
REFLECTION

REFLECTION ON THE RESEARCH OBJECTIVE

OBJECTIVE

TO EXPLORE STRATEGIES/DESIGN PRINCIPLES FOR WATER RESILIENT URBAN LANDSCAPE DEVELOPMENT BASED ON DIKE-POND SYSTEM, WATER MANAGEMENT METHODS IN THE FLOODPLAINS OF THE WESTRIVER THROUGH MULTI-SCALE

The result of the research has met this objective through developing the follow sub-questions:

1 -What are the traditional dyke-fish pond system and ecological water management and its social structure through different levels(region, village, building) ?

The lessons from different system are learned through taking a deep look at the result and process of history practice in relation to water management, agriculture and urbanization. The result has shown that these different elements are closely connected to each other to form a layer system that has its own dynamic and would affect each other in different levels.

2-What are the principles about living with water including water cycles(water storage, drainage and purification), ecology(restoration of biodiversity, dynamic), agriculture(recycling) and social structure(water culture, activities)?

The result has shown that a cross-scale principle and multifunctional water management principle is vital for all the different system to work closely and effectively. In addition, other principles like: Long-term development process; Collaborative effort; Understanding terrain conditions; Working with nature and space for water; Re-use and circularity are also found very important towards the research. All these principles are learned from historical practice in this region and could be related to practice in other places of the world like Netherlands, Indonesia.

3-How to apply principles in design explorations in different geographical environment(plain and mountain) in relation to water management(flood storage and drainage, grey water purification and storage, rain water harvest), ecology(restoration of diversity, dynamic), urbanization(increase of water dynamics, excessive water storage, water reuse, increase of flood resilience) and social structure(recreation around water, new typologies of public space)?

This question is answered by multi-scale plan and design of a new water landscape in Xingtian county, Shunde district as an example. The result includes a strategic plan for the future water management, ecology development, infrastructure and urbanization in Xingtian county and a series of tool kit showing how to transform the current landscape to it. An elaboration in Village and building scale helps to explain how the water management could benefit for the spatial quality, water living and public life.

SPECIFIC LESSONS AND PRINCIPLES FROM THE RESEARCH

4-What are the lessons learned(principles) of connecting agri-aquaculture, water management, urbanization to make a new type of delta urban landscape?
-What is the possibility of its application in other region?

The general knowledge extracted from the research has a very important application also for other region in Pearl River Delta and other places among the world towards a new paradigm of living with water and developing with water. The water management through multiscale has proved that once applied to larger context of the delta, it would also work because of similarity in the existing situation. However, the Pearl River Delta is a large delta with different affection from the sea, river and rain water. For example when applying to the sea shore of this region like Shenzhen and Zhuhai, other principles should also be brought forward towards problems like sea level rising, salt tide infusion and hurricane.

1. Dyke-fishpond A special agriculture pattern

The dyke-fishpond system is a very special form of aqua-agriculture that is never found in other places in the world. It only appears by over thousands of observation and fighting against the flood in Pearl River Delta and becomes a specific agriculture landuse in this region.

2. A special human settlement closely connected to water

As a large amount of Pear River Delta is formed from the water as fluvial plain, all the public life, production, transportation and even religion and political system is originated from water. For instance, the house is located in the dyke of fishpond and public buildings like temples and libraries are connected with Fengshui ponds for collecting water. Water is not only a nature in this region but also a belief of fortune and luck. It became a form of god (the turtle god) to be worshipped and the dealing with water issue generated the initial

government in this region from the bottom to the top.

3. A broken chain with history and dramatic urban development

Because of the good natural condition and political concessions, the Pearl River Delta has been witnessed a great change from rural situation to one of the fastest developing area in the world. This fast development has brought a dramatic transformation and demolishment of the native landscape that has been formed step by step. This arises a consciousness of how to protect the historical heritage and develop upon it, instead of destroying everything and build from zero. Thus it becomes a very interesting case to elaborate and as a result, the proposal in this thesis could contribute to the plan and design exploration for a more sustainable future for this delta.

GENERAL LESSONS AND PRINCIPLES FROM THE RESEARCH

1. Long-term development process

Phase plan & design

The formation of the special water management and urbanization in Pearl River Delta takes over millennium and it also applies for other region of the world to value the process. Landscape is a process of different layers: water network; topography; soil ; infrastructure; landuse like agriculture and urbanization. These layers affect each other and have their own dynamics. This knowledge could also applied to other region to take the landscape development as a process instead of a result. Thus, to deal with the uncertainty and to offer more flexibility, it's important to take the design phase into consideration. The nature and built environment have different speed of growing or construction so the different development stage shall be planned.

2. Multiscale approach

Design across scales

The water system is a continuous system that connects different watershed and

flooding area together, which means a simple change in one level would affect the others. The historical water management of Pearl River Delta has been applied from regional scale, county scale and village & building scale as a complete system. It also applies to other river or sea zone in the world to think across scales and deal with water as a large system. In addition, for a broader context that has less relationship with water, it's also important to work through scales that have influence on each other.

3. Collaborative effort

Design for connecting political system

The water management in Pearl River Delta has been formed by a cooperation from different local governments and regional plan to work across political border. It also applies to other context because the landscape is usually highly connected to each other without a clear border. Thus it's important for a landscape architect to think beyond given site boundary.

4. Understanding terrain conditions

The natural topography and terrain condition provides a place with special development not only for water, soil and vegetation, but also for urbanization. A proper understanding of the terrain would help to plan the different development reasonably.

5. Working with nature and space for water

As the climate change becomes more and more serious, it would be vital to draw lessons from all over the world. The Pearl River Delta lessons of working with nature such like: keep proper distance between river dyke and the main water course; Work with the natural sediments to create islands would be very helpful for other region that has flood problem. This principle has also been applied in Netherlands as the project "Room for river". In the result of the plan a new flooding zone is created for hold excessive river and rain water which would be transformed by nature into a river flood plain. Besides, the modern practice

has shown failure in broad context that controlling nature is not possible and heavy price has been paid. Instead, working with nature means landscape planner or designer should respect the natural law and design with it and use it as a powerful tool.

6. Multifunctional water management

The historical water management in Pearl River Delta not only works for drainage and water collection, but also stimulate transportation, agriculture and housing. As is also shown in other cases around the world(eg. the multifunctional dyke in Netherlands), an integrated design and plan of water infrastructure offers multiple benefit for living, recreation and eco-system developing and it works well. The modern practice of single system is neither effective nor attractive to other development, which proves to be high cost and not working. Thus when thinking about the water management in a broader context it's always important to think what is the development that could be stimulated by it.

7. Re-use and circularity

The dyke-fishpond system works very well in its material circulation. To plan and design a more sustainable future, it's very important to take this principle into consideration in world wide context. This principle could also be used through scales from a circulation in rain garden to an urban metabolism in a city. The lesson learned here contained special crops, animals and soil condition while the principle of making circular design is very important towards limited source in the world.

ROLE OF DESIGN IN RESEARCH

1. Design as a research orientation

The design plays an important role in this research by setting a clear target for the it. Since the research area is so large that one could spends a whole life on it, it helps a lot to first set a design target and narrow down the research

field. For instance, the design intention was set up during P1 as a new framework for resilient urban landscape by transformation of historical aqua-agriculture and eco water management. This target has defined a clear direction for the research and put forward categorical questions that needs to be answered in order to get there. Thus, to set up a design proposal in the beginning helps a research in determination of direction.

2. Design as a test tool for research

To test if the principles and strategies resulted from a research could work, design is a good tool. In addition, it's also a good opportunity to transform the knowledge from research and put it into practice. The result is not often satisfactory yet it illustrates a possibility of the solution to certain problems. In addition, one principle found in specific site that seems not be working well anymore might be utilized in another place. Sometimes it even works better. In that sense, the design is a very useful tool that could help research from all aspects based on this case.