



Landscape into Urbanism

Integrating landscape as an urban infrastructure broadening functional possibilities towards a long term oriented visions, using the case of Changxing, China



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1. Concept introduction:

Landscape into Urbanism

- Shift of landscape's role in urbanism
- The values of landscape responding to urbanism
- Concept of 'Landscape into Urbanism'

1.1 Swift of landscape's role in urbanism

Because of the increasingly urging climate challenge and energy scarcity, all kinds of urban problems related to environmental condition emerge, such as flooding on urban area, water pollution etc. Sorts of pressures such as increasing population, limited space for urban expansion and urban resilience against sudden changes all require more attention on environmental issue from urbanism aspect. With the rising of ecological thinking and research on sustainable urban development, landscape has turned from the passive background of urbanism into a more active figure in urbanization process. (Aymonino, 2010)

The interdependent relation between urbanism and landscape is often ignored. In conventional thinking, urbanism pays attentions to spatial, constructional and socio-economic issues in built-up areas, while landscape merely relates to (rural) natural environmental issues (Velde, 2011). It is apparently true that human activities in urbanization process cultivate the natural land. However, the productive and topographic characters of landscape which shapes the cities' location, form, size and even how the city develops shall not be ignored as well. Thusly, it is quite reasonable to argue that landscape and urbanism have a mutual-effect relationship and embed with each other.

Such cooperation between landscape and urbanism has been discussed and explored by various theories and practices. Early from Garden City Model, Ebenezer Howard developed a urban-rural system, which emphasized the balance development between urban and rural area in a even broader environment. Comparable to this kind of pattern, the development of urban landscape is considered as a dynamic process. (Howard, 1898) Later, Ian McHag clearly pointed out the essential role and functions of natural landscape. More important is the sense to take environment elements and processes into urban planning to against the tabula rasa thinking on urban construction (McHag, 1995). As a response, following researches on ecological urbanism and other similar subjects all focus on analysis natural efforts and metabolism system into an urban perspective. In recent years, the theory Landscape Urbanism also tries to explore how to integrate landscape and urbanism as a whole dynamic balance system (Waldheim, 2005).

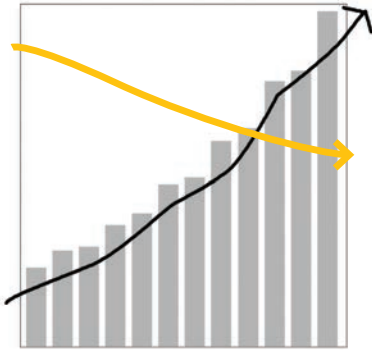


Figure1: Rising attention on environmental consideration on urbanism due to climate change
Source: www.



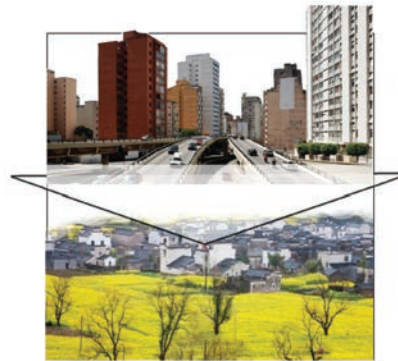
Figure2: Increasing pressure from urban growth and urbanization pattern
Source: www.

INCOMPLETE CONSIDERATION OF LANDSCAPE IN URBAN SYSTEM:



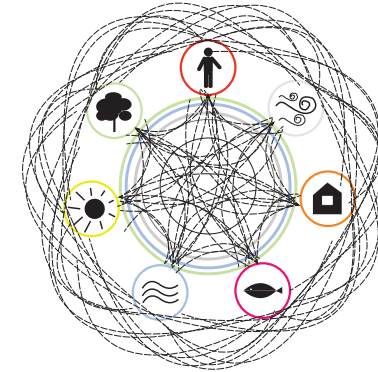
Limited natural resource

- pressure from continuous urban growth
- pressure from unproper pattern of urban growth, such as urban sprawl



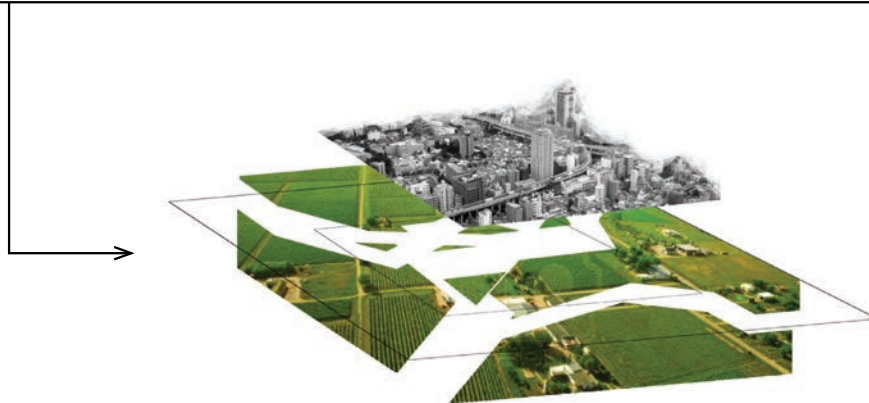
Not consider landscape into urban system

- ignorance of landscape structure in urban construction
- lack of exploring landscape value in urban development



Not consider landscape itself as a dynamic system

- ignorance the connection between different elements
- ignorance the efforts in long term process



Fragmented urban-landscape:

- losing sustainable natural resource
- losing high quality of living environment
- losing balance in urban-landscape metabolism
- losing proper urban-rural identity

Figure3: Incomplete consideration on landscape in urban system
Source: Author, 2012

Could we take an alternative aspect from landscape to deal with urban issues?



Figure4:
Source:

1.2 The values of landscape responding to urbanism

With the shift in the understanding landscape as a picturesque expression in articulated environment to an operative medium in urban practices, both urban planners and landscape architects started to recognize and rethink the swift of landscape's role in urbanism landscape's specific qualities that responding its capability in modifying urbanism.

Through the exploration of historical theories and practices, the values of landscape responding to urbanism could be categorized as its complexity, medium effort in urbanism and social relevance in environmental justice.

First of all, the rapid changing global and local urban issues require a framework with equally complexity and multi-scalar approaches to deal with both current conditions and future possibilities (Mostafavi, 2010). As a respond, landscape holds the characters as a broad cross-disciplinary in ranges of perspectives that link to economic property and social well-being. On the other hand, due to landscape's closely relation with ecology, it contributes to treat the urban environment as a comprehensive human metabolism. Thusly, with more consideration in urban-environment resilience, the conventional urban practice could better join in the long term process, and regarded as a flexible evolutionary rather than a rigid definite form (Marshall, 2012).

Secondly, under the context of increasing urbanized world, the traditional division between city and landscape become more and more blur. A new way of viewing interactive relation between urban and landscape is mutual coalition. As said by Frits Palmboom, 'The contemporary city is a phenomenon of landscape' and 'our environment is an urbanized landscape' (Palmboom, 2010), the interaction between urban and landscape require the acceptance of the ecological along with social process in the urban-landscape environment. In another word, such combination process could be seen as a kind of human ecology (Sijmons, 2009), which provide an alternative planning perspective or even development paradigm that is ecological viable, culturally relevant to the identity of the place, and also sustainable in the long term (Waldheim, 2009). According to

VALUE OF LANDSCAPE: Systematic responding characters



Complex system rely on long-term process

- a broad cross-disciplinary and multi-scale mode
- link to economic property value and social well-being
- correspond to the complexity of urban system

Diverse urban & rural experience

- provide space for development
- flexible condition for various programs
- enhance and explore local identity

Explore a new development paradigm

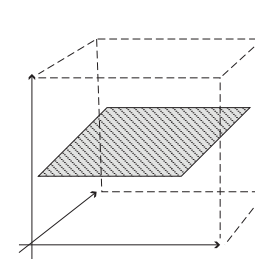
- explore urban & rural relation
- guide for urban expansion and development
- support urban resilience and sustainability

Environmental justice

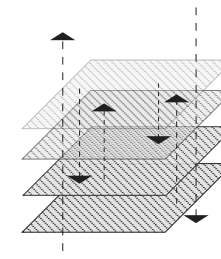
- consider the environmental change on social aspect
- develop environmental responsible lifestyle and spatial structure

Figure5: Value of landscape: systematic responding characters
Source: Author, 2012

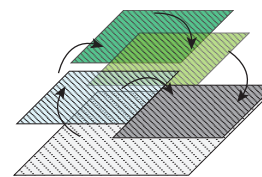
VALUE OF LANDSCAPE: Reflection on urban form and function



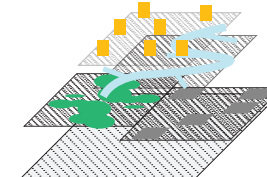
SCALE



RELATION



STRUCTURE



ELEMENT

-Express in suitable scale to clarify urban-landscape character

-Maintain supportive cooperation relationship through different urban-landscape layers

-Explore a synergic urban-landscape structure with mutually reinforcing efforts

-Select strategic elements as stimulating interventions with typical typology

Figure6: Value of landscape: Reflection on urban form and function
Source: Author, 2012

1. Concept introduction:

Landscape into Urbanism

VALUE OF LANDSCAPE: Efforts on diverse scales

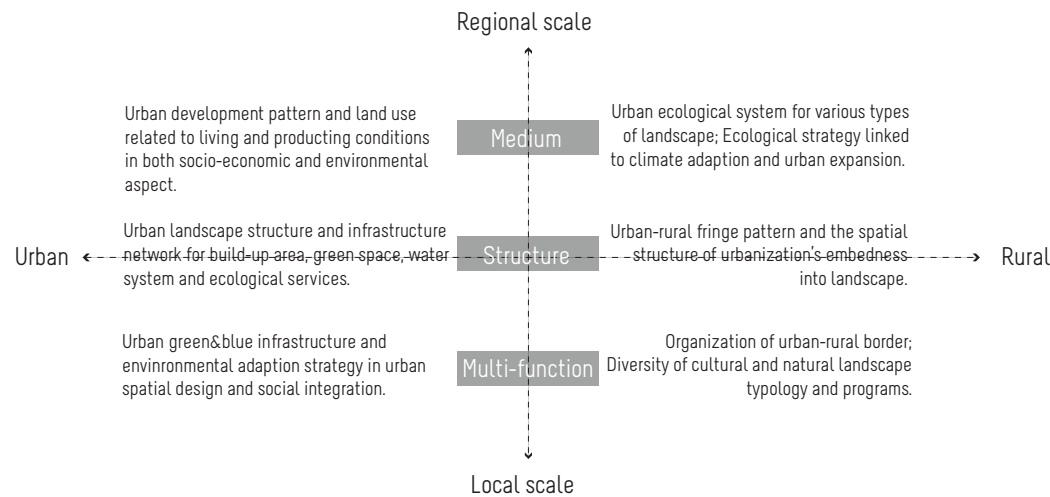


Figure7: Value of landscape:Efforts on diverse scales
Source: Author, 2012

VALUE OF LANDSCAPE: Reflection on societal-economic aspect

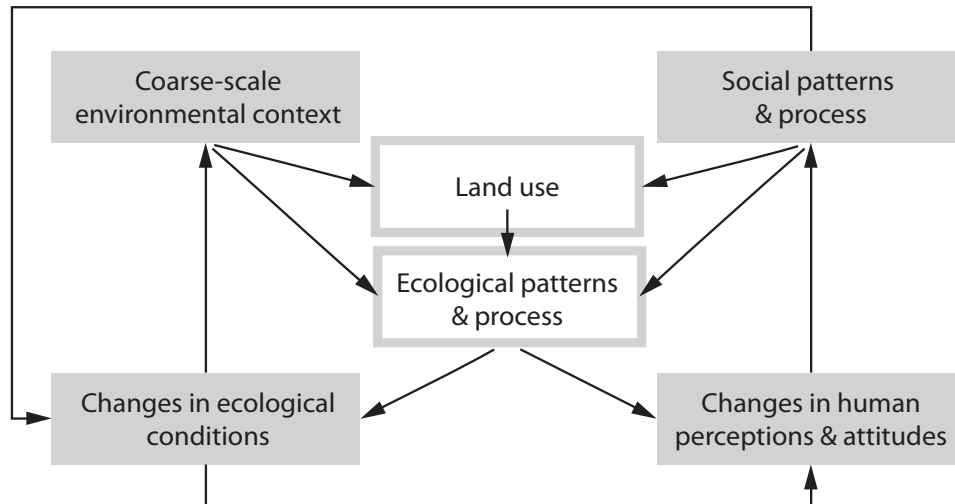


Figure8: Value of landscape:Reflection on social-economic aspect
Source: Author, 2012

that, landscape thinking provides more opportunities for diverse urban and natural experiences. A comprehensive consideration in urban landscape relationship could benefit their cooperation with each other. This embed effort contributes to support a variety of living systems, combining both human activities and natural cycles (SWA, 2010). Thusly, with respect to natural/cultural habitats, the local identity and lifestyle embedded in the urban-landscape structure could be conserved for further developed (Douglas & Ravetz, 2011).

Furthermore, because environmental quality is closely linked to economic property, social value and the city competitiveness, the involvement of environmental justice is also one of the important characters of landscape. Due to the interaction of urban and landscape, the impact of environmental changes on social groups shall be valued as well in the property development (Fainstein, 2010). Since everyone has the right to share environment and also the responsible to protect the balance urban-landscape relation, the planning of related environmental policy is not just about spatial organization, but also about dealing with complex property conflicts among various stakeholders and the organizing of governance operation structure.

1.3 Concept of 'Landscape into Urbanism'

All these qualities discussed above argue about landscape's capability to modify urbanization process in a relative flexible and sustainable way. As such, the concept of 'Landscape into Urbanism' emerges. With the view that landscape has an active and interdependent effort on urbanism, this concept tries to recognize the value of landscape, explore and embed the quality of landscape into urbanism. Thusly, it aims to propose a guideline or planning framework for urban development. This framework uses landscape as a medium to absorb urbanization into itself, meanwhile, maintain the continuity of both urban and landscape's quality flexibly. The goal of such propose is to achieve a relative balanced urban-landscape relationship, which organizes and responds to characters on each side, mutually reflects on each other's form and function, and could also benefits the long term development in socio-economic aspects.

Under the concept of 'landscape into urbanism', the further research question stand as what kind of spatial forms of such interaction between urban and landscape would be? What are its specific approaches in multi-scale and multi-aspects? How do such interaction and embed function in the long term process as a sustainable development paradigm for future urbanization? These questions will be pointed and further researched in the following practical planning and design case.

CONCEPT:

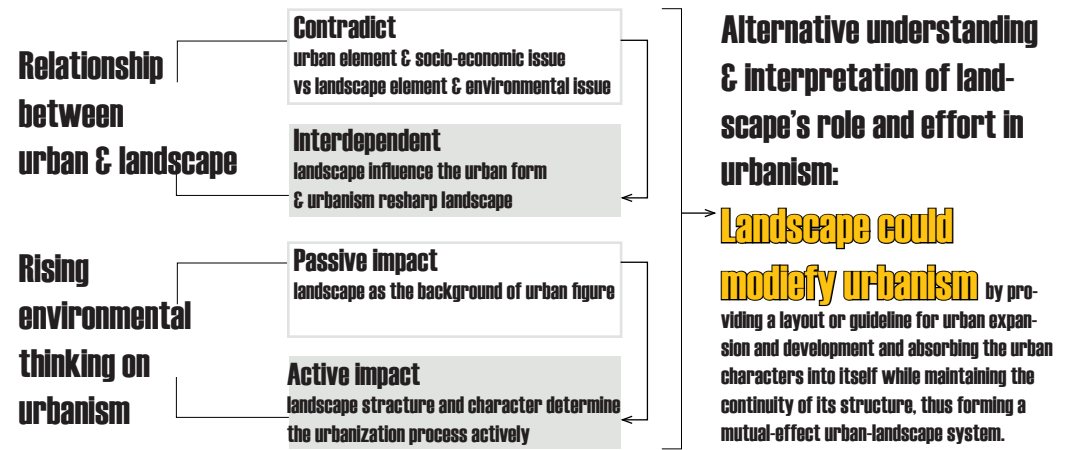


Figure9: Concept of 'Landscape into Urbanism'
Source: Author, 2012

A BALANCED URBAN-LANDSCAPE RELATIONSHIP:

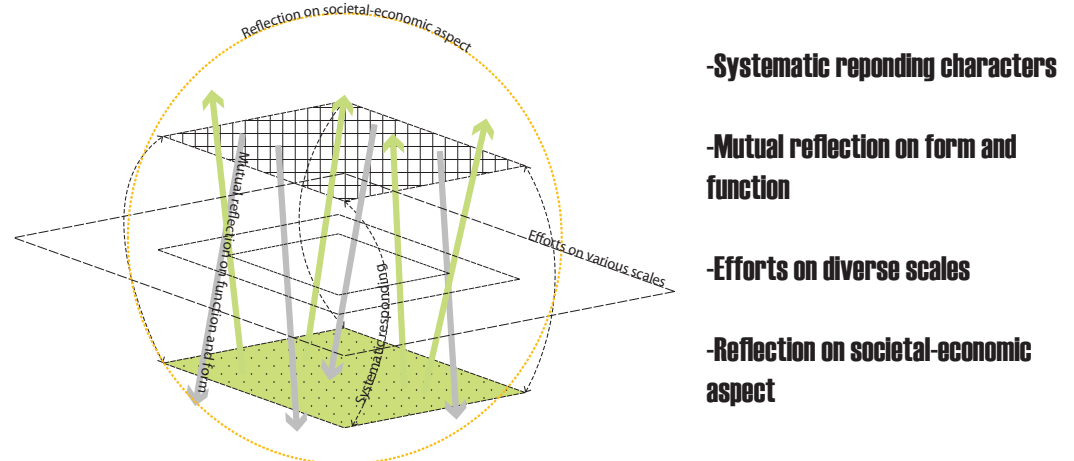


Figure10: A balanced urban-landscape relationship
Source: Author, 2012



2. Methodology

Research with design in the layer-approach model

- Research by design and design by research
- The layer approach model
- Methodology flow

2.1 'Research by Design' and 'Design by Research'

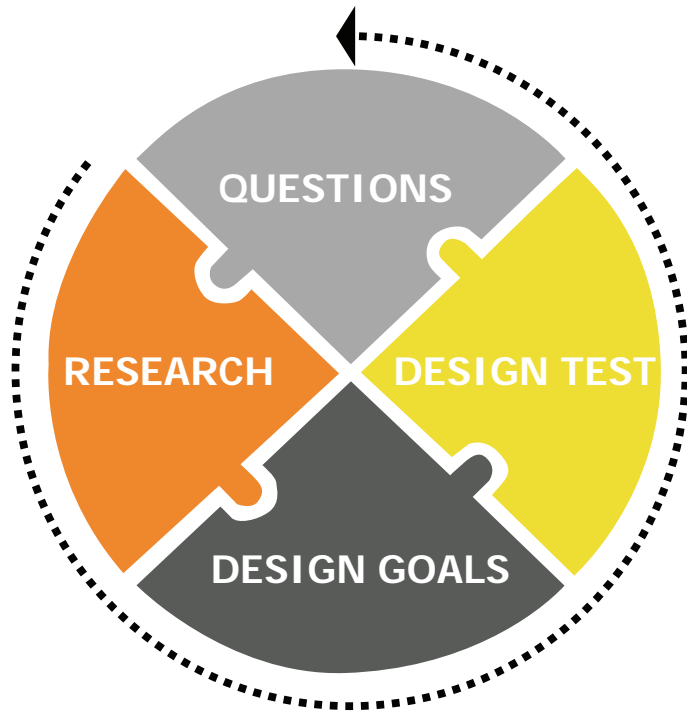


Figure11: The process of 'design by research' and 'research by design'.
Source: Author, 2012.

The whole process of planning this project consists of bringing up question, building up research, and developing a certain format of result to test in design. Or in other word, it could be described as a combination process of 'research by design' and 'design by research'.

The actions of design, to serve and test the concept of 'Landscape into Urbanism' in this case, stand as a start point. While the series expected design products could hardly come from the air. The 'design by research' explains itself that the design should be developed and verified through specific research as stepping-stones. In order to clarify the design task, the research for problem statement plays an essential role to show the direction for further strategies. This process includes an overall site context research and site diagnosis to tell the existing and potential problems, which lead to a convincing problem statement as a kind of motivation for design. And series of research questions following after the problem statement help to clarify different design goals in various aspects.

While the 'research by design' plays an extension of previous analysis work, that the hypothesis or proposal raised by the research need to be tested in a practical way as design. Certain proposed principles and spatial models joining in zooming-in design could open alternative views for further research on more practical angle. On the other hand, this practical experiment also provides criteria for research on the topic. And the research thusly could better serve for the design goal. In a word, the 'design' and 'research' benefits with each other as synchronal tools in the whole planning process.

The Layer Model

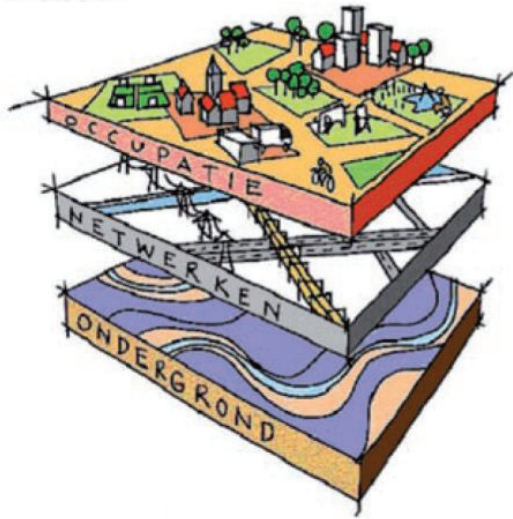


Figure12: The layer-approach model
Source: www.ruimtexmilieu.nl

	Design and planning tasks	Time horizon	
Layer 1	Substratum - Dealing with the physical effects of climate change - Modernising the water management system	100-500 years	
Layer 2	Networks - Strengthening the position of the Netherlands in international networks - Control and steer the growth of mobility	50-100 years	
Layer 3	Occupation - Accommodating spatial claims and shrinkage in relation to values and attractivity.	25-50 years	
	Coherence - Creating synergy between interventions	> Conditioning spatial planning > Facilitating spatial planning	

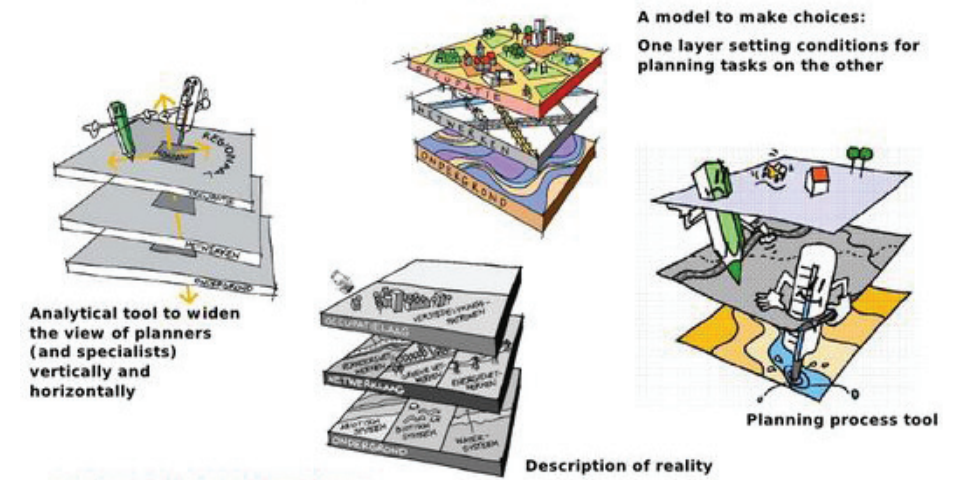
Figure13: The introduction of layer approach model
Source: De Hoog & Sijmons, 1998.

Figure14: How does layer model guide for planning
Source: Dawvellier, 2004.

2.2 The Layer Approach Model

Because the concept for the project closely links with urban-landscape relationship in a long term process, a certain analytical model that is able to cover both urban and landscape character in multi-scalar and temporal way is needed. Thusly, the layer-approach model is introduced here as an basic thinking method for this project's theoretical and analytical frameworks.

According to the layer-approach model, the dynamic spatial structure could be differed as substratum, networks, and occupation pattern- i.e. three layers (De Hoog et al., 1998). This adoption of three layers could be applied in the case of Changxing in both analysis and design. On one hand, this layer-approach pays a clear attention to not only the urban pattern, but the underground landscape as an essential base. On the other hand, it also provide a start point to regard the integration of landscape condition, structure networks and concrete spatial occupations. Meanwhile, the challenges of applying this model also arise. Because of the different layers have their own dynamics in temporal scale (fig35), and different characters in form and function, the main challenges stand as how to concern for the overall transformation process and the interaction between each layers (Teunissen, 2002; Schaick & Klaasen, 2011).



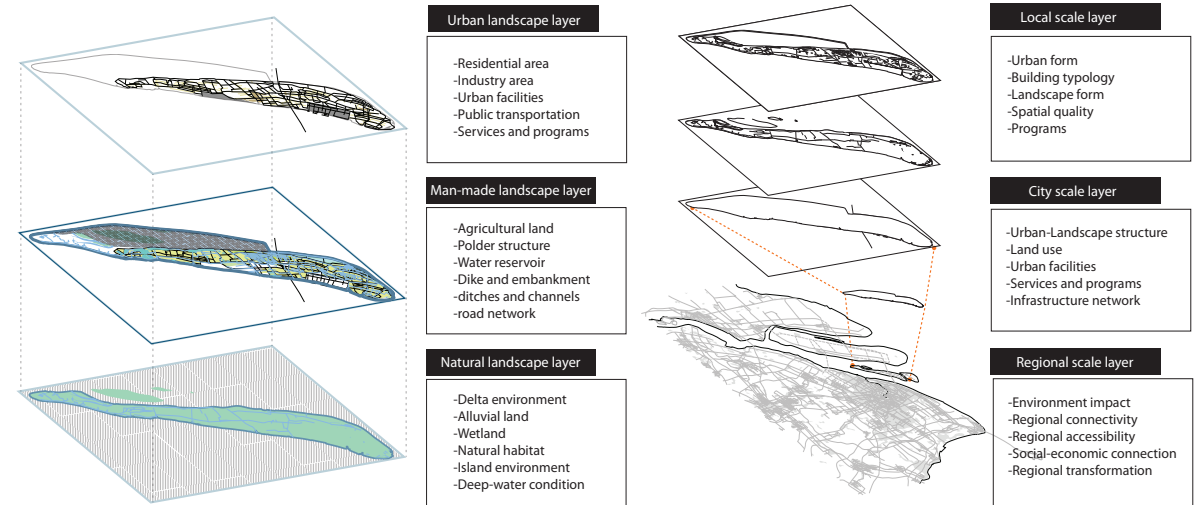


Figure15: The layer-approach analysis of Changxing
Source: Author, 2012

As Sijmons (2002) states that the layer-approach model means 'a strategic proposal to organize a multitude of spatial tasks and projects', and from this order a new logic of prioritizing one task over the other; a new logic of which task would belong to which level of government arise. "It was a working philosophy, a strategic model, a planning concept. Since then, it went its own way." (Sijmons, 2002). As such, its applications in the case of Changxing display in three main aspects. First of all is the layer-approach analysis on different urban-landscape components. The analysis of each layer reflects specific local potentials and risks. Secondly, the layer-approach also aims at revealing or creating interactions between different layers, in order to form a relative balance urban-landscape relationship. Last but not least, it's related to not only diverse spatial components, but also multi-scales and a long-term process in urban transformation. In another word, it also contains layers of scales, from regional to local scale, and layers of time, from past to future. The interactions would be explored based on the reflection on such complex urban-landscape transformation. And certain proposals are expects to adjust the changes to fit towards a more resilient and sustainable development direction.

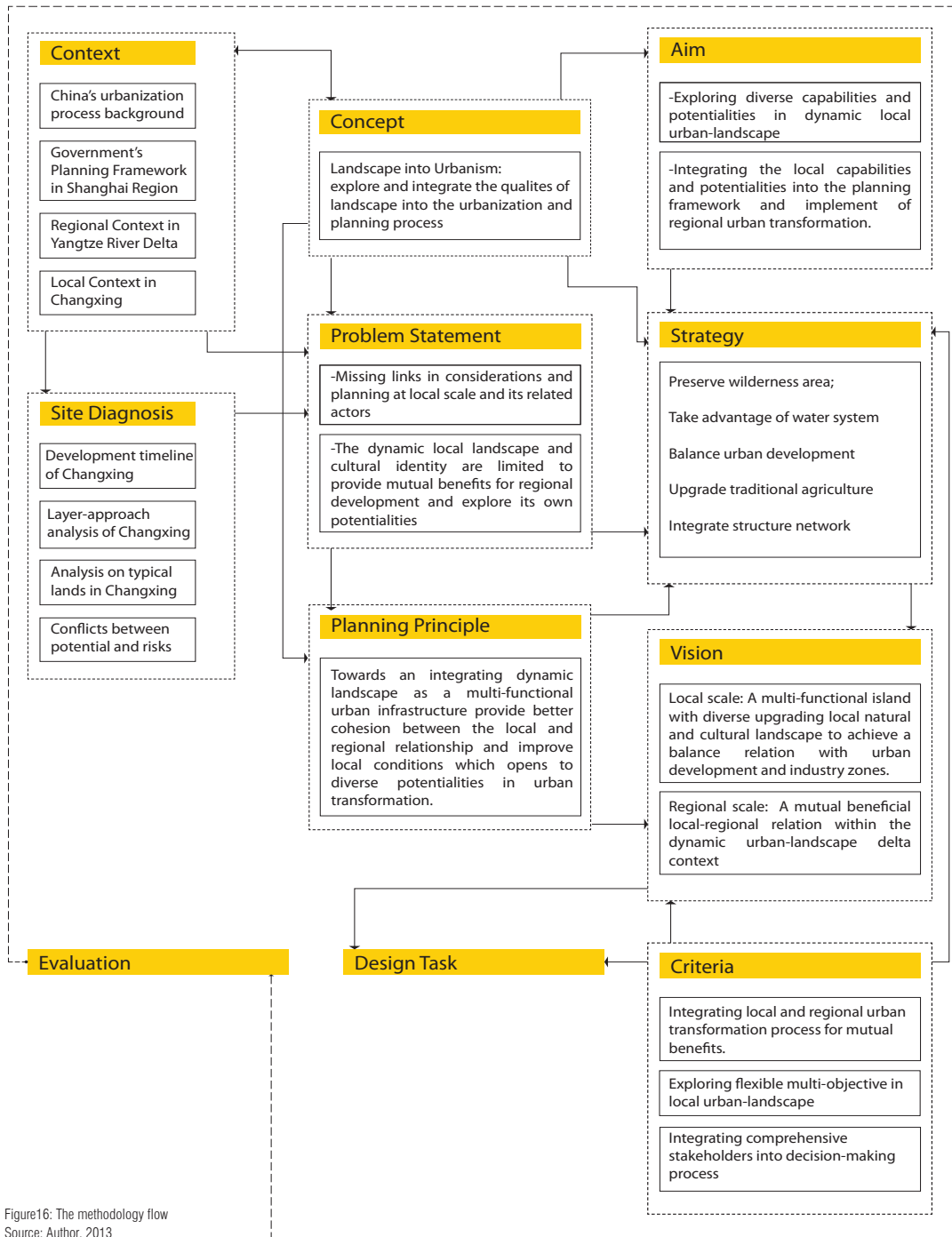


Figure16: The methodology flow
Source: Author, 2013

3.3 The methodology flow

Based on the methods of 'design by research & research by design' and layer-approach model, the project's methodology flow goes through a logic storyline as the diagram shows (Fig.32). All the phases are interdependent. They form as a thinking & operation network referring to each other, rather than the merely linear organization. During this process, the rising up of research questions always play as the stepping-stone, no matter in research or design part.

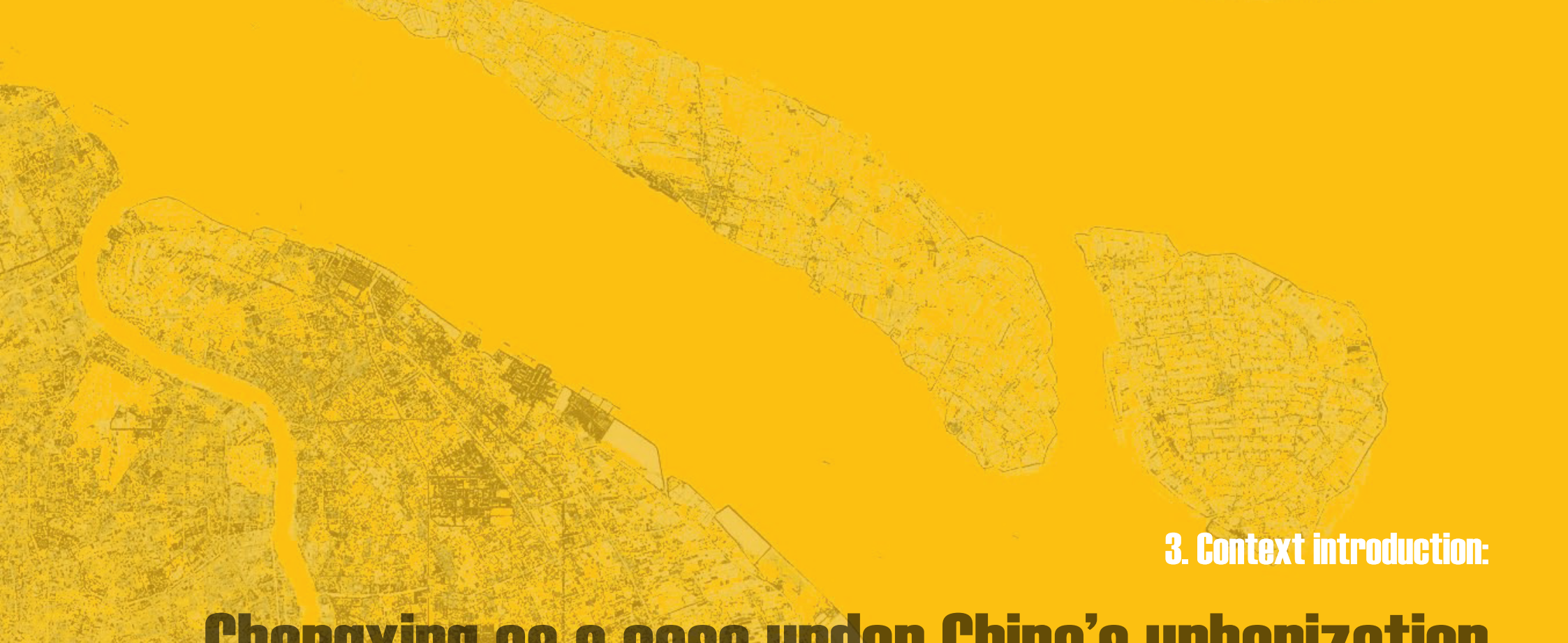
The motivation starts with the developing of concept. The idea of 'Landscape into Urbanism' as concept provides a general direction for research and design. This direction also emphasizes a certain perspective, saying consideration of landscape in urban planning, in context research and site diagnosis. As a linkage, the research questions for 'design by research' raise up to guide further analysis in site diagnosis. Meanwhile, during this process, the method of layer-approach also contributes to analysis the specific characters of landscape layer, with its interaction with other layers.

Therefore, based on both overall review on site's condition and current planning framework, a critical problem statement would try to point out the missing links in existing decision making process, and the weaknesses or risks in spatial planning. Thusly, combined with the concept as direction and problem statement as path, the research question for 'research by design' could be reached. The main research question focuses on a general comprehensive solution. For further detail research and design, several sub-research questions are raised up. Those sub-research questions pay attentions on different aspects, in order to explore various potentialities for comprehensive solutions. These research questions then connect the problems statements to planning strategies in next step.

With the planning principles and aims as targets, series of planning strategies are developed as responses to the missing links in problem statements. The strategies are not limited in providing improvements in spatial organization, but also assume a critical thinking on existing planning framework, considering the comprehensive participation of actors. And then vision on both local scale and regional scale stand to clarify the planning position in this project.

For the design task as next part, additional criteria are formed to test the previous strategies. These criteria aim at arguing the strategies' practical efforts. Through such assessment, a certain guideline for testing the planning principle in specific spatial condition could be developed in next step as the design task.

Finally, a comprehensive overview as evaluation for the whole research and design will be add to provide a conclusion and critical retrospect to this project.



3. Context introduction:

Changxing as a case under China's urbanization

- China's urbanization process as background
- The urbanization tendency as regional context
- The environmental concern as regional context
- The urbanization demand of Changxing

3.1 China's urbanization process as background

Before 1978, the urban-rural duality system in China limited the productivity in both city and rural area for a long time. Major of the social-economic resource were limited in cities. Meanwhile large numbers of labor force were not able to move from rural to urban area due to the rigid house-hold registration regulation. Such duality led to great division in the urban-rural relationship (Zhao, 2004). While after the economic-reform and opening-up policy, rapid urban growth began due to increasing foreign-domestic investment and rural-urban migration. From 1978 to 2008, the annual growth rate of China's GDP remains from 8-14%. The economic structure and labor force market continuously transform from agriculture to industry and service. At the same time, urban land keeps increasing in the land use trend.

However, during this rapid urbanization process, several essential problems can not be overlooked. As the government taking economic as development center, it is difficult to avoid the situation that somehow such urbanization achieves its rapidness with the cost of quality. The apparent imbalance expresses in the five aspects as development speed and quality, construction and management, productivity and living environment, economy and social well-being, urban development and environment protection. The data of overall urbanization process display that the emission of pollution increase rate is higher than the urbanization rate, land-urbanization increase rate is faster than the population-urbanization rate, and the planning urban construction land is also increasing faster than the completed urban land. Such phenomenon reveals the relatively blind trend in China's rapid urbanization process.

What's more, this trend has already made unbalance in different aspects. On one hand, the problem is the unbalanced urban development itself. Because of the original differences in geographic location, natural-social resources and economic development level, certain places such as the eastern costal area or capital cities already have superior condition for urbanization. Then with the intensification from globalization force and administration policy making, the disparity in social-economic resources between essential metropolitan, big provincial cities and small scale cities or towns has been increasingly obvious, let alone the countryside villages.

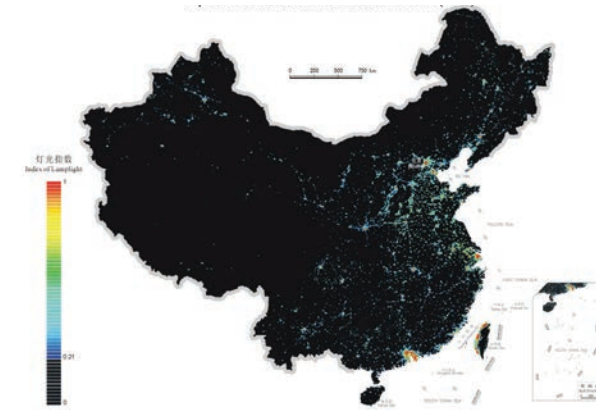


Figure17: Spatial of urbanization distribution of China
Source: School of Geography, Beijing Normal University, 2002

Those strong-development cities absorb population and constructions much more than the loading capacity they have, both socially and environmentally. While those less attractive areas are forced to lose their competitiveness, shrinking in labor force and investment. On the other hand, the problem lies in the impact of urbanization. The lagging of residents' income compared to the fast rising prices together with the increasing income gap among different groups lead to social imbalance and fragmentation in both societal and spatial. At the same time, the myopia in long-term sustainable development results in innumerable urbanization projects taken with the price of destruction in historical-culture and valuable environment. The great demand from urbanization in resource and spatial will bring risks in the long term if a smarter, more sustainable urban growth pattern were not taken into consideration.

As consequence, the quality of China's present urbanization relies in how to organize the urban develop itself and its cost in time and space. The challenge for a more sustainable urban growth pattern focuses on increasing land-use efficiency, integrating social-economic and environmental consideration, and a long term perspective thinking. Apparently, in this exploration process, the urban-landscape relation in multi-scale and aspects would stand as an essential role to reconcile the contradiction between constructions versus protection, and provide a relative elastic approach towards sustainable development in the long term.



Figure18: Imbalance in China's urbanization process
Source: Author, 2012



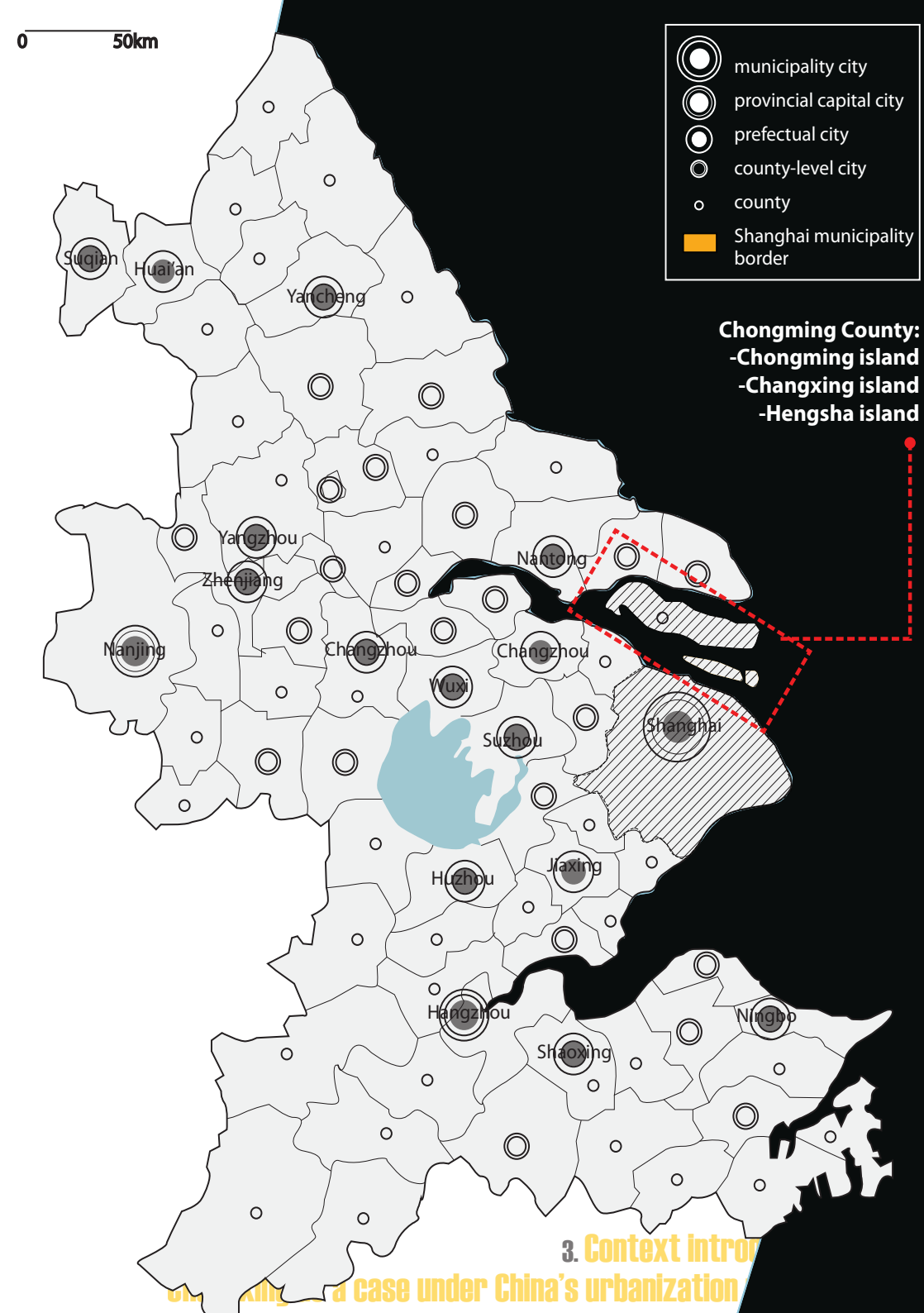
Figure19: Environmental pollution by industry in China
Source: www.

2.2 The urbanization tendency as regional context

The project site is the Changxing Island, which belongs to Shanghai municipality city as one of its county. Because of its sensitive delta location in the Yangtze River Delta, its original land condition is very suitable for agriculture use. On the other aspect, the island character which lacks of road transportation connection render it to be quite a isolated place falling behind the urbanization pace in the whole region. Nevertheless, during recent years, even small island place like Changxing Island has to face the impact of regional development as its big context. With the requirement of urban expansion and industry development in not only Shanghai metropolitan area but also Yangtze River Delta region, this island can hardly avoid to join in the rapid urbanization process.

Yangtze River Delta region is one of China's earliest and most prospered urban regions. For historical and geometrical reasons, Yangtze River Delta (YRD) region has long urban prosperity background and very supportive economic condition for modern urbanization. Generally speaking, the urban network in YRD is relatively complete. Shanghai is the absolute center as an international metropolitan. Nanjing and Hangzhou stand as the secondary center city as the province capital city. Following are other main regional cities as Suzhou, Wuxi and Ningbo. Other smaller cities and towns develop under the impacts of these main center cities. With wide spread infrastructure network and industry clusters as connections, these cities in different scales have form a gradient urban area that support with each other, sharing common resource and cooperation (Tao and Zhen, 2002). Then what's the role of Changxing in YRD region?

Figure20: Changxing's role in the regional urban hierarchy
Source: Author, 2012



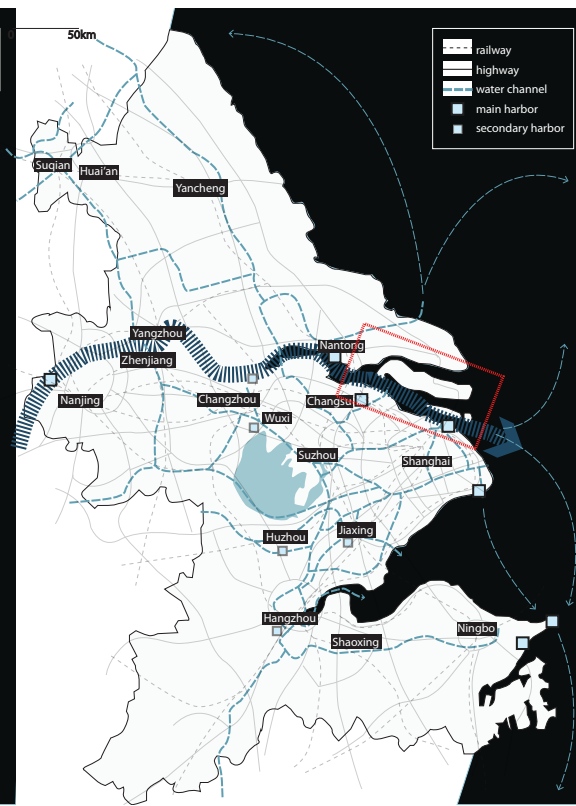
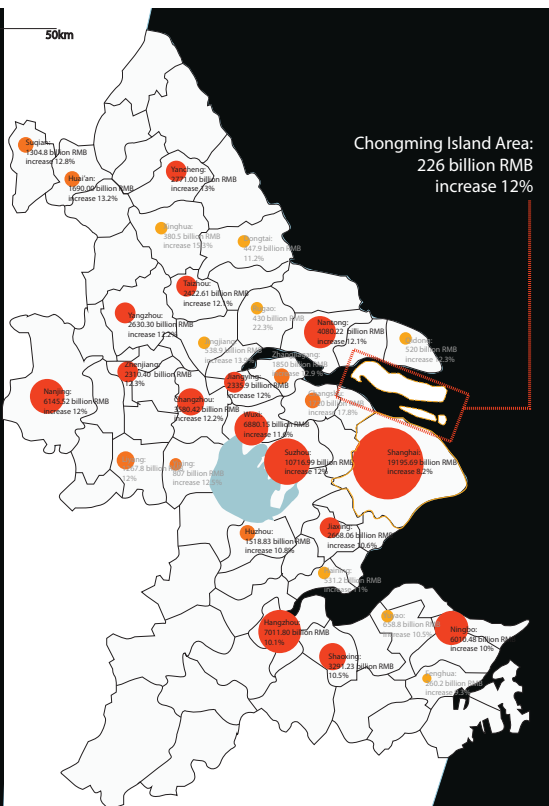
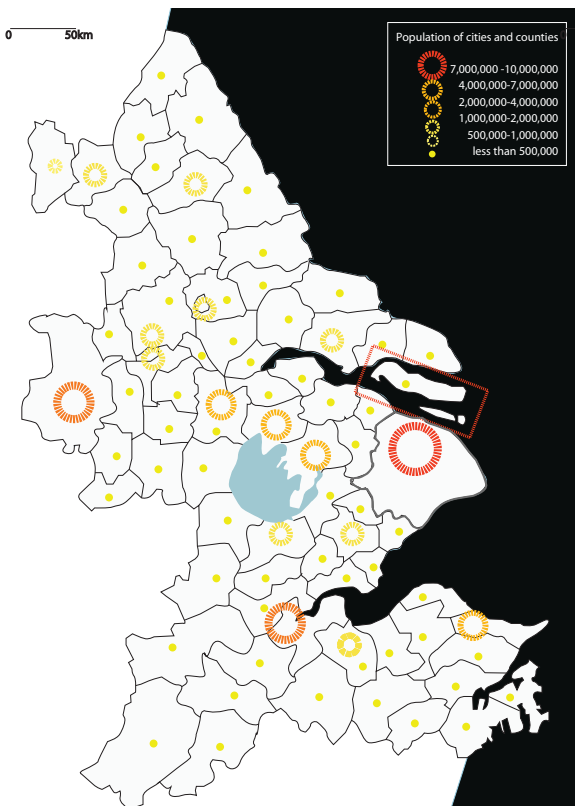


Figure21: Regional comparison on population
Source: Author, 2012

Figure22: Regional comparison on GDP and GDP growth
Source: Author, 2012

Figure23: Regional comparison on infrastructure network
Source: Author, 2012

Figure24: Regional comparison on transportation network
Source: Author, 2012

In social aspect, Changxing only has 36 thousand local residents, which just renders in a county level. Together with its belong district Chongming area, the total population is still less than 500000, which could hardly be compared to surrounding large cities or metropolitan city as Shanghai. And economic aspect, Changxing's GDP is only 1/4 of Shanghai's suburb area. But its 12% growth rate per year could catch up the average level in the YRD. While it is still difficult to deny that Changxing stands in a low level both in social-economic aspect.

In the perspective of infrastructure aspect, it is also apparent that the whole Chongming region, including Changxing, stands a little bit out of the regional infrastructure networks. Because of the isolated island character, the developments of Chongming

area's road infrastructure and public transport lag behind surrounding areas quite a lot. But because of its connective location between Yangtze River and the Eastern Sea of China, it has great advantage in water transport. Many important regional and local water routes and ferry lines pass through this water channel. And Changxing and Hengsha's deep-water condition are very suitable for harbor construction. **This advantage in water transport as a connective note offers development opportunity to upgrade the low social-economic level in this area.**

3. Context Introduction: Changxing as a case under China's urbanization process

With the government's planning strategy to develop Shanghai metropolitan area further towards north to build up stronger social-economic connection with the north of Jiangsu Province (The Comprehensive Plan of Shanghai Metro-region, 1999-2020), the development direction toward north is recognized as a potential urbanization tendency that should be focused on in the recent future. The Chongming Island area which contains Chongming, Changxing and Hengshan is the very key starting area. **Changxing Island, as the one that has closest relationship with Shanghai, holds the advantages in water transport condition, cheap land resource, environment condition as an important junction node for future urban development.**

For better governance, the administration of Changxing and Hengsha Island was switched from Shanghai Baoshan District to Chongming County as a whole. Zooming into Shanghai metro-region, the isolated condition of Changxing Island has been improved by the newly constructed crossing-river national highway from Shanghai to Chongming then to north of Jiangsu Province, and also the planning expand of metro line No. 19. What's more vital for Changxing Island is the inception of large scale industry into it (The Comprehensive Plan of Chongming Island Area, 2002-2020). Based on the great deep-water harbor condition in the south bank of Changxing, large scales of marine engineering and ship-industry have been introduced into this island. Such industry implantation will lead to enormous social-economic changes. Such sudden and rapid industry development would make a big difference in the island's economic structure and original land use. According to government's estimation, there will be almost 150,000 people migrating into Changxing due to increasing employment opportunities (The Comprehensive Plan of Changxing, 2002-2020). Thusly, larger numbers of housing, services, public facilities, and infrastructure network are required. A sudden shift from agriculture to industry, a foreseeable rapid urbanization process just happened in Changxing.

0 50km

The urban system in Yangtze Delta Region

The missing link of Shanghai Metropolitan area towards north of Jiangsu Province
 -> A potential to build up north-connection and develop Chongming Island Area

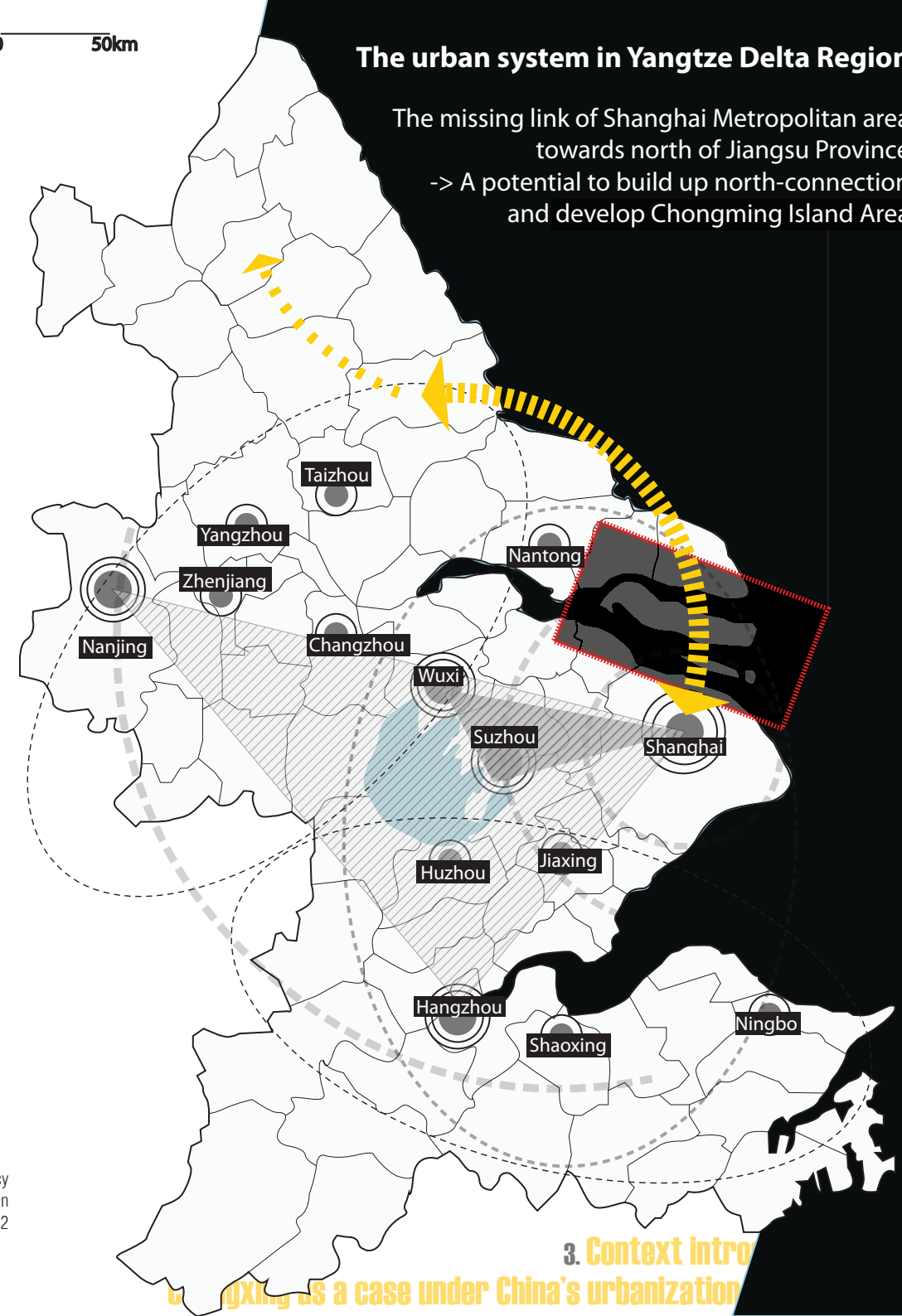


Figure25: The urbanization tendency in Yangtze River Delta region
 Source: Author, 2012

3. Context intro

Changxing as a case under China's urbanization

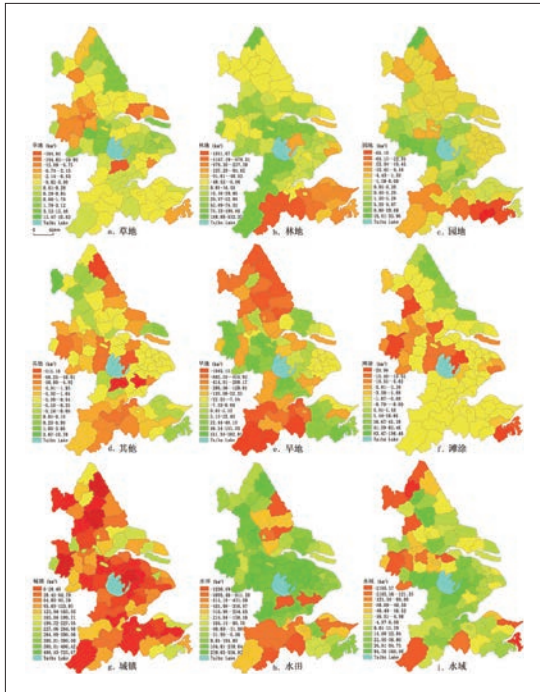


Figure26: Spatial distribution of land conversion in Yangtze River Delta from 1991-2008.
Source: Wang, Fang & Wang 2011.

Figure27: Land conversion into city and town from farmland and local landscape
Source: Author, 2012.

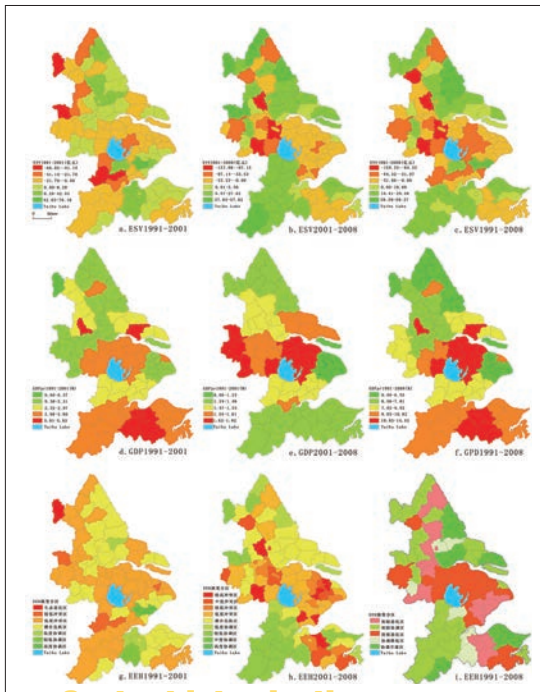
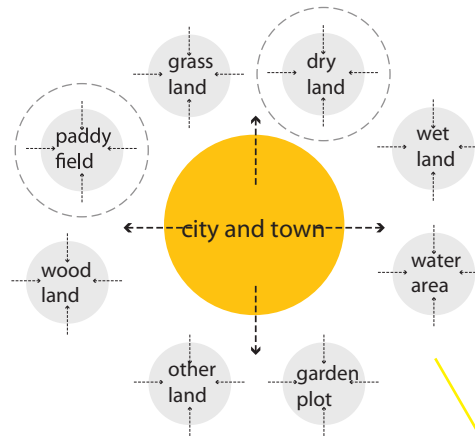
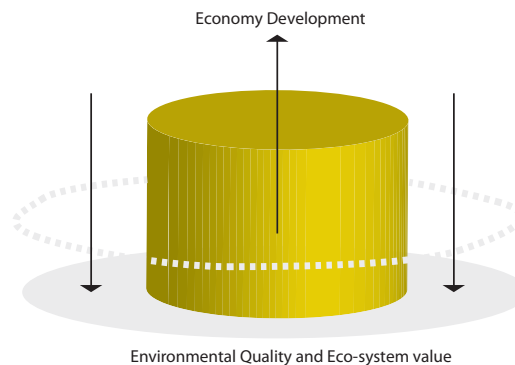


Figure28: The changes of Eco-service value, GDP and the coordinate rate between them in Yangtze River Delta from 1991-2008.
Source: Wang, Fang & Wang 2011.

Figure29: Economy growth by the cost of environmental quality
Source: Author, 2012.



2.3 The environmental concern as regional context

While the alternative perspective in environmental condition reveals the existing negative impact and also potential risks from the fast-increasing urbanization. According to the GIS research data and maps, from 1991 to 2008, the conversion of land use in YRD is significant. The types of land use could be categorized as 9 types in YRD region, which are city and town, water area, wetland, dry land, paddy field, grassland, garden plot, wood land and other land (Wang et al. 2011). During the two decades, the most increasing one is city and town, which mainly converted from the paddy field, day land, grass land and garden plot. In a word, the expansion of urban land majorly comes from the shrinking farmland and typical local landscape.

On the other hand, the data also shows that in Shanghai-Nanjing-Hangzhou area, where the GDP develops relatively faster, the eco-service value decreased most apparently. Such economy growth by the cost of environment quality is quite obvious in YRD during these decades.

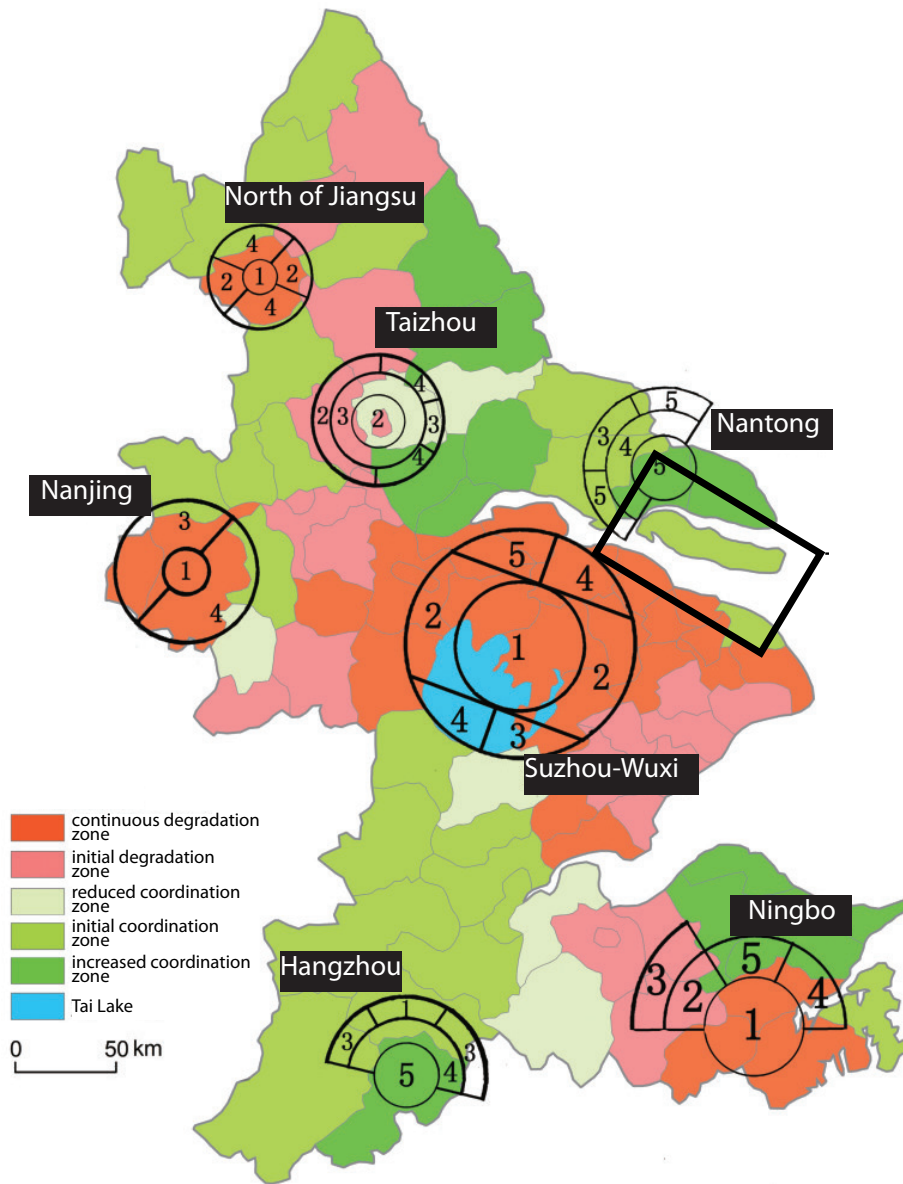


Figure30: Spatial combination with the coordination rate between GDP and eco-service value in YRD.
Source: Wang, Fang & Wang 2011.

Therefore, a challenge for regional development in the long term could be described as the contradiction between the inevitable urbanization demand and the following environmental degradation. The research data and map shows that the area with high urbanization level gradually become continuous degradation zone in eco-service value. And with the decrease of urban influence, the environment quality remains better. Highly-developed urban zone such as Shanghai metropolitan area together with Suzhou and Wuxi, and Nanjing city region all render into continuous degradation zone. And the urban areas in second development hierarchy such as Ningbo also become initial degradation zone. While other areas without strong influence of urbanization could remain the environmental quality as initial coordination or increased coordination zone. Chongming area, including Changxing, still keeps its relative high environmental quality due to its separation to large scale urbanization. However, with 'toward north of Jiangsu Province' development direction, Chongming area also has to face urbanization demand. Thusly, the contradiction between original environmental quality and the urbanization pressure become even an apparent challenge in Changxing.



Figure31: Changxing in Shanghai's administration system
Source: Author, 2012.

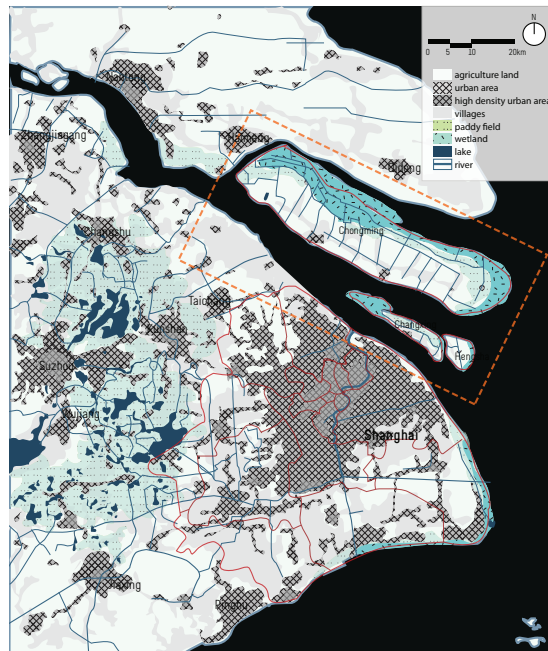


Figure32: The landscape condition in Shanghai region
Source: Author, 2012.

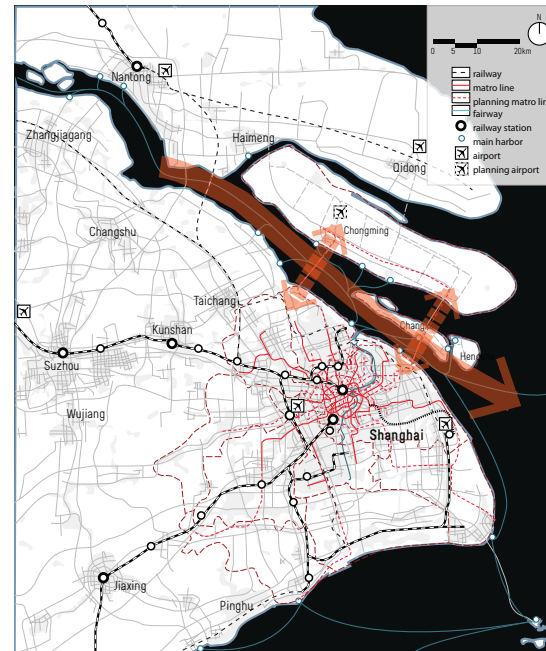


Figure33: The infrastructure network and transportation in Shanghai region
Source: Author, 2012.

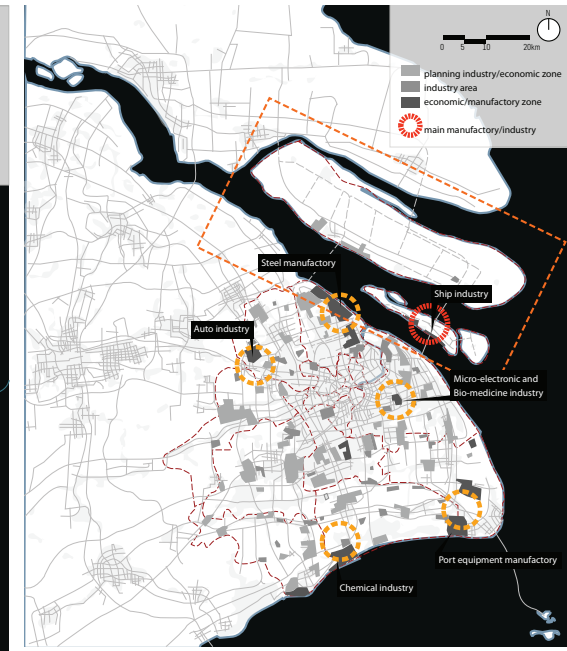


Figure34: The implement of six industry zones in Shanghai region
Source: Author, 2012.

2.4 The urbanization demand of Changxing

The urbanization tendency and environmental concern reflect more concrete in Changxing when zooming into the scale of Shanghai metropolitan region. In Shanghai's administration system, Chongming region, including the islands of Chongming, Changxing and Hengsha, has been separated from Baoshan District since 2001 as an independent district of Shanghai for better governance in the whole islands area. Therefore, Changxing become a county under the Chongming District. Because of the delta environment, Chongming District remains relative good condition in natural landscape and large scale of agriculture. The major of valuable wetland in YRD concentrate in Chongming and Changxing. And together with Tai Lake region, Chongming area is also an important fresh water resource because of its relative high environmental quality. At the same time, due to its island character, this area is quite isolated from the infrastructure network of Shanghai metropolitan region, and its main connection with surrounding region focuses on water transport. In recent years, as a response to the 'towards north of Jiangsu Province' development direction, the government has built up a national highway passing through Changxing island to connect Chongming island and north of Jiangsu Province with Shanghai region. Following with

the expansion of infrastructure, one of Shanghai's metro line is also planned to pass through Changxing to provide better regional accessibility in public transportation. **Further more, the national government and municipality of Shanghai have planned to implement one of the largest marine engineering and ship-industry zone in Changxing because of its good condition in water transport and harbor-construction. Thusly, Changxing stands as one of the six main industry zones in Shanghai, and takes the responsibility for further economic development. Because of such implement of large scale industry, Changxing has to face the demand of fast urbanization due to increasing population by new employments.**

3. Context Introduction: Changxing as a case under China's urbanization process

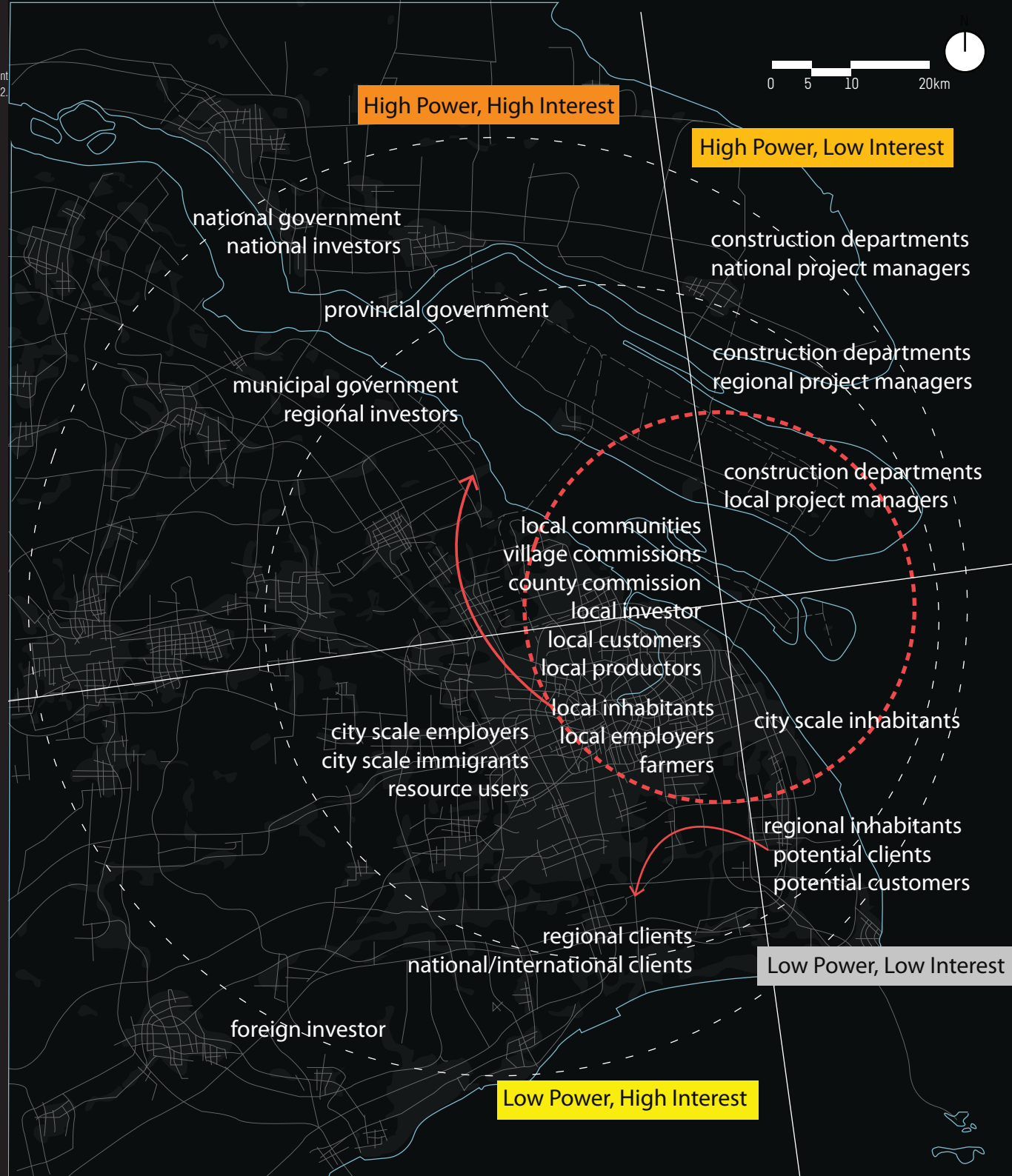


Figure35: The ship industry
Source: www



Figure36: The rural image in Changxing
Source: www

Figure37: The actors condition related to implement industry in Changxing
Source: Author, 2012.



However, such decision-making is mainly based on the regional level, without comprehensive consideration of Changxing's local condition and the fully participation of local actors in Changxing. At present, the regional administrator only offers a policy to arrange large scale industrial construction in Changxing. While there is no discussion about how to conserve the local condition in such industrialization and following urbanization plan. The valuable qualities of local landscape, the interests of tradition agriculture, and the living & working condition of local residents are not taken into the consideration of such sudden and essential change.



4. Site introduction and diagnosis :

The conflicts in Changxing's urban-landscape

- Site introduction
- The forming process of Changxing's urban landscape
- Layer-approach analysis of Changxing
- Zooming-in analysis of typical lands
- Overview on the site's conflicts

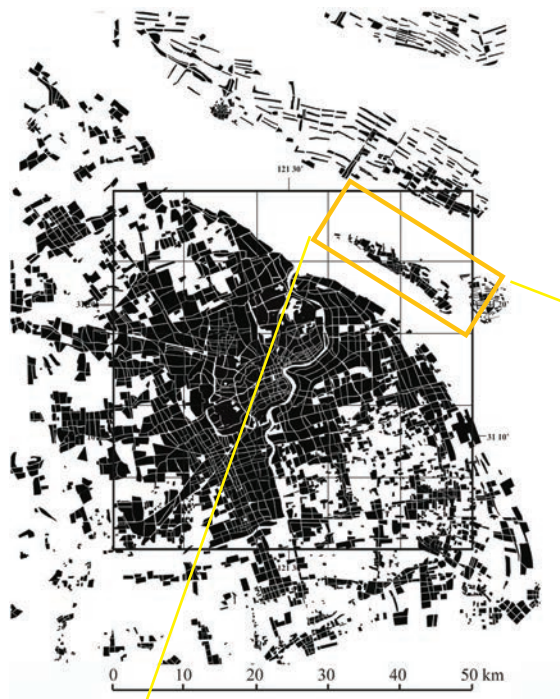
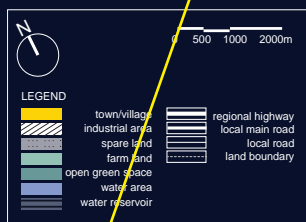


Figure38: Site's location
in Shanghai metropolitan scale
Source: Author, 2012

4.1 Site introduction

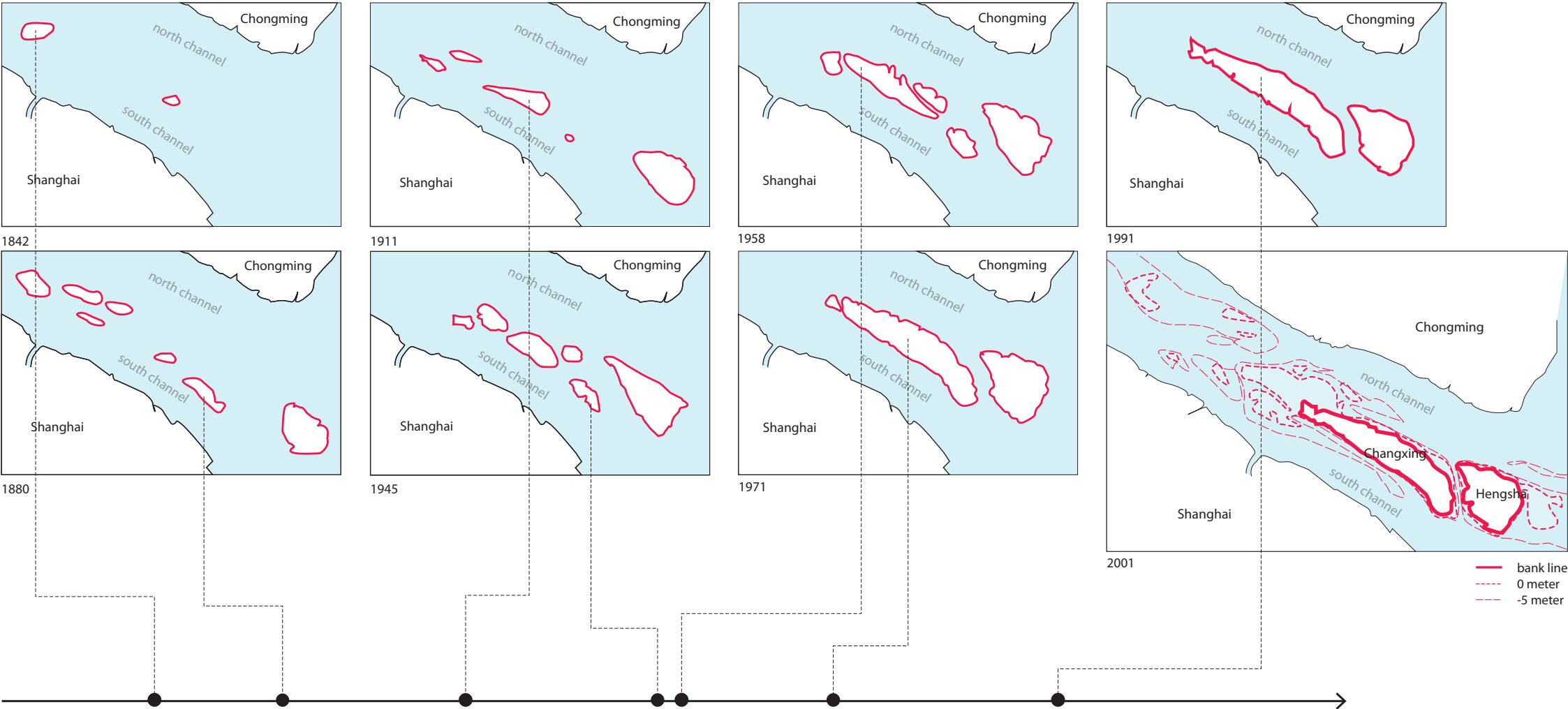
At present, Changxing stand as a county belong to Chongming District in Shanghai. Its total area remains as 155 square kilometers (including the water reservoir area), with 36 thousand local residents. The main urbanized areas are the aggregated towns and linear spread villages. There are four main towns spread in the island, which is called Fenghuang, Yuansha, Qianwei and Panyuan. Rest of the land, except 67 square kilometer water reservoir, are mainly used as agriculture, which consist of ponds, canals and paddy land. Along the east coast of island, almost 5 square kilometers of wetland stands as an important environmental habitat for the creatures in Yangtze Rive Delta.

Figure39: The site's current situation
Source: Author, 2013



4. Site diagnosis:

The conflicts in Changxing's urban landscape



1644 started to form small alluvial islands

1842 formed two main alluvial islands

1880 growing alluvial islands

1927 formed the main body of Changxing island and Hengsha island

1930-1960 combination of several small alluvial islands

1960-1970 small islands formed into a whole as Changxing island through dike engineering

1970-2000 continuous growing in north bank; south bank keeps steady because of engineering and protection for industry area

started human activity and development
migration from Shanghai, started agriculture and fishing

developing relative large scale of towns and villages, keeping agriculture and fishing as main economic resource

planning infrastructure connection with Shanghai, introducing marine engineering and ship-industry as main development project

4. Site diagnosis:

The conflicts in Changxing's urban landscape

Figure39: The geology forming process of Changxing Island
Source: Author, 2012

4.2 The forming process of Changxing's urban landscape

Changxing is a typical alluvial island in Yangtze River Delta region. The forming process of its urban landscape has a close relationship with the dynamic delta environment.

The combination of natural forces and human engineering contribute to the forming of its landscape. Due to its junction location in Yangtze River and East China Sea, sand and soil following with downstream river keep aggregating in this area in history, forming into small earth. After a long period, several small alluvial land grew larger and larger that could be available for human activities. After the forming of main island body around 1927, large numbers of people from surrounding area started to move into the island, engaging in agriculture and fishing activities. From then that, local living people had been engaged building up dikes to strengthen the island. During 1960s to 1970s, six small alluvial islands formed into a whole as Changxing Island through the comprehensive embankment project (Shanghai Baoshan District History Achieve, 1988-2005).

The stability of island provides spatial condition for developing towns and villages, and also large scale of agriculture and fishing activities as main supportive economy. Later, with the continuous urban development in both local and surrounding areas, the regional infrastructure network tends to extend through these islands area for improving regional connections between Shanghai and north of Jiangsu Province. In 2009, the regional bridge/tunnel highway connecting Shanghai and Qidong passing through Changxing and Chongming had been put into used. This step stands as an essential progress for Changxing's joining in regional infrastructure network. Because of it, the commuting between Changxing and Shanghai is shorted into half an hour. And it also provides possibility for the extension of metro line as an important public transportation in Changxing. What's more, the introduction of ship-industry and marine engineering into Changxing makes the biggest difference to the island.

Before the implement of industrial area, Changxing's urbanization process is mainly influenced by its local landscape. The unique delta environment creates possibilities for Changxing's urban construction through agriculture development at the starting phase. The soil, water, and climate condition in Changxing are very suitable for large scale of agriculture activities, especially for orange plantation and fishing. The basic development in agriculture led to population growth and the constructions of towns and villages in Changxing. Later on, under the combinative efforts of natural forces and human activities, Changxing had formed its local landscape with unique green & water network with aggregated towns and linear villages embedded. Because the isolated island character, Changxing is weak in regional accessibility, and mainly depends on its agriculture. Thusly, the spatial arrangement of its urban occupation has a close relationship with farmlands and water routes. Such local landscape creates diverse urban-landscape typologies. Further more, the delta environment also provides valuable natural resources for Changxing. There are

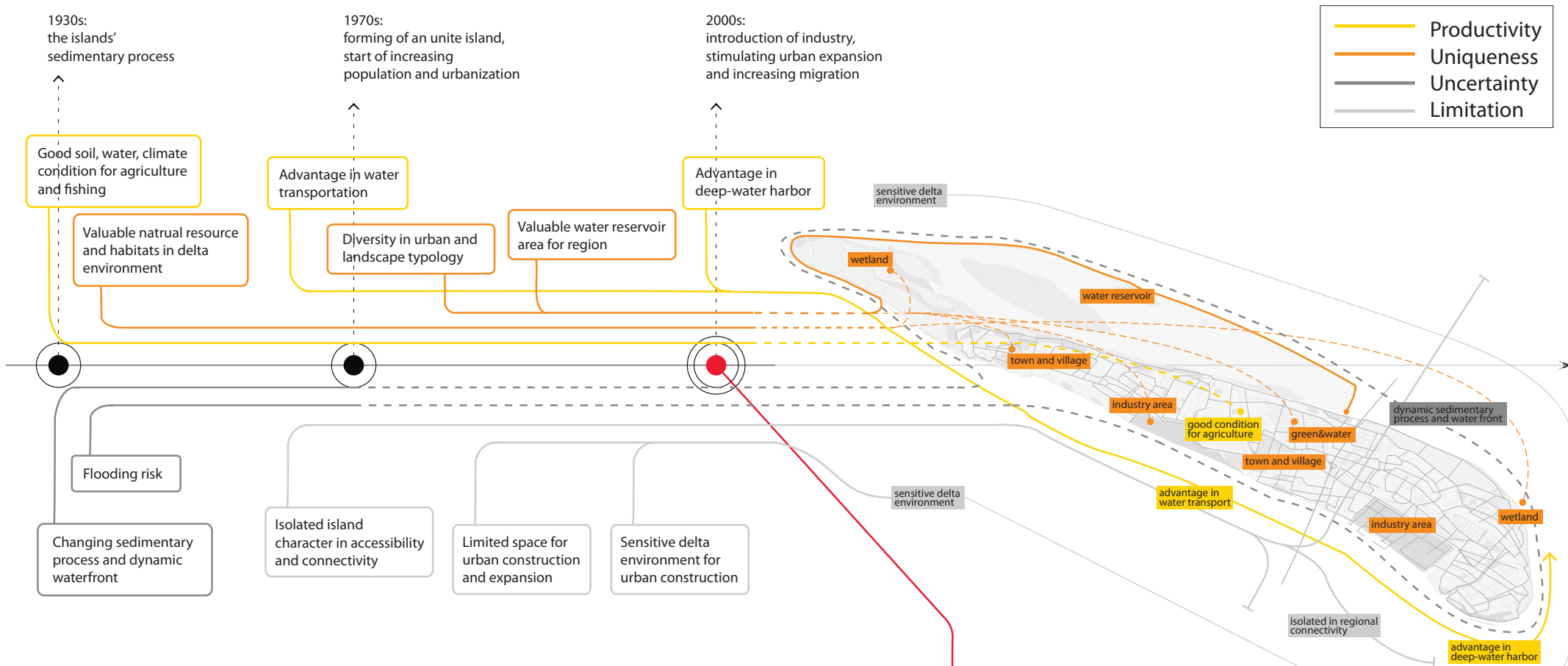
Before the implement of industrial area, Changxing's urbanization process is mainly influenced by its local landscape. (Fig40)

The unique delta environment creates possibilities for Changxing's urban construction through agriculture development at the starting phase. The soil, water, and climate condition in Changxing are very suitable for large scale of agriculture activities, especially for orange plantation and fishing. The basic development in agriculture led to population growth and the constructions of towns and villages in Changxing.

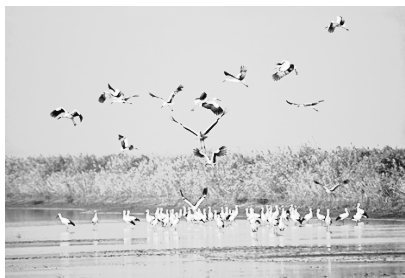
Later on, under the combinative efforts of natural forces and human activities, Changxing had formed its local landscape with unique green & water network with aggregated towns and linear villages embedded. Because the isolated island character, Changxing is weak in regional accessibility, and mainly depends on its agriculture. Thusly, the spatial arrangement of its urban occupation has a close relationship with farmlands and water routes. Such local landscape creates diverse urban-landscape typologies.

Further more, the delta environment also provides valuable natural resources for Changxing. There are large wetland areas along the island, which are important natural habitats for diverse creatures in Yangtze River Delta region. And in 2010, the Qingcaosha water reservoir had been constructed in northwestern part of Changxing as the biggest fresh water resource for Shanghai. While on the other hand, because of the dynamic sedimentary process and water issue in delta region, the risks of flooding and drought should also be considered as the negative uncertainty in the future.

Meanwhile, just because of Changxing's advantages in water transport and deep-water condition for harbor construction, the government decided to build large scale of ship-industry and marine engineering area in the south waterfront of Changxing. This introduction of industry interrupts Changxing's original urban-landscape relationship and its role in regional urban transformation.



How does landscape act in Changxing's urbanization process:



Unique delta environment holds valuable habitats for diverse creatures and natural resource for urban development.



The local soil, water, climate condition is suitable for agriculture and fishing, which set an essential base for population growth and urban development



The diversity of local landscape in water system and green fields reflects in original building typology and spatial organization pattern.



The advantages in water transport and harbor construction provide an opportunity for related industry.



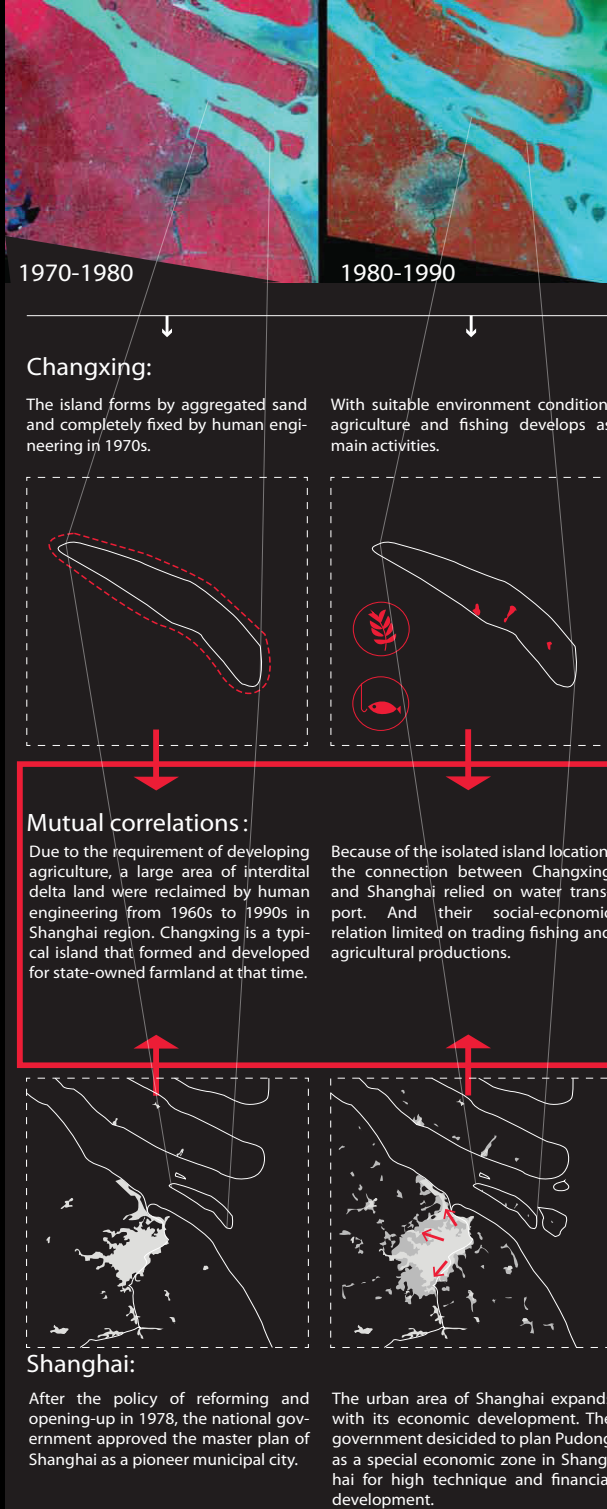
Risks of flooding and drought because of the dynamic sedimentary process and water issue in delta region increase the uncertainty in future.

Figure40: Landscape's effort in Changxing's developing process
Source: Author, 2012

4. Site diagnosis:

The conflicts in Changxing's urban landscape

4.3 The mutual correlations of Changxing in regional urban transformation



Before this change point, Changxing only play a relative passive role in the regional urban system. Its mutual correlations in regional context limited in providing agricultural products. Although the metropolitan region of Shanghai had experienced a rapid urban development, especially in Pudong district, such urban development only express quite limited impact to Changxing due to its disconnected in both infrastructure and social-economic networks.

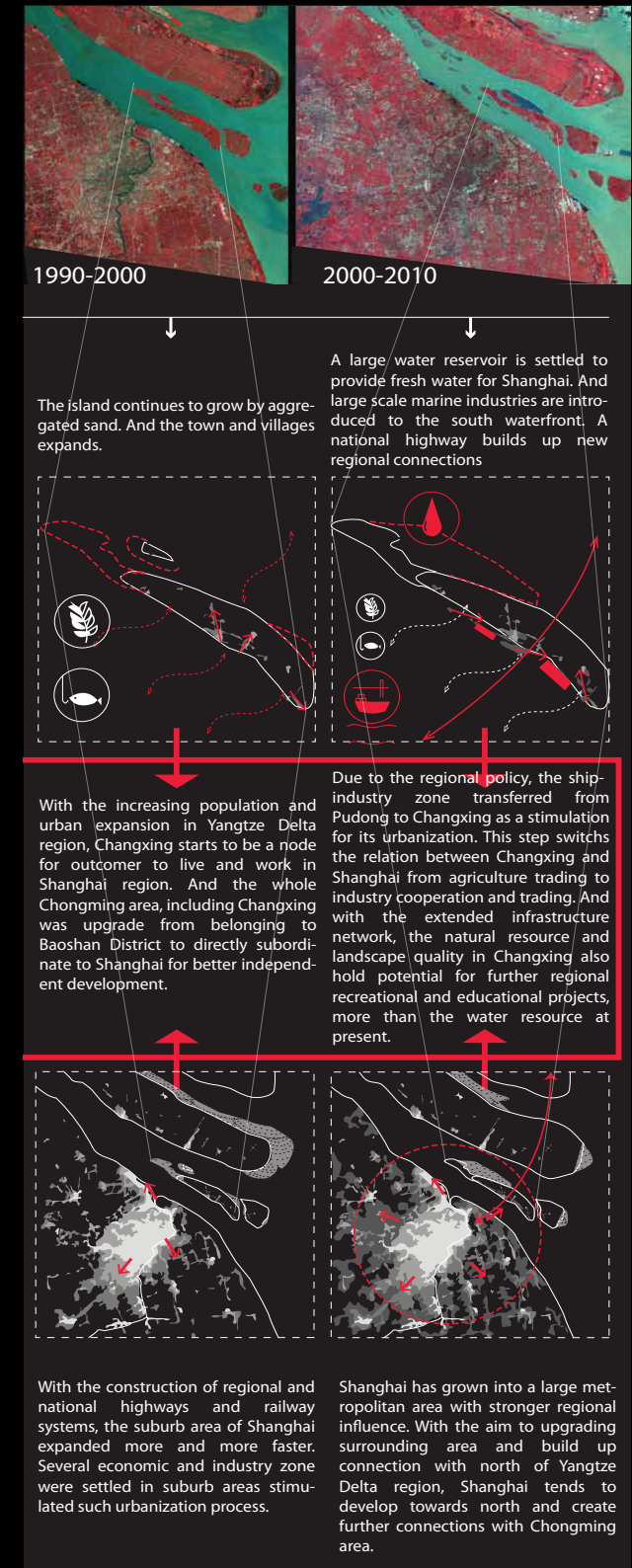
After the policy of reforming and opening-up in 1978, Shanghai as the municipality city in Yangtze River Delta region had a great social-economic growth, which led to large scale of urban expansion. At the beginning, such urban expansion tended towards western part of Shanghai, with its connection to Suzhou and Wuxi.

In 1991, the government decided to plan and construct Pudong district as a special economic area in Shanghai focusing on high-technology and financial service industry development. Later, with progress in constructing regional infrastructure network, Shanghai continued its expansion in surrounding area, with implementation of new towns and industry zone.

During this process, Changxing also went through certain degree of population growth and urban development, which is much less than Shanghai's suburb area. Its regional connection mainly depends on agricultural products trading with Shanghai through water transport. Besides, certain amounts of local residents also work in Shanghai. And there are also out-comers attracted by employment opportunity in Shanghai while actually work and live in Changxing at the end.

Figure41: Mutual correlations in Changxing's regional transformation-a
Source: Author, 2012

Figure42: Mutual correlations in Changxing's regional transformation-b
Source: Author, 2012



In current situation, Shanghai requires for expanding its metropolitan influence further to north of Jiangsu Province. Such tendency leads to two main changes in Changxing. One is the extension of infrastructure. The other one is the implementation of ship-industry in Changxing. The newly-constructed regional highway passing through Changxing greatly shorts the commuting time and convenience in transport. And the large scale industry which takes the place of traditional agriculture standing as the first supportive economy in Changxing would provide more than a large number of employment opportunities, but also attract investments in the industry-related services and programs. The combination of these two changes broadens Changxing's regional correlations with its industrial cooperation and trading with other industry zones in Baoshan, Pudong and surrounding areas.

Meanwhile, this change could be also a risk. Firstly, the construction of industry zone occupied a large scale of valuable waterfront, and brings pollutions in sensitive delta environment. Secondly, the increasing population by new employments requires spatial and social condition to survive, which would inevitably lead to urban expansion in original towns and villages. Thusly, the local natural and cultural landscape has to face the challenge of unwise urban growth. Last but not least, the totally switch from tradition agriculture to ship-industry as the supportive economy might lead to reducing farmland, degrading original social-economic network, and even social segregation.

4. Site diagnosis:

The conflicts in Changxing's urban landscape

4.4 Layer-approach analysis of Changxing

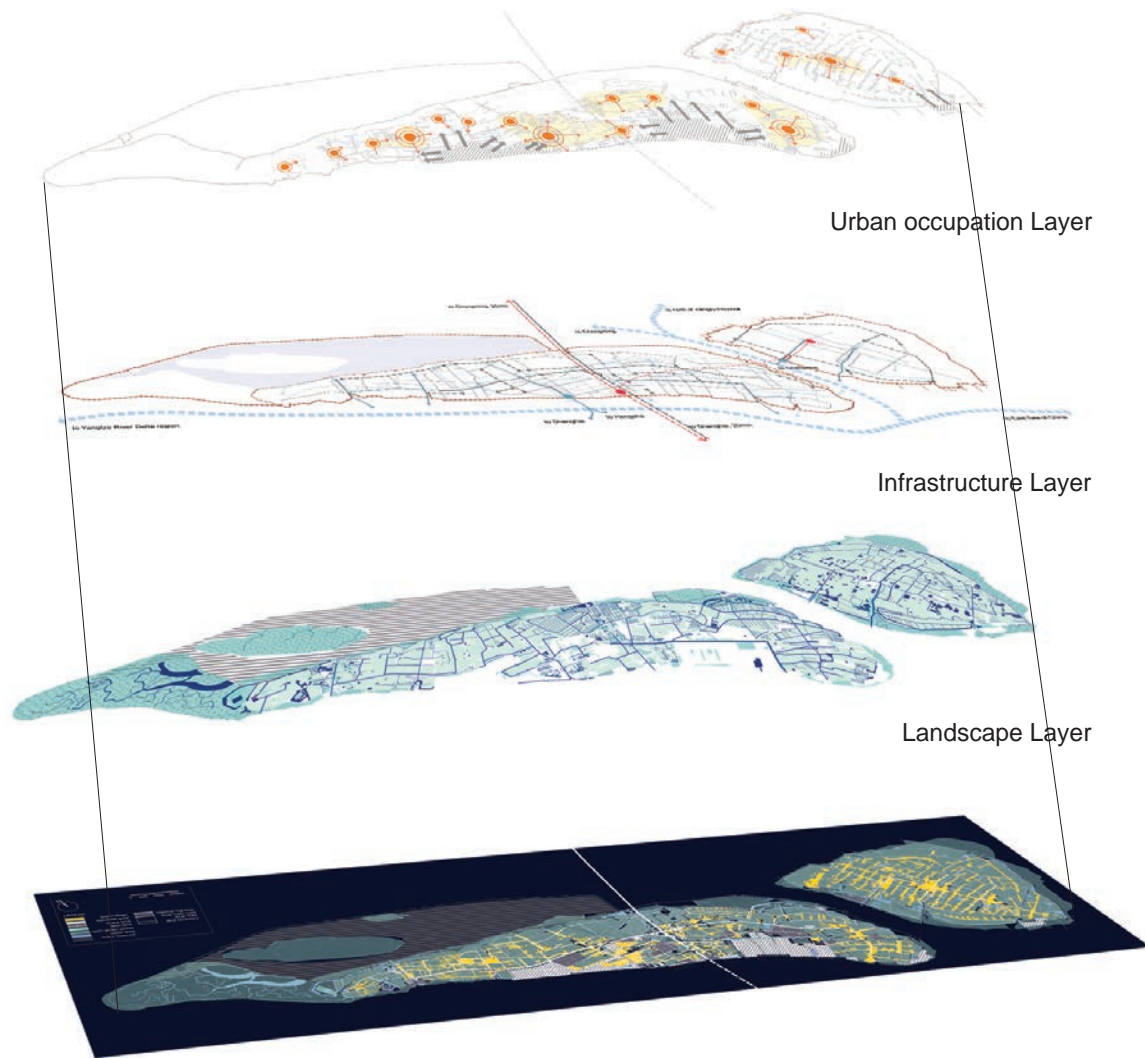


Figure44: Layer-approach model of Changxing
Source: Author, 2013

However, the capabilities of Changxing's local natural and cultural landscape are somehow ignored in the regional decision-making of implementing industry. In order to explore the potentials and risks in Changxing's urban-landscape, the layer-approach method is applied in the site diagnosis to analysis different characters in each layer and also the interactions between them.

The analysis area includes islands of Changxing and Hengsha, for their similar characters and close interactions. According to layer-approach model, the analysis would focus on the landscape layer as the basic container, the infrastructure layer as the organization, and the urban occupation layer as key elements. (Fig44)

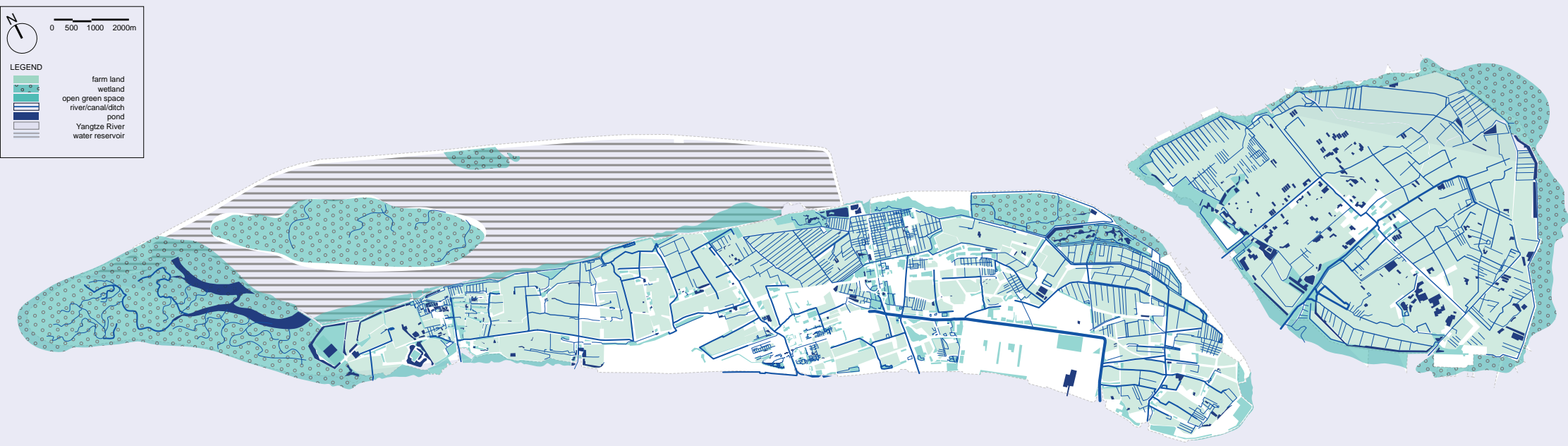


Figure45: Landscape layer of Changxing
Source: Author, 2013

As stated before, landscape plays an key role in the forming process of Changxing. The current landscape condition express in three main aspects: wilderness area, green-water system, and farmland.

Due to the dynamic delta environment, there are large areas of wetland in the western part of Changxing, and also a small part in eastern part of Hengsha Island. These wetland render as important natural habitats in Yangtze River Delta region for diverse creatures, and also contributes to provide the fresh water resource in Changixng. While at present, except the dyke in eastern part of island, these wetlands are not specially protected or used. Under the natural forces, the eastern wetland areas are still growing with aggregated sand. Besides, Changxing also has a large water reservoir area, which provides more than half amount of fresh water to Shanghai.

The major lands of Changxing are used as farmland, especially in north part of the island. The farmland is organized by the local water network, and they also influence the spatial arrangement of villages. While in relative high-density towns, farmland could be separated into fragments. Orange plantation and fishing are Changxing's unique agricultural activities. In recent years, there are also some agricultural-related tourism and leisure programs developing in the island. Hengsha focus more on fishing and traditional agriculture. However, this kind of traditional agriculture has to face the challenge of industry development.

The island character creates unique green-water networks as spatial structure in Changxing and Hengsha. Together with wetland, there are lots of valuable waterfronts with open green space in the islands, which are not taken advantage of.

- Qualities/Potentials:
 - Valuable water reservoir area
 - Valuable wetland area
- Farmland embedded in green-water network as typical local landscape
- Weaknesses/Risks
 - Pollutions and destructions towards sensitive delta environment
 - Marginalized green spaces and waterfronts
 - Disruptions on water network due to urban constructions
 - Recession on tradition agriculture

4. Site diagnosis:

The conflicts in Changxing's urban landscape

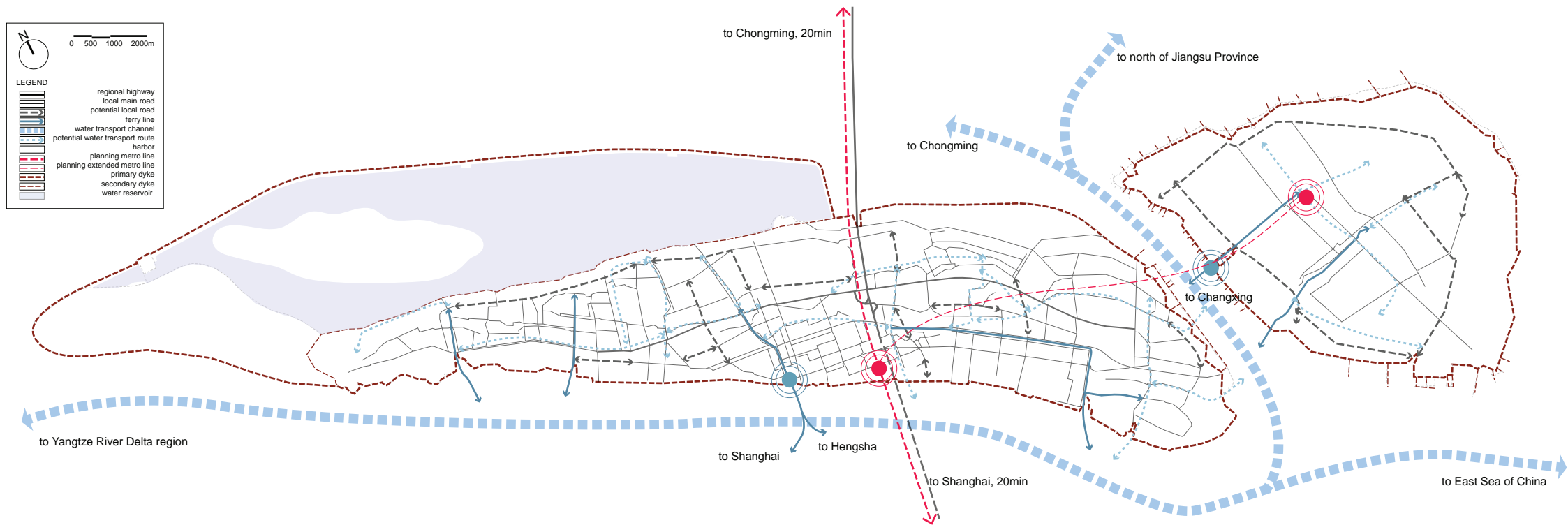


Figure46: Infrastructure layer of Changxing
Source: Author, 2013

The infrastructure layer in Changxing consists of the road network, water network, and water defense system.

Because of the low urbanization level, the road network in Changxing and Hengsha is quite simple. At present, only one regional highway passes through Changxing, connecting the island with surrounding region. Based on this highway, an extended metro line from Shanghai is planning to reach Changxing and even Hengsha in the future. While the local roads are quite simple: only two main roads go through the west-east direction, with several secondary roads connecting the south-north direction. The roads in Changxing are also influenced by the organization of farmland and water network. Meanwhile, there is no any other public transportation method in Changxing, except one bus line. And there is no formal bicycle route in the islands yet.

The water network spread all over Changxing. They contribute to organize both farmland and urban occupation. There are several main cannels inside the islands for cargo transport, and several harbor for regional water transport. Although such spread water network creates basic condition for the water transport inside the island, the discontinuity of several main cannels due to urban construction or other reason made this transport method unavailable at present.

The water defense system in the islands consists of dykes and pump stations to avoid flooding. The primary dyke goes through the whole island, together with the border of water reservoir area. And the secondary dyke helps to strengthen the protections for urban region.

- Qualities/Potentials:
 - Develop water transport for both local and regional connections
 - Improve non-vehicle friendly transport method and facilities
 - Develop for local public transportation
- Weaknesses/Risks:
 - Lack of regional mobility and accessibility
 - Lack of public transportation
 - Detached waterfront
 - Flooding risk

4. Site diagnosis: The conflicts in Changxing's urban landscape

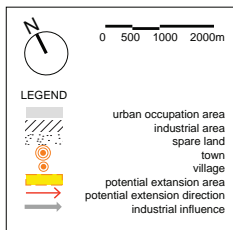


Figure47: Urban occupation layer of Changxing
Source: Author, 2013

Towns, villages, and industrial area are the main components as urban occupation in Changxing and Hengsha.

Since Changxing and Hengsha are still in a relative low urbanization level, they do not have formal urban region as city, but just aggregated towns and linear villages spread in landscape. There are four main towns in Changxing with numbers of subsidiary villages. The biggest town called Fenghuang locates in the middle of the island. It is the social-economic center of Changxing because of its owning of various urban services and relative good accessibility in both local and regional scale. Another important town in Changxing is Panyuan Town in the eastern part of island. It has close relationship with the center town in Hengsha, both of them depend on fishing due to their near-location of

harbor. Besides towns, the villages in the islands are usually spread linearly along main roads or cannels at the border of farmland. Such typology of linear villages with water or farmland stands as the typical local landscape.

The newly implanted ship-industry areas take the place in south waterfront of Changxing. These industrial lands lead to a strong detachment from waterfront. And lots of constructions for infrastructure and urbanization follow with the industry development. In the surrounding area of industrial land, many villages are destroyed for new urban densification or broadening roads. What's more, due to the increasing population by industry development, several nearby towns and villages already start to expand without comprehensive planning on urban pattern.

4. Site diagnosis:

The conflicts in Changxing's urban landscape

<p>Qualities/Potentials:</p> <ul style="list-style-type: none"> -Attracting investment due to industry development -Increasing population due to new employments -Rising up local urbanization level
<p>Weaknesses/Risks:</p> <ul style="list-style-type: none"> -Industrial pollution in nearby areas -Destruction on local landscape due to unsuitable urbanization pattern -Social-economic segregation due to imbalance development between industry and agriculture



Town



Industry



Water reservoir



Village



Agriculture



Wetland

Figure48: Six land typology of site
Source: Google map, 2012

4.5 Zooming-in analysis on typical lands

The layer-approach analysis on whole island scale reveals certain potentials and risks in landscape, infrastructure and urban occupation. In order to further explore the interaction between these layers, a serious of zooming-in analysis is necessary. In this process, a similar layer-approach is applied, while derived as the layers of land use, structure network and programs.

The whole land of Changxing could be categorized into four typical lands: 1. aggregated town; 2. linear villages; 3. industrial land; 4. farmland. Each type express certain specific spatial and social-economic characters of urban landscape. What's more, the cooperative or contradict relationship between landscape, infrastructure and urban occupation layer in specific land use also express.

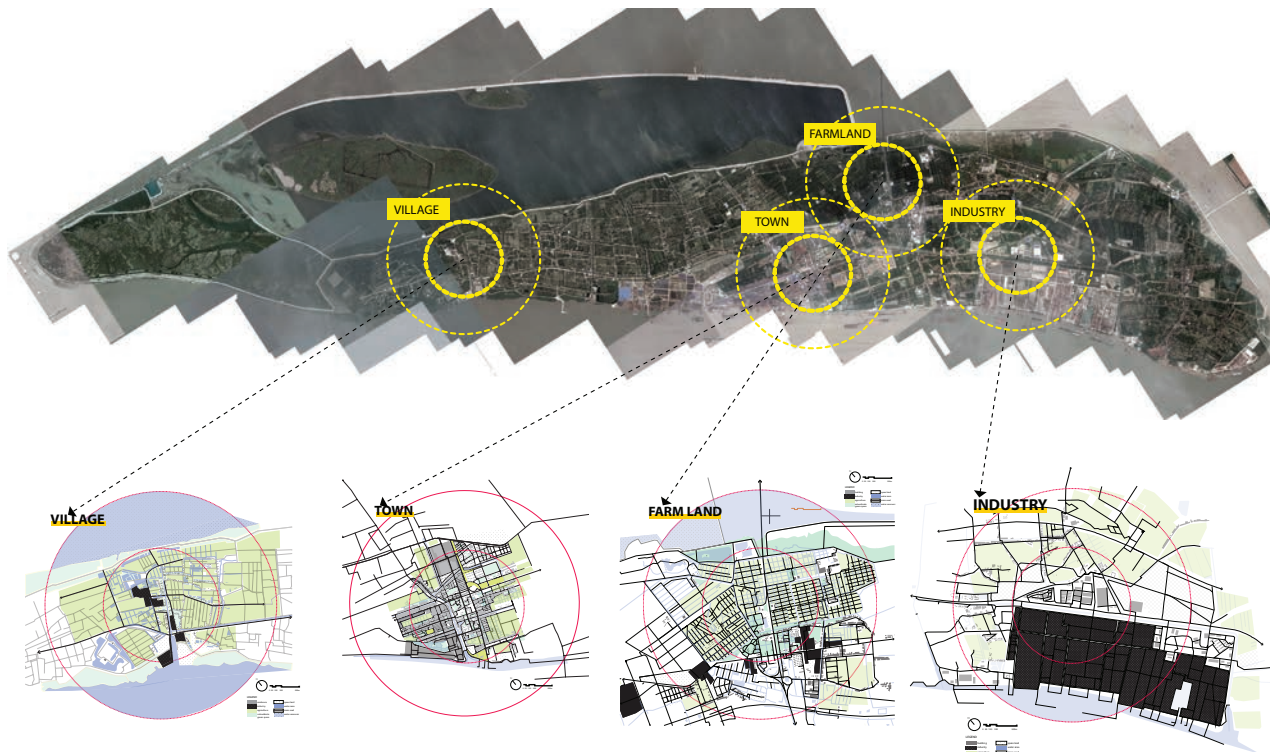


Figure49: Four typical land in Changxing
Source: Author, 2012

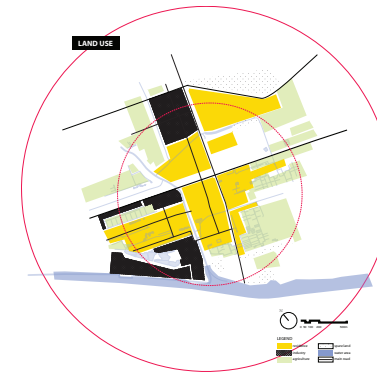
4. Site diagnosis:

The conflicts in Changxing's urban landscape

Figure50: Zooming-in analysis on 'town'
 Source: Author, 2012



For the analysis of aggregated town as a main land typology, the biggest town named Fenghuang in Changxing is chosen as a typical area. Fenghuang town is the earliest developed urban area in Changxing, and is treated as the local social-economic center.



The radius of Fenghuang town is almost 1 kilometer, which is a suitable distance for walking. The major land is used as aggregated residential buildings, surrounded by agriculture land. And several plots near waterfront are taken by manufactory industry for convenience in transport. Such aggregated town holds relative high urban density compared to elsewhere in the island. While at present, there are still several spare land for further urban expansion densification here. Meanwhile, the new-expanded roads crossing by also provide better



For a specific site as Changxing with low urbanization level in sensitive environment, there are three main elements in the structure networks: infrastructure network, water network, and green space network. These three networks not only shape each other mutually, but also influence the urban structure as a combination. And their characters turn into specific urban quality or risks.

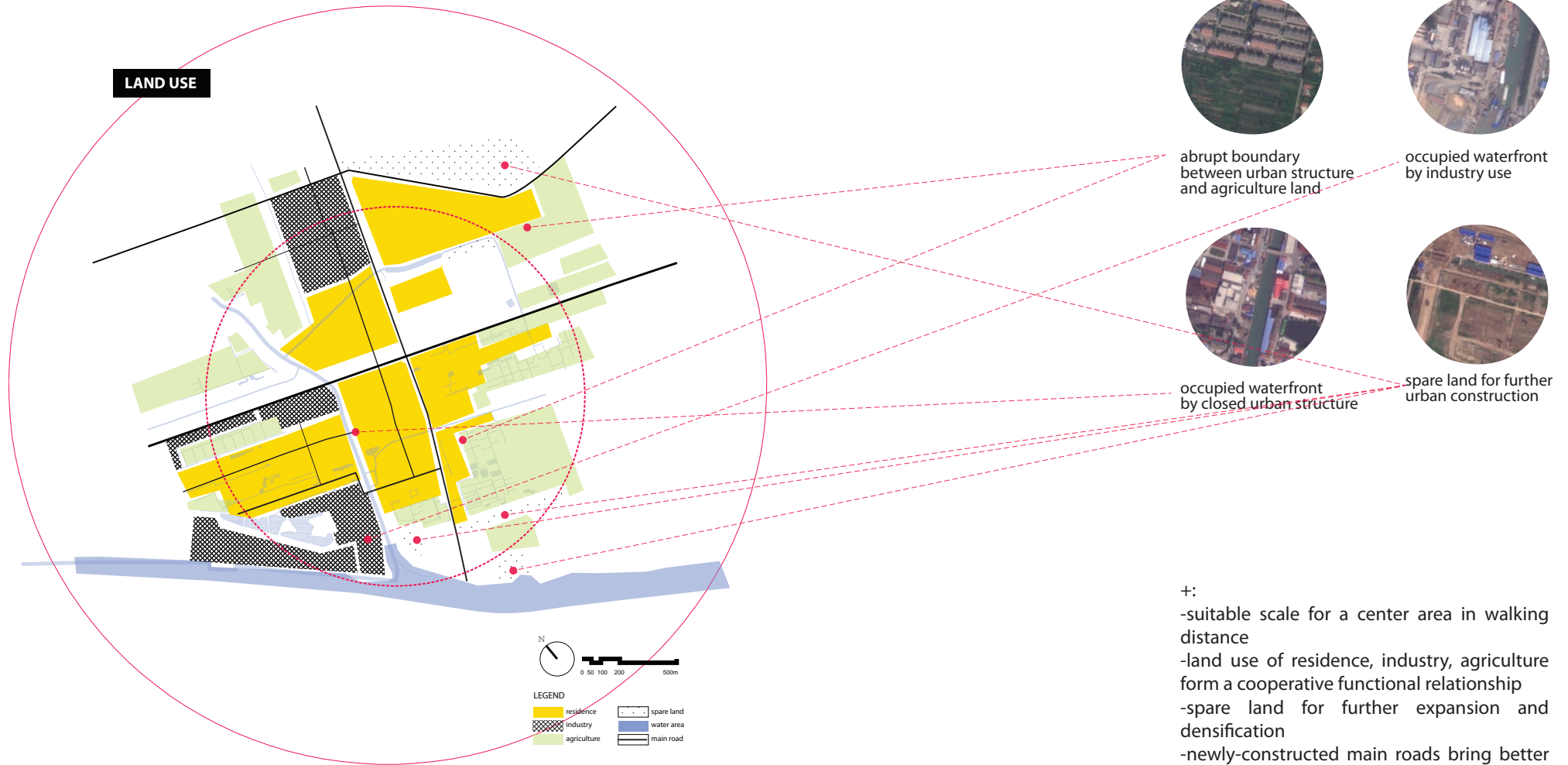


As the biggest aggregated town in Changxing, Fenghuang functions as a social-economic center. The major of commercial, recreational, cultural and public facilities serving for the whole island concentrate here, forming a relative lively urban atmosphere. The services mainly focus on local residence, with the simple aim to satisfy the basic living requirements at present. Therefore, even such low-level retails could meet the requirements of increasing migrants, it is difficult to face the challenge to upgrade itself into comprehensive

4. Site diagnosis:

The conflicts in Changxing's urban landscape

Figure51: Zooming-in analysis on 'town'-land use
 Source: Author, 2012

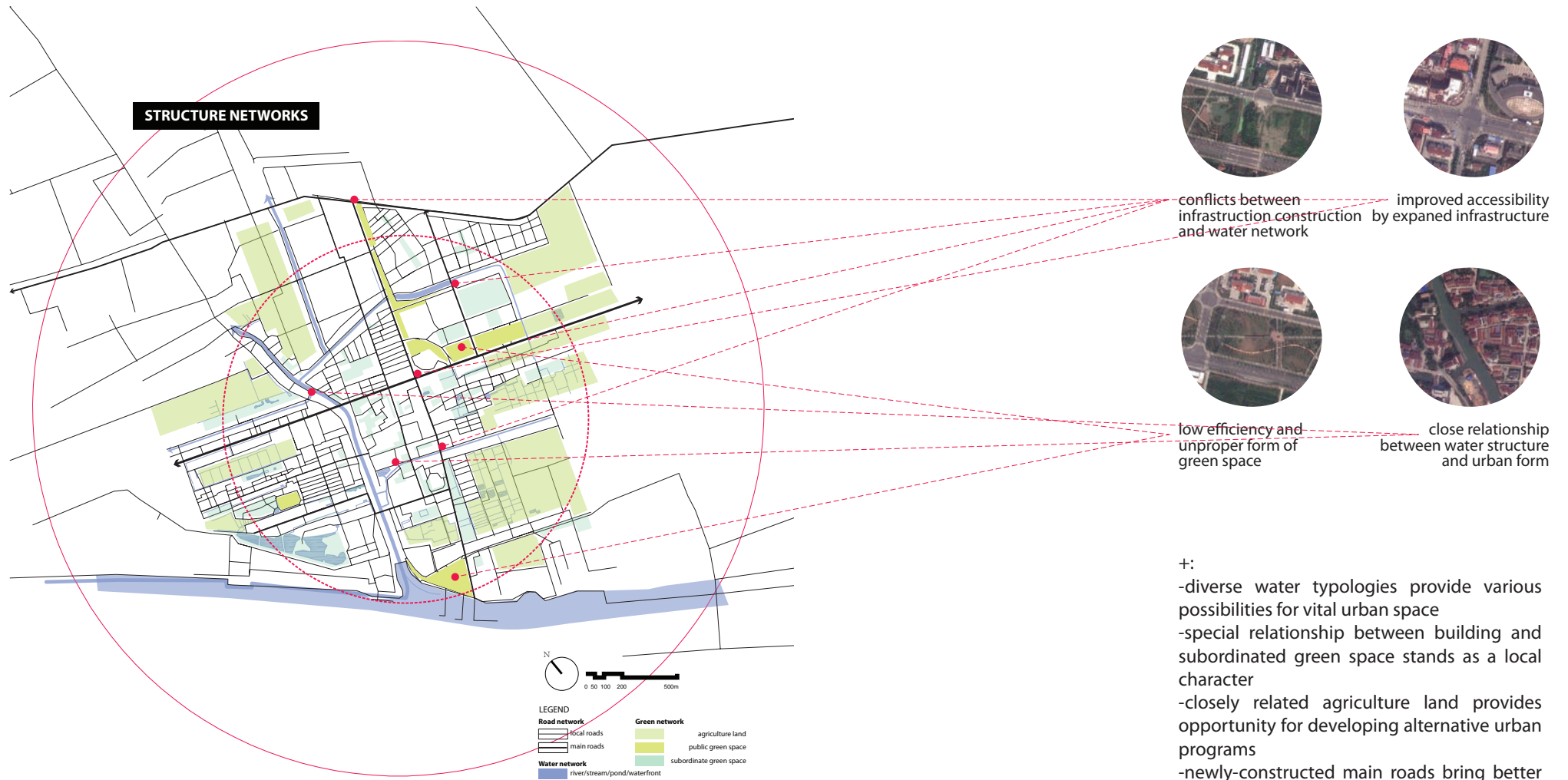


- +:
- suitable scale for a center area in walking distance
- land use of residence, industry, agriculture form a cooperative functional relationship
- spare land for further expansion and densification
- newly-constructed main roads bring better accessibility and mobility

-
- occupied waterfront by industry and closed urban structure
- abrupt boundary between urban occupation and agriculture land
- even urban occupation without hierarchy in form and function

The radius of Fenghuang town is almost 1 kilometer, which is a suitable distance for walking. The major land is used as aggregated residential buildings, surrounded by agriculture land. And several plots near waterfront are taken by manufactory industry for convenience in transport. Such aggregated town holds relative high urban density compared to elsewhere in the island. While at present, there are still several spare land for further urban expansion densification here. Meanwhile, the new-expanded roads crossing by also provide better accessibility for this center area.

Figure52: Zooming-in analysis on 'town'-structure network
 Source: Author, 2012



For a specific site as Changxing with low urbanization level in sensitive environment, there are three main elements in the structure networks: infrastructure network, water network, and green space network. These three networks not only shape each other mutually, but also influence the urban structure as a combination. And their characters turn into specific urban quality or risks.

4. Site diagnosis:

The conflicts in Changxing's urban landscape

- +:
 - diverse water typologies provide various possibilities for vital urban space
 - special relationship between building and subordinated green space stands as a local character
 - closely related agriculture land provides opportunity for developing alternative urban programs
 - newly-constructed main roads bring better accessibility and mobility
- :
 - occupied waterfront by industry and closed urban structure
 - water pollution by industry and living waste
 - low efficiency and improper form of green space
 - conflicts between infrastructure construction and water system

Figure53: Zooming-in analysis on 'town'-program
 Source: Author, 2012



As the biggest aggregated town in Changxing, Fenghuang functions as a social-economic center. The major of commercial, recreational, cultural and public facilities serving for the whole island concentrate here, forming a relative lively urban atmosphere. The services mainly focus on local residence, with the simple aim to satisfy the basic living requirements at present. Therefore, even such low-level retails could meet the requirements of increasing migrants, it is difficult to face the challenge to upgrade itself into comprehensive service industry without any improvement.

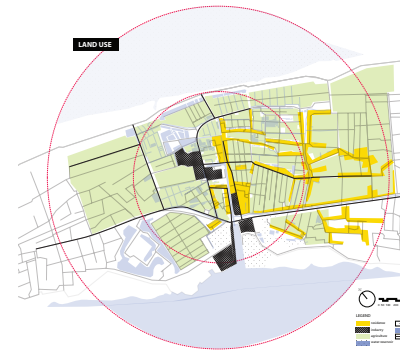
+:
 -the relative aggregated programs forms a lively urban atmosphere in the town
 -the aggregated programs provide relative complete services and facilities to satisfy the basic living requirements in local level
 -the centric location with various programs makes Fenghuang the center of Changxing

-:
 -the programs only serve in local level, without high quality service and regional attractions
 -the current programs have few reflection with local characters in form and function
 -the current programs lack of attention on cultural aspect
 -the arrangement of programs lack of further planning for upgrading to a comprehensive service industry chain

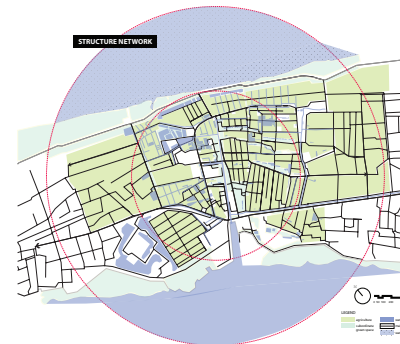
Figure54: Zooming-in analysis on 'village'
 Source: Author, 2012



Pangshi is another town in the west of Changxing Island. It is a relative small town mainly consisting of linear villages. It is chosen as the typical area for the villages in Changxing because the common characters it presents: the build-up area remains low-urbanized level, the villages mainly aggregated along the waterfronts, and most of the surrounding land is used as farmland with a few industry area embedded.



Pangshi town mainly consists of large areas of agriculture land, with low density linear villages along the waterfronts and local roads. The river across Pangshi town from south to north and a main local road across east to west provide relative convenient transport condition for industry location. And there are several spare land along the south waterfront along the island. Since this town has certain distance with the island's center and main industry area, it is still unknown whether its main use will switch from agriculture to industry or service with further urbanization.



The river across Pangshi town from south to north and its spread water system organizes the main build-up area and land use. The water reservoir area holds limitation in the north side. The large waterfront in the south side provides transport condition for commercial activities to Pangshi. The original local roads are constructed because of farmland organization. In recent years, the expansion of several main roads across Pangshi brings more transport connection into this area.

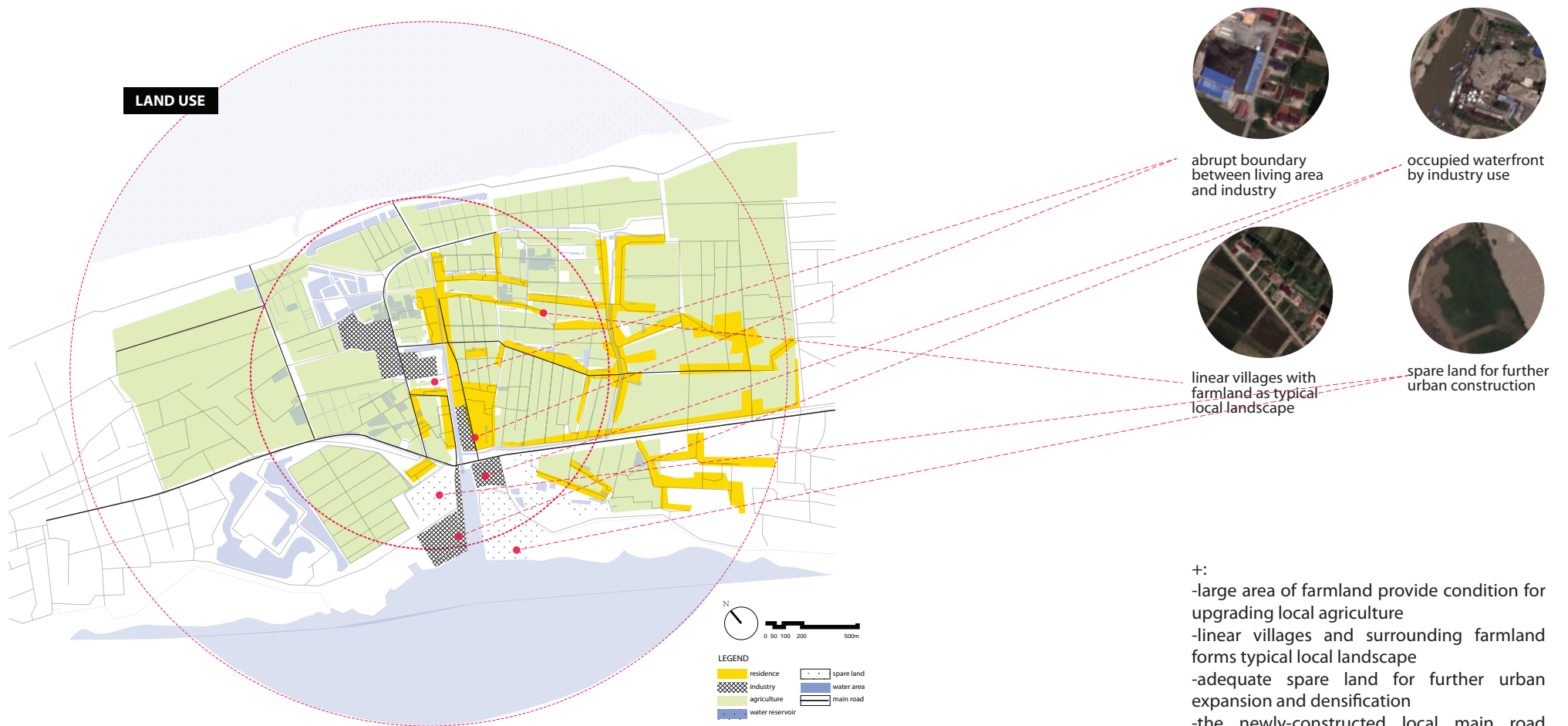


Because of its limitation in urban density and transportation, Pangshi only have several small scale industry programs along the main riverfront. There are just one or two commercial program here. Most of the commercial, recreational and cultural activities rely on the programs and facilities in the island center or neighboring villages.

4. Site diagnosis:

The conflicts in Changxing's urban landscape

Figure55: Zooming-in analysis on 'village'-land use
 Source: Author, 2012



Pangshi town mainly consists of large areas of agriculture land, with low density linear villages along the waterfronts and local roads. The river across Pangshi town from south to north and a main local road across east to west provide relative convenient transport condition for industry location. And there are several spare land along the south waterfront along the island. Since this town has certain distance with the island's center and main industry area, it is still unknown whether its main use will switch from agriculture to industry or service with further urbanization.

abrupt boundary between living area and industry

occupied waterfront by industry use

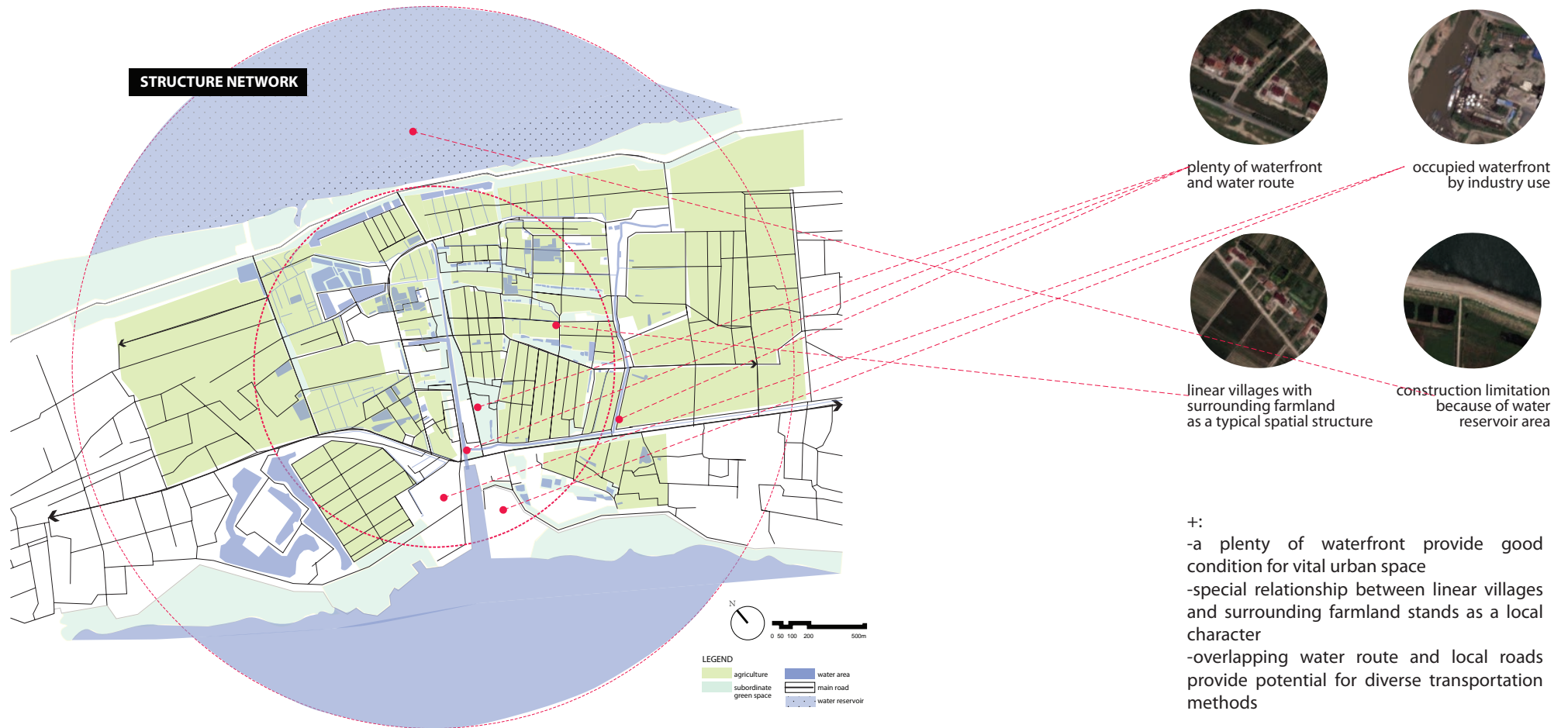
linear villages with farmland as typical local landscape

spare land for further urban construction

- +:
- large area of farmland provide condition for upgrading local agriculture
 - linear villages and surrounding farmland forms typical local landscape
 - adequate spare land for further urban expansion and densification
 - the newly-constructed local main road brings better accessibility and mobility

- :
- occupied valuable riverfront by industry use with low spatial efficiency
 - abrupt boundary between living area and industry
 - relative spread land use without a functional and spatial hierarchy

Figure56: Zooming-in analysis on 'village'-structure network
 Source: Author, 2012



The river across Pangshi town from south to north and its spread water system organizes the main build-up area and land use. The water reservoir area holds limitation in the north side. The large waterfront in the south side provides transport condition for commercial activities to Pangshi. The original local roads are constructed because of farmland organization. In recent years, the expansion of several main roads across Pangshi brings more transport connection into this area.

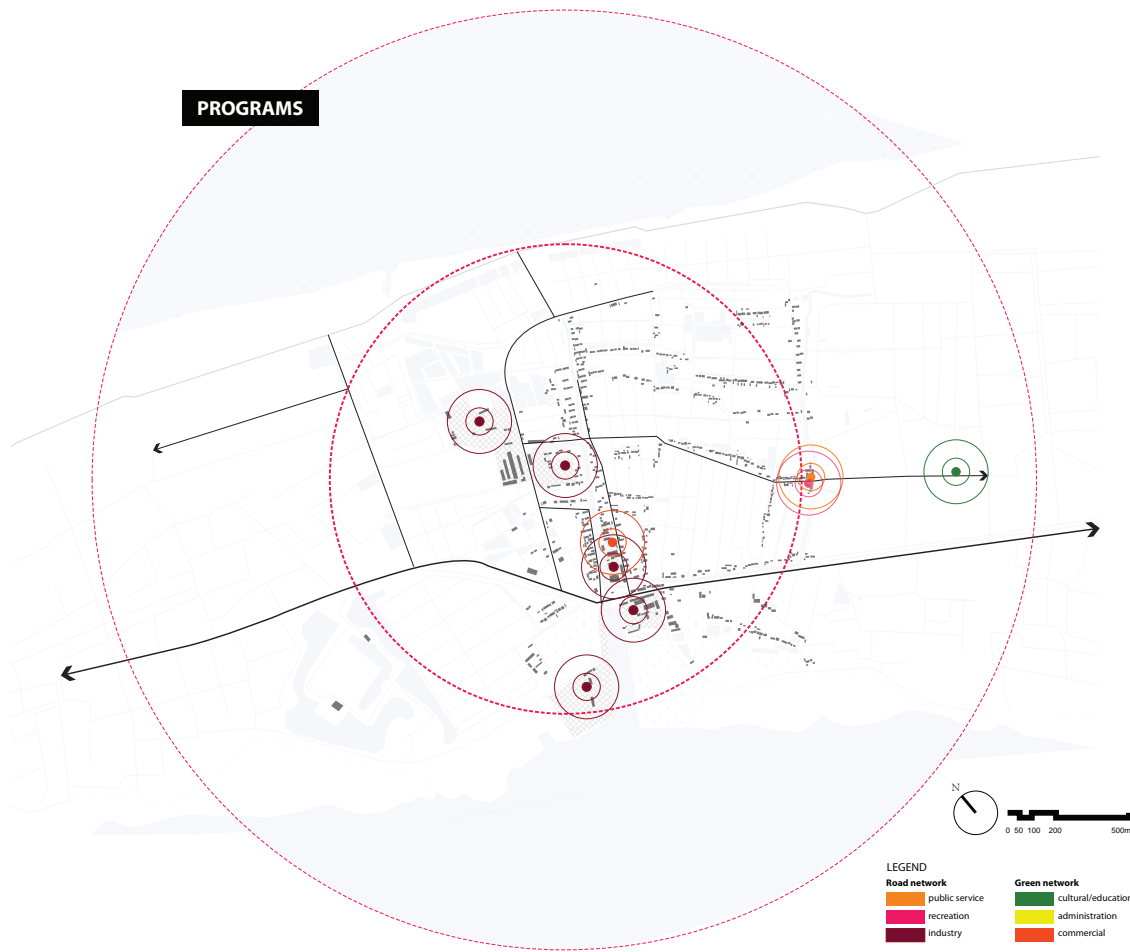
- +:
 -a plenty of waterfront provide good condition for vital urban space
 -special relationship between linear villages and surrounding farmland stands as a local character
 -overlapping water route and local roads provide potential for diverse transportation methods

- :
 -occupied waterfront by industry use with low spatial efficiency
 -water pollution by industry alongside
 -construction limitation because of near location of water reservoir area
 -lack of public transportation
 -bad local and regional accessibility and mobility

4. Site diagnosis:

The conflicts in Changxing's urban landscape

Figure57: Zooming-in analysis on 'village'-program
 Source: Author, 2012

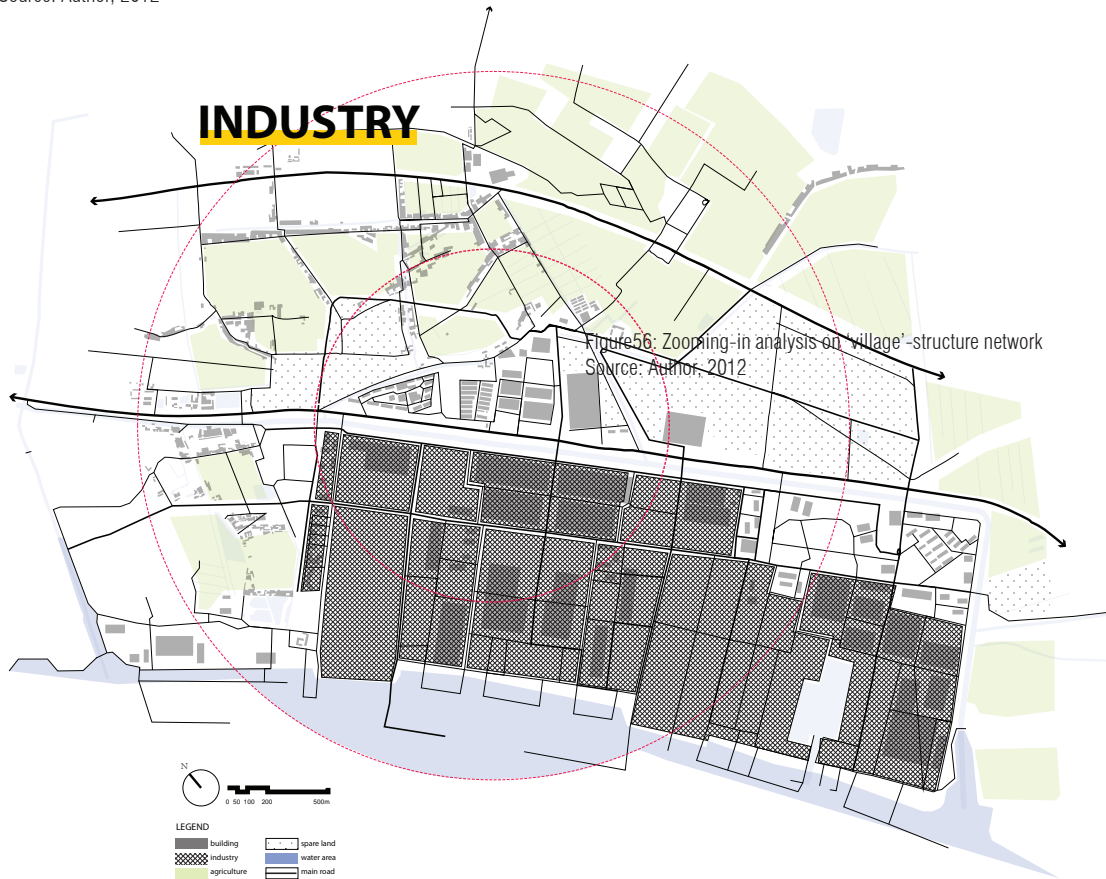


Because of its limitation in urban density and transportation, Pangshi only have several small scale industry programs along the main riverfront. There are just one or two commercial program here. Most of the commercial, recreational and cultural activities rely on the programs and facilities in the island center or neighboring villages.

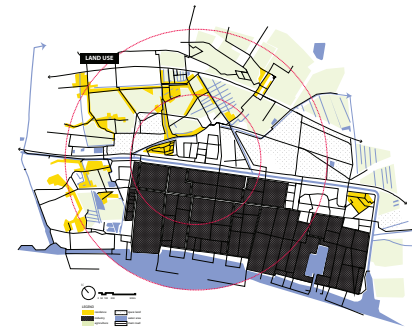
+:
 -relative steady programs for agriculture, industry and basic living forms clear function for this area
 -sharing programs and facilities provide efficient function organization for such low density area

-:
 -relative low living and working convenience because of lacking programs and service facilities
 -the limited types and numbers in programs may withdraw the further development
 -the arrangement of programs lack of consideration for upgrading local agriculture in the future

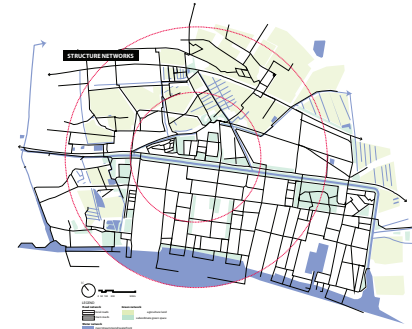
Figure58: Zooming-in analysis on 'industry'
 Source: Author, 2012



The newly-implanted industry area stands as an essential element for the island's further development. Thusly, the largest industry area in Changxing is chosen as the typical industry zone for analysis. The typical advantages and disadvantages in form and function are presented here.



Large area of original farmland and villages are replaced by the ship-industry zone. Such large scale of heavy industry area forms a closed zone with strong influence to surrounding area. Meanwhile, its neighboring areas still remain for simple agriculture use and low density residence. There is no direct cooperation between such industry use and the original living-agriculture use.

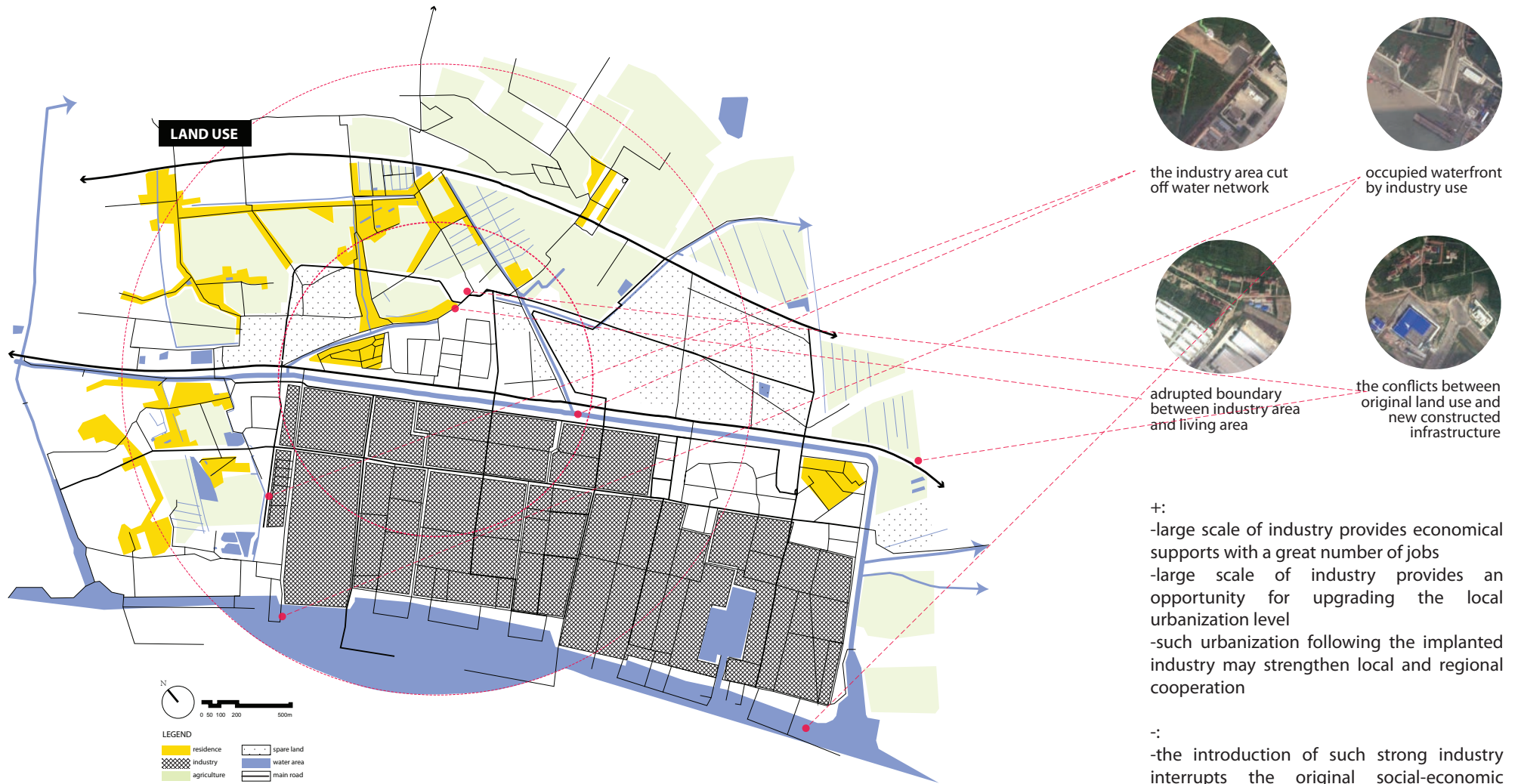


The original urban-landscape structure in this area is mainly organized according to the water system and farmland use, which is similar and continuous to elsewhere in the island. However, the large industry zone cut off such green-blue network because its rigid spatial form and special demands in infrastructure. And due to the marine engineering's technique and transportation requirements, the large waterfront area is occupied and separated with the formal land use.



Except than marine engineering and ship-industry, those programs surrounding the industry area mainly serve for the basic daily living, but not for the extension supportive function for the industry area. In the foreseeable future, the increasing population attracted by the emerging jobs in this industry zone would require additional living and working facilities. What's more, for a sustainable social-economic development, this industry zone also demands upgrading in additional mutual supportive service industry. Therefore, the current programs should be improved as an adaptation.

Figure59: Zooming-in analysis on 'industry'-land use
 Source: Author, 2012

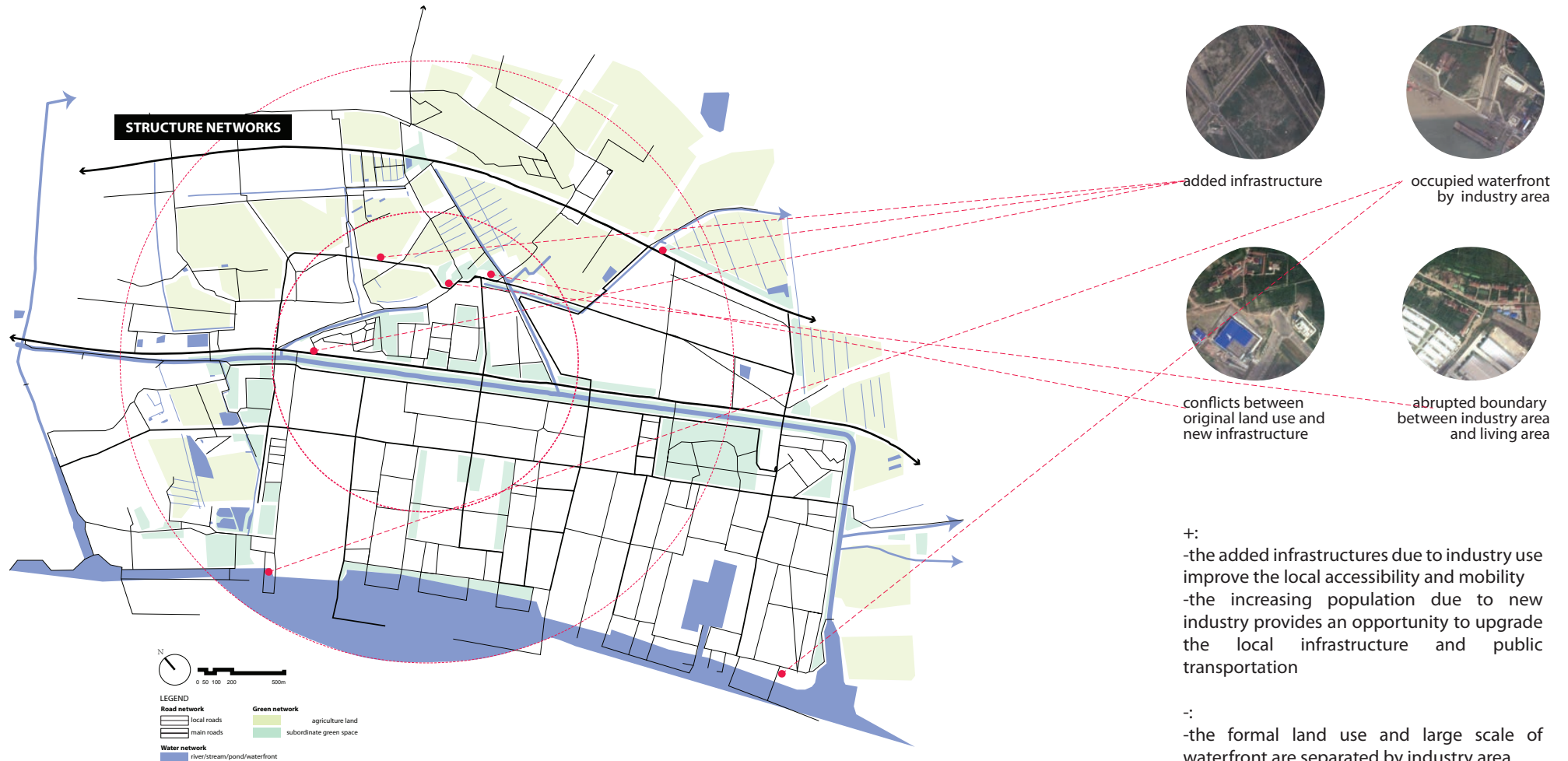


Large area of original farmland and villages are replaced by the ship-industry zone. Such large scale of heavy industry area forms a closed zone with strong influence to surrounding area. Meanwhile, its neighboring areas still remain for simple agriculture use and low density residence. There is no direct cooperation between such industry use and the original living-agriculture use.

+:
 -large scale of industry provides economical supports with a great number of jobs
 -large scale of industry provides an opportunity for upgrading the local urbanization level
 -such urbanization following the implanted industry may strengthen local and regional cooperation

-:
 -the introduction of such strong industry interrupts the original social-economic structure
 -the large industry zone cut off the original urban-landscape structure
 -the industry waste may leads to environmental pollution
 -the land use in surrounding area does not adjust to the implanted industry area in form and function

Figure60: Zooming-in analysis on 'industry'-structure network
 Source: Author, 2012



+:
 -the added infrastructures due to industry use improve the local accessibility and mobility
 -the increasing population due to new industry provides an opportunity to upgrade the local infrastructure and public transportation

-:
 -the formal land use and large scale of waterfront are separated by industry area
 -lots of green and water network are cut off by industry zone
 -conflicts between original land use and newly constructed infrastructure
 -lack of soft boundary between heavy industry zone and living area

The original urban-landscape structure in this area is mainly organized according to the water system and farmland use, which is similar and continuous to elsewhere in the island. However, the large industry zone cut off such green-blue network because its rigid spatial form and special demands in infrastructure. And due to the marine engineering's technique and transportation requirements, the large waterfront area is occupied and separated with the formal land use.

4. Site diagnosis:
The conflicts in Changxing's urban landscape

Figure61: Zooming-in analysis on 'industry'-program
 Source: Author, 2012

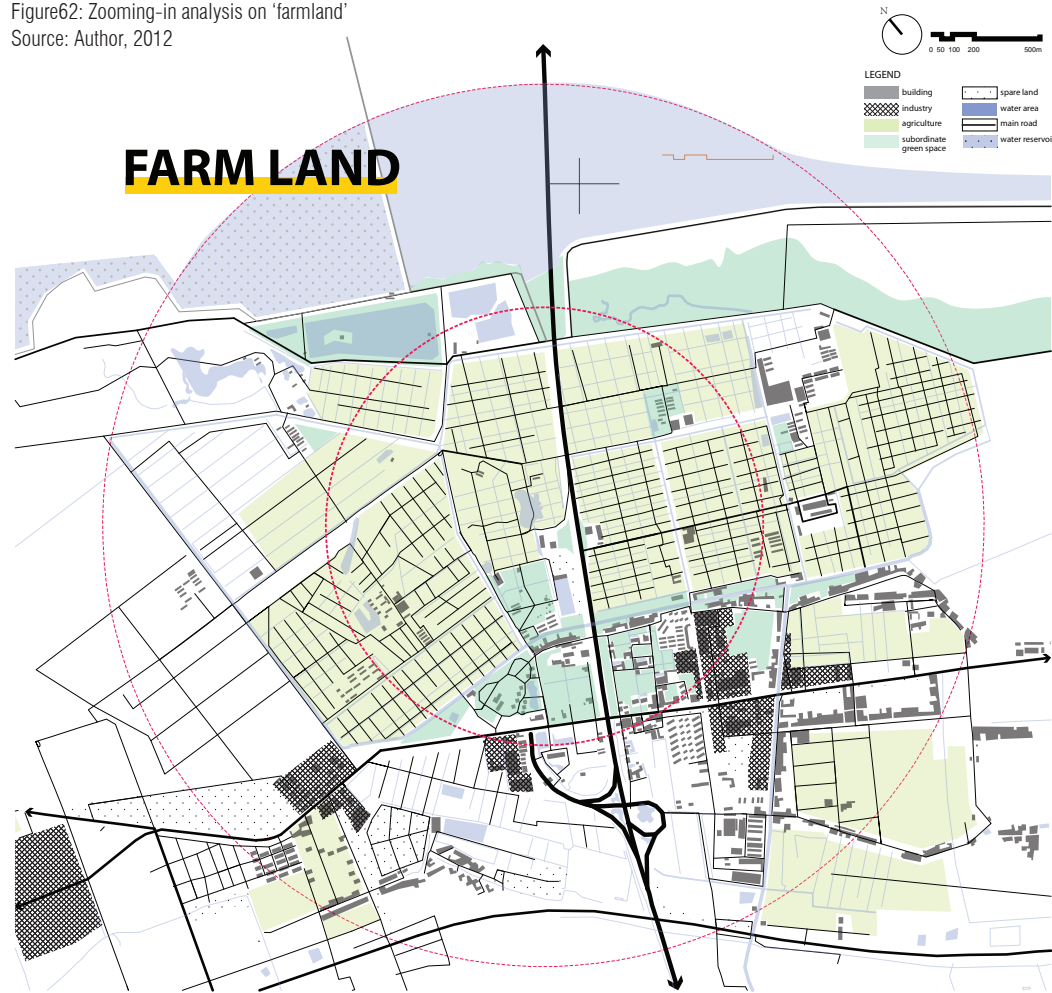


Except than marine engineering and ship-industry, those programs surrounding the industry area mainly serve for the basic daily living, but not for the extension supportive function for the industry area. In the foreseeable future, the increasing population attracted by the emerging jobs in this industry zone would require additional living and working facilities. What's more, for a sustainable social-economic development, this industry zone also demands upgrading in additional mutual supportive service industry. Therefore, the current programs should be improved as an adaption.

+:
 -the current programs meet the basic living and working needs at present
 -the unique marine-engineering and ship-industry provide opportunity for this are to develop related service programs with competitiveness

-:
 -the current programs does not direct relate to the industry function
 -the current programs could not meet the increasing demand in daily use
 -the arrangement of programs ignores providing condition for upgrading service industry

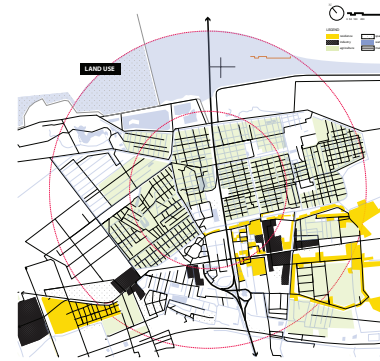
Figure62: Zooming-in analysis on 'farmland'
 Source: Author, 2012



Major area of Changxing Island is covered by farmland. These farmland are usually organized by the local water network. And the linear villages settle along the roads or water routes along the farmland. Such form and function arrangement forms a typical local landscape. While with the introduction of industry, these farmlands have to face the challenge of following urbanization because of their relative adequate land resource and land price. Meanwhile, how the tradition agriculture could adjust to urbanization remains to be considered. The Qianwei Farmland is the largest farmland in Changxing, with typical local orange plantation. With the expansion of local infrastructure, this area faces the common challenge of farmland.

4. Site diagnosis:

The conflicts in Changxing's urban landscape



Qianwei farmland consists of large scale orange plantation garden and several aggregated residence along the local roads. Because of the water reservoir area and wetland in its north side, there is certain limitation on construction in the north part. While in the south area, due to the improving accessibility by expanded road, lots of spare land and green area are planned to be urbanized to meet the requirement of increasing population.

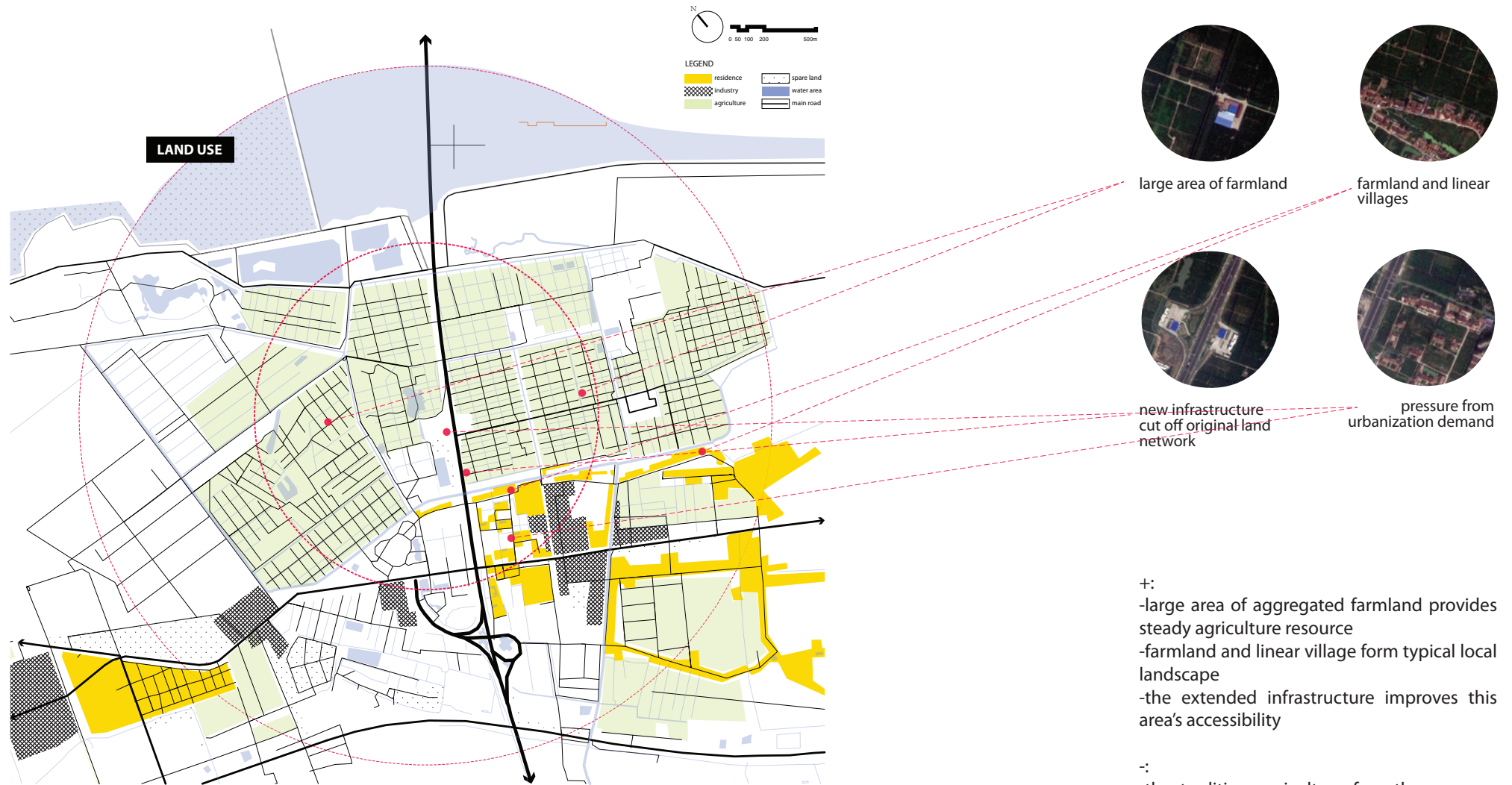


The original urban-landscape structure in this area is mainly organized according to the water system and farmland use, which is similar and continuous to elsewhere in the island. However, the large industry zone cut off such green-blue network because its rigid spatial form and special demands in infrastructure. And due to the marine engineering's technique and transportation requirements, the large waterfront area is occupied and separated with the formal land use.



The recent functions of this farmland still focus on traditional agriculture and plantation. Certain numbers of commercial and recreational programs settled along the new infrastructure because of the improved accessibility in local scale. While the main programs serving for daily living and working still aggregated in living area. Few programs are explored to upgrade the current agriculture activities facing the urbanization pressure.

Figure63: Zooming-in analysis on 'farmland'-land use
 Source: Author, 2012

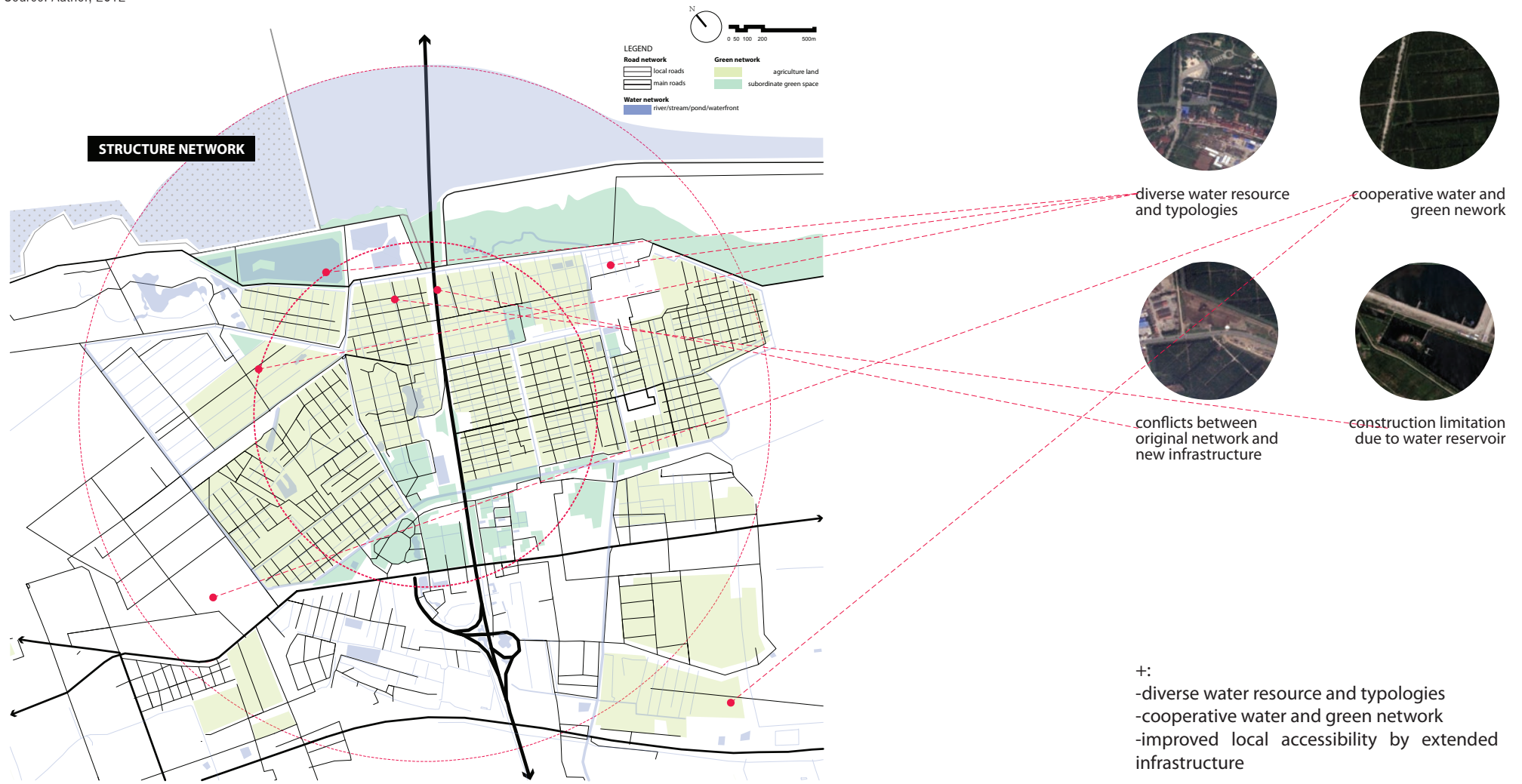


Qianwei farmland consists of large scale orange plantation garden and several aggregated residence along the local roads. Because of the water reservoir area and wetland in its north side, there is certain limitation on construction in the north part. While in the south area, due to the improving accessibility by expanded road, lots of spare land and green area are planned to be urbanized to meet the requirement of increasing population.

+:
 -large area of aggregated farmland provides steady agriculture resource
 -farmland and linear village form typical local landscape
 -the extended infrastructure improves this area's accessibility

-:
 -the tradition agriculture face the pressure from urbanization
 -the tradition agriculture face the pressure to upgrade
 -conflicts between limitation on construction and pressure on urbanization

Figure64: Zooming-in analysis on 'farmland'-structure network
 Source: Author, 2012



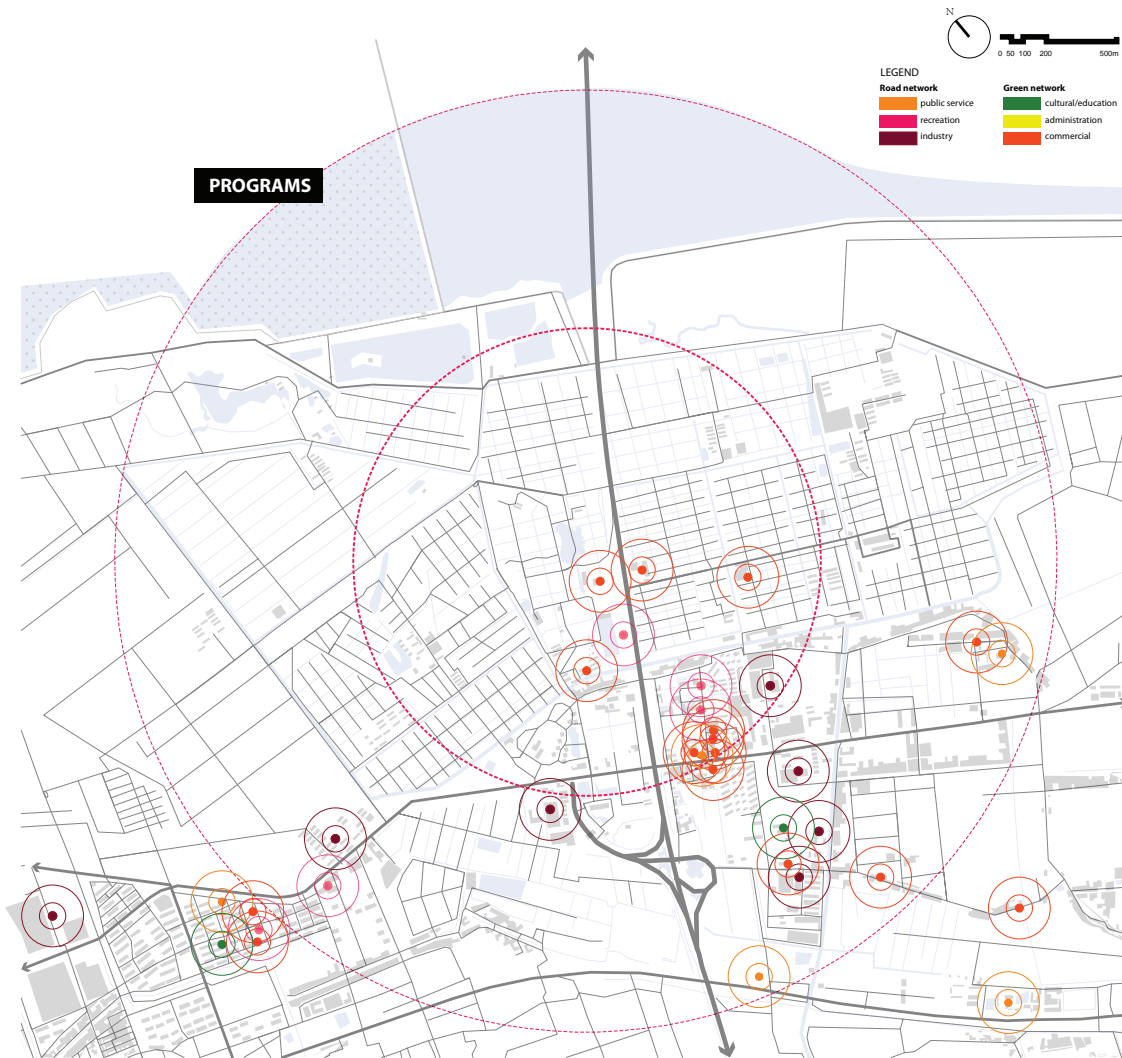
The local water network is regulated to form the irrigation system for the large farmland. So the water network spread evenly in the farmland with ponds and streams. The local road network also coordinates with such water routes for efficient agriculture activities. Meanwhile, this large scale green area forms a natural barrier for the water reservoir. While the extended infrastructure interrupts such structure although it improves the local accessibility.

+:
 -diverse water resource and typologies
 -cooperative water and green network
 -improved local accessibility by extended infrastructure

-:
 -construction limitation due to water reservoir
 -conflicts between new infrastructure and original water-green network
 -pollution by new infrastructure

4. Site diagnosis: The conflicts in Changxing's urban landscape

Figure65: Zooming-in analysis on 'farmland'-program
 Source: Author, 2012



The recent functions of this farmland still focus on traditional agriculture and plantation. Certain numbers of commercial and recreational programs settled along the new infrastructure because of the improved accessibility in local scale. While the main programs serving for daily living and working still aggregated in living area. Few programs are explored to upgrade the current agriculture activities facing the urbanization pressure.

+:
 -steady agriculture activity as strong local identity
 -basic programs meet the requirements of daily use
 -extended infrastructure brings potentials to develop more programs

-:
 -few programs direct related to upgrading agriculture activity
 -these programs do not take advantage of the large farmland to serve in a large scale with more competitiveness
 -the existing programs do not form a synergic cooperation among themselves

Qualities

Water:

- Fresh water resource
- Diverse waterscape
- Waterfront as valuable urban space
- Water transport advantage

Farmland:

- Adequate land resource
- Strong local identity in orange plantation
- Farmland with water network and linear villages as typical local landscape

Dynamic Natural and Cultural Landscape:

- Dynamic waterfront in delta environment
- Wetland resource
- Diversity in natural habitats and biodiversity
- Unique island atmosphere in culture and lifestyle
- Local cultural landscape and heritages

Risks

Pressure from Urbanization:

- Unwise urban growth pattern without fully consideration on local conditions
- Destruction on local landscape because of new urban construction
- Lack of systematic programs with diverse functions to support urban development

Industrial influence:

- destruction on environment and potential pollution
- spatial and social segregation by large industry zone
- over-relying on industry that pushing other functions away

Environmental risks:

- Flooding or drought risks
- Pollution on water, air, solid waste
- Energy scarcity

4.6 Overview on the site's conflicts

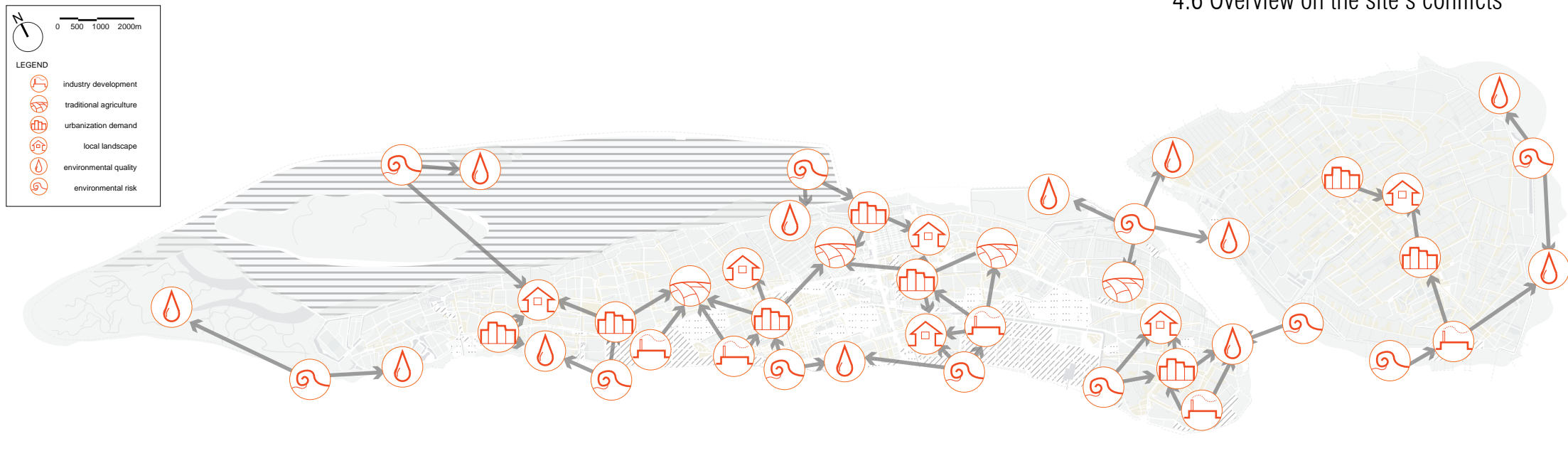


Figure67: The 'conflicts' map of Changxing
Source: Author, 2013

According to the analysis both on whole island and typical areas, the main qualities and risks of Changxing could be summarized as: (Fig66)

Qualities:

Water:

- Fresh water resource
- Diverse waterscape
- Waterfront as valuable urban space
- Water transport advantage

Farmland:

- Adequate land resource
- Strong local identity in orange plantation
- Farmland with water network and linear villages as typical local landscape

Dynamic Natural and Cultural Landscape:

- Dynamic waterfront in delta environment
- Wetland resource

Dynamic Natural and Cultural Landscape:

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Risks

Pressure from Urbanization:

- Unwise urban growth pattern without fully consideration on local conditions
- Destruction on local landscape because of new urban construction
- Lack of systematic programs with diverse functions to support urban development

Industrial influence:

- destruction on environment and potential pollution
- spatial and social segregation by large industry zone

-over-relying on industry that pushing other functions away

Environmental risks:

- Flooding or drought risks
- Pollution on water, air, solid waste
- Energy scarcity

Thusly, according the previous summary of Changxing's qualities and risks, the major conflicts among them could be assumed as: (fig67)

-The conflicts between new-implement industry development and traditional agriculture as the local basement

-The conflicts between fast urbanization demand and valuable local cultural& natural landscape

-The conflicts between environmental qualities and environmental risks

4. Site diagnosis:

The conflicts in Changxing's urban landscape



5. Problem Statement :

Missing links in Changxing's urban transformation

- Critical review on government's plan
- Three main missing links
 - Problem statement



5.1 Critical review on government's plan

Based on the government's plan, several ship-factory and marine engineering company have already moved into Changxing Island since 2002. The industry zone with planning area of 55 square kilometers has been located in the south bank of Changxing. Together with industry, a lot of associated facilities and infrastructure are under construction. Up till now, there are already 80,000 migrants living and working in Changxing Island, mainly because of the newly coming industry. In the future, more people might be attracted to come, thusly require a great spatial and social transformation from agriculture (land) to industry, and following facilities as services, or even life style.

Facing the inevitable urbanization task, it is important to clarify the opportunities and challenges that Changxing has to deal with. It is apparent that Changxing holds advantages in its junction location that connecting Shanghai and north of Jiangsu Province, its great water transportation condition, its cheap land and good environment for living. These factors provide opportunities for its future industry development as a marine engineering center, attracting more population and more infrastructure construction and more investment for further development. Meanwhile, its weakness facing such transformation should not be neglected either. Firstly, even with the cross-river highway, Changxing's connectivity and

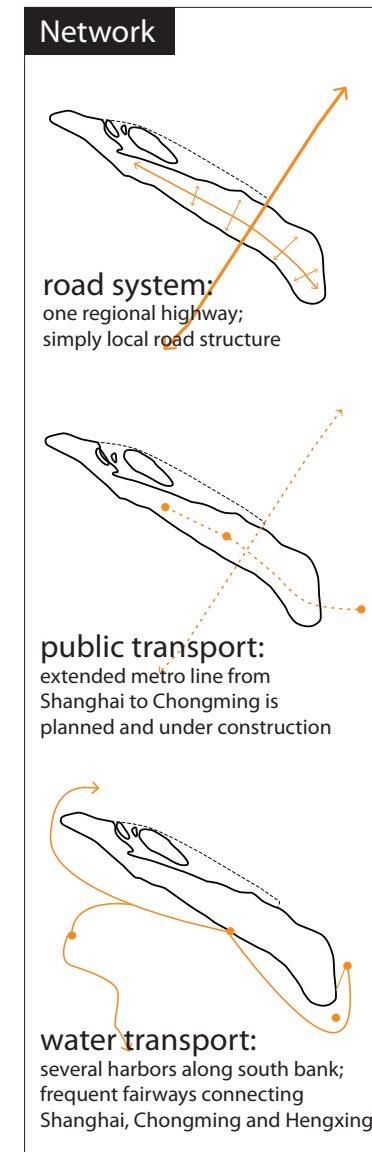
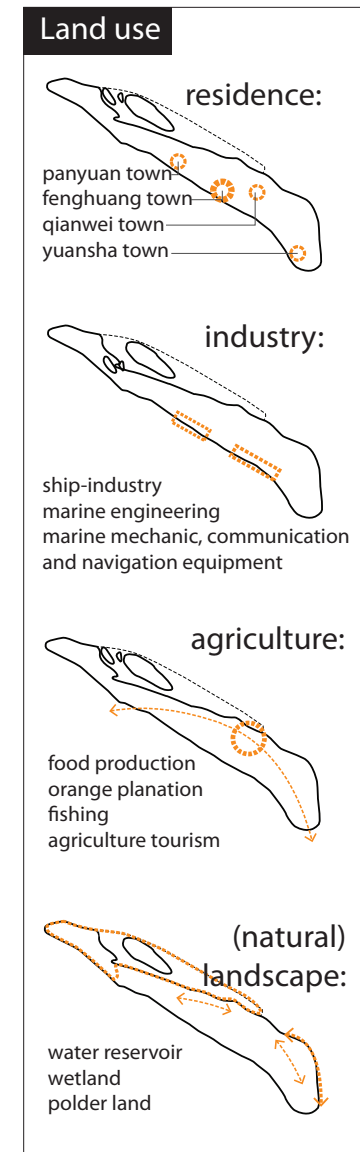
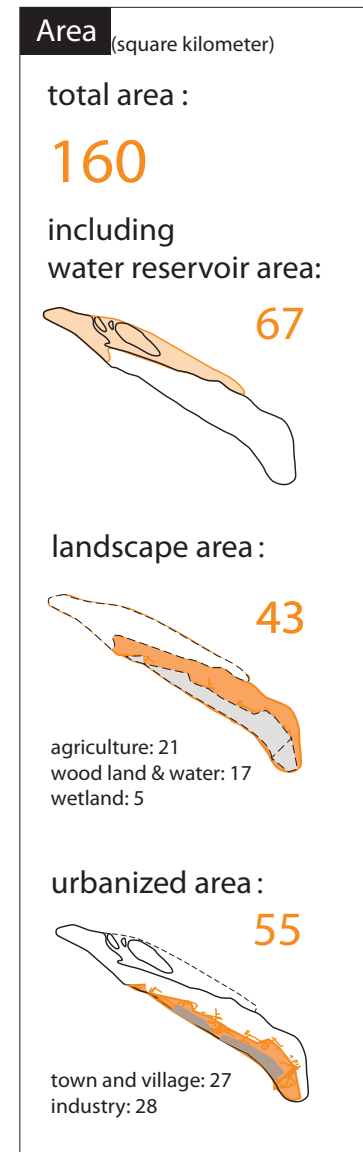
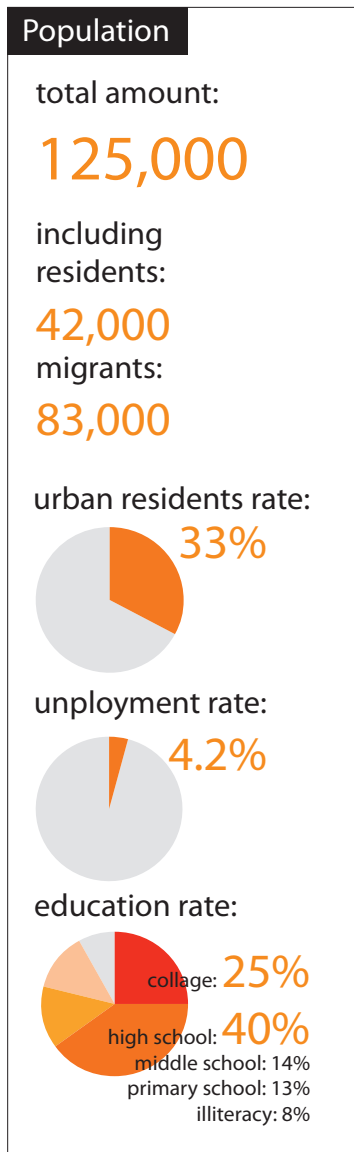


Figure68: Current situation of Changxing
Source: Author, 2012

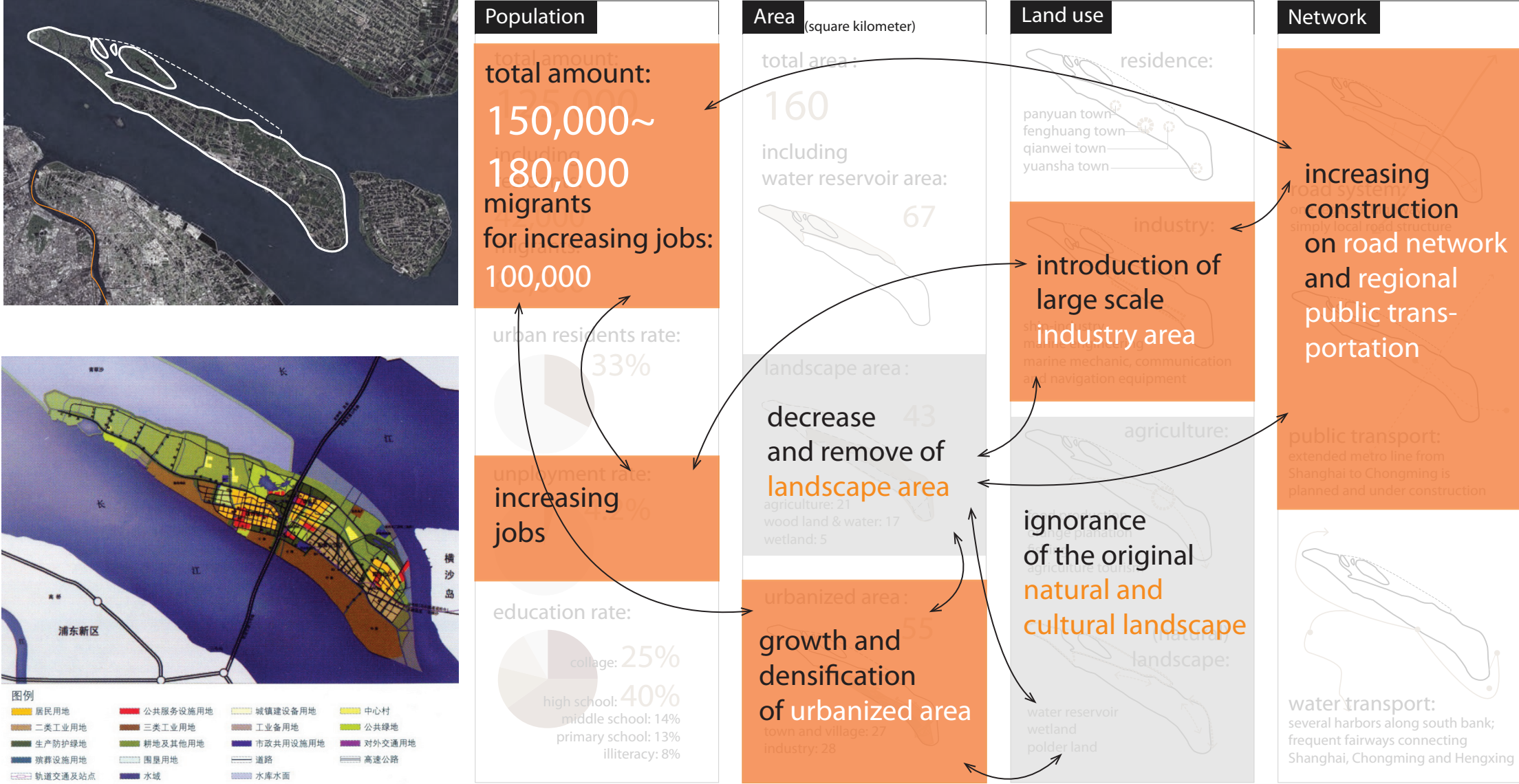
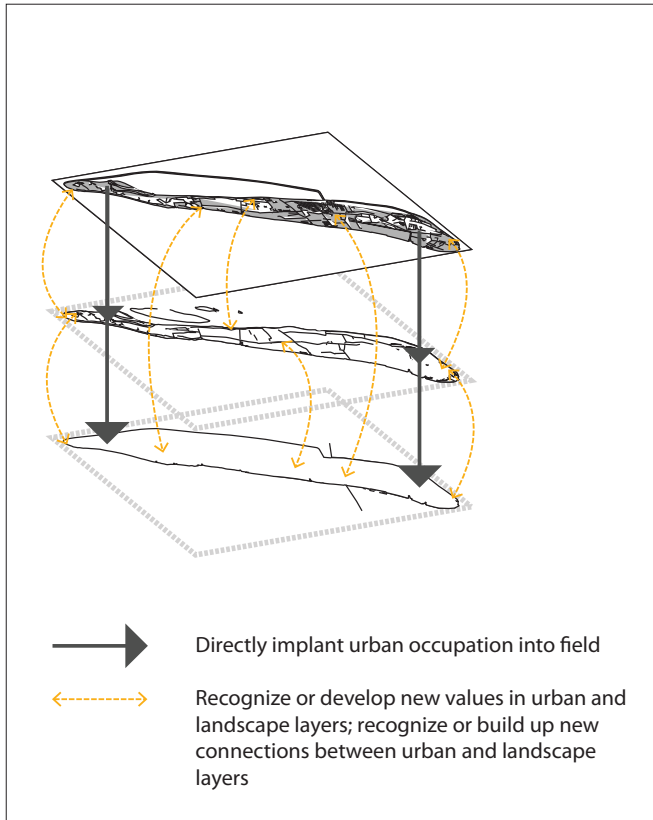


Figure69: Changes in Changxing due to government's plan
Source: Author, 2012

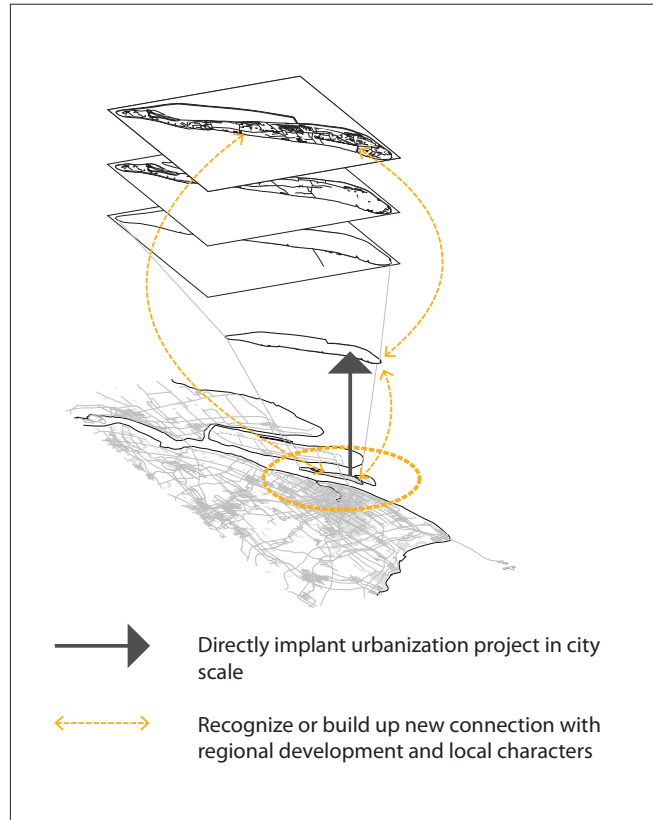
accessibility in regional scale is still very bad. Secondly, due to its relatively isolated status for quite a long period, the original urban development level in Changxing is immature. The island lacks all kinds of basic infrastructure network, transportation method, urban facilities and social-economic components to prepare for a rapid urbanization together with high quality in social and environmental

aspects. Therefore, under the pressure of achieving short-term goals, the ignorance of local natural and cultural landscape may happen, which lead to damage on sensitive delta environment and local identity.

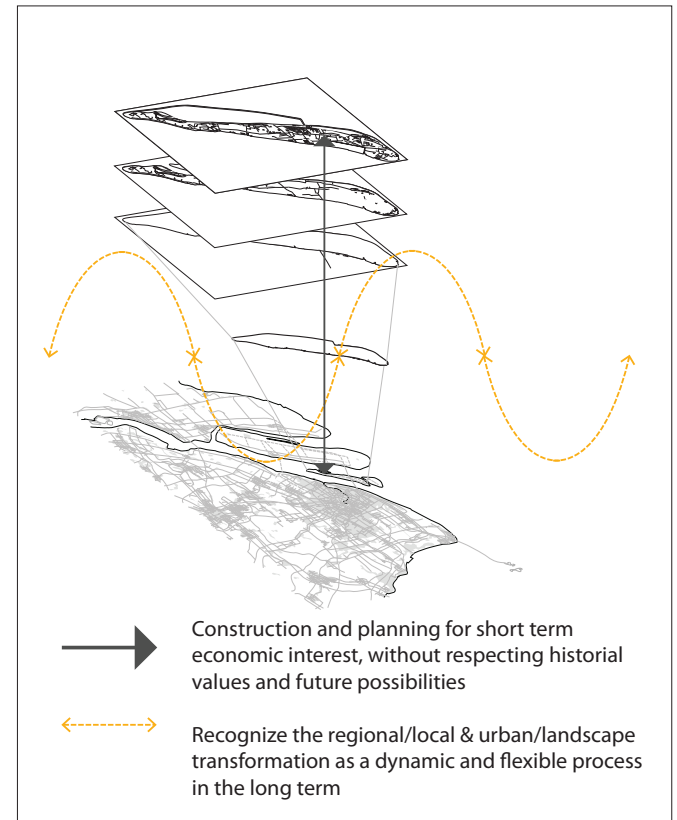
5. Problem statement:
Missing links in Changxing's urban-landscape transformation



Missing links among urban-cultural/natural landscape layers



Missing links among regional, city and local scales



Missing links among historical, current and future process

Figure70: Three missing links in Changxing's planning framework
 Source: Author, 2012

5.2 Three missing links in Changxing's planning framework

According to the site diagnosis and review on the government's plan, it is assumed that the government merely emphasizes the industry development and following urbanization in Changxing from the perspective of regional urban transformation. While the very local condition in Changxing is ignored, so does the potentialities other than industry be underestimated. The reason for such tabula-rosa thinking could be summarized as three missing links in Changxing's planning framework, which expressed as layer model:

- Missing links between urban and landscape layers
- Missing links between regional and local layers
- Missing links between temporal layers from past to future concerns



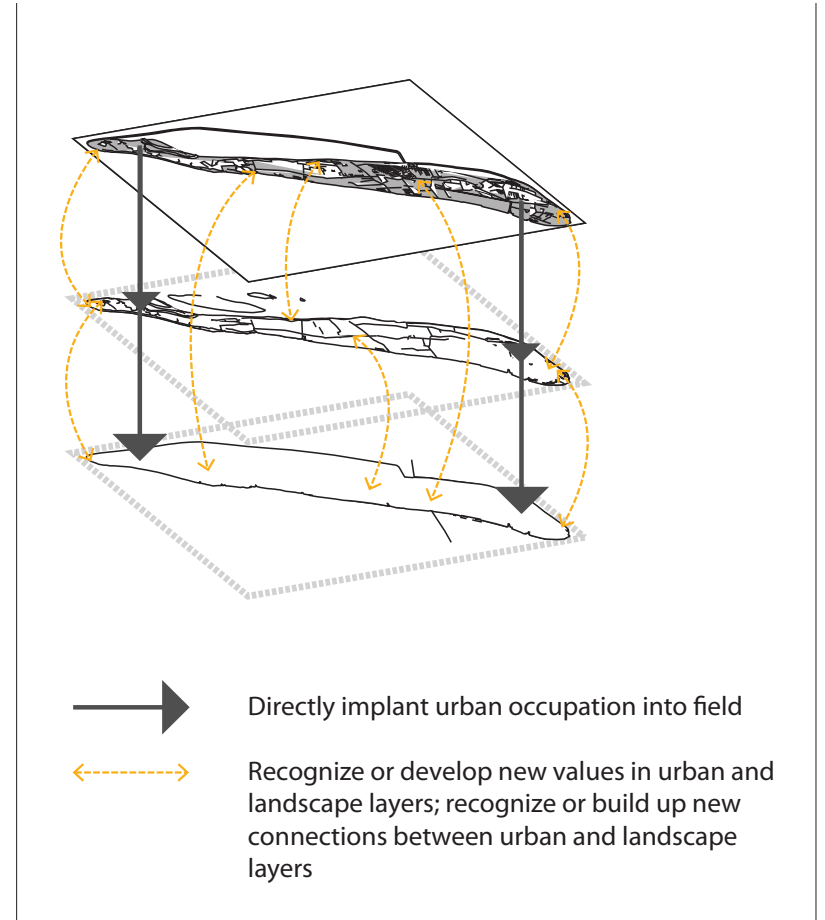
Missing link between urban-landscape layers

- > **Fragmented urban-landscape structure**
- > **Require recognition of landscape value and combine it with urban characters in spatial and functional organization**







In a tabula-rasa thinking method, the urban occupation could be directly implanted into the site without fully recognizing and adapting to the basic condition. Thusly, the consideration of recognizing the values on the basic landscape layer or building up mutual adaption between urban and landscape layers are missing.

Such missing links would lead to a fragmented urban-landscape structure that the urban and landscape lack of reflections on each other's form and function, and the value of local natural and cultural landscape would be degraded due to such disrespect.

In the case of Changxing, such missing links might cause unsuitable urbanization pattern, over-relying on industry development, environmental pollution, and degradation of local natural & cultural landscape as part of local identity.



Missing links among urban-cultural/natural landscape layers

Urban-layer	Landscape-layer
 -Limited urban infrastructure and facilities	 -Environmental pollution from industry and urban construction
 -Unsuitable urban form/typology/scale	 -Natural disaster risk
 -Over-relying on industry	 -Degradation of local natural and cultural landscape characteristics

5. Problem statement:

Missing links in Changxing's urban-landscape transformation

Figure73: Missing links between regional and local layer
Source: Author, 2012



Missing link between regional-local layers

> Detached regional-local relation

> Require more comprehensive considerations on local condition and further social-economic cooperation between regional and local level.

Figure74: Detached regional-local relation
Source: Author, 2012

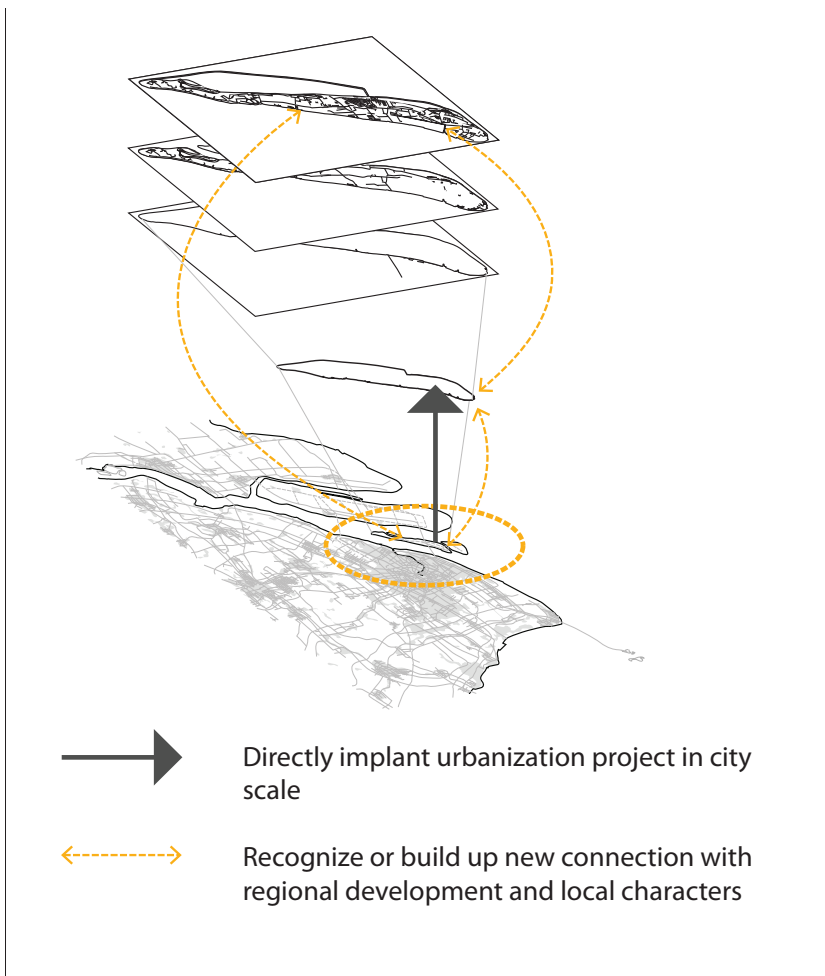
In the top-down planning framework, directly implanting certain urban project or strategy into city scale or local scale from the perspective of regional scale usually appears. Although the direction or goal of such implantation is benefits for regional development, however, it might not fit with the specific condition on local scale. Recognizing and building up mutual beneficial correlations in multi-scales stand as the missing links between regional and local layers.

If the local condition does not make a voice in regional development task, then the planning and implementation could hardly work efficiently because of lacking spatial connections and social-economic cooperation between regional and local level.

For Changxing, due to its low urban development level, merely adding a industry project together with a extension part of regional infrastructure does not provide effective social-economic and spatial connections to help Changxing really join in the regional urban network. Such missing links thusly lead to a detached regional-local relationship.

5. Problem statement:

Missing links in Changxing's urban-landscape transformation



Missing links among regional, city and local scales

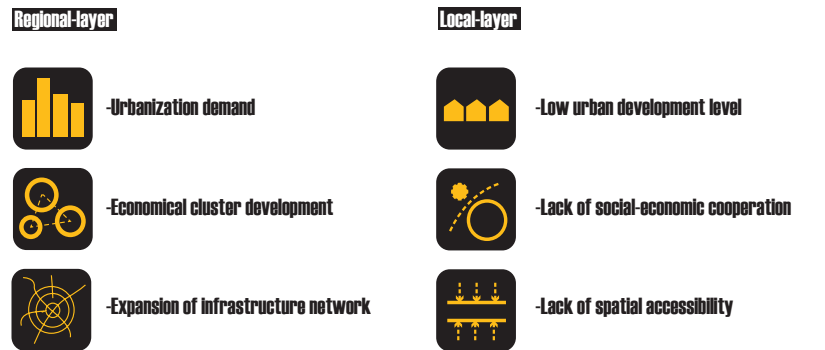


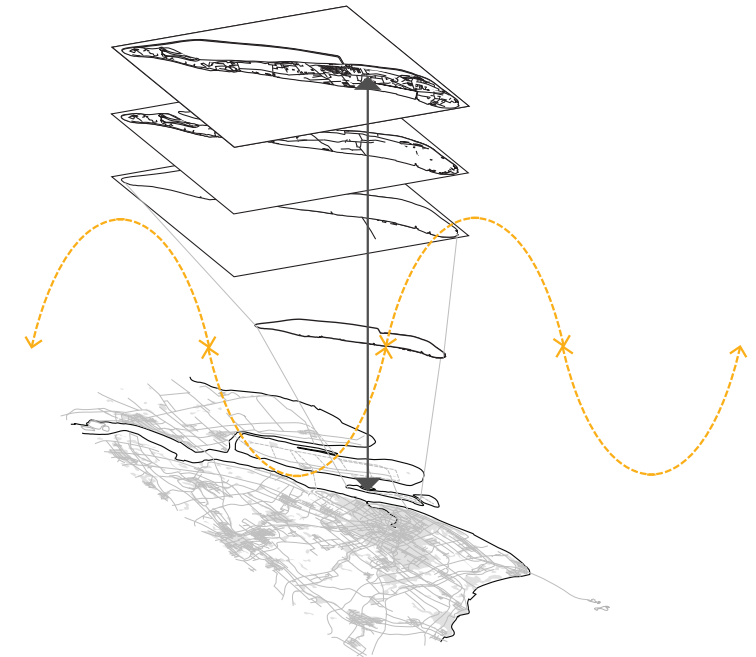


Figure75: Missing links between temporal layers
Source: Author, 2012

Missing link between past-future layers

- > Unlinked past-future transformation process
- > Require making a balance between short term and long term interest, and building up a more flexible and resilient urban-landscape system

Figure76: Unlinked urban transformation in temporal process
Source: Author, 2012



The tabula-rasa thinking not only reflects in spatial arrangement, but also in temporal concerns. The missing links between temporal concerns could be summarized as the disrespect for historical values and the myopia to merely focus on short-term interests but not long-term development.

Without recognizing certain valuable rules and experiences in historical process, some cultural identity might get lost in a rootless plan. And over-focusing on short-term interests rather than the long-term quality would reduce the urban flexibility and resilience when facing future risks. Such missing points cause the unlinked temporal concerns in planning.

For Changxing, its natural and cultural landscape conveys not only historical values, but also carry great potentialities in future development. Over-relying on the short-term interests from industry development might lead to degrading on environmental quality, which directly effects the social well-being and urban resilience in a long term.

- Construction and planning for short term economic interest, without respecting historical values and future possibilities
- ↔ Recognize the regional/local & urban/landscape transformation as a dynamic and flexible process in the long term

Missing links among historical, current and future process

Current-layer

- Short term interests
- Economic development
- Permanent urban construction

Future-layer

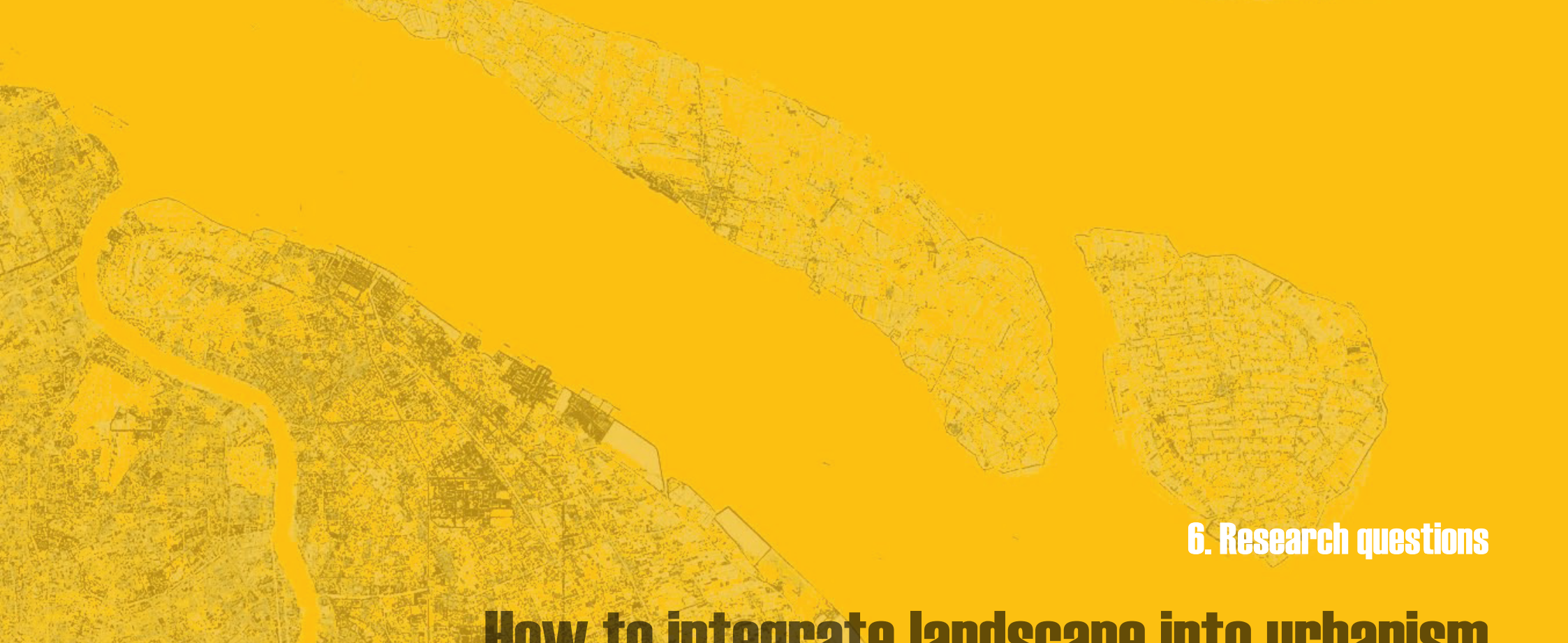
- Long term interests and sustainable development pattern
- Social well-being and environment quality
- Flexible urban-landscape structure

5. Problem statement:

Missing links in Changxing's urban-landscape transformation

As a conclusion, due to the introduction of large-scale industry and related urban constructions, Changxing, as an environmental-sensitive island in low development level, faces the increasing population and demand of fast urbanization to provide urban infrastructure for them. The common fast urbanization pattern in Chinese new town and the government's plan, somehow, often ignore the value of local environment. Such ignorance will lead to a fragmented urban-landscape structure and contradiction between urbanization and environment, particularly not thinking on the potential diverse role of the island into the new region in a long term perspective. In a word, the missing consideration on local natural and cultural landscape, the missing link between regional development and local condition would be the problem that challenges the quality of Changxing's urbanization process affecting its flexibility on relation to long term processes who recognize the landscape variables- island, delta dynamics and regional and local development.

Such a neglect consideration of local condition makes Changxing passively follow as the extension of regional infrastructure network. Thusly, its dynamic local landscape and cultural identical quality are limited to provide mutual benefits for regional development and explore its own potentialities.

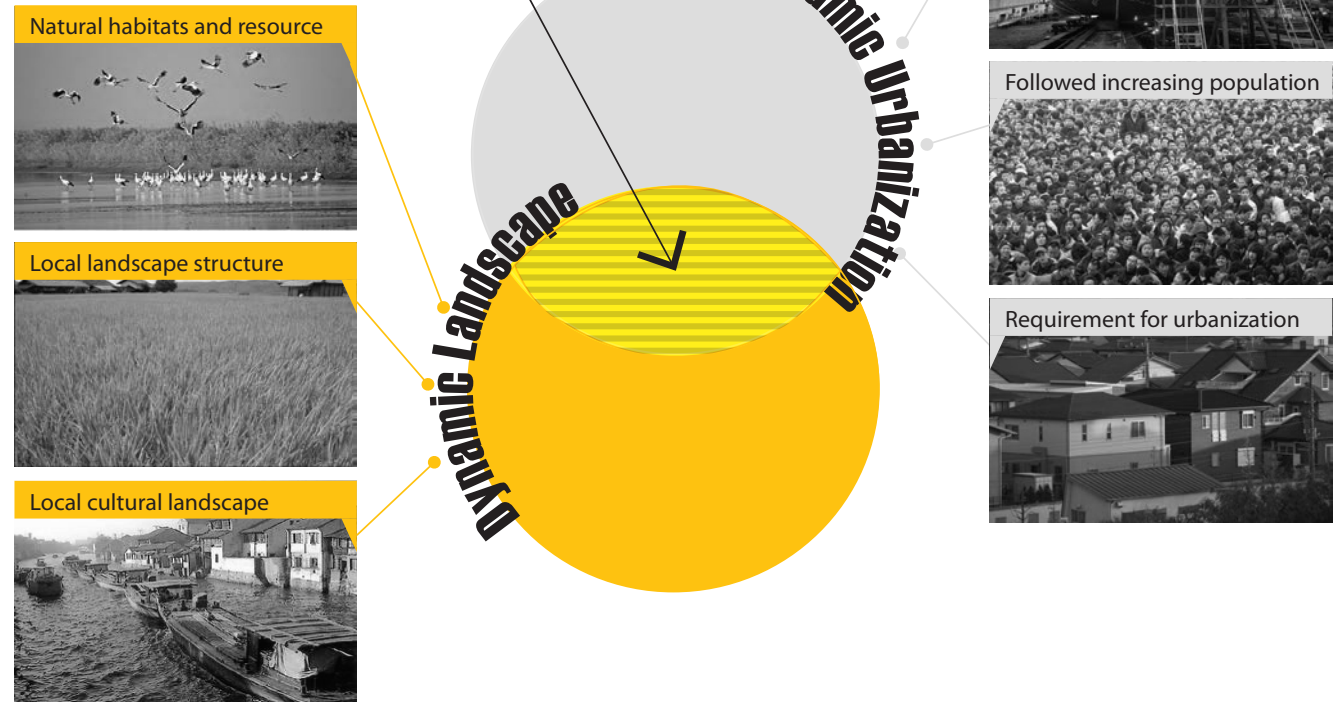


6. Research questions

How to integrate landscape into urbanism

- Aim and Main research question
- Sub research questions

WHAT IF ...



6.1 Aim and main research question

MAIN RESEARCH QUESTION:

Whether and how could an alternative urban-landscape structure for Changxing based on its local and regional condition provide a better balanced development pattern for both urban and environment?

Depending on the motivation and problem statement described previously, the R&D aim of this project is to integrate the local landscape, both natural and cultural, as a part of urban infrastructure to modify the contradiction between the fast urbanization demand and its own environment. The main research question is thusly related to the following actions:

-Exploring diverse capabilities and potentialities in dynamic local urban-landscape

-Integrating the local capabilities and potentialities into the planning framework and implement of regional urban transformation.

This research question directly relate to both the layer of urbanism and the layer of landscape, as responding to the concept Landscape into Urbanism. Beyond, it also relates to the links that supporting such interaction and different operation in a long term process. Several sub research questions focusing on these aspects will help to lead answers to the main research question.

Figure77: Integrate landscape into urbanism in Changxing
Source: Author, 2012

6.2 Sub research questions

The sub research questions are closely related to the problem description in the layer model of urban layer, landscape layer and scale/time process layer.

On the urban-layer, the sub-research questions are:

- How to assess the impact of newly coming industry to the original urban form?
- How to achieve high spatial quality in the urbanization process?
- How to improve local accessibility and regional connectivity during this urbanization process?
- How to provide a flexible transformation of the industry and related urban issue for long term development in regional competitiveness?

On the (natural) landscape-layer, the sub-research questions stand as:

- How to assess the value of local natural and cultural landscape?
- How to reflect the landscape quality in new build-up urban form?
- How to prevent environment risks caused by implanting industry and climate change?
- How to integrate landscape as an urban infrastructure in multi-scales?

And for the operation links between urban and landscape, the questions are:

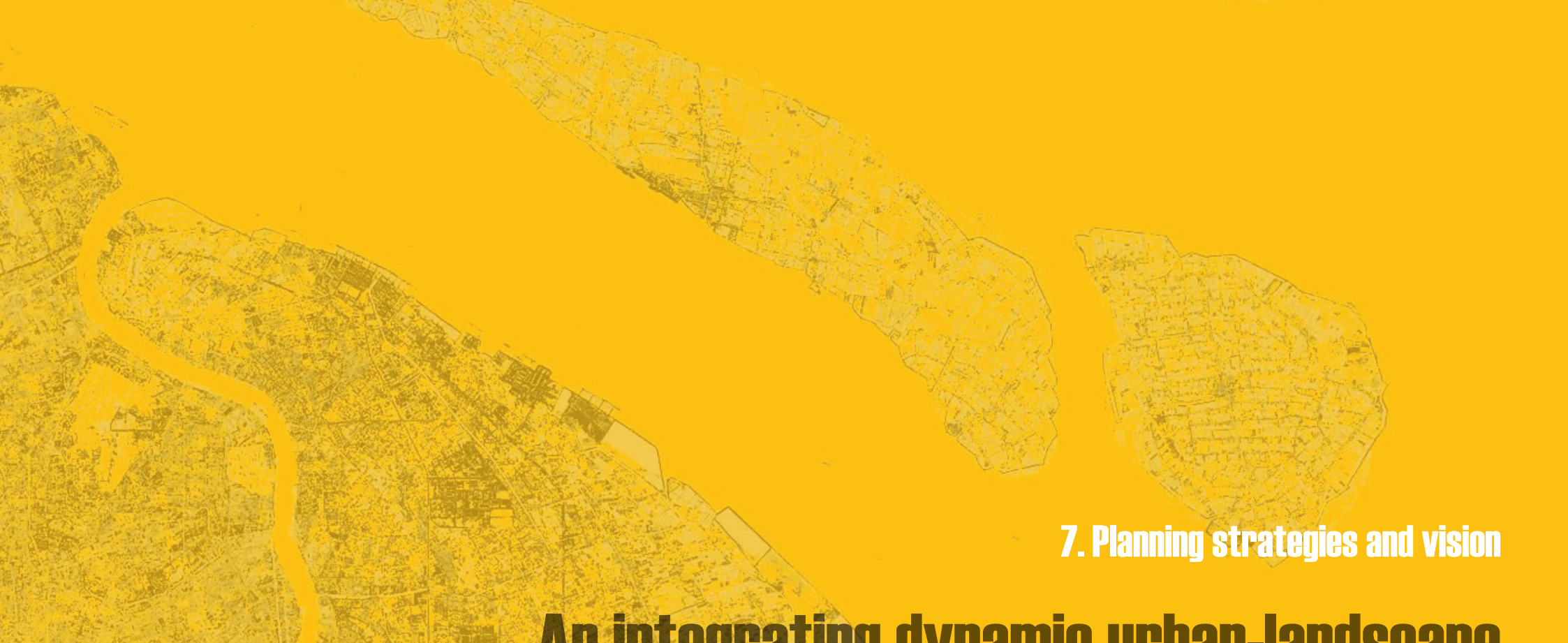
- How to relate landscape quality with urban-rural land use?
- How to integrate the urban-landscape structure into the dynamic urban transformation?
- How to manage the urban-landscape structure among decision-making process in the short and long term development?

On the scale/time process layer, the questions go to:

- How to make corresponding between local and regional development?
- How to achieve a balance between short term and long term development?
- How to build up a flexible urban-landscape and regional-local relationship facing dynamic urban transformation?

6. Aim and Research questions:

How to integrate landscape into urbanism?



7. Planning strategies and vision

An integrating dynamic urban-landscape

- Planning principle
- Strategies
- Vision
- Planning criteria

7.1 Planning principle

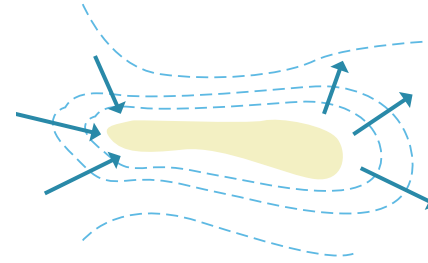
The planning principle for this project is:

To achieve an integrating dynamic landscape as a multi-objective urban infrastructure could provide better cohesion between the local and regional relationship and improve local condition which opens to a diverse potentialities in urban transformation.

So the decision making process will be also studied and within it some concrete proposal on tools and instruments will be offered after an analysis on potential strategies considering in order to counteracts the current ways towards one where the landscape dynamic and the multi layered approaches could be integrated to the urbanization process.

Main conceptual strategy is to preserve and upgrade diverse local natural and cultural landscape to achieve a balance relation with urban development and industry zones: urban'scape, farm'scape, industry'scape, water'scape, wetland'scape

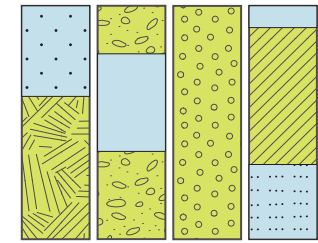
WATER'SCAPE



Dynamic Delta Environment & Island Atmosphere

- wetland area, open green space
- water system, waterfront

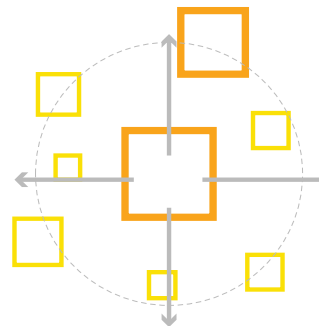
FARM'SCAPE



Agriculture as Local Identity

- green-water structure in farmland
- plantation and fishing as traditional programs

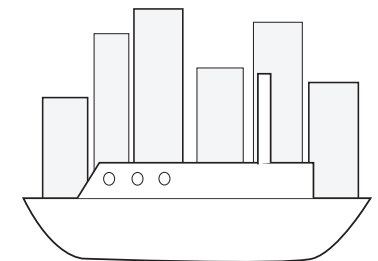
URBAN'SCAPE



Town and Village fit in with urbanization demand

- increasing house for growing populaiton
- adding /improving urban facilities and services

INDUSTRY'SCAPE



Ship-industry & Marine engineering as supportive economy

- be balance with local landscape
- create diverse opportunities for employments, services, infrastructures

Figure78: diverse landscapes in Changxing
Source: Author, 2012

7.1 Planning principle

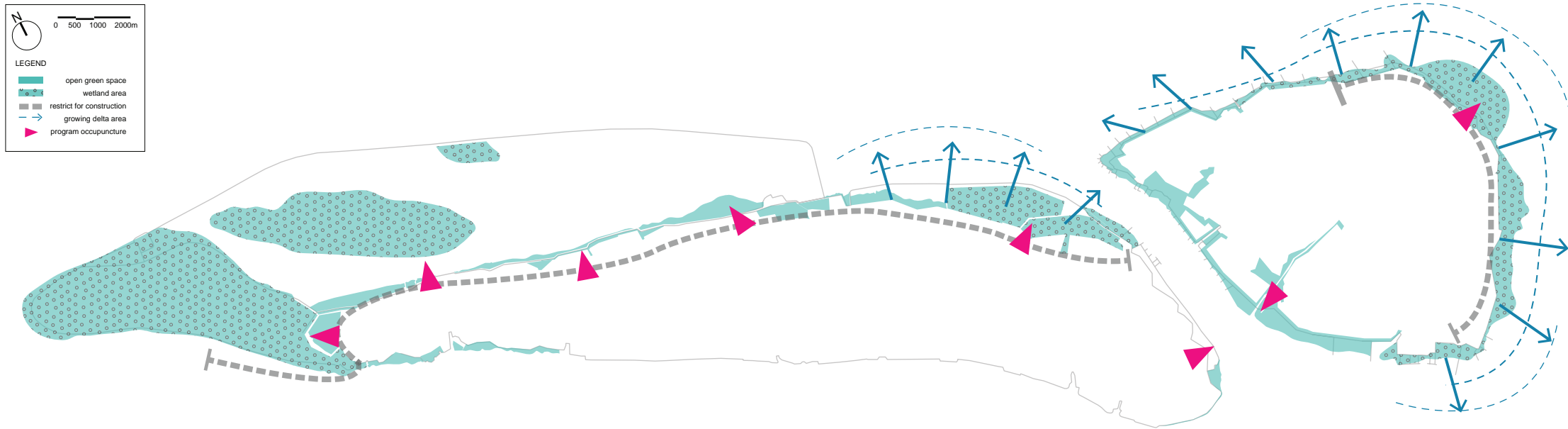


Figure79: Strategy1-preserve wilderness area
Source: Author, 2013

Strategy1: preserve wilderness area:

-preserver wetland areas

-set up limited-construction boundary for environmental sensitive areas

-embed proper programs that benefits from the fields

-using wilderness fields as flooding buffer zones

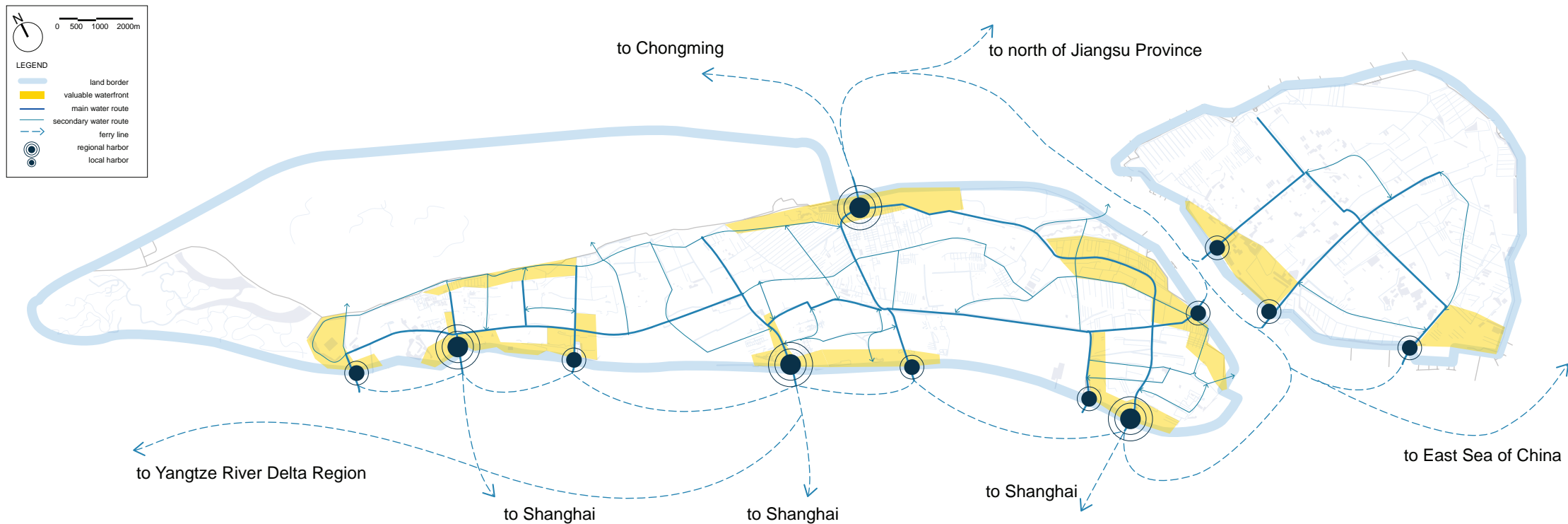


Figure80: Strategy2-take advantage of water system
Source: Author, 2013

Strategy2: take advantage of water system:

- develop valuable waterfront areas for vitalizing urban space and improving local landscape**
- reorganize channels and water networks for local landscape and water transport**
- set up harbors, water routes, and ferry lines for further developing water transport.**

7. Planning strategies and vision:

An integrating dynamic urban-landscape

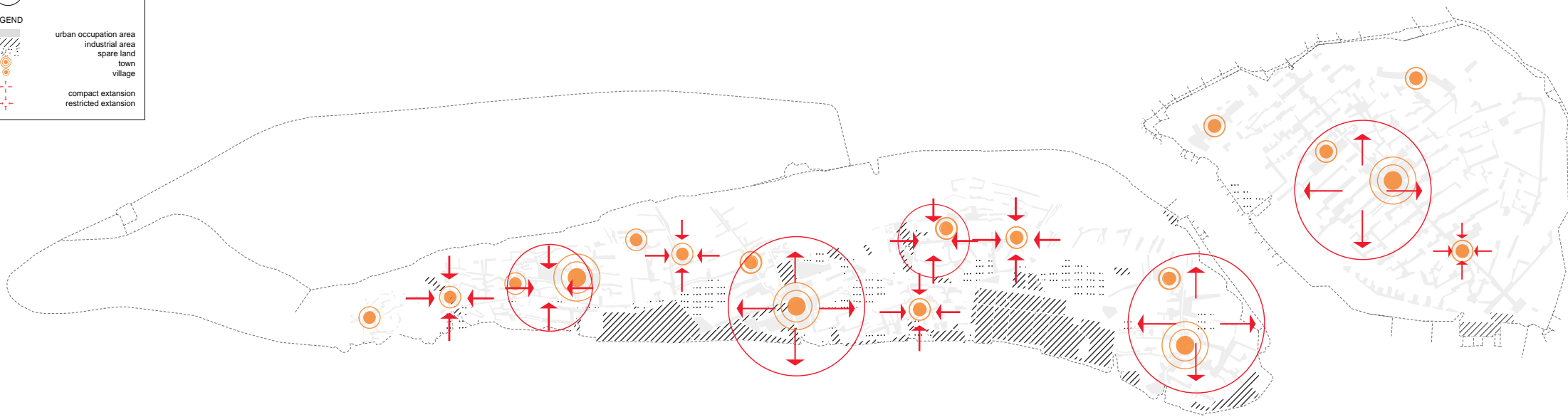
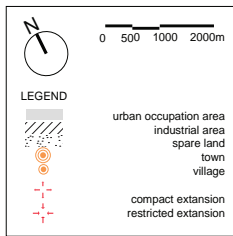


Figure81: Strategy3-balance urban development
Source: Author, 2013

-Strategy3: Balance urban development:

-extend and dense main towns and villages to meet urbanization demand due to population growth

-control and arrange the urban growth in a relative compact pattern

-preserve linear villages as typical local landscape

-add diverse services and programs for better urban atmosphere

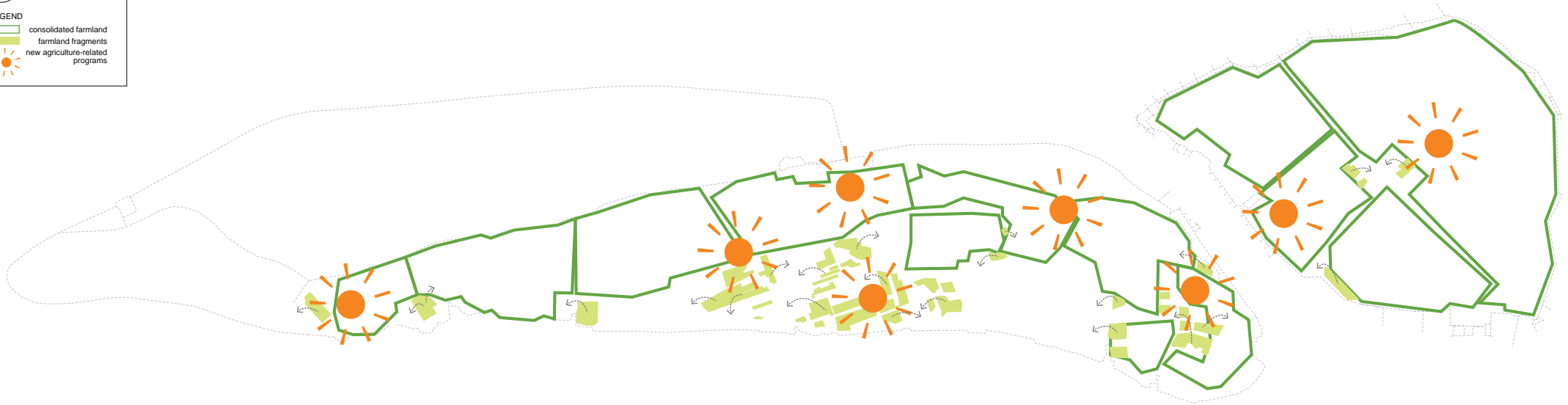
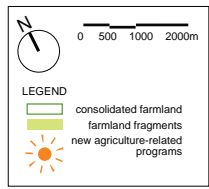


Figure82: Strategy4-upgrade traditional agriculture
Source: Author, 2013

Strategy4: Upgrade traditional agriculture:

- consolidate large scale farmlands for unified function**
- switch small fragmented farmlands to alternative functions according to surrounding land use**
- improve local road-connections and transport conditions for agricultural activities**
- =introduce agricultural-related services and programs to upgrade traditional agriculture.**

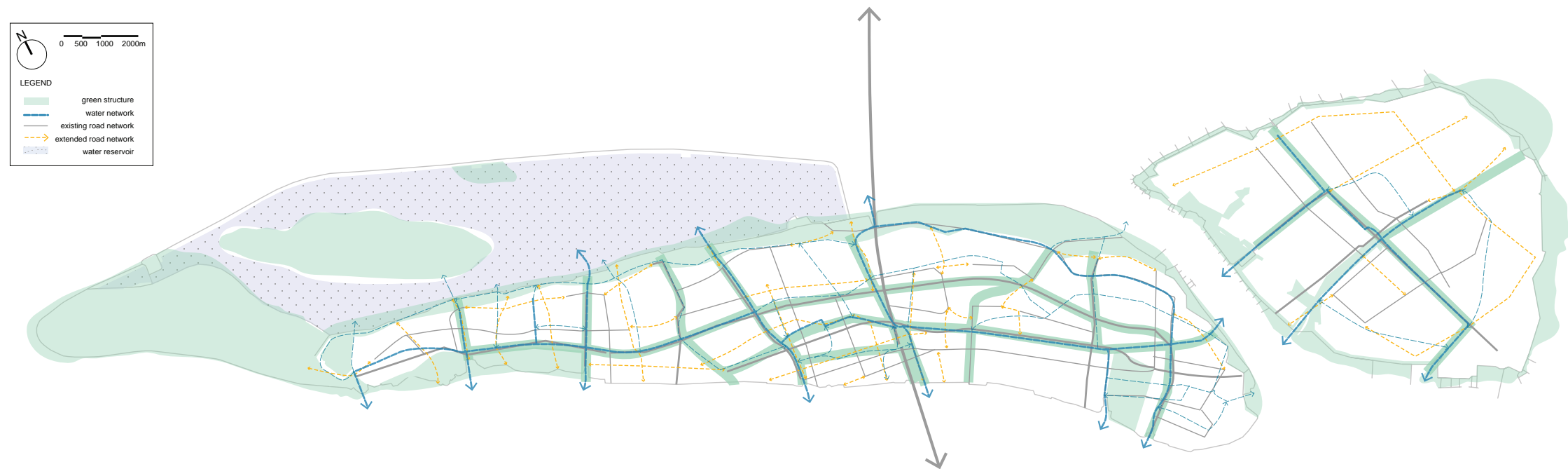
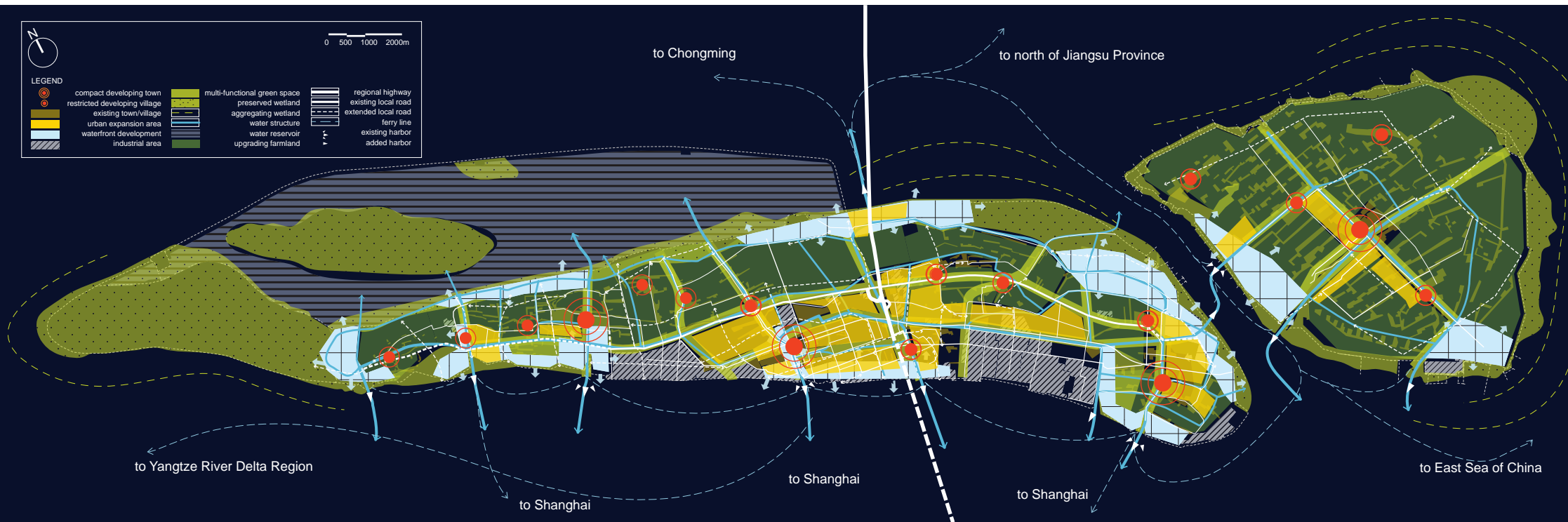


Figure83: Strategy5-integrate structure network
Source: Author, 2013

Strategy5: Integrate structure network:

- improve and complete infrastructural networks by extending main roads and adding local roads**
- set up water routes and bicycle routes as compensation to road network**
- use green space and water network as backbones to organize roads and urban areas**
- introduce related programs to take advantage of green-water networks**

7.2 Vision



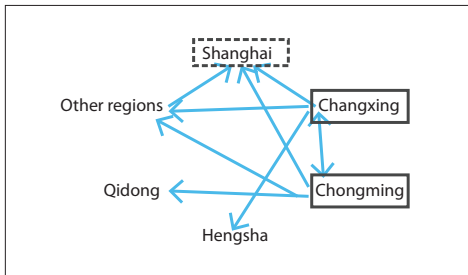
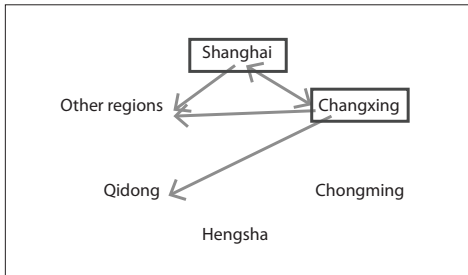
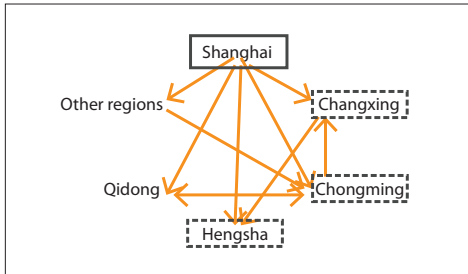
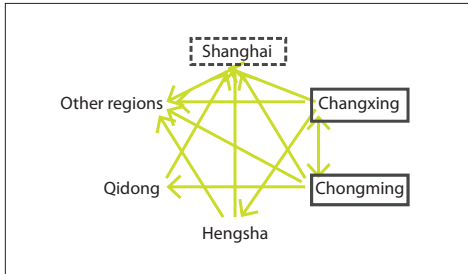
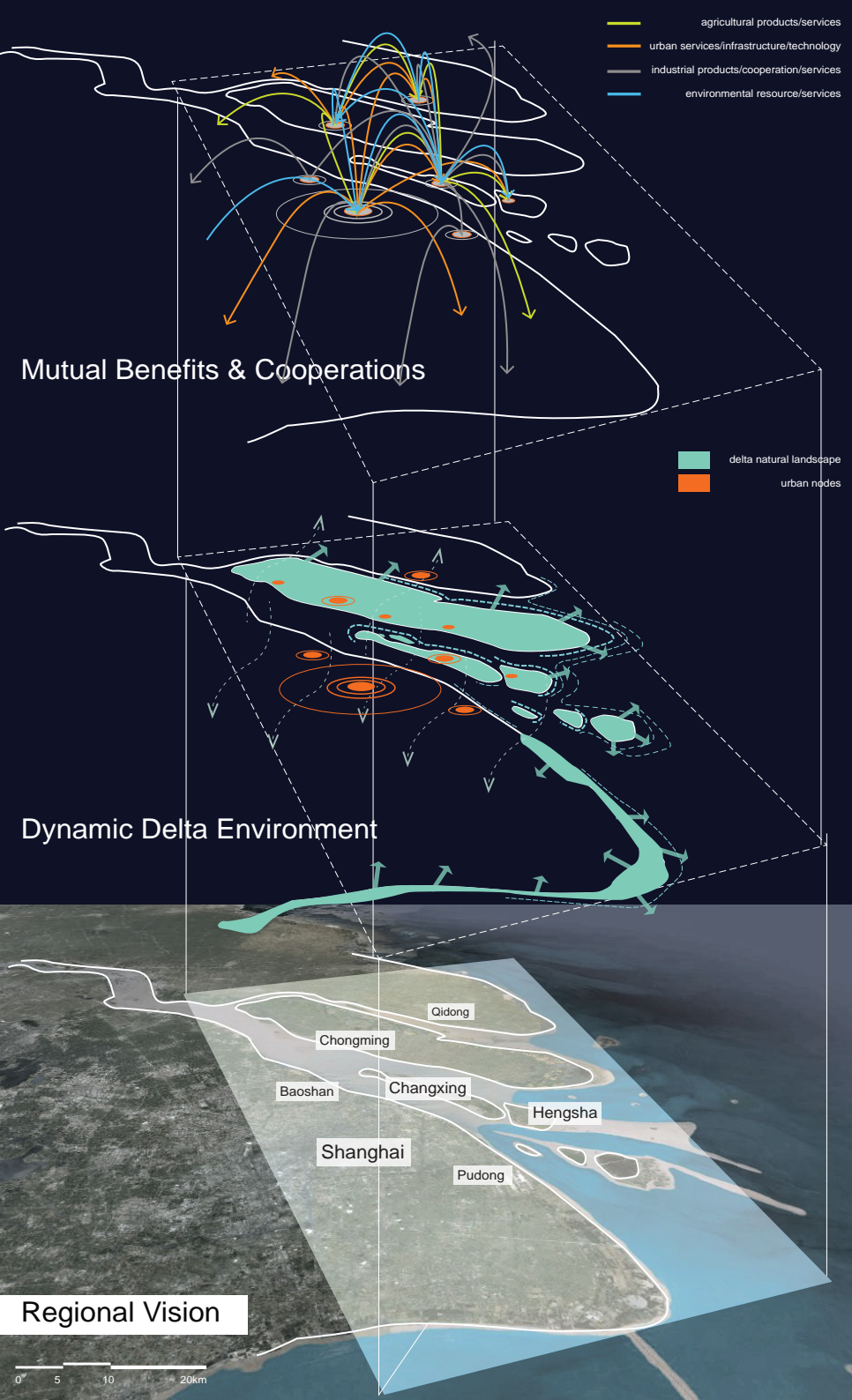
Vision in island scale: A multi-functional island with diverse upgrading local natural and cultural landscape to achieve a balance relation with urban development and industry zones: urban'scape, farm'scape, industry'scape, water'scape, wetland'scape

In the vision in island scale, a diverse local landscape with multi-functions stand as a medium to organize the urban development in a flexible way. On one hand, the urbanization pattern shows respect to local landscape structure. Important towns are expanded in a efficiently compact way, while the spatial arrangement of linear villages are more conserved as part of local landscape. Valuable waterfronts are taken for key urban projects to vitalize the public space. And the industrial developments help to upgrade related services and programs in nearby urban space. On the other hand, the landscape structure participates into the urban form and function organizations. The wetland areas are well conserved and

also contribute in educational, recreational, productive functions. Traditional farmlands are upgraded with improving accessibility and newly implanted agricultural-related programs such as leisure, sport, and tourism. And the green-water network functions as landscape infrastructure to provide multi-urban functions from water transport, bicycle routes, green buffering zone around industry zone etc. Thusly, the urban and landscape elements benefit and cooperate with each other to form a balance structure in both form and function.

Figure84: Vision on local scale
Source: Author, 2013

7. Planning strategies and vision: An integrating dynamic urban-landscape



Vision on regional scale: A mutual beneficial local-regional relation within the dynamic urban-landscape delta context

The vision on regional scale is based on the multi-functional urban landscape in local level. With the protection and revitalizing of landscape's capabilities, both the urban and landscape condition in regional scale would also get improved.

On one hand, the dynamic delta environment on regional scale could be preserved with the respects on landscape qualities. This dynamic delta contributes to better environment conditions and more balance control on urbanization from the regional level.

On the other hand, Changxing islands area could be explored with diverse mutual correlations with surrounding region, thusly actively joining in the regional urban network. If integrating the landscape, more than industrial links could be built between Changxing and surrounding region, but also links in environmental services, links in agricultural services, and links in urban services.



Figure86: Diverse regional correlations
Source: Author, 2013

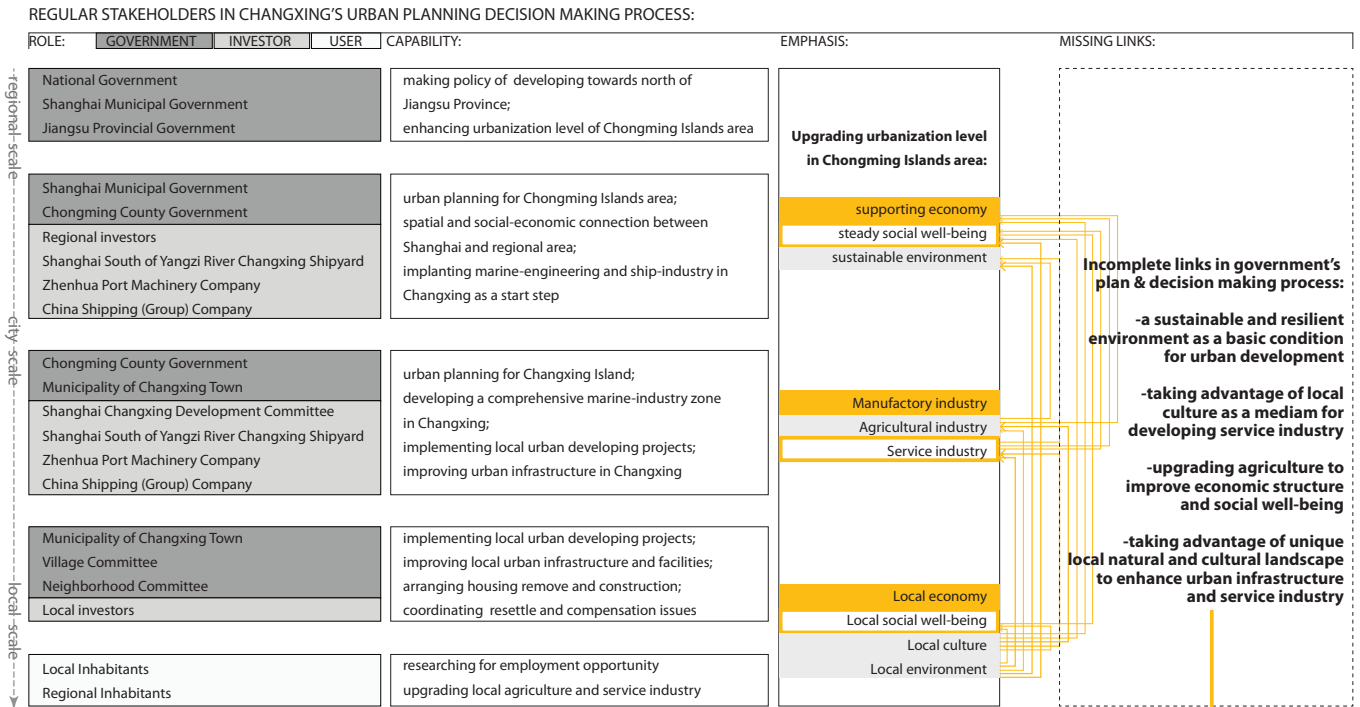
Figure85: Vision on regional scale
Source: Author, 2013

7. Planning strategies and vision:
An integrating dynamic urban-landscape



8. Planning criteria

Testing strategies and vision in long-term process



All the new changes and improvements assumed in vision depend on whether the dynamic urban-landscape relation could be integrated into the planning framework. Such proposal should not only focus on spatial planning level, but also need to review the disadvantages in decision-making process, saying the incomprehensive participation of actors and missing links in planning. After reviewing the current environmental concern in government's planning framework, a more comprehensive guideline based on previous strategies could be reached for design task in the next step.

Thusly, in order to testing whether the strategies for vision could achieve the planning aim effectively, these three main actions are used as criteria in the next step for design task.

Integrating local and regional urban transformation process for mutual benefits.

- the forming process of dynamic local landscape
- the urban transformation trend in regional scale
- the changing role and function of Changxing in regional context

Exploring flexible multi-objective in local urban-landscape

- solve conflicts in different land typologies
- the flexible adaption in local urban-landscape transformation
- integrate local natural and cultural landscape into multi-objectives

Integrating comprehensive stakeholders into decision-making process

- add missing actors and management process in existing decision-making system
- considering participation of specific actors and related management process
- exploring the potential demands of local and regional users

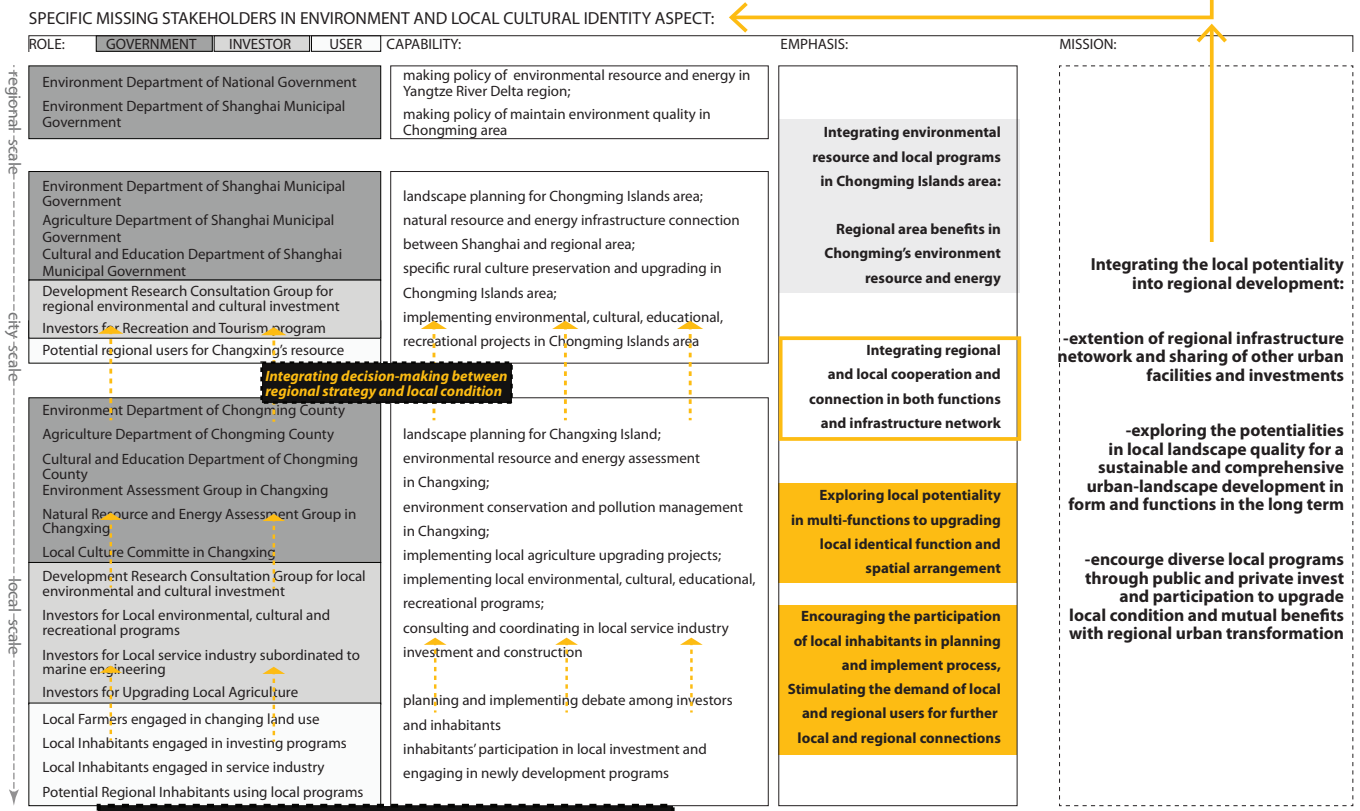


Figure87: Review on government's decision making process
Source: Author, 2012



9.Appendix

- Social and academic relevance
- Time Schedule
- Literature Review

9.1 Social and academic relevance

The social relevance of this project is rooted on the context of China's fast urbanization process. As explained before, there are various kinds of problems among this inevitable urban transformation. The confliction between urbanization and landscape is also among those. This issue is directly related to not only the spatial quality of living environment, but also the social-economic organization in newly exploited urban area. In current situation, numbers of towns and villages face similar urbanization pressure as Changxing. Because of the urge to achieve short-term urbanization goals, their landscape quality and cultural traditions, which tend to effort rather in a invisible way in the long term, are often neglected. This project would try to rise the attention of such misunderstanding of urban-landscape relationship, and provide more environmental senses through exploring the natural and cultural landscape values to maintain a more sustainable urbanization process. And the proposed urban-landscape pattern in Changxing could be considered as an possible reference for other similar planning areas.

While the academic relevance of this project is more focusing on applying the concepts of landscape urbanism, infrastructural landscape, and layer-approach model into practical case. The concept 'Landscape into Urbanism' stands as the derivative exploration of sorts of urban-landscape related theories. The ideas and strategies from Garden City model, from ecological urbanism, from landscape urbanism, and green infrastructure and so on are all been taken into consideration. As response, this project aims at providing a systematic analytical framework and planning principles on this specific theme.

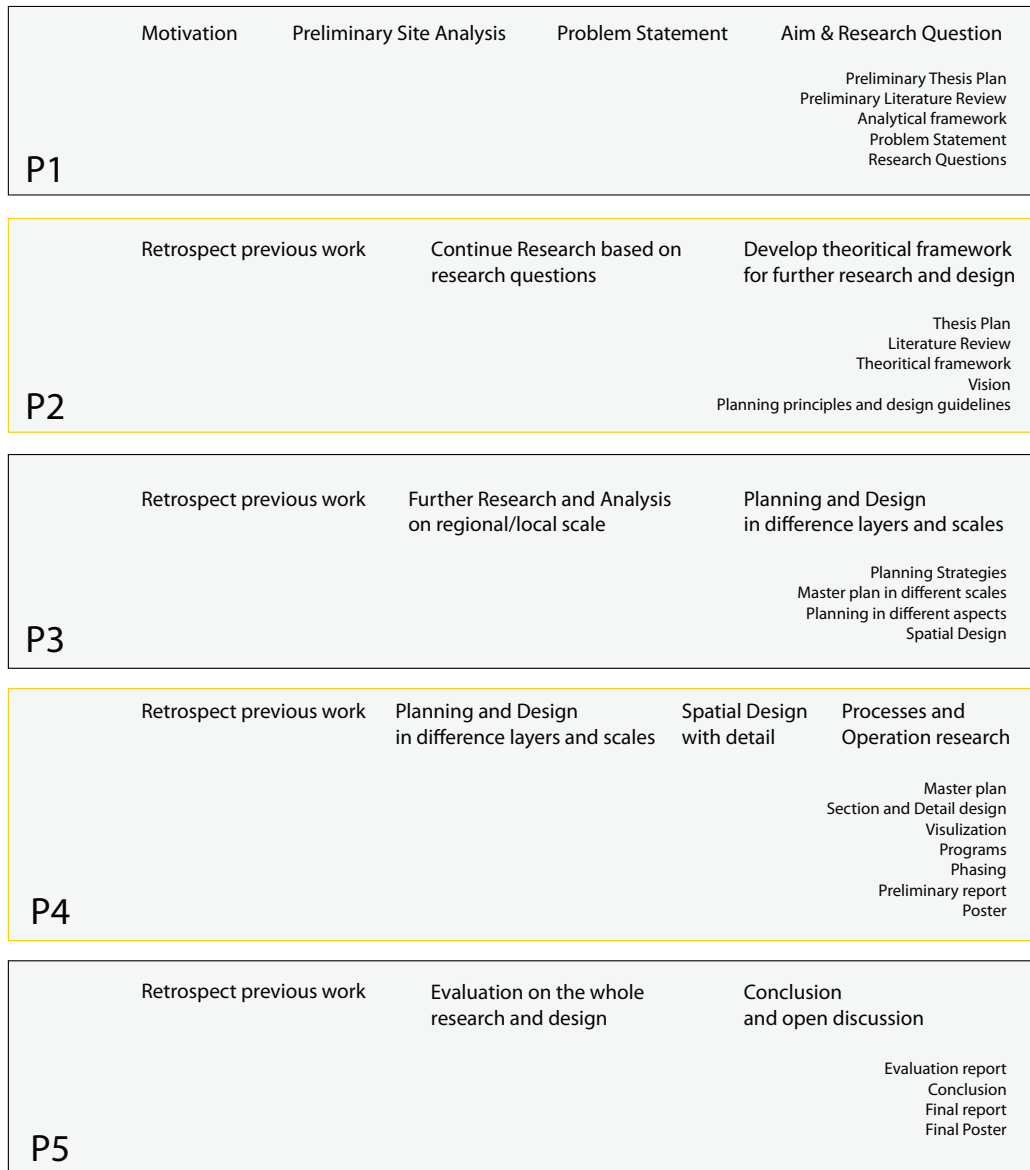


Figure88: Time schedule and expected products
 Source: Author, 2012

9.2 Time Schedule

The whole research and design process will be gradually moved forward through five periods. Each period has its own tasks and products, while at the same time correspond with each other as a flexible feed-back system. As a summary, there will be a presentation in the end of each period for discussion and evaluation. At the end, considering the whole research and design process, we can reach a comprehensive answer for the research question. Meanwhile, this answer could also be taken as another open question for future exploration.

The first period focus on searching motivation for the graduation project, developing a main research theme, and reaching problem statement and research questions of the project through preliminary analysis. The second period is planning for further research based on the previous clues, and aims at reaching a theoretical framework and vision for the project. The third period continues as exploring planning guidelines in multi-aspects and multi-scale for the coming design process. The concrete planning strategies and spatial design in different scales will thusly be arranged in the fourth period. Then in the last period, there will be discussion of the operation process together with the evaluation of the whole research and design.

Integrating Landscape

From Green Infrastructure to Landscape Urbanism

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Abstract –With the inevitable increasing population and continuous urbanization as a global trend, the pressure from various urban problems intermingled with environmental issues has been more and more obvious in the urbanization process, which lead to a rising environmental thinking on urbanism. This environmental conscious leads to a rethinking of the urban-landscape relationship.

On one hand, series researches such as ecological urbanism (Mostafavi, 2011), sustainable urbanism, eco-cities etc. contribute to deeper understanding on urban ecosystem (Sijmons, 2009). These theories thus pay more attention on the ecological characters of urban landscape. As a respond to such recognition on urban ecology value, the theory and practices of green infrastructure stand out as one of the essential strategies to conserve the valuable quality in urban ecosystem. On the other perspective or as an alternative exploration on value of green infrastructure, the rising concept of landscape urbanism in recent decades continues to explore whether and how the capability of landscape system could function not just providing ecological services, but also as a resilient framework or medium for urbanism in the future (Corner, 1997;2003; Waldheim, 2006). As a combination of these two sides, the landscape was clarified with mutually reflection on urban function and development pattern through its systematic form as green infrastructure in urban system.

This literature review paper aims at exploring the argument on whether and how could the landscape integrate with urbanism. The review would focus on searching concrete understanding of green infrastructure and its specific planning principles and spatial forms in practices. Beginning with introduction of rising environmental thinking, the review will overview the ecological service value in urban landscape. Then follow with the theories of green infrastructure as a main spatial form of such landscape quality in urban context. As an additional developing point to the landscape's potential infrastructural character, the concept of landscape urbanism will be discussed to expand the understanding of landscape's role as a flexible medium in urban development process.

To conclude, this literature review will explore the concept, characters, and strategies of landscape as a flexible medium in urban system. And this result would be taken to provide planning principles and critical evaluations on the concrete urban-landscape strategies on the personal graduation design.

Key words –Green infrastructure, landscape urbanism, infrastructural landscape, urban planning

1 Introduction: the context of rising ecological thinking on urban planning

1.1 environmental risks and changing climate: uncertainty on tradition urban planning and future condition

The ever-urgent environmental issues have rise alarms to human society. The increasingly emerging environment pollutions, scarcity of natural-social resources and fragmented urban landscape may require a retrospective and predictive thinking on the traditional urbanization pattern, especially on

urban planning concerning with environmental aspect.

In recent decades, environmental disasters have arose more and more attention on environmental risks due to climate change. The notorious Hurricane Katrina attacking Florida unveiled the weakness of modern urban areas facing flooding as extreme events. Other than normal environmental pollutions, climate change brings more uncertainties, as mentioned Dessai said that "... three decades of research on climate sensitivity have not reduced, but rather have increased the uncertainty surrounding

the numerical range of the concept." (Dessai et al, 2009). What's more, as a global phenomenon, the impacts of climate change are local, while we do not know how, where, when and with what intensity these general feathers will translate at the local level (Giordano, 2012). Thusly, the current predict-and-act approach towards certainty around climate change impacts might be elusive (Lempert et al, 2004).

Together with formal environmental issues, climate change adds additional uncertainties to the traditional framework of urban problems, and forms a particular threat to the rigid long-term urban infrastructure. Therefore, it is crucial to take climate change challenges into the planning process at both national and local levels in the long term when it comes to plan, design, build, operate and maintain urban infrastructures (Giordano, 2012).

1.2-A retrospect on conventional urban planning on environmental aspect:

Apparently, existing land and associated elements have been intentionally removed or revised by human actions, saying as the "disturbance patch" in landscape ecological concept (Forman, 1995). While it is argued that the conventional urban planning practices somehow ignored the natural configuration (Benedict & McMahon, 2002). The tangible processes of urbanization in urban and rural region simplify species compositions, disrupt hydrological systems, modify energy and material cycling of ecosystems. As a consequence, the ecosystems in urban or even rural areas are rapidly becoming fragmented, transformed, or entirely lost. (Douglas, 1983; Grimm et al., 2000; Whitford et al., 2001) Such tabula rosa planning and actions lead to not only interruption of ecological systems but also interruption of human cultural systems that the ecological process of a place has been significantly impaired and the physical manifestations of cultural associations with the place have also been altered or erased (Satherley, 2006). And this disturbance shall be blame not simply on urban growth due to increasing population, but also the pattern of urban growth such as urban sprawl (Daniels & Lapping, 2005).

From the early 1970s, an environmental movement emerged in western nations recognizing this issue reacted to adapt sustainable means of living and development (United Nations Division for Sustainable Development, 1992). The concept of "Sustainable development" refers to "a mode of human development in which resource use aims to meet human needs while preserving the environment so that these needs can be met not only in the present, but also for generations to come" (United Nations, 1987). Under this guideline, several related theories emerged regarding the urban

ecology and resilience in urban planning thinking and practice. These sorts of theories start to emphasize the smart growth pattern and urban resilience as a retrospect on conventional urban planning. The ecological pattern and process in man-made physical conditions and the resource management are particularly studied for the understanding of the special urban ecology system (Niemela, 2011). Such ecological urbanism view the fragility of the planet and its resources as an opportunity for speculating planning and design innovations –new approaches and new sensibilities that have the capability to incorporate ecology and urbanization (Mostafavi, 2011).

2 Green Infrastructure as a bounding approach: why, what, how

2.1- The emerging of green infrastructure:

Under the context explained previously, the only certainty might well be that we have to learn and live with uncertainty and try to set up plans with a certain degree of flexibility for urban resilience (Sijmons, 1990). Urban resilience means the capacity to absorb external disturbance and reorganize the function and structure of system itself during and after extensive changes (Peterson et al., 1998; Folke et al., 2004). And to preserve such a resilient urban ecosystem that offers ecological functions underpinning sustainable human development, the conservation of ecological diversity has become a crucial goal of urban planning (Beatley, 2000; Kim & Pauleit, 2007; Lovenhaft et al., 2002; Rookwood, 1995; Motberg et al., 2007). In 1969, McHarg proposed the idea of using ecology as a basis for design on landscape and urban planning. He expressed this vision as "enhancing the creative fit of man-environment, realizing man's design with nature" (McHarg, 1969). The functions of ecological system in urban regions include supporting balance ecological process and recycle, providing cultural values such as recreations, enhancement of property and community cohesion, provisioning for food, water, fuel, and regulating environmental functions (Daily, 1997; Flores et al., 1998). Therefore, a framework for promoting urban ecological values in multi-functional, multi-scale and systematic way is introduces, saying green infrastructure (Benedict & McMahon, 2002).

2.2-the concept and characters of green infrastructure:

Green Infrastructure (GI) is defined as "an interconnected network of green space that conserves natural ecosystem values and functions and provides associated benefits to human populations. It is the ecological framework needed for environmental, social and economic sustainability-the natural life support system for the

nations ...It is introduced as a strategic approach to land conservation that addresses the ecological and social impacts of sprawl and the accelerated consumption and fragmentation of open land” (Benedict & McMahon, 2002). The ‘green space’ in this definition is not limited in urban green space or parks, but also refers to waterways, all kinds of natural habitats, greenways and other open lands at all spatial scales (Barker, 1997; Tzoulas et al., 2007).

Various natural and restored ecosystems and landscape features consist two main components of GI as “hubs” and “links” (Benedict & McMahon, 2002). Hubs provide natural habitats for the wildlife and related ecological process passing through. Links connect the system together and enable the interconnected network function well. This character of connectivity originates from two important precedents: 1. the linking of parks and other green spaces for human benefits; 2. the linking of natural areas for ecological benefits in keeping biodiversity and countering habitat fragmentation. As the famous landscape architect pioneer Frederick Law Olmsted stated that “no single park, no matter how large and how well designed, would provide the citizens with the beneficial influences of nature.” And “parks needed to be linked to one another and to surrounding residential neighborhoods” (Charles, 1989).

What’s more, GI has adapted the principles of greenways (Little, 1990; Fabos, 2004) , expanding landscape debates from the analysis of isolated green space design and management towards a multi-functional and systematic network approach. Thusly, the distinguish character of GI lies in its ability to integrate the principles of connectivity, multi-functionality and strategic management to support a more holistic planning approach (Weber et al., 2006; Tzoulas et al., 2007). And it applies landscape ecology further on urban planning and design in practice (Mell, 2010).

2.3-the effort of green infrastructure:

In 1999, the states from the USA Council that “GI strategies actively seek to understand, leverage and value the different ecological, social, and economic functions provided by natural systems in order to guide more efficient and sustainable land use and development patterns as well as protect ecosystem.” (The President’s Council on Sustainable Development, 1999) along with innovative projects has led to a rapid spread of the concept and application of GI.

The role of GI in landscape management and urban planning depends on a number of variables: location, assessed need, policy and existing resource base. What it offers is not a singular or uniform process that rigidly applied in all environments, but an

adaptive approach (Mell, 2011). Considering the development of GI on global spread, there is a growing consensus on how it differs spatially and what it can achieve. The contents from Table 1 summery GI’s main focuses in different regions. Such variation suggests that the projects labeled as “GI” could provide geographically-adaptive and joined-up applications (Benedict & McMahon, 2006).

UK	North America	Europe
i. Community forestry ii. Sustainable urban design iii. Urban renaissance iv. Sustainable communities v. Climate change adaptation vi. Healthy lifestyles and landscapes vii. Biodiversity and conservation	i. Climate change adaptation ii. Micro-climate control in urban areas iii. Biodiversity conservation and assessments iv. Sustainable urban design v. Sustainable drainage systems vi. Smart Growth vii. Water resource management	i. High density urban development ii. Mobility iii. Climate change mitigation and adaptation iv. Sustainable urban design

Table 1. Focus of green infrastructure planning in the UK, North America and Europe, (Source: Mell, I.C., 2011).

Generally speaking, the application of GI theory provides adaptive theoretical and practical solutions to the continued ecological demands upon urban areas (Mell, 2011). The GI system helps to protect and restore ecosystems in urban context by providing a framework for sustainable future development that fosters a diversity of ecological, social and economic benefits (Benedict & McMahon, 2002). Due to the lack of informed valuations of environmental resources, ecological values based in urban landscape context are often marginalized. As a respond, GI aims to bring urban planners, ecologists, architects and developers together and propose a holistic and functional understanding of the ecology of urban environments (Benedict & McMahon, 2006; Mell, 2009). Further more, it addresses the need to view urban landscape as a platform for adaptive investments (Benedict & McMahon, 2006; Tzoulas et al., 2007; Tynanine, 2001; Castleton et al, 2010).

Through this process, GI promotes a complex amalgamation of ideas within a coherent and pragmatic approach to green investments which bring together the understanding of ecological networks (Ignatieva, Stewart & Meurk, 2011), connectivity (Kambites & Owen, 2007) and multi-functionality with the sustainable development agenda (Lindsay et al., 2001) to frame its innovative spatial delivery (Madureira, Anderson & Monteiro, 2011).

As a summery, the benefits of integrating GI into land-use and urban planning process (Benedict & McMahon, 2002) could be listed below:

- Recognizes and addresses the needs of people and nature;
- Provides a mechanism to balance environmental and economic factors;

-Provides a framework for integrating diverse natural resource and growth management activities in a holistic, ecosystem-based approach;
 -Ensures that both green space and development are placed where they are most appropriate;
 -Identifies vital ecological areas priors to development;
 -Identifies opportunities for the restoration and enhancement of naturally functioning systems in urban areas;
 -Provides a unifying vision for the future;
 -Enables communities to create a system that is greater than the sum of its parts;
 -Provides communities and developers with predictability and certainty;
 -Enables conservation and development to be planned cooperatively.
 Therefore, GI plays a role of connecting various landscape features and promotes the diversity, access and mobility of landscape ecosystem (Farina, 1998; Jongman et al. 2004). And with the embedment of multi-functionality (Valentine, 2001; Sibley, 1995; Peet & Watts, 1996), the efforts of GI also have complex interactions in social, economic and cultural aspects, including providing access to green space for social well-being (Mansor, 2009), promoting environmental education (Fjortoft & Sageie, 2000) etc. More details are shown in Table2.

Green Infrastructure Benefits by Type

Type	Benefit
Environmental	<ul style="list-style-type: none"> -Increase carbon sequestration -Improve air quality -Efficient land use -Improve human health -Flood protection -Drinking water source protection -Replenish groundwater -Improve watershed health -Protect or restore wildlife habitat -Reduce sewer overflow events -Restore impaired waters -Meet regulatory requirements for receiving waters
Economic	<ul style="list-style-type: none"> -Reduce hard infrastructure construction cost -Maintain aging infrastructure -Increase land values -Encourage economic development -Reduce energy consumption and costs -Increase life cycle cost savings
Social	<ul style="list-style-type: none"> -Establish urban greenways -Provide pedestrian and bicycle access -Create and enhance livability in urban green space Educate the public about environment protection -Urban heat island mitigation

Table 2. Green Infrastructure Benefits by Type. (Source: Benedict & McMahon, 2002).

2.4-planning principles of GI:

In order to insure GI to be planned holistically and implemented publicly, several principles for GI planning are stated by Benedict and McMahon as below:

1. GI should function as the framework for conservation and development: using GI planning to identify opportunities to restore the vital ecological connections and maintain those protected areas, so that the adverse impacts of rapid urban growth on ecosystem could be reduced.
2. Integrating GI in the planning and design of development projects: GI provides an ecological framework that identifies the critique

ecological hubs and linkages for protection in advance of development.

3. Linkage as a key element: On one hand, GI system requires strategic connections between components to maintain vital ecological processes and services. On the other hand, the linkages between different related agencies, nongovernmental organizations and private sectors are necessary.
4. GI functions across jurisdictions and at multi-scales: GI system connects across urban, suburban, rural and wilderness landscapes at national, regional, community and parcel scales.
5. GI is grounded in interdisciplinary theories and practices : landscape architecture, urban planning, civil engineering etc. contribute to the successful planning and design of GI system.
6. GI is a critique public investment: As a public issue that benefits environmentally, socially, economically, GI involves diverse stakeholders and actors in the whole planning process.

3. Further exploration on green infrastructure: landscape urbanism as a rising concept

3.1-the limitation of green infrastructure:

The rising GI and the environmental thinking as its basement also lead to a retrospect on the role of landscape in current urban context. ‘Landscape’ is quite an oscillating term. It is initially formed by natural power that offers natural resources and near-nature impressions, but it is not nature by itself-it is a man-made cultural and aesthetic product (Sprin, 1996; Schmelzer, 2012). Meanwhile, “What landscape finally differentiates from the city is not its cultural shaping, nor the category of aesthetical perception. In the deepest core the term in differentiation to city implies a vision of nature in landscape.” (Wolfrum, 2002) On the other hand, in conventional think also distinguish ‘urban’ and ‘landscape’ by viewing the city as an artifact place against the background of the non-city, separated from its environments (Velder & Wit, 2009). In another word, “The historical footprint of the city is a definite limited space in an indefinite, limitless landscape.” (Steenbergen, 2008)

However, with the increasing urban development, the distinctive physical characteristics of city has shifted into a rather indistinctive, fragmented territories, where the border between urban and landscape is blurred (Velder & Wit, 2009; Schmelzer, 2012). With the development of technology and civil engineering, city has been more and more open to its surrounding landscape through expanding infrastructure and urbanization. This shifting position could be view from the changing stages of landscape in urban region,

especially clear in the metropolitan area (Steenbergen & Reh, 2003; 2011). At the beginning, landscape is introduced as an Arcadian territory in the city in the form of country estates in urban hinterland [fig1]. In the second stage, the opening up of the city stands as the urban park as a colonization model [fig2]. And then the urban landscape continuously transforms into urban grid or with street system [fig3]. The current stage turns out to be the disappearance of distinction between city and landscape that city and landscape are united in an 'unlimited' urban field of hybrid intermediate form (Velder & Wit, 2009) [fig.4].

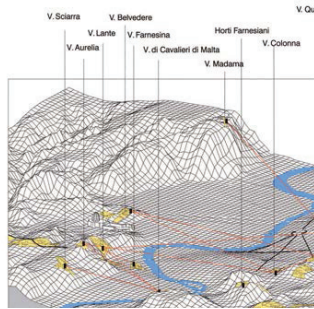


Figure 1. Landscape and Metropolis phase 1: the unlocking and architectonic integration of city and landscape by means of the country estate, (source: Steenbergen & Reh, 2003, p17)



Figure 2. Landscape and Metropolis phase 2: the opening up of the city perimeter with the city park as a colonisation model. (source: Photograph by Marie-Laure Hoedemakers.)



Figure 3. Landscape and Metropolis phase 3: the park system as an urban framework within the open body of the city, (source: Olmsted & Eliot, 1894)



Figure 4. Landscape and Metropolis phase 4: Urban-landscape continuum, (source: Velder, 2009)

Thusly, in such opening process, the relation between 'urban' and 'landscape' could be argued to be interdependent that the urbanization process influence surrounding landscape strongly, while the topographic and productive characteristics of landscape also effect urban forms (Velder, 2012), and the urban landscape tends to an innate and non-hierarchical relationship between artifice and nature (Lerup, 2000). Under such shifting territory, other than the urban ecological values emphasized by GI or conventional urban planning, a more integrating approach to exploring the potentialities of uncertain territories without definitive boundaries. (Koolhaas, 1995; Schmelzer, 2012).

3.2-the rising concept of landscape urbanism

As a further step over GI's ecological thinking on urban aspect, landscape is argued as an instrumental tool to think and regulate spatial phenomena of territories under the concept of Landscape Urbanism (LU).

The concept of LU has been discussed by numerous voices. Referring to Charles Waldheim, LU "describes a disciplinary realignment currently under way in which landscape replaces architecture as the basic building block of contemporary urbanism. For many, across a range of disciplines, landscape has become both the lens through which the contemporary city is represented and the

medium through which it is constructed." (Waldheim, 2006) And AA defines that " LU constitutes a collective endeavor to construct a new mode of practice where techniques and modes of operation historically described as landscape design can be integrated into the domain of urbanism. Landscape is incorporated primarily to provide a thematic and scalar opportunity to engage directly with the systems of forces that continuously reconfigure the city. It offers the double opportunity to re-frame urban problems an to re-contextualize the practice in general."

These two representative explanations put LU in the position of a update planning and design principle for the contemporary urban situation. As a response to the complex urban environment and non-linear approaches in post-modern theoretical and visual practices, LU actually proposes an innovative thinking that bringing the design practices of urbanism and architecture into contact with landscape to rejuvenate all three (Hight, 2003). It could be summarized as "a strategic approach to the formation of an urban scheme through the transformation of processes related to landscape". (Gray, 2007)

3.3-the characteristics of landscape urbanism

The main emphasized points of LU could be pointed as: cross-disciplinarily, process and openness (Reed, 2006; Steiner, 2006; Wall, 1999; Corner, 2003;2006; Czerniak, 2006).

First of all, LU draws from an understanding of various disciplinary, functions, spatial formations and impacts both in urban and landscape aspect. It is widely cross-disciplinary and functions across territories of vast scale and scope (Czerniak, 2006; Corner, 2006).

Secondly, LU is perceived as a synthesis of natural and social process. On one hand, this character contributes to conceive urbanism not only as a functioning matrix of connective tissue that organizes objects and space, but also a constantly dynamic process containing all the events moving through (Wall, 1999; Steiner, 2006). The dynamic landscape standing as an active surface, then offers a framework to structure the conditions for new interactions among it (Wall, 1999). Thusly, the urbanization and its process as a whole could be viewed as a kind of human ecology then that it contains complex interrelationships with constant productivity in spatial organization and emergent order (Sijmons, 2009). On the other hand, this 'process' requires operative methods other than merely rigid forms in LU. There is a shift from 'image-based planning' to 'operative method' in LU that it prioritize the way in which things evolve (Mostafavi, 2003).

The third important point of LU is described as 'openness' (Connolly, 2004). This character expresses itself as the emphasis on operation and adaptability in multi-scalar and flexible forms towards various disturbances (Connolly, 2004; Buttner, 1998; Reed, 2006). Uncertainty in urban context derives from the own urban problems and pressure from climate change. It is argued that there's no final mature form in such uncertainty. As such, the urban-landscape situation may be regarded as 'being evolutionary' (Marshall, 2012). With the aim of being adaptive, the urban-landscape organization in LU points to 'a looser, emergent urbanism', tries to offer an alternative to 'the rigid mechanisms of centralist planning' (Corner, 2003). Although such a dynamic, open-ended matrix could hardly be operated upon with any certainty outcome, such complex interrelation still stays in a surface stage with no clear ideas about what and how materialization would happen beyond the notion (Read, 2007; Ware, 2007). At present, it is still 'a productive attitude' (Corner, 2003), a certain type of ethos to 'a way of doing and a mentality with privileging certain values' (Hight, 2003). In another word, although such openness is expressed in LU, its fully implications have not been explored (Connolly, 2004).

In summary, landscape is proposed to be a model for urbanism in the theory of LU. Because landscape's obvious relationship to the extended field of the contemporary city, it could potentially provide not only configuration, but also dynamic performance in the long term from its surface condition (Stan, 2002). As a complex amalgam, LU stands as an attitude of thinking and acting that activate urban-landscape as an alternative retrospect to traditional space making (Stan, 2002; Corner, 2003).

4 Conclusion: Infrastructural landscape: a combined evolving strategy

As a review to the content before, the emerging of both GI and LU reflects the fact that the changing urban-landscape relationship with unknown future requires and regenerates a new integrating method which is based on sustainable development in the long term (Geuze, 2010). The changing role of landscape from the background of urban context to an positive actor stands as a clue for the shifting from GI to LU. In GI, the value of ecological services is recognized and systematically organized as practice approaches to converse urban ecology and other related urban-landscape functions in social-economic aspects. While based on this ecological thinking, LU takes a further step to imply landscape character as a model for urbanism. More

than conserving ecological values in urban context, LU proposes 'process over time, the operational method and the imaginary' as alternative thinking and acting in urban transformation (Corner, 2006; Doherty, 2005). What it is emphasized in LU is 'a process, rather than design', and 'a creation of potential' (Corner, 2004). Corner argues that such process cannot be designed in total, but must be 'grown' in seeding, cultivating, propagating and evolving (Corner, 2005). Thusly, the key element that differ LU from GI is pointed as a looking at ecology, not for technique, but for metaphor that for "ideational, representational and material implications with respect to cultural processes and evolutionary transformation" (Corner, 1997).

From GI to LU, the attempts to integrate not only ecological values but also ecological-cultural process between human-nonhuman ecosystems advance (Satherley, 2006). As conclusion for the review, landscape could be proposed as a medium that flexibly adjust to future urban growth while help to maintain the continuity of urban ecosystems. This inspires my personal projects not only to take environmental thinking into consideration, but also explore to integrate landscape as a flexible soft urban infrastructure to deal with urbanization issue in urban-landscape structure, planning framework, and spatial form or process.

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