graduation Project and the SDG

Fig.138 The Countryside will be Optional Settlement for New Generations

on the spatial social problems caused by historical urbanization and serves the SDGs. The development of the countryside provides an opportunity for humanity to organically integrate artificial constructions into the metabolism of the natural landscape, to benefit the locals in poor areas through the innovation of eco-friendly industries, and to engage the public in co-create process of a just society vision.

The exploration of sustainable development reveals that urbanization is not the only option for developing civilized settlements, and it is still possible to integrate our lives with the nature in a harmonious way. This would be an advanced, prosperous and green future.

The Countryside for A Sustainable Future

Fig.139 Contribution of the Project to the SDG

Reflection

Lessons learned from the Gruaduation Exploration

Social Relevance of the Project

The thesis of my graduation project explores the potential future of the countryside in the Greater Bay Area (GBA). It is a discussion under the worldwide Countryside agenda from the perspective of a planner in the future. The project aims to contribute specific spatial knowledge to the broad topic, and explore new opportunities for the rural area, in order to propose a cooperative urban-rural relationship and propose optional possibilities for quality and just settlements in the future. Existing sharp social and environmental conflicts are reasons why I chose the countryside in an international megacity region as a research sample.

Edward Glaeser described the city as the “greatest invention” of the human (2011). However, the high-speed urbanization around the world is causing a series of problems: the losing ecological resilience due to the hard pavement, the resource competition between settlements, and the increasing class distinction under this stiff race. The unfairness is continued as the result of urbanization running out of control. The countryside has become an agenda today due to this growing environmental and social crisis. Worldwide architects and urbanists start to reflect on the methods people developed settlements in past centuries, and the countryside reattracted number of attentions because of the extensive area and characters of nature-based production which is different from the urban development model.

This trend is reflected in China's policies of rural revitalisation and urban-rural integration. The continue increasing urbanization rate shows that Chinese countryside still contains huge potential to explore a more sustainable development pattern and contribute to this global rural agenda. However, the reality is that the countryside is suffering from its weak position in linear urbanization. Under the influence of the historical dual urban-rural relationship, there is still a huge development gap between rural and urban areas. In the mentioned regional competition, the rural landscape is occupied by urban construction, the natural environment is degraded by industrialization and the labour force escapes to the cities due to an unjust distribution of spatial resources. The project aims to analyse the specific reasons behind the phenomenon and explore practical strategies for reducing the disparities, in order to contribute to the transformation of a equitable regional structure.

Lesson Learned from the Exploration

The challenge of this research lies in the broadness of the problem and the complexity of the GBA as a multi-scale socio-spatial complex. Although my graduation studio,

Planning Complex Cities, provides me with profound theoretical and practical knowledge to understand the implications of this complexity. It does not provide a practical framework for spatial analysis as most of the relevant research focuses on theoretical studies of the regional relationship. Developing from the broad to the specific, the project gradually sets a series of methods to understand the specific mechanism of the countryside as complex system and provides flexible spatial strategies.

Firstly, the layers approach was used as the major method to deal with the complexity brought by scale and iteraction. The application of the Layers Approach could be seen throughout my research. Its strength lies in the deconstruction of complex system mechanisms into layers of key elements and the interactions between the layers. Each layer can be studied separately, or the role of the specific elements in the overall system can be discussed through overlapping. It is worth to mention that the intervention of the elements of on each layer covers the whole design site during the design process, which changes the system fragmentation in traditional functional zoning. Multifunctional strategies were also developed through the interaction of layers. It is a design process from simple elements to complex hybrid systems.

Secondly, my understanding of design and research shifted during the exploration. Retrospect the impact of urbanization on the rural areas made me aware of the limitations of elitist top-down planning. In the grand blueprints of traditional planning, planners create rationalistic functional zones while ignoring the dynamic impact of the activities by different stakeholders within the system. However, in vision-oriented spatial planning, the plan is a spatial framework made up of strategies, and design is seen as a tool for testing spatial strategies in research. The results of the design should be seen as a reference rather than a fixed final form, thereby allowing flexibility for engaging and bottom-up development while implementing the guidance interventions

Before starting the design, I attended a workshop providing development suggestions for the Zoetermeer Innovation Park. Distinguished from a controlling detailed project for construction, the result of the workshop is a guiding structure provides a spatial condition dealing with prior issues and proposing principles for future development. What I learned from this experience is that planning should be a long-term, socially participatory and dynamic process. The planner optimises existing mechanisms and aligns different social groups through constructing spatial basis, and the form is influenced together by bottom-up and top-down activities.

Besides, I realized the importance of thinking the complex system from different perspectives. It can help to analyse the root reasons behind specific problems systematically and provide comprehensive solutions. Sustainability, as a comprehensive concept, needs to be achieved through collaboration between different disciplines in the planning process.

Reflection

Lessons learned from the Gruaduation Exploration

Concerning this, the department of Urbanism in TU Delft provide me with the chance to understand urbanization from not only urbanism but also landscape perspective and deeply explore the development possibilities beyond the urbanized area. The multi-perspective exploration exposed the importance of cooperation between different disciplines. The inclusive and cooperative academic environment is the solid backup force and diverse idea hub for me to contribute specific knowledge on sustainable development as an urbanist.

Limitation

through GIS data, the lack of precision only helped to give a rough idea of the context of the site and made it difficult to represent the detailed spatial organisation of the elements. Additionally, the planned online interviews did not materialize due to the limite time. This method is an important part of social research, but the time required to find diverse interviewees via the internet forced me to abandon this plan. Although studies could be found in the literature, the lack of actual dialogue made it difficult to fully understand the attitudes of different groups and made the analysis and conclusions about the governance model somewhat subjective. In order to use the imprecise data and less comprehensive social research efficiently for a practical proposal, I focused on the analysis of the organisation of rural elements. Through understanding the transition of the system structure and following impact on related activities, the results obtained from the literature can be proved or supplemented. This strategy helped me to build an evidence-based hypothesis in the limited time to tackle the prior conflicts and provide possibilities for in-depth research in the future

Ethical Reflection

Due to the epidemic, a part of the information in research was obtained through news on the internet. The limited content made it difficult to find specific evidence of spatial problems. Besides, as the development of rural areas has been out of the public eye for a long time, most reports on the development of rural areas are currently written by governments and formal medias. Regional development as an achievement is closely related to government evaluation, so that these articles are very cautious in their descriptions. Concluding comments are usually positive but exposure of current problems and critical perspectives are lacking. This led me to think about the role of the media in society. As an observer of social phenomenon, the media should take on the responsibility of identifying social contradictions and critically evaluating following impact. For spatial planning developing, the perspective of the media is part of the public knowledge and the critique from different perspectives would contribute to a more comprehensive social research result.

Conclusion

"Sous Les Paves La Plage", the radical slogan from the last century, could adequately summarise my understanding of urbanism: the discipline is more than the science for cities. it is the imagination of future possibilities based on research and understanding of the complex social-spacial system. This is the broad but root motivation of my graduation exploration.

The experience of the exploration is tough but fascinating. I have learnt to balance the macro ambitions with concrete practices in addressing complex spatial problems, and learned the tools to deal with the complexity of this system. Furthermore, I began to understand the dynamic process of transformation of settlement systems as a socio-spatial composite machenism. The condition of people's life is related to the place they live, and I will continue observing the world from the perspective of an urbanist in my future practice and exploration.

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Fig.140 Firework in Qiaolin Village

VII APPENDIX

Research Philosophy

Dialectics Dealing with The Complexity of the System

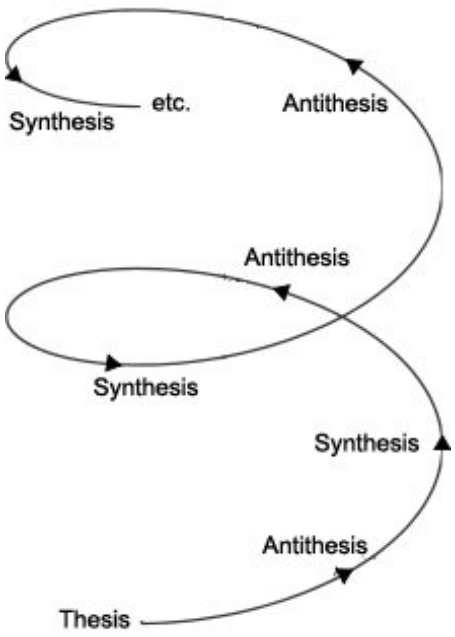

Fig.141
Dynamic Development Exposed By Dialectics

Dialectics

First proposed by Hegel, the method is an analysis framwork based on understanding the inner development and interaction between the dynamic system.

Dialectics exposes that the development of the system is perpetual, the stable situation should be regarded as a dynamic balance within the system. It points the key to promoting the transition is catching the contradiction, which is the objective and root reason that leads to systematic revolution and development.

The project uses dialectics as the research philosophy to deal with the complexity and the dynamic in the spatial planning system.

Research based on Dialectics

To understand the mechanism behind the urban-rural system and promote the transition of the roles of the countryside through the method of Dialectics. The complex system could be destructured into core notions and linked to the three rules in Dialectics:

Unity of Opposites

For instance, regarding the urban-rural relationship as an objective, the existing dual model and ideal relationship are two opposite statues of the specific urban-rural system in essence. The process of development is an iteration of constantly updated contexts.

Negation of Negation

The development of the system is dynamic, and contradiction, the root gap between status within the system, is the reason that pushes the transition. So, it is important to define the contradiction in the urban-rural relationship and countryside system for promoting the optimation.

Quantitative and Qualitative Change

In Dialectics, the contradictions (qualitative elements) of the system could be defined through summing phenomenons (quantitative elements). The contradiction for countryside revitalization could be concluded by inducting reasons behind existing dilemmas in rural development.

Methodology Form

Research Methods Answering Research Questions

Combining sub research questions and related methods with my graduation timeline, the framework explains the process for exploring the reseach questions step by step for achieving the research aim in the project.

(Sub-) research question	Method	Intended outcome
Redefine (Regional): What are the characters of the GBA as the system context?	• **Literature Review** *policy documents,* *agglomeration theory* • **Mapping** *Spatial condition for development* *International bay area in China*	**Aim *(function)*** • Understanding the position of the GBA on global and national scale • In order to setting foundation for elaborate analysis in following steps regarding the conclusion as the specific regional context
Redefine (regional + local): What are present roles of the countryside in the GBA?	• **Literature Review** *Retroactive analysis* *statistical data Analysis* *Agri-Aquaculture system* *Planning and policies* • **Mapping** *meso scale, micro scale* • **Layers Approach** *Layers construction*	**Aim *(regional shape→ local function)*** • Understanding the characters of the countryside within the regional network (shape and structure) • Constructing layers approach, defining attribute layers based on key elements • Exploring the features of the GBA countryside on meso and micro scales, defining typologies and locations. Exploring the challenges and opportunities of agriculture production in selected locations
Redefine (regional + local): What are potential roles of the countryside in the future?	• **Literature Review** *Agriculture development* *books and reports* • **Case Study** *global countryside* *design projects*	**Aim *(function)*** • Exploring the possibilities of the countryside development combining historical characters and technology development, • Propose the conceptual manifesto as preliminary vision, • Developing principles
Development Pattern (local): How to promote production innovation in the countryside based on the multifunctional agri-aquaculture land use strategies?	• **Layers Approach** *Analysis & design on attribute layers* • **Research through Design** *Design with flows* *Pattern Language* • **Backcasting**	**Aim** • Applying related principles through design • Exploring potential development pattern related to production sector **Production** Elaborate design (spatial and economical)
Development Pattern (local): How could spatial strategies contribute to the flooding resilience and livability in the countryside?		**Aim** • Applying related principles through design • Exploring potential development pattern for environmental resilience and living quality. **Production** Elaborate design (spatial, environmental, social)
Development Pattern (local): How to propose a sustainable and multifunctional development pattern for the countryside considering production, flooding resilience and livability comprehensively?	• **Layers Approach** *Layers superimposition* • **Research through Design** • **Backcasting**	**Aim** • Combining previous design oriented by different themes • Defining elaborate regional roles of the selected location in the GBA **Production** Brief design project
Regional Integration (regional): How could local development in the countryside contribute to an integrated urban-rural network in the GBA?	• **Layers Approach** • **Mapping** • **Research through Design**	**Aim** • Integrating the selected sites into regional network consider specific regional roles and optimizing the urban-rural integration in the GBA • Completing the vision and propose conceptual model **Production** Maps, report, diagrams
Regional Integration (regional + local): How to implement the proposal through phased strategies and polices?	• **Stakeholder Analysis** *Interest map, matrix* • **Research through Design** *Phasing Strategies* **Backcasting**	**Aim** • Building flexible governance framework proposing inclusive and win-win strategies, • Implementing through phasing strategies **Production** Report with diagrams and maps

Related Reading

Critique Writing of the Literature about the Countryside

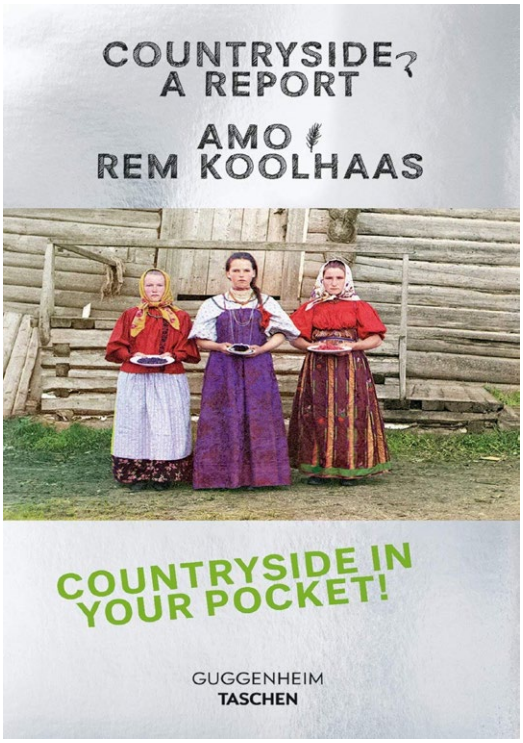

Fig.142 Book: Countryside, A Report

Resource: Countryside, A Report

Characters:
Villages with Chinese Characters, Stephan Petermann, 2020

Starting with quoting the well-known principle given by Den Xiaoping for Chinese development in the 1960s, the author, focuses on the development with Chinese characteristics in four rural areas including Dong Feng, Shou Guang, Yubulu area and Liuzhuang. The report is one of "travelogue essays" (OMA, 2020) in the book Countryside, A Report, which is published by AMO in 2020 to show their strong interest in exploring the possible future of the countryside due to the rapid urbanization.

As a narrative report based on reality, the author tried to be as objective as possible while observing. The four selected villages could be linked to four topics: the integrated production chain based on the technical

infrastructures, sustainable development, traditional culture and management policy, which link to the main possible driving powers of the countryside today. Through describing the detailed production patterns and recording conversations with locals, the author presented the management and current life state of villagers vividly. The angle of observation could be called "the angle of Xiangshen" in Chinese, which could help the researcher understanding the mechanism of the system based on localization, further, catching main conflicts and creating an achievable vision for future (Biao & Qi, 2020).

Nevertheless, the article did not have enough study on the planning policy due to the poetic and obscure official documents. "When I mention it to the students, they look puzzled. They always have a hard time understanding what Xi means when he speaks" (AMO, 2020, p130). It makes it difficult to fully understand speeches of Xi Jinping and the principle of Chinese policy documents about the development of rural areas. The problem leads to insufficient analysis in the policy parts and spatial structure. The chapter about the Big Beige Books-Beijing is brief, and the research on the cases is lack considerations under the regional geographic and planning context. In a word, the report tried to study the development pattern of the four villages point by point but not put them in a coherent spatial network. Besides, in Liuzhuang, the Last Real Commune, although the author has heard the drawback of the existing management and the facts that the villagers are breaking the existing rules, he still regards the village as a utopia of Commune Socialism and did not point the closed system is unstable. The key issue should be the pattern to building a resilient and sustainable self-circular system that is well-connected with larger free-market outside.

To sum up, the report presents diverse aspects to understand "Villages with Chinese Characters" (AMO, 2020, p124) and point the possible triggers of the transition. However, the article did not give the answer to the problem it pointed at the beginning. The selected cases with limited statistic data and coherent spatial analysis are insufficiently to provide a convincing solution or for Chinese countryside. Despite its limitations, the report provides readers a fact-based method to observe and research what is happing in Chinese rural area, together with valuable possibilities. It is a creative base for further research and study. We are going to create a vision for rural complexes with Chinese characters, and a solution for dwelling in the future.

Additional Discussion

The Meaning of the Rural Development for the Broader Context

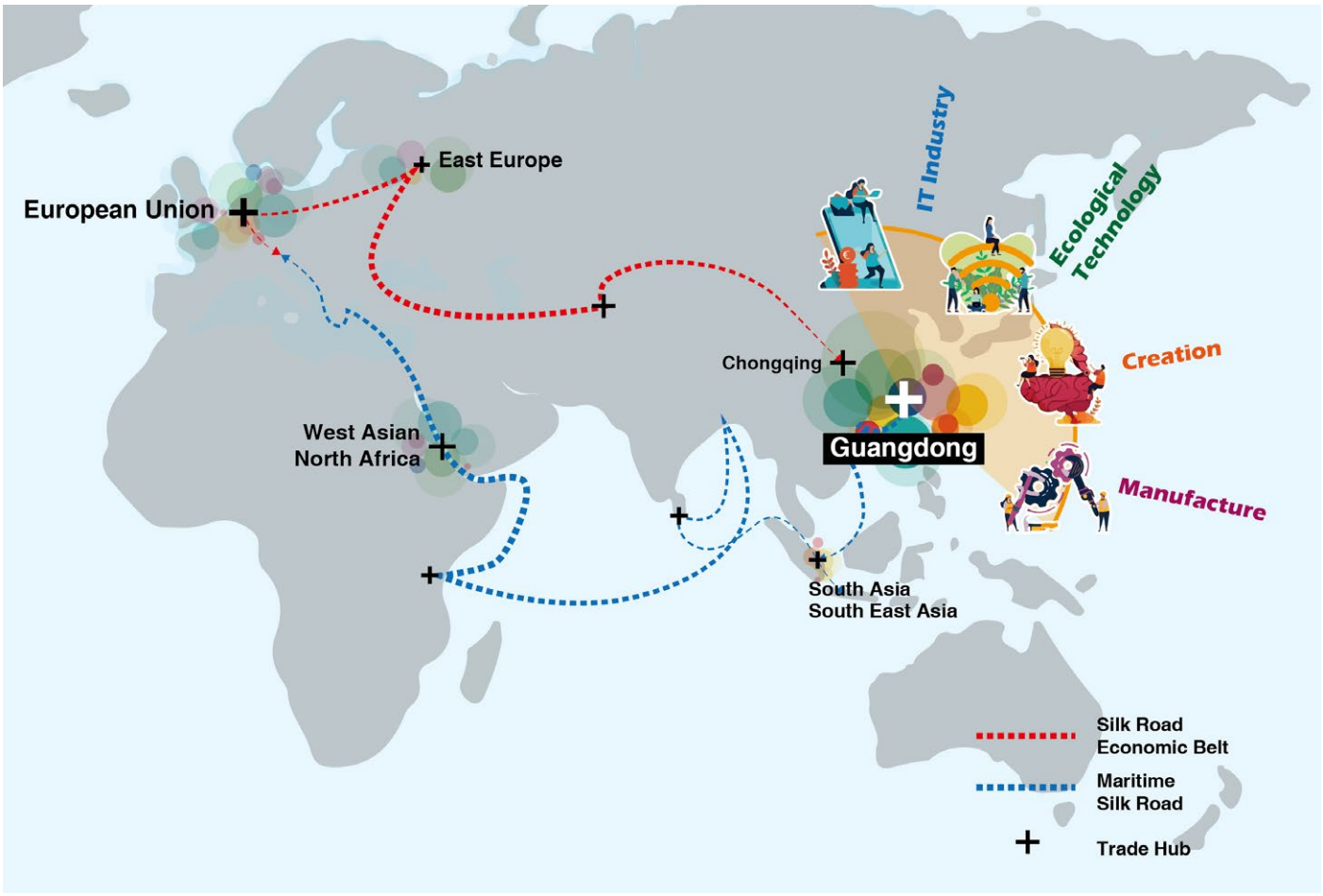

Fig.143 The GBA in the Martitime Silk Road

Rural development in the GBA has meaning not only for the region itself, but also for the long-term development of the country and the world. The path declared in the manifesto provides a sustainable sample for Chinese countryside and proposed principles dealing with the common issues arising from the past linear urbanisation.

In Chinese One Belt One Road (OBOR) plan, the GBA is the starting point and a gateway region of the Maritime Silk Road. Rural regeneration will give this global metropolitan region new capacities: it has the potential to become an international export area for modern agri-aqualculture trade in the future. It is conceivable that the cooperation between China and international knowledge hubs, for example Europe, in the fields of life and environmental sciences will be promoted by this vision. And the agriculture advancement could contribute to addressing food safety issues in the poor areas of the global south.

Figures

Source of the Figures in Report

Fig. 1. *Richard Hamilton, Exhibition, "This is Tomorrow", 1956*

Fig. 2. *Author*

Fig. 3. *Designboom, https://www.designboom.com/architecture/rem-koolhaas-amo-countryside-guggenheim-new-york-exhibition-02-19-2020/*

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