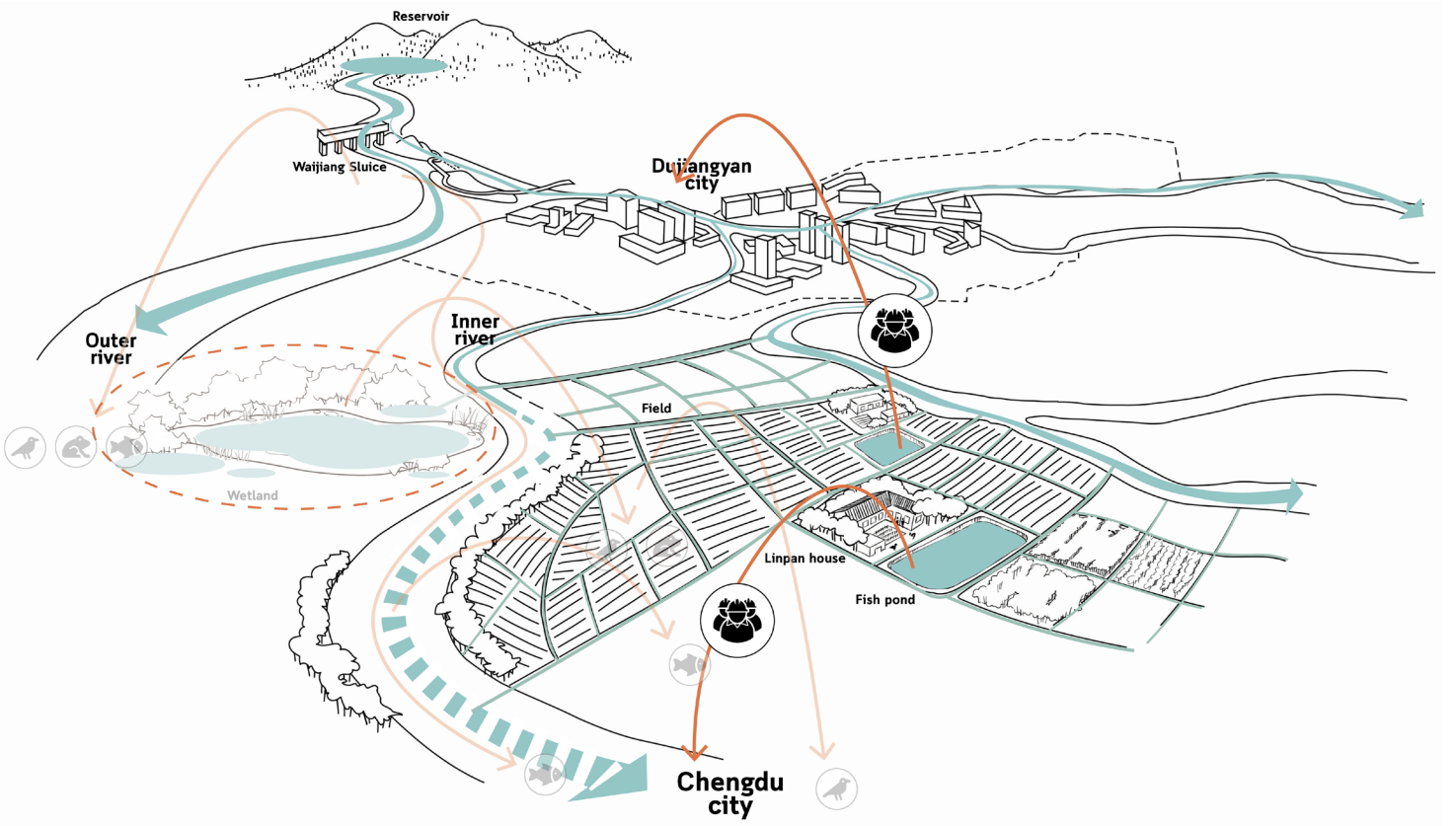

Bring Linpan back to life.

Revival of the Linpan community, Sichuan, China, in a modern context through adaptation and appreciation of its circularity.

Zhiyun Zhang

2023 Graduation Project

Colophon.

Bring Linpan back to life
Revival of the Linpan community, Sichuan, China, in a modern context through adaptation and appreciation of its circularity.

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P5 report
December, 2023

Flowscape studio-Circular water stories
MSc Landscape Architecture
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Acknowledgement.

During my two-year tenure at TU Delft, I have experienced significant personal and academic growth. I would like to extend my sincere gratitude to all those who have supported me along the way.

First of all, I want to express my sincere appreciation to my mentors, Inge Bobbink and Yawei Chen. Since my first year as a graduate student, Inge has always been a knowledgeable, professional, considerate, gentle, and humorous teacher in the minds of all my classmates. Her unwavering commitment to providing academic guidance, drawing upon her extensive experience and unique perspective, has played a crucial role in refining both the general direction and intricate details of my graduation project. Inge has also been a source of tremendous spiritual support, motivating me to persevere through moments of confusion or lack of motivation. I would also like to extend my gratitude to Yawei. Her exceptional professional theoretical expertise and cultural background have enriched my foundational knowledge and facilitated logical organization. She has been vital in providing valuable guidance on developing my theoretical framework and constructing coherent written content. The support and mentorship from both Inge and Yawei have been integral to a complete and convincing project. I am profoundly grateful for their contributions to my educational experience at TU Delft.

In addition, I would like to express my gratitude to all the students at the Circular Water Stories Lab. They have opened my eyes to the different ways landscape students from different educational backgrounds think, research, organize, and design. Working with them have enriched my knowledge of water and the discipline of landscape.

Of course, I couldn't have gotten this far without my family and friends. I appreciate my parents deeply for respecting my decision and going out of their way to support me, both emotionally and financially, during crucial decision-making moments. Additionally, I've been fortunate to have wonderful friends who've been there through thick and thin, sharing both the joys and challenges. Their companionship has been pivotal in navigating the ups and downs of my academic and personal life, and their words and actions have consistently served as a source of motivation and encouragement for me.

Menu.

1

INTRODUCTION

Background
Problem Statement
Research Question

"In the face of this transformation, the rural heritage landscape is at a crossroads, grappling with unique problems that require prompt attention and innovative solutions."

Background.

Rural heritage landscapes around the world

The worldwide rapid development has led to an unprecedented urbanization process, which has brought numerous challenges and complexities to the rural-urban landscape in many different countries. Urban sprawl results in the loss of character of surrounding rural landscapes, entails the urbanization of natural and agricultural environments, and the fragmentation of natural-urban habitat, and affects the respective ecosystem.

Among them, rural heritage landscapes with significant historical and cultural values face even more severe and complex problems. They record the trajectory of mankind's productive activities and bear witness to mankind's wisdom in living in harmony with nature in different environments and periods. In the face of this transformation, the rural heritage landscape is at a crossroads, grappling with unique problems that require prompt attention and innovative solutions.

China's Challenges

China's economic ascent over the past few decades has been nothing short of remarkable. However, this rapid development has been largely urban-centric, leading to the underdevelopment and neglect of the rural areas. The country is currently grappling with the need to balance the conflicts between rural and urban land utilization, infrastructure development, and the allocation of human resources. At the same time, its large population, long history, complex geographic composition and particular social system make the challenge even more difficult. These are issues that took centuries to evolve and resolve in Western societies, but China must address them within a compressed timeframe.

Linpan rural landscape: A Unique Case Study

Linpan is a unique traditional rural landscape, mainly found on the plains of western Sichuan, China. It is known for its traditional agricultural practices, characterized by a harmonious coexistence between people and nature. The centuries-old terraced fields, forests, and intricate irrigation systems represent a sustainable way of life that is deeply rooted in the region. The traditional architecture, festivals, lifestyles and the interdependence between human and nature can definitely be viewed as rich cultural heritage, which also provides valuable insights into the historical and cultural aspects of rural life in China.

After learing about this region, I decide to study Linpan landscape as an example of rural heritage landscape stems from several considerations. Firstly, this region has received limited attention in the realm of academic research, making it an ideal candidate for in-depth exploration. Secondly, like many other rural region, Linpan has received an onslaught of expansion and development from neighboring cities, especially the neighboring city of Dujiangyan and the provincial capital of Chengdu. From this perspective, Linpan is representative of many rural areas in China, making it a valuable case study to understand the broader implications of rural heritage landscape preservation and development. Lastly, Linpan landscape exhibits unique characteristics that deserves study and preservation.

Chengdu Plain Linpan settlement.
Source: Time of Day·History of Chengdu

Problem Statement.

Out–migration and aging

Dujiangyan, like many other rural areas, is coping with two interrelated demographic challenges: population outmigration and population aging. Data from the Sichuan Provincial Bureau of Statistics shows that according to the results of the seventh national census in 2020, the population of Sichuan aged 65 and above is 14.168 million, accounting for 16.93% of the permanent population. This is an increase of 5.98 percentage points from 2010 and 3.43 percentage points higher than that of the whole country. In 2020, the proportion of Sichuan's rural permanent population aged 65 and over reached 21.92%, which is 4.99 percentage points higher than that of the province. It has entered a super-aging society.

The significant outmigration from Dujiangyan rural region, primarily motivated by the appeal of urban opportunities and convenience, has led many of the city's young workforce to pursue better prospects in nearby urban centers like Chengdu or Dujiangyan city. The young people moved out and thus left behind an increasingly elderly population. The reasons for this outmigration are comlicated and comprehensive, including limited local employment opportunities, higher education prospects in urban areas, and the desire for a more modern lifestyle.

The outmigration of young adults results in a diminished labor force, which has a negative impact on the local economy, agriculture, and a lot of other traditional industries. Consequently, numerous Linpans and associated facilities have fallen into disrepair, emptiness, or even vanished altogether. A dearth of vitality within the workforce poses an obstacle to economic progress, making it challenging for Dujiangyan to retain its distinctive regional identity and competitiveness.

Environmental deterioration

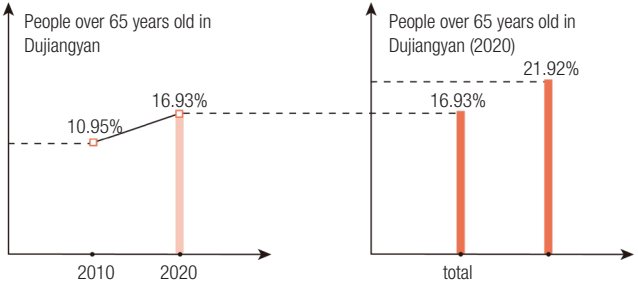
The overall environmental situation in Linpan is not optimistic either.

From an individual Linpan perspective, the surrounding courtyard landscape environment is poor and lacks management. In some Linpans, the water is turbid and polluted and the buildings are too old or broke. Some of the newer buildings feature colorful tile or concrete pavers that are out of character with their surroundings. The basic sanitation and aesthetics of Linpan are also uneven and the overall standard was poor. The deeper reason is that the so-called conservation of forest heritage is just a new forest museum, while the existing Linpans are not well preserved. As a result, many Linpans have experienced shrinkage, disappearance or uncontrolled expansion.

In the regional scale, the Linpan area is facing the deterioration of the ecological environment and the imbalance of the ecological system. The seasonal water shortage and floods have become one of the most serious local ecological problems. Due to irregular rainfall in Sichuan in recent years, summer droughts have caused a few widespread grain harvest failures, which dealt another blow to the already stagnant agricultural development. Besides, the decline of

forests, the hardening of irrigation canals, and the rough separation of land by transportation facilities have led to the reduction and fragmentation of ecological patches. The number and types of wild animals are also declining year by year.

Besides, the entire region is also poorly developed in terms of basic infrastructure, resulting in a relatively poor overall living environment. Because of the incomplete construction of garbage collection systems and facilities, many residents are unable to clean up garbage in time, and the garbage accumulates in front of and behind their houses, which has a negative impact on the beauty and hygiene of the environment. The construction of transportation is also relatively lagging behind. The roads in and out of Linpan are few and narrow. Most of them are cement roads, which are inconvenient for vehicles to enter and exit.



Percentage of people over 65 years old in Dujiangyan whole and rural areas diagram (2000-2018).
Source: Xinhua News Agency's "Looking" Weekly.

1. "Tide of Leaving Hometowns" of Migrant Workers
2. Floating garbage in the river 3. Garbage piled up in the village
4. Damaged Linpan building 5. A farmer pointing at dry farmland
6.Newly built and unconventional Linpan building
Source: Time of Day·History of Chengdu (2020)

Research question and relevance.

> *How can the deteriorated Linpan rural landscape be revitalized through landscape architectonic design?*

Relevance:

Holistic Landscape
Heritage Landscape
Urbanization
Rural Revitalization in China
Sustainable development

Content	*Sub questions*	*Method*	*Resource*
THE PAST	- How does the Linpan landscape work, and what is its quality?	*Analysis+Interpretation:* Literature review / Site study / Interview	Rural Heritage Landscape Holistic Landscape Theory
THE PRESENT	- What are the (negative) impacts of the rapid urbanization that has occurred (and will continue to occur) on the Linpan rural landscape?	*Analysis+Visioning:* Diagnosis / Process mapping / Problem classification	Holistic Landscape Theory
	-Is preserving parts of the landscape and transforming others by keeping the circular quality of the Linpan viable?	*Extraction+Experiment:* Conceptual framing / Functional design / Questioning and Testing	Case study 1
	-What landscape architecture means can enable Linpan's landscape to cope with future urbanization?	*Design by Research:* Case study / Modeling / Scenario design / Design through scales	Case study 2
THE FUTURE	- How these landscape means will influence and shape the future of Linpan rural landscape?	*Design Projection+Evaluation:* Future visioning / Risk and possibility evaluation	Holistic Landscape Theory

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2

RESEARCH FRAMEWORK

Theoretical framework
Case study
Applying to site
Research&Design Framework

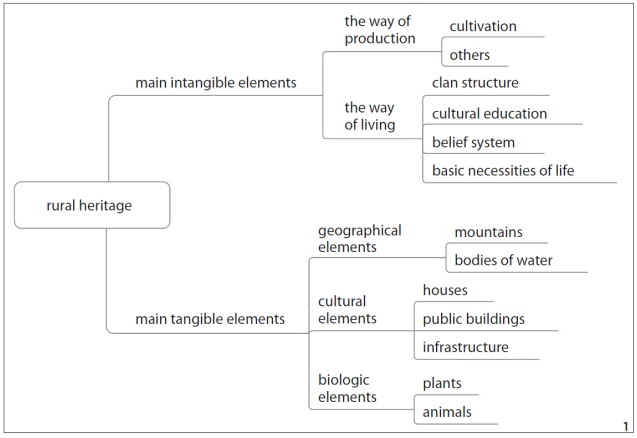
"While there isn't a single, comprehensive definition for 'rural heritage landscape,' it generally encompasses the architectural heritage of the countryside along with its broader geographic, historical, and cultural context"
———Xiaofan Du and Ding Shi, 2019

Theoretical Framework.
Rural landscape as heritage

Cultural landscapes, defined as the 'combined works of nature and man,' bear witness to the deep-rooted relationship between humanity and its natural surroundings. Whether situated in urban or rural settings, they provide a living record of human societal evolution (Sauer 1925). In 1992, cultural landscapes were formally recognized as part of the heritage category in the Guidelines, with rural landscapes falling under the subcategory of 'continuing landscapes.'

Traditional rural landscapes hold immense conservation value due to their characteristic topographic sequences, fostering unique connections between people and their surroundings, lifestyles, cultural heritage, and offering substantial opportunities for biodiversity preservation. While there isn't a single, comprehensive definition for 'rural heritage landscape', it generally encompasses the architectural heritage of the countryside along with its broader geographic, historical, and cultural context (Xiaofan Du and Ding Shi, 2019). These landscapes result from centuries of daily efforts by agricultural workers and significant events, such as drainage projects and urban expansion.

In rural areas, the relationship between people and the land is not constant. Urbanization and global markets are shifting people away from traditional agriculture, leading to agricultural land abandonment, which benefits natural ecosystems but adversely affects farmland biodiversity. Globalization presents challenges to these landscapes as changing land use patterns and urbanization



Constituent elements of rural heritage
Source: Shi and Zhao 2018.

draw people away from rural areas, resulting in agricultural land abandonment. Moreover, urbanization and global market integration reduce reliance on local ecosystem services, breaking the historical links between the social and ecological aspects of these landscapes (Baudry, 2000).

In the face of these changes, traditional rural landscapes, known for their significant conservation value, are typically managed through a 'preservation strategy,' involving financial rewards to maintain traditional practices. Conservation policies usually

focus on a "preservation strategy," using financial rewards to maintain tradition. However, the limitations are obvious too. This overlooks the historic social-ecological harmony where people directly benefited from nature, encouraging sustainable land use. To address these changes, it is essential to recognize the 'living' aspect of rural heritage by considering the dimension of time in addition to the three spatial dimensions. The historical harmony between humans and the land has been disrupted, necessitating the establishment of a new, sustainable human-land relationship to adapt to changing times.

Therefore an alternative approach, the 'transformation strategy,' acknowledging that preserving the past is impractical, is born. It emphasizes direct links between people and nature over indirect incentive-based connections. This strategy aims to empower rural communities to establish new, direct relationships with nature, promoting sustainable development and envisioning the future instead of clinging to the past. (Fischer, 2012)

Content of new human–land relationship

Landscape is the imprint of the relationship between space and nonspace, which is collectively referred to as human-land relationship. The two more important categories in the human-land relationship are those between people and those between people and nature. In traditional rural landscapes, human-land relations include coordination and conflict among farmers, subordination and confrontation between farmers and local governments, adaptation of farmers to the climate, and dependence of farmers on the land, etc. All people, people and nature interact with each other and form the rural landscape under the catalyst of time.

However, in the current era of drastic changes, the relationship between people and land is facing rupture, deconstruction and reorganization. Countries worldwide are going through the period of rebuilding the rural human-land relationship. Given the declining local population and shifting land functions, integrating outsiders into the landscape is inevitable. One widely accepted approach is combining land and culture through methods like rural tourism, which can revitalize both culture and ecosystems. Under such circumstances, the human-land relationship in the rural landscape becomes more complex due to the weakening of the original relationship and the addition of new relationships. For the original inhabitants, the landscape and the land exist in their lives and are closely related to them. For the tourists, no matter how much they try to get close to the land, they always maintain a sense of distance, viewing the landscape with a separation of subjectivity and objectivity (Yu Kongjian, 2002). Therefore, concerns remain about whether tourism will damage rural heritage. While some argue that cultural landscapes may change under the influence of tourism development, it's essential to acknowledge that local culture and heritage evolve over time, much like the sediment along a riverbank. Therefore, interventions must be executed carefully to preserve the 'sense of place' while creating a new, worthy 'heritage' to safeguard.

Method of building new human–land relationship
Fully mobilizing people's enthusiasm at different levels is the key to achieving and maintaining a *new human-land relationship* (Fischer, 2012).

1) At community level, the socio-cultural vitality is strongly and positively correlated with the traditional rural landscape integrity. 2) At individual level, endogenous driving factors (i.e. human–environment connection and community-based organization) have more general and positive effects on residents' cognition, willingness, and behavior toward traditional rural landscape preservation comparing with the exogenous driving factors (i.e. top-down regulation policy and tourism development); resident's cognition, willingness, and behavior are homogenous despite different genders, occupations, and education levels.

Due to the complexity of the scale range, time span, problem areas, and land attribution involved in the rural heritatage landscape, a referable research methodology needs to be introduced. This is why Holistic landscape is then used and applied.

"For the original inhabitants,
the landscape and the land exist in their
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———Yu Kongjian, 2002

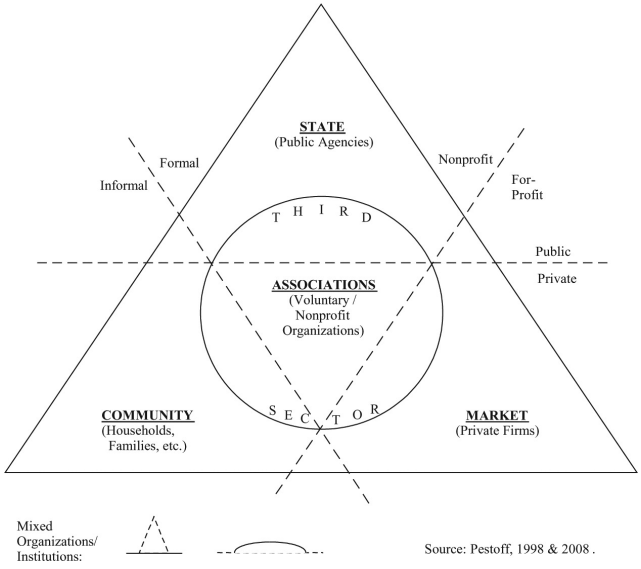
Holistic landscape

According to Naveh (2000), the essence of Holistic Landscape is a systems view linking natural and human systems. In studying the landscape as a whole, we see it as a whole, a system that is greater than the sum of its parts. And before we can understand the parts, we need to understand the whole.

The meaning of applying holistic landscape concept

Holistic landscapes are concerned with integrating their structures and functions into coherent sustainable ecospheres, and thereby to the establishment of a sustainable balance between attractive and productive biosphere landscapes and healthy and livable technosphere landscapes. It indicates a transdisciplinary conception of landscape which require the integration, connectivity and complementarity of innovative and non-conventional 'post-modern' approaches to scientific knowledge, order and creativity.

Holistic landscape concept also provides a way to better understand and study landscape ecology (Naveh, 2000). In terms of scale, the landscape needs to be studied within a larger scale of time and space. The scale goes from the regional to the town to the neighbourhood and even to the individual. A scale landscape is itself an aggregate system of smaller scale landscapes, and an element of a larger scale landscape system. The whole process of studying spatial variation in landscapes at a variety of scales is a systematic scan—the purpose is to find out the neglected influencing factors and internal relationships. It is worth noting that the timeline expresses not only the palimpsest of landscape in the time sequence, but also contains the attitude orientation of the landscape architect - conservative or radical attitude towards the traces of history, optimistic or not towards the future (industrial) development.



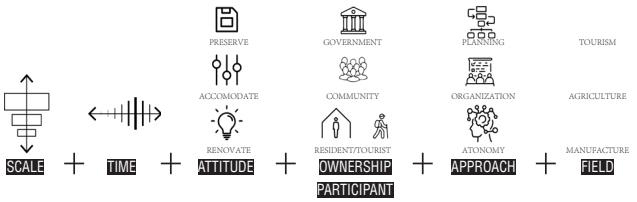
In terms of content, the natural and cultural components of a regional landscape, its forests, meadows and shrublands, its wetlands and rivers, its fields, its residential and industrial areas, its roads, traffic and power lines, and their history all contribute to the overall and truly realistic character of the landscape. They comprise its various human-ecological, social, economic, psychological, spiritual, aesthetic and functional aspects of experiencing and using the landscapes. Together, these fields form the theoretical and methodological cornerstone of the study of the different elements of a landscape and the subtle relationships between them (Baudry, 2000). These elements can be divided into two categories: space and nonspace, among which people have the most profound effect. The relationship between man and nature and between man and man can be refined and analyzed. The welfare triangle, where people with different concepts, different levels, and different interests are marked, can be introduced to aid this process. Despite the presence of numerous intricate content elements, they

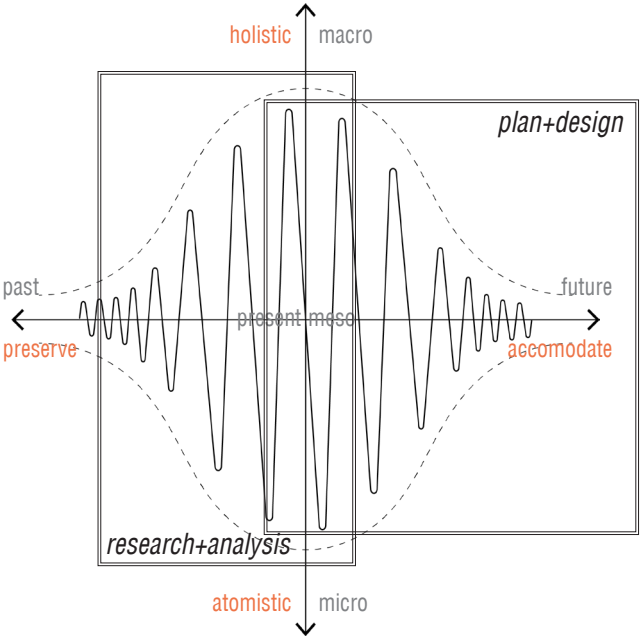
are not haphazard and disorganized. Within each temporal-spatial scale, there are major elements and elemental relationships that dominate the development of the landscape within that scale. It may be water systems, transportation, or any element that has the most influence on the scale. Starting from this point, it is possible to layer and understand the holistic landscape.

Holistic landscape concept matches...

The Linpan landscape system (LLS) in Chengdu Plain, which once managed the best balance between human and nature after its centuries of development, is now also facing its own intergenerational pain—the dilemma of urban expansion and modern industrial invasion in the 21st century background. The overall circulatory system that was normally maintained suddenly faces both internal and external pressure. The Linpan landscape system is actually a good example of holistic landscape. Its individual formation is closely related to the water system and topography at each spatial scale, while its present spatial form and cultural background are also the cumulative results of long-term social development.

By considering the LLS as a condensation and symbol of nature and culture, the solution to the problem can be deduced: First zooming out to see the overall system, then zooming in to specific scales and elements. Grasping the main elements will be the key to solving the problem. In the LLS consisting of the Dujiangyan water project in the upper reaches and thousands of Linpans in the lower reaches, the water system all over the plain and the tangible and intangible heritage including culture, architecture, and lifestyle are the factor of internal relations. Consequently, the water system and heritage should be the key points for breaking the dilemma of Old and new era alternation faced by LLS.





Multi-meanings of Holistic landscape theory and its graphical coordinate system
Drawn by the author.

Case Study.

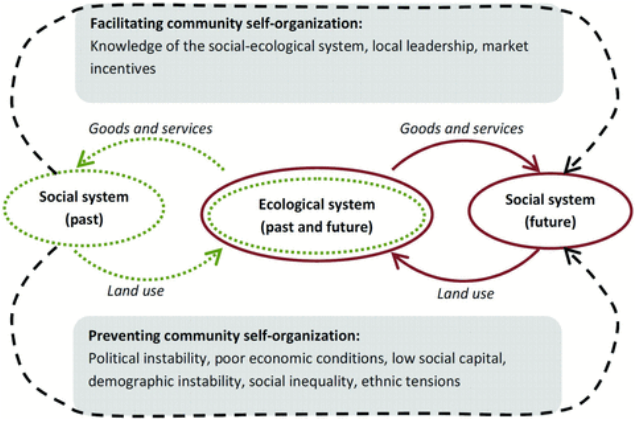
Case study 1: Saxon region in Central Romania, a traditional farming landscape

The Saxon region in Central Romania stands out as a prime example of a traditional farming landscape. This diverse landscape follows a predictable pattern: valleys with villages, arable fields, and hay meadows; slopes with pastures; and ridges covered in forests, with other minor land uses scattered about. Seminatural vegetation like grassland, hedgerows, streamside areas, and scattered trees dot the landscape. Despite facing various challenges, the Saxon landscape has preserved much of its traditional character and biodiversity. It's crucial to acknowledge the strong historical ties between people and nature in such landscapes. These were once tightly connected social-ecological systems (see Figure 2), where human activities shaped the land, and, in return, the land provided various ecosystem services. The continuation of traditional farming practices has been instrumental in the survival of numerous species that have dwindled or disappeared elsewhere in Europe.

Currently the Saxon region faces severe socioeconomic challenges, including unprofitable traditional agriculture, declining livestock, limited access to essential services, increased poverty post-revolution, high unemployment, corruption eroding trust, ethnic conflicts, and weak social cohesion, all impacting traditional land use practices.

The reserchers propose an alternative way to frame conservation policy, which we term the “transformation strategy” (Figure 2). Our proposed transformation strategy focuses on the vital connection between nature and society in preserving traditional farming landscapes. Unlike preservation, which aims to maintain existing links, transformation fosters new connections between ecosystems and social systems. To create a sustainable social-ecological system, researchers advocate for both a "land use" link from the social to the ecological subsystem and an "ecosystem services" link from the ecological to the social system (see Figure 2). By ensuring direct benefits from farmland ecosystems, people are more likely to manage them sustainably. The preservation strategy, the prevailing conservation approach, only acknowledges the land use link and overlooks the crucial ecosystem services connection, neglecting the holistic management of the social-ecological system.

Having redefined the conservation challenge to acknowledge the



Social–ecological transformation in traditional farming land-scapes. Drawn by Fischer.

interconnectedness of people and their environment, the next step is how to put this into action. Two crucial policy elements come into play: first, identifying feasible and desirable new connections with the environment, and second, fostering a supportive environment that enables communities to actively establish these new connections (Fischer, 2012).

Traditional farming landscapes offer opportunities to maintain biodiversity through various avenues. Policies can facilitate community certification for existing organic practices, create markets for organic and regional products, or promote ecotourism, fostering new institutions and community identities centered around nature. The key is aligning land use with local community values while conserving biodiversity. For example, in the Saxon region, the ADEPT Foundation supports low-intensity farming through market development and milk collection centers. The "Whole Village Project" by the Mihai Eminescu Trust assists communities in preserving heritage while planning compatible development. Throughout the process, the spontaneous participation of the residents is very important. However, community involvement alone is insufficient; dedicated policy programs, such as incentive schemes, outreach, and education initiatives, are needed to empower communities in forging meaningful connections with nature.

"While there isn't a single, comprehensive definition for 'rural heritage landscape,' it generally encompasses the architectural heritage of the countryside along with its broader geographic, historical, and cultural context"
———Xiaofan Du and Ding Shi, 2019

A traditional agricultural landscape in the Saxon area of Romania.
Photo by: Joern Fischer.

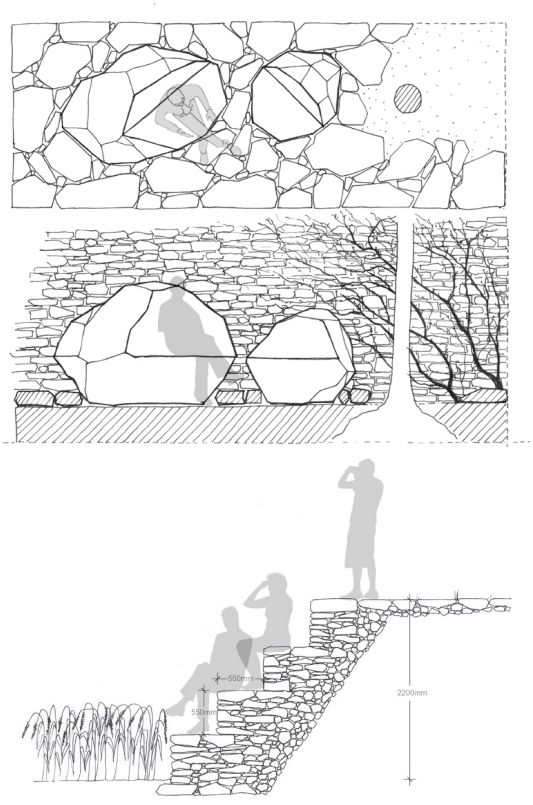
Case study 2: Inclusive Tourism in Xijingyul Village in China

Xijingyu Village is located in Jizhou District, Tianjin, China. Before it was renovated, it was already a famous "stone village". Stone streets, stone walls, stone houses, stone mills and stone grinding mills made the landscape unique. However, at the same time, the village was developed in a blind and disorderly way. The traditional style is threatened by the spontaneous construction limited by the vision. The village lacks overall coordination.

“Understanding Landscape in Villages” is the Foundation of Actions

Different from landscaping in cities, landscaping in villages means not the realization of one piece of blueprint, but the long-standing accumulation and changes. Many landscape elements in villages do not have deliberate forms, and everything keeps the most direct and the closest relation with life. Finding rules in the relation between people and geology from residence units, village settlements and natural geological environments of the settlements and digging landscape features of Xijingyu Village are the foundation of landscaping this time.

The "Yu" is the valley, surrounded by mountains on all sides, and the "Jing Yu" formed by the central depression is the basic geographical pattern of the village. The reclamation of the surrounding uplands has created a large number of stone terraces and orchards. In the center of the "Well Valley", where the wind and air are collected, is the living space of the villagers. It is no coincidence that the geographical core and the lowest point of the village is the square in the center of the village, where the focal point of water catchment and drainage and the center of villagers' life naturally emerged. The terraces, houses and fences inside and outside the village are made of dolomite, which is easily available in the area. The dolomite deposited during the Middle and Late Archean periods shows slightly different colors depending on its composition. Dolomite is easy



Scheme for Masonry Practice
of Public Seats and of Observation Platforms.
Drawn by: Tiantian

Comparison on The “Flat Masonry” and “Vertical Masonry” Stone Lane.
Photo by: Tiantian

to obtain, brittle and fragile, and mostly thin-layered. This quality of construction material contributes to the overall appearance of Xijinyu.

Landscape protection and landscape creation

The stone masonry process requires several processes such as quarrying, material selection, measuring, pointing, level finding, line hanging, hammering and basing. With the rapid development of the times and productivity, "stone masonry" has lost its advantages, and even nearly disappeared.

An important part of the landscape creation work is to put "stone masonry" in the context of sustainable development and green low-carbon concept of creation, to re-energize the vitality of traditional skills. Invite villagers to participate and listen to their voices to make the design more "grounded". Based on the interpersonal characteristics of the rural "acquaintance society" and the villagers' deep knowledge of the countryside, communication and learning with the villagers were emphasized during the construction process. Design team invited village stonemasons to create and study together on the ground. At the same time, It's also necessary to improve the method of communication and discussed with villagers on site in a more easily understood hand-drawn form, creating a series of new landscapes together. The village operation team cultivates the industry economic vigor with features of Xijingyu.

Case study review.

After examining the theory and specific cases, I have summarized some of the elements that will benefit my conceptual development.

In case1, the traditional agricultural landscape of central Romania is under the impact of many socio-economic challenges, and in order to preserve the important link between nature and society in the traditional agricultural landscape, the human-land relationship is placed within **a sustainable socio–ecological system**. The term "sustainable" refers to the valorization of the ecological service system beyond the usable value of the land and its interaction with the social system. In addition, in recognition of this concept, a supportive environment is actively fostered by building up community-based organizations. Governments and residents can be linked up through them. Therefore each part of the whole participant system has their own responsibilities and is able to work together: the government provides support (financially and intellectual) and gives direction from the top down, the residents generate motivation and participation in order to realize the reformation from the bottom up, and the community/ neighbourhood take charge of conveying information and unifying and coordinating multiple viewpoints in between.

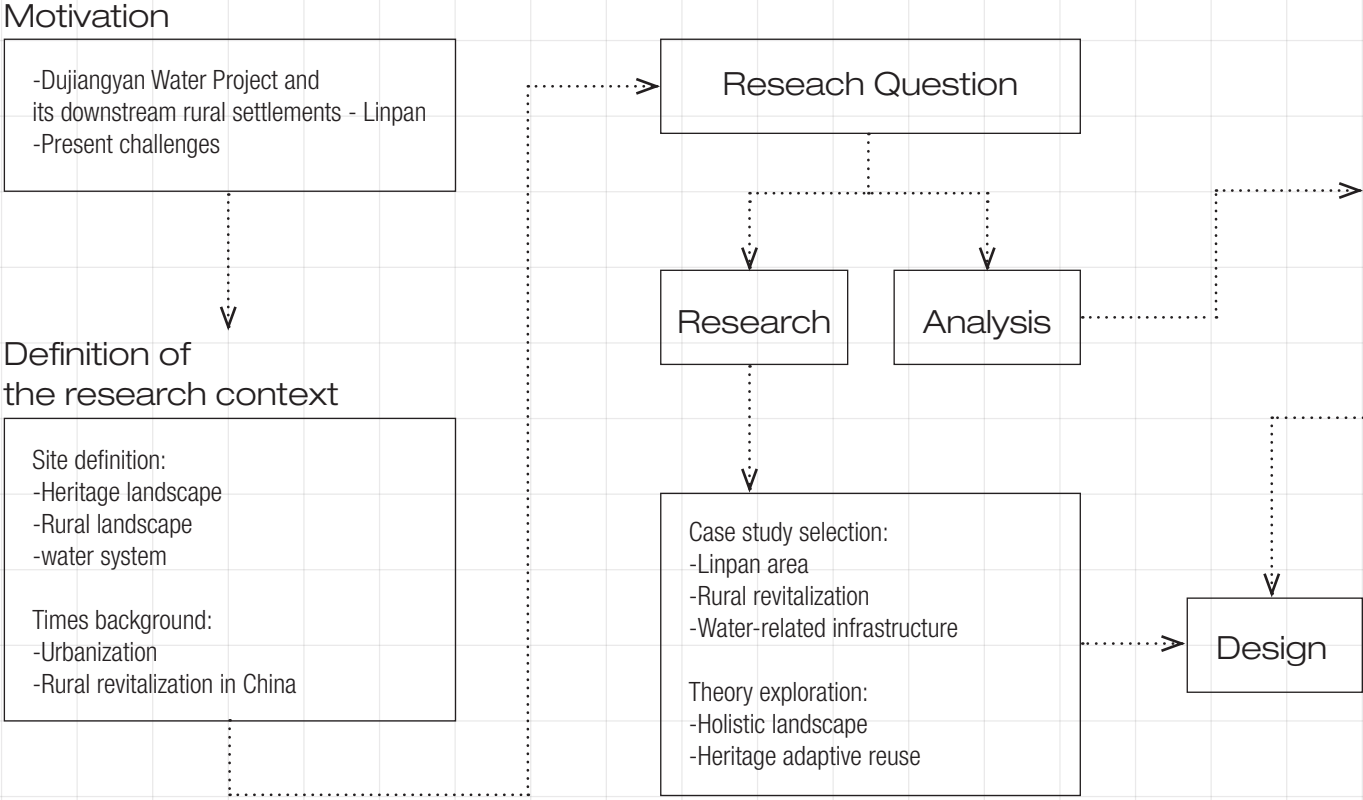
Case2 shows a traditional village renovation project in Xijingyu Village, Tianjin, China. I believe that the cornerstone of this project's success is to fully understand the original character of the site. Xijingyu village is built with a large amount of stone, which creates a unique village style, however, it is not intentionally guided from the beginning, but rather accumulates and changes over a long period of time. Therefore, when the village development is facing difficulties, the designer needs to look back at the formation of human-land relationship from the residential units, the village settlement, and the natural geological environment of the settlement, analyze the reasons for the presentation of the style, and try to guide the modernization of the original landscape characteristics by combining it with the current social background. One of the methods with remarkable results is **the re–cycling of site raw materials**. The extensive use of stone is a characteristic feature of Xijingyu village. After the demolition of dilapidated houses and buildings, reusing them in the construction of other landscape elements can effectively preserve the village style, achieve visual unity, and reduce remodeling expenses in terms of budget. At the same time, in the process of renovation of the village, the original social structure of "familiar society" is respected, and opinions are discussed and exchanged with the villagers on the spot, with real consideration given to the feelings of the users-village residents.

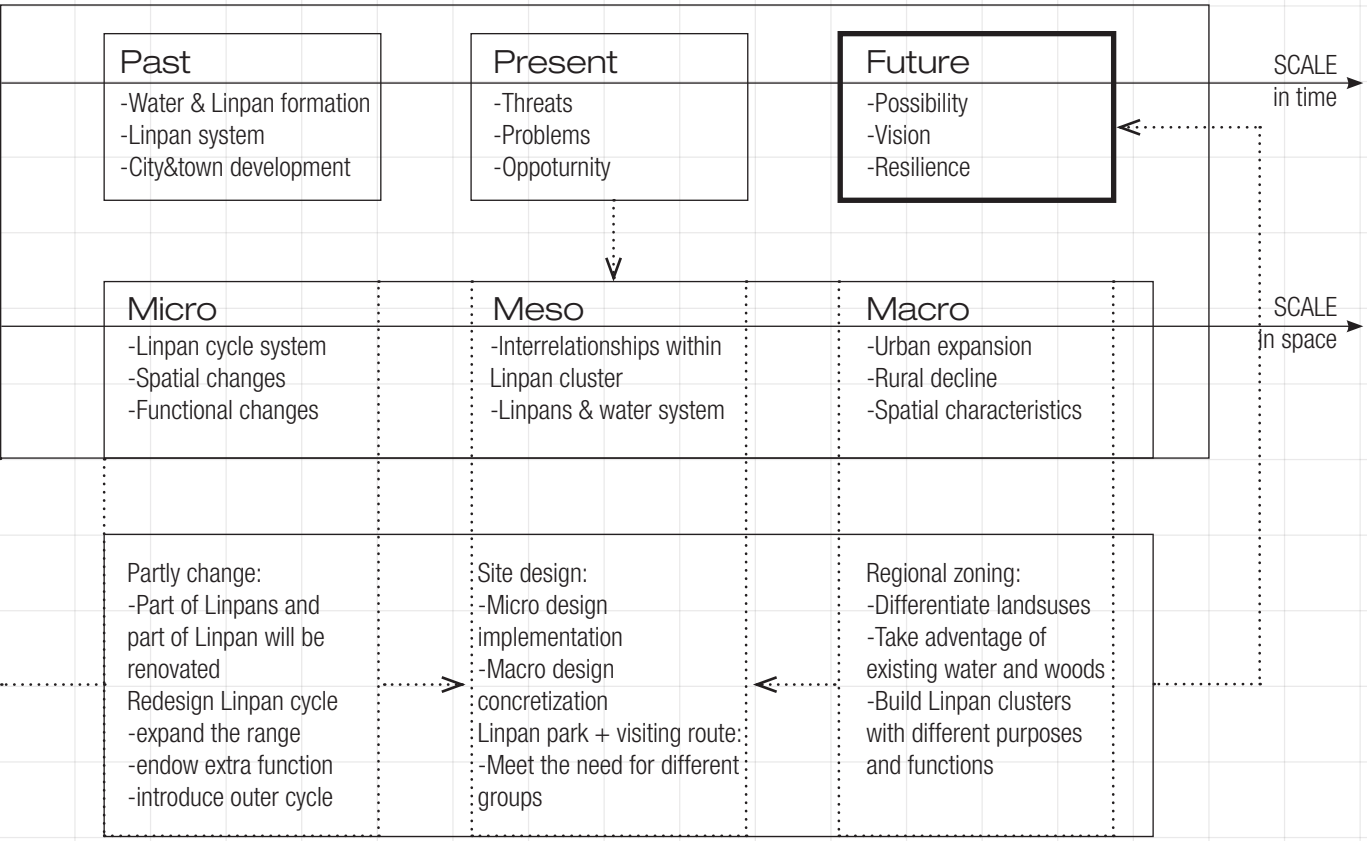
Applying to site.

Based on the issues and challenges already sorted out in the previous chapters, Linpan and the entire Chengdu Plain need an overall strategy to deal with the problems one by one. As a compound rural scattered settlement unit with a long history integrating life, production, ecology and landscape, Linpan's cultural and historical value makes it enter the World Heritage List. Corresponding to its historical background, the *Preservation and Revitalization of Heritage (Landscape)* in the modern context is among The main subjects. The word *rural* which describes its location makes *Rural Landscape* important keywords in the project.

Principles		Strategies
Holistic Landscape Concept Holistic landscape concept provides a way to better understand and study landscape ecology: how to organize and integrate landscapes with high complexty involving spatial and temporal scales, multiple relationships, and multiple disciplines	⇒	**Linpan landscape in a holistic view** The Linpan landscape needs a comprehensive modernization plan, considering factors like ecology, economy, and culture. This plan will address various scales and scenarios to enhance both environmental and social quality in Linpan and Chengdu Plain.
Comlicated stakeholders and decision makers (case1) The new human-land relationship needs to be explored on a site-specific basis, but the constant aim therein is to fully mobilize the people rather than to make them passive recipients of policies. Financial support from the government is one aspect, but it is more important to stimulate the creativity of the people through education and leadership.	⇒	**Government, Community, Residents** According to the hierarchy of rights from high to low, the stakeholders involved in Linpan development can be divided into Urban Construction Bureau, Tourism Bureau, Forestry Bureau, etc. in Dujiangyan City - village committees, local enterprises (especially real estate companies) - local residents, out-of-town workers, and the travellers.
Balance of attitudinal orientations The timeline of landscape expresses not only the palimpsest of landscape in the time sequence, but also contains the attitude orientation of the landscape architect - conservative or radical attitude towards the traces of history, optimistic or not towards the future (industrial) development.	⇒	**Balance of attitudinal orientations** After studying case1 and 2 one can learn that reading the original landscape culture and extracting the original landscape characteristics are the basis for action. It is important to recognize that it is unrealistic to preserve the past, and the key is to establish a new relationship between people and the land.
Understanding the existing landscape (case2) In the process of re-constructing the relationship between people and the land, it is wiser to take materials in situ both materially and spiritually. Reusing the original landscape materials can preserve the characteristics of the site and achieve the ecological and environmental protection purpose of material recycling. Reconstruction of human-land relations can also draw on the past in all aspects of the internal, especially the need to grasp the essence and core.	⇒	**Taking advantage of the existing landscape** -Linpan's harmonious coexistence of nature and humanity relies on its well-established ecological systematic circulation. Innovating this circulation is key to preserving Linpan in the modern era. -When renovating Linpans, it is important to make full use of the original environment and conditions - bamboo forests, wooden and bamboo buildings, water systems, etc. - and to fully mobilize the labor force of local people.

Research&Design Framework.




Past
-Water & Linpan formation
-Linpan system
-City&town development
Present
-Threats
-Problems
-Oppoturnity
Future
-Possibility
-Vision
-Resilience
SCALE
in time
Micro
-Linpan cycle system
-Spatial changes
-Functional changes
Meso
-Interrelationships within Linpan cluster
-Linpans & water system
Macro
-Urban expansion
-Rural decline
-Spatial characteristics
SCALE
in space
Partly change:
-Part of Linpans and part of Linpan will be renovated
Redesign Linpan cycle
-expand the range
-endow extra function
-introduce outer cycle
Site design:
-Micro design implementation
-Macro design concretization
Linpan park + visiting route:
-Meet the need for different groups
Regional zoning:
-Differentiate landsuses
-Take adventage of existing water and woods
-Build Linpan clusters with different purposes and functions

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3

THE PAST:
Linpan as a Heritage

Dujiangyan Water Project
Linpan Rural Landscape
How Linpan Works
Why Heritage

"Dujiangyan's construction and ongoing upkeep turned the Chengdu Plain into a bountiful region, granting people control over water resources, fostering political, economic, and cultural development in Sichuan for centuries."

Dujiangyan water project.
Site context

The Dujiangyan system, a colossal ancient Chinese water conservancy project located in Sichuan Province, has served its purpose for over two millennia. Constructed by Li Bing and his son in the 3rd century BC, this project, without harming natural resources, ingeniously harnessed them to foster harmony between people, land, and water, making it a remarkable ecological endeavor.

It earned recognition as a provincial cultural relic protection unit in 1980, a national key cultural relic protection unit in 1982, and, in 2000, achieved World Heritage status alongside Qingcheng Mountain for its unique approach to water diversion without dams.

Dujiangyan county border

Dujiangyan city

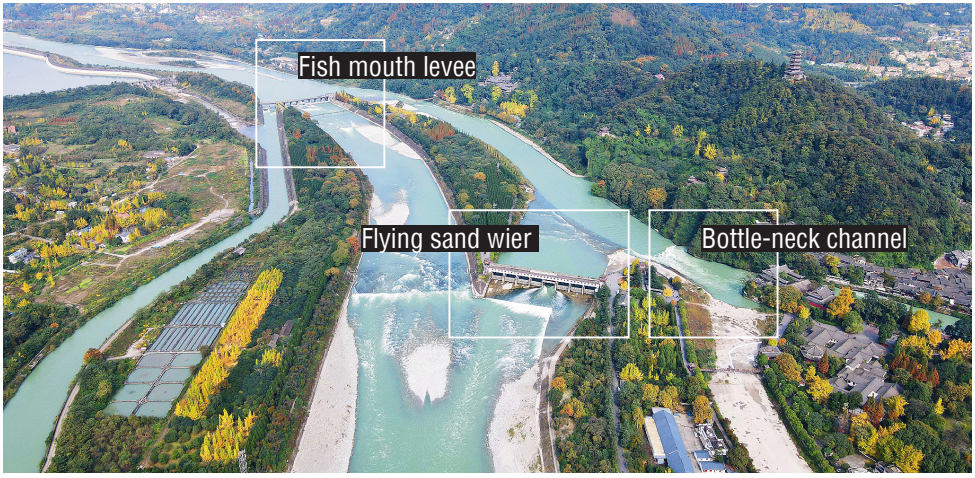
Chengdu downtown

Chengdu plain

0 1 2 3km

China, Sichuan Province, Chengdu City range.
Drawn by author.

Dujiangyan water project



Dujiangyan Water Project.
Photo by: Pangjie

The entire Dujiangyan water project can be divided into two systems: the wier head and the irrigation water network. The head of the weir includes the three main constructions of Fish mouth levee (water diversion project), Flying sand wier (spill and sediment discharge project), and Bottle-neck channel (water diversion project) that work in harmony with one another to ensure against flooding and keep the fields well supplied with water. In addition, there are inner and outer diamond dikes, herringbone dikes and other ancillary buildings. The Dujiangyan project is mainly used for water diversion for irrigation, and also has comprehensive functions such as flood control and sediment discharge, water transportation, and urban water supply.

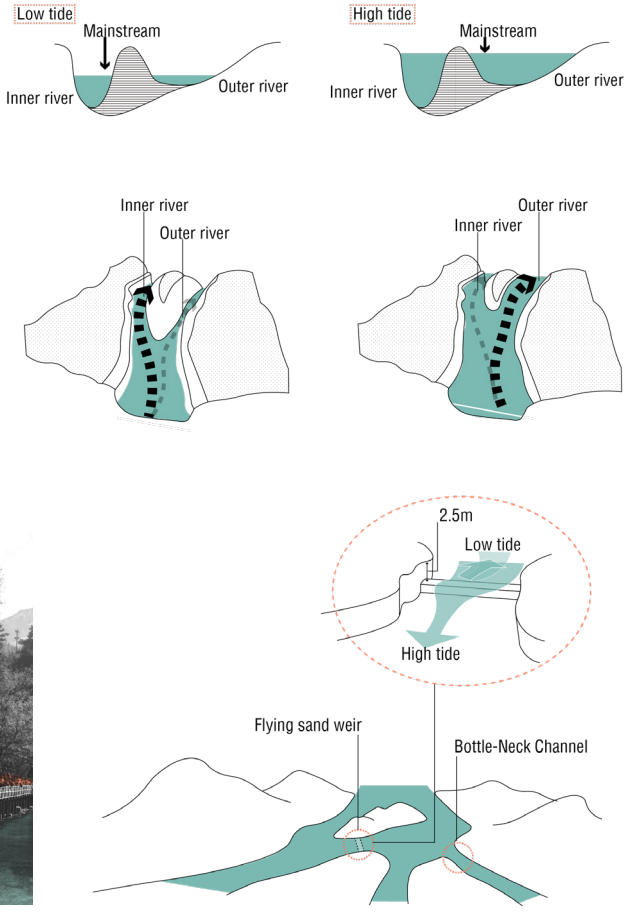
The Minjiang River, originating from Minshan Mountain, flows to Yulei Mountain in Dujiangyan's urban area and towards Chengdu Plain to the southeast. Dujiangyan City, only 50 kilometers from downtown Chengdu, sits at an altitude difference of 273 meters. During floods, the river's powerful flow poses disaster risks.

Dujiangyan's primary roles include irrigation, flood control, water transportation, and urban water supply. Its construction and ongoing upkeep turned the Chengdu Plain into a bountiful region, granting people control over water resources, fostering political, economic, and cultural development in Sichuan for centuries.

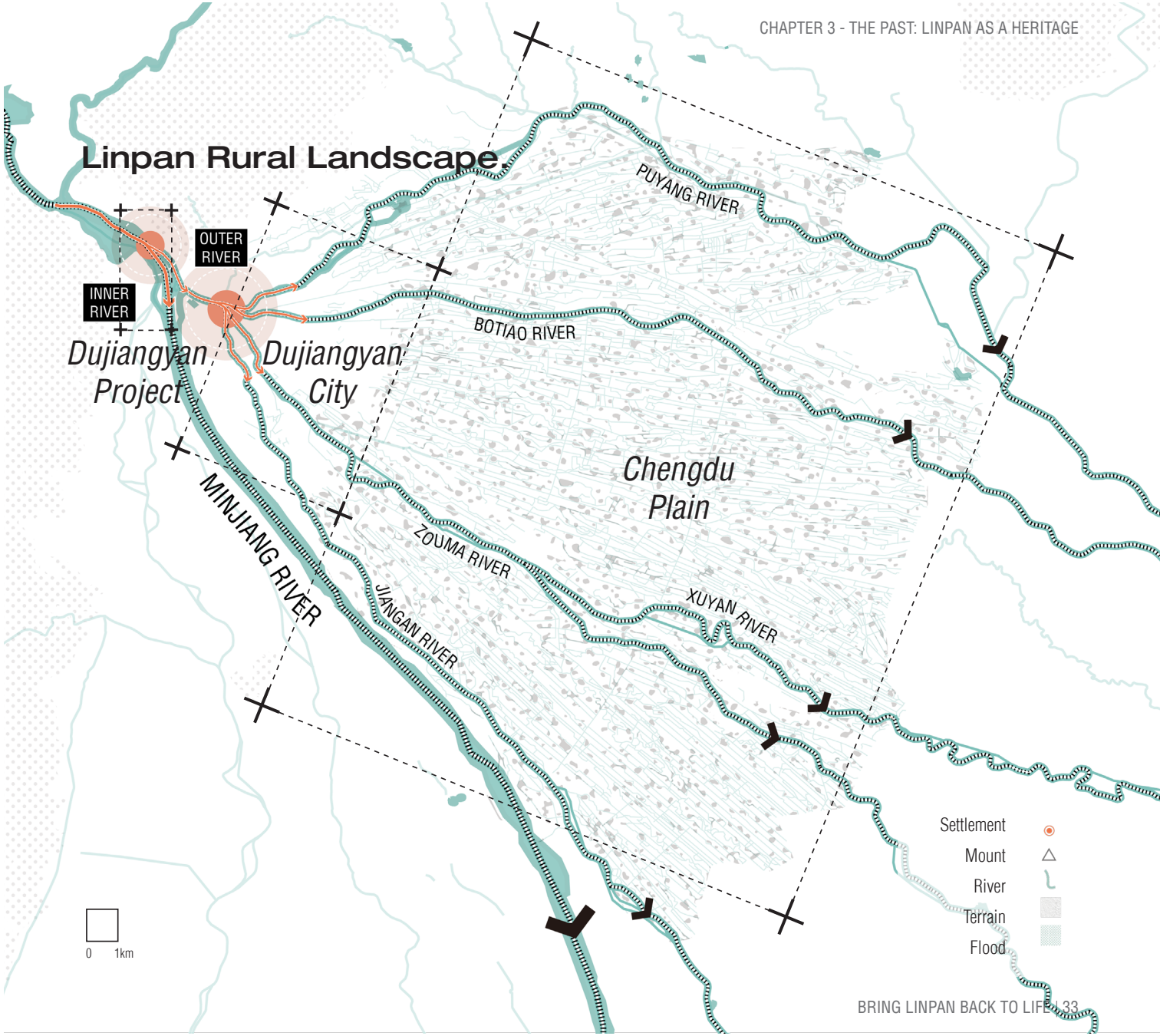
The Flying Sand Weir has a 200-meter-wide opening that connects the inner and outer streams. This ensures against flooding by allowing the natural swirling flow of the water to drain out excess water from the inner to the outer stream. The swirl also drains out silt and sediment that failed to go into the outer stream. A modern reinforced concrete weir has replaced the original weighted bamboo baskets.

The Bottle-Neck Channel, which was gouged through the mountain, is the final part of the system. The channel distributes the water to the farmlands in the Chengdu Plain, whilst the narrow entrance, that gives it its name, works as a check gate, creating the whirlpool flow that carries away the excess water over Flying Sand Fence, to ensure against flooding.

Fig. 1-1 Working mechanism of the Fish Mouth Levee.



Working mechanism of Fish Mouth Levee and Flying Sand Weir. Drawn by author.

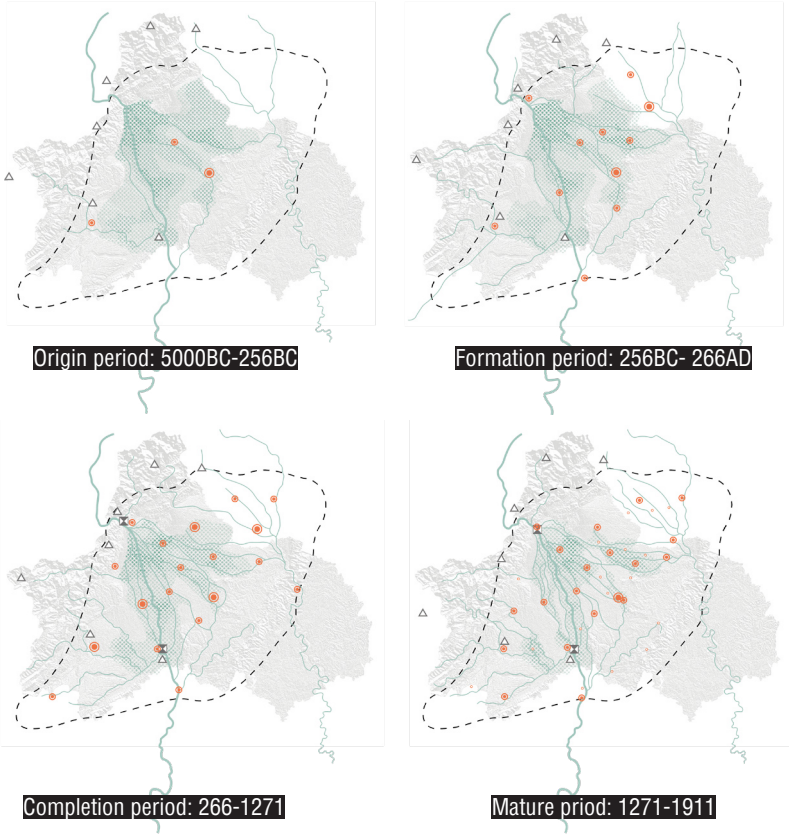

Linpan Rural Landscape
OUTER RIVER
INNER RIVER
Dujiangyan Project
Dujiangyan City
PUYANG RIVER
BOTIAO RIVER
Chengdu Plain
ZOUMA RIVER
XUYAN RIVER
MINJIANG RIVER
JIANGAN RIVER
0 1km
Settlement
Mount
River
Terrain
Flood

History development

During the origin period, the embryonic form of the water system in the Chengdu Plain is emerging, however the main rivers are in a disorderly radial pattern and changed frequently. The tributaries didn't form fixed and stable waterways, bringing several floods and droughts.

Since 260BC, the construction of the Dujiangyan Water Conservancy Project completely changed the water control environment in the Chengdu Plain, significantly reducing floods frequency and severity, and improving agricultural irrigation efficiency. The water system in the Chengdu Plain mainly expands to the east, and the channels gradually became fixed and clear with the maintanence of residents. The overall shape of water systems gradually becomes a dendritic water network.

The open up of inner and outer rivers provided sufficient water resources for the construction and economic development of Chengdu city. With obvious transportation advantages, there



Water and Urban development on Chengdu Plain
Source: Li Heng. Drawn by author.

were a rapid development of Chengdu's urban economy and a dramatic change in town form and layout. According to the maps, the number and range of cities and towns increased significantly over time, while flooding, conversely, decreased with the gradual development of water systems.
the Baitiao River and Zuoma River entering Chengdu's urban area are referred to as the Jinjiang River.

Seasonal rainfall makes the lower-reach-places very dependent on the upstream Minjiang River water source. As a unique agricultural and rural landscape, Dujiangyan Project had a profound influence on the production and life of downstream residents, as well as the shaping of the Chengdu Plain in terms of spatial form. This downstream map shows the pattern and textures of the plain, which also explain the inner relationship between water system, function, spatial form, etc.

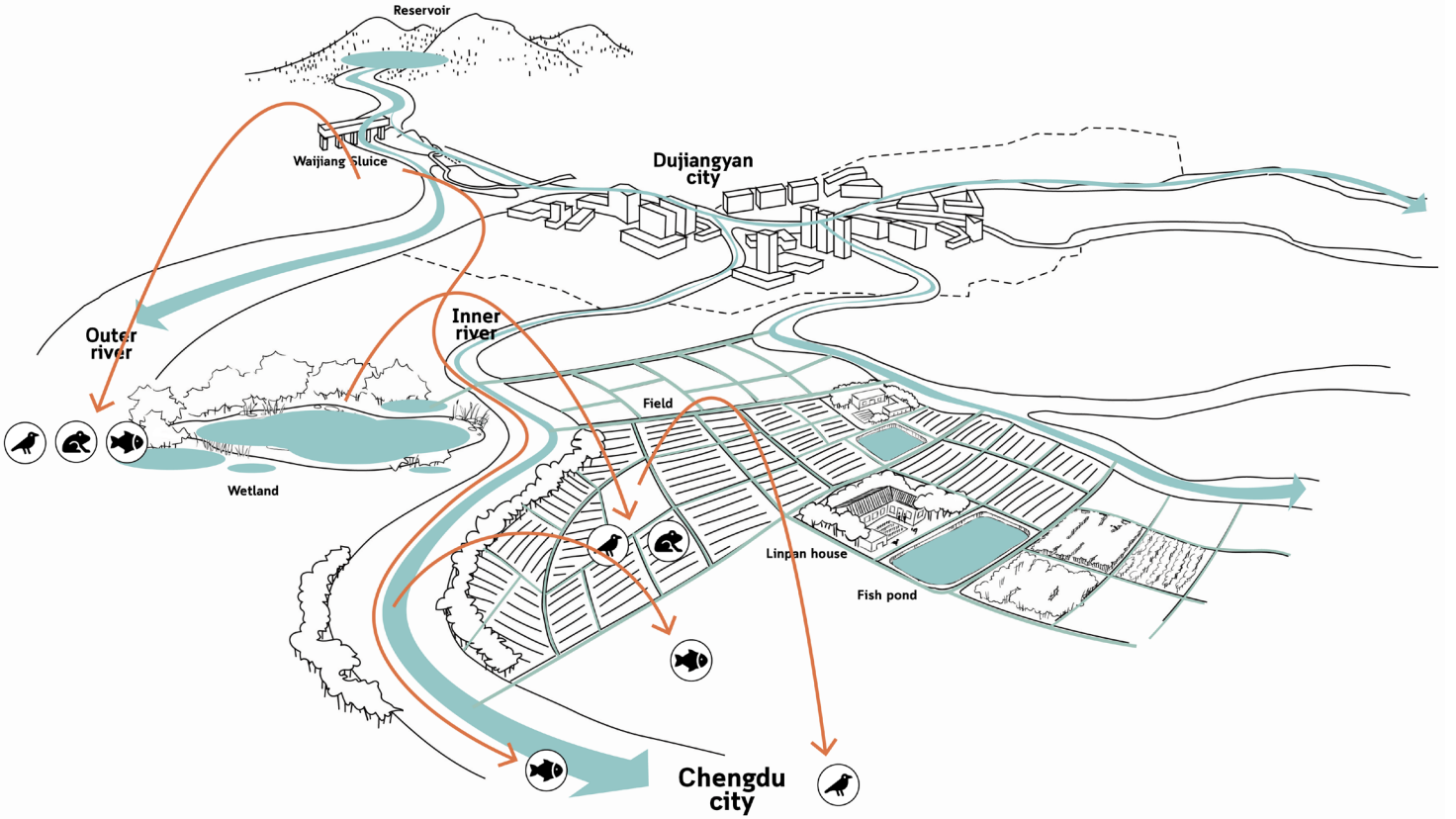
Circulation on Chengdu Plain

It was only when we looked back and sorted out the history that we discovered that there was such a deep and long-standing connection between the development of the Chengdu Plain and water. In the past, people's life and production all depended on the upstream Dujiangyan, and this great water conservancy project has been maintained for more than two thousand years. Everything here revolves around water.

Today's Dujiangyan water system is still in operation. The origin of the water is stored in a reservoir on the Mount Yulei, flowing down to Dujiangyan. After the water conservancy adjustment of Dujiangyan Project, the water flow is divided into Inner river and Outer river to the east and north respectively. After flowing through the main urban area of Dujiangyan, there are two options for the water to flow on the flat Chengdu Plain: to form part of wetland tidal flats in a natural state, or to form vast irrigation canals to irrigate farmland under artificial water conservancy treatment. The first type provides a habitat for many creatures, but the area of these natural wetlands has gradually shrunk, and the second type has developed a unique forest settlement structure and lifestyle through people's labor and wisdom.

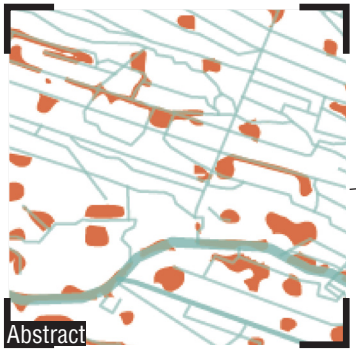
Linpan represents ecological settlement units of field green islands formed in semi-natural and semi-constructed wetlands under the influence of the Dujiangyan water conservancy project. These units form a large area of oasis in the periphery of the city and act on the climate regulation of the Chengdu Plain environmental improvement.

Circulation on the Plain



Traditional Circulation on the whole Chengdu Plain.

How Linpan Works.



Irrigation water net

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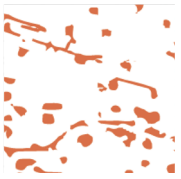
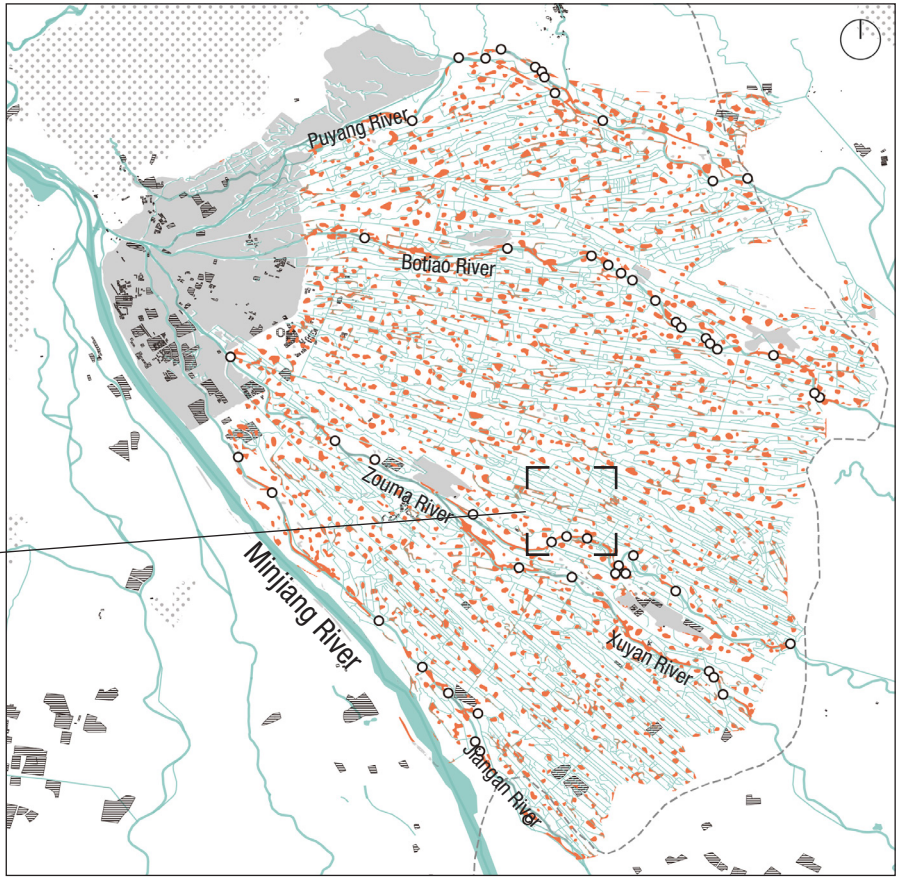
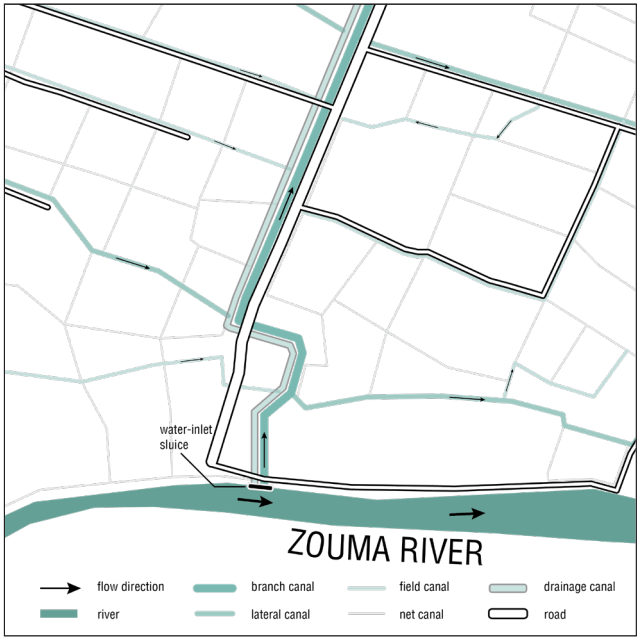


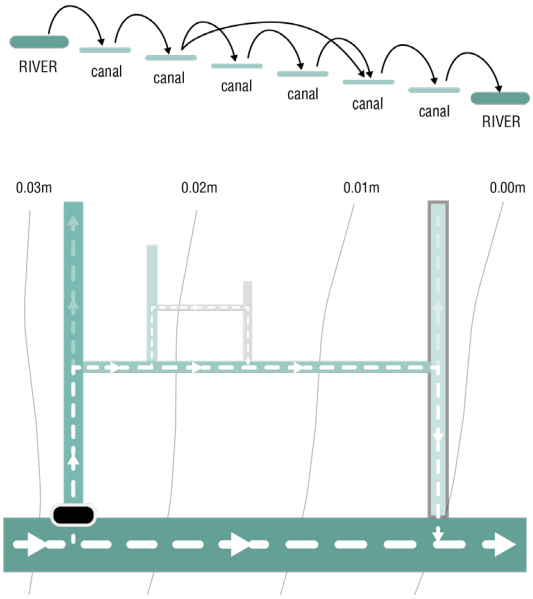
Linpan settlement

Water system and Linpans on Chengdu Plain.



Water system.



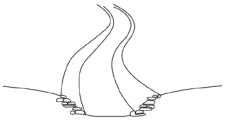


Plan and working scheme of Linpan water system.

The blocks show that water system mainly consist of diversion channels at all levels of the irrigation district, roughly divided into four levels, using the height difference to divert water to complete irrigation, while many facilities to assist in the control of irrigation.

Water from the river flows through the inlet sluice, entered the irrigation canals, which basically have four to five levels. The first-level canal is called branch canal, which is the widest and shallowest, and the last-level canal is called net canal, which is the narrowest and deepest. The overall terrain trend of the Dujiangyan Plain is high in the northwest and low in the southeast. In ancient times, people use the original micro-topography and the artificially-created height difference to guide the water flow to the fields and houses level by level. The water finally flows into the

1



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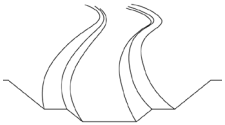

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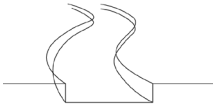

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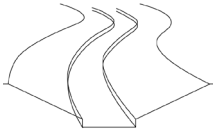
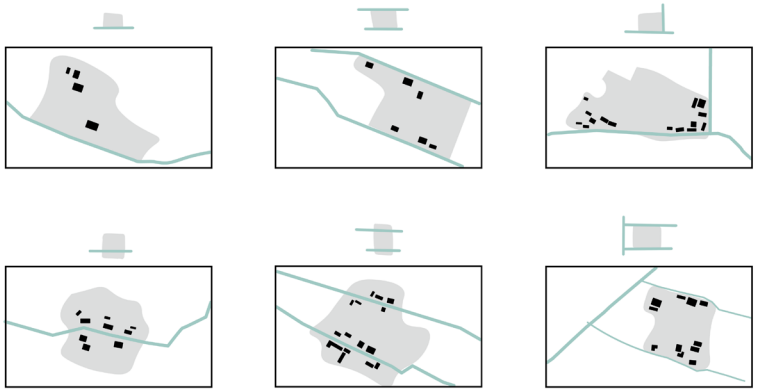


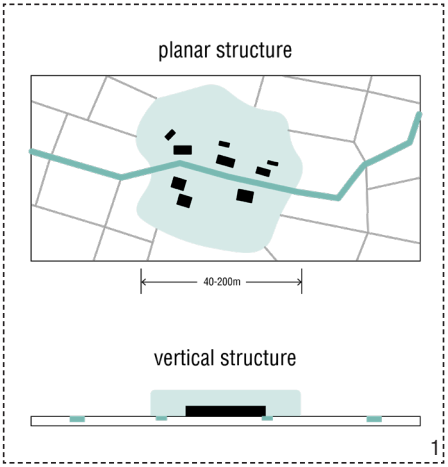


drainage channel, and then back into the river. After generations of updating and repairing the canals, the water reaches the each Linpan residents and farmlands through the net canal and the field canal, weaving into a dense water system network, which makes it more convenient and direct to obtain domestic water and agricultural water.

From the satellite map, I summarise six spatial relationships between waterways and Linpans. It can be seen that Linpan and the watercourse are always in close proximity to each other. There are usually 1-3 tertiary channels that form the space of Linpan. Some channels run through the Linpan and some are close to it. What is clear is that residents tend to build their houses next to the channels.

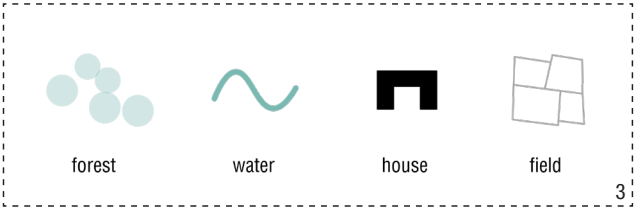
1. branch canal 2. lateral canal 3. field canal 4. net canal
5.six different spatial components of canal and settlement
Photo by Dachuan Sun. Drawn by anthor.

Linpan settlement



The Minjiang River flows through Dujiangyan's head weir into the Chengdu Plain, sustaining a vast irrigation network comprising thousands of canals. This system nourishes 1,000 hectares of fertile land and numerous Linpans.

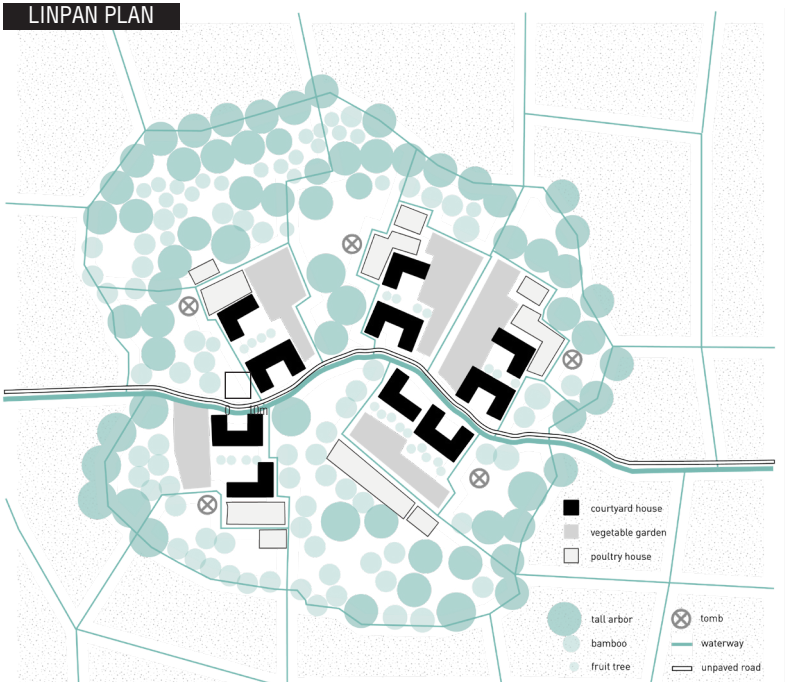
Linpans are unique to the Chengdu Plain, where "Lin" signifies the forest, particularly bamboo groves, and "pan" denotes the shape. Western Sichuan Linpans represent a harmonious blend of farmyards, trees, bamboo woodlands, rivers, and cultivated land, creating a holistic rural living environment that blends production, life, and landscape.



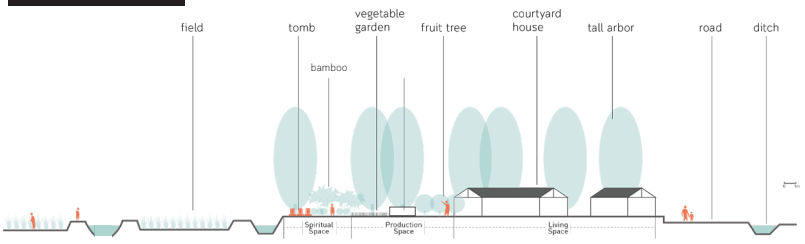
1 Linpan spatial structure. 2 Linpan view. Photo by Yuanxin.
3. Elements of Linpan.

These Linpans epitomize the synergy between human and nature, serving as a crucial resource for the sustainable development of

LINPAN PLAN



LINPAN SECTION



society, economy, and ecology in Western Sichuan. They hold cultural significance and play a vital role in preserving indigenous cultural traditions and emotions. This mode of production and life has a long history, and it is in harmony with the farming conditions, traditional farming methods and living needs of the Chengdu Plain.

Spacial structure

A Linpan is a harmonious blend of dwellings, trees, water, and fields, shaping a quintessential rural landscape. This distinctive setting features a sparse collection of residential houses and water sources encircled by towering trees, while the exterior is embraced by farmland, giving it a top-down appearance of a panel and a distant impression of a forest. This configuration characterizes the rural residential environment in the Chengdu Plain region, embodying an integrated way of life that combines production, daily living, and landscape.

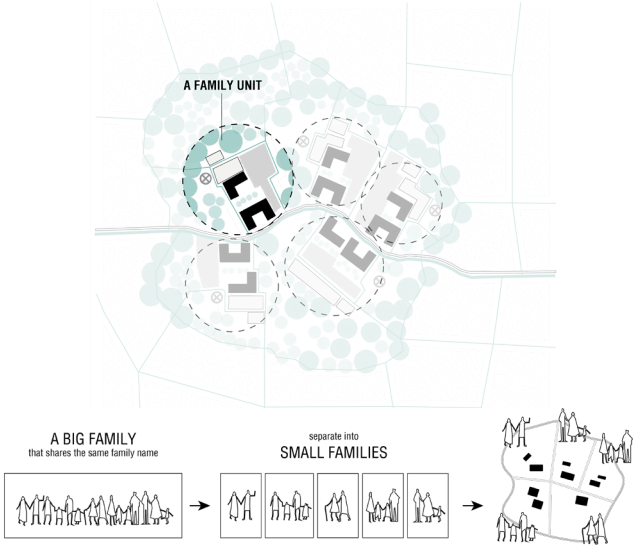
Horizontally, the upper layer of trees serves as a canopy, harnessing solar energy, providing shade, windbreaks, and soil preservation, while regulating the microclimate to maintain a comfortable temperature for human habitation. The second layer consists of houses, serving as the primary hub for human activities. The third layer comprises extensive fields, effectively converting solar energy into sustenance. Typically,

the distance from the house to the farmland spans between 30 to 200 meters, ensuring that the fields are in close proximity to the dwellings.

Unit composition

Linpan is based on extended family lineages with a common surname. A big family is composed of many small family units, who live in different courtyards, and these courtyards together form a complete Linpan. A Linpan can have up to 20 family units.

Usually as a family is settled, the male descendants will move out to establish new households when married. The location of the new household built is usually on the farmland that is near their family house and thus form an arrangement of gathered Linpanthat expands from the family house. As a result, the arrangement of buildings within a Linpanfully reflects the consanguineous relation of the villagers.



Linpan environmental characteristics photo.
Photo by Zhuangziyu

Human activities

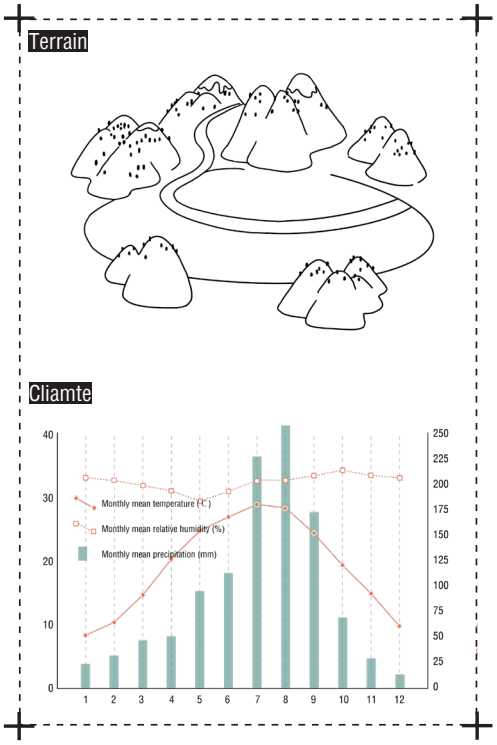
The human activities in the upper and lower reaches of Dujiangyan present different features because of having different main functions. At the head of Dujiangyan Project, surrounded by green mountains and green waters, the superior ecological environment and historical sites make it a leisure and tourist attraction in addition to undertaking the function of water conservancy regulation.

Downstream, a vast irrigation system spreads out, and in symbiosis with it is a system of woodland settlements created by indigenous people over thousands of years using water and in situ conditions. People live near the water, get their food from the water, rely on the water as a means of transportation, and relax and socialize by the water.

Traditional daily human activities in Linpan.
Source: Heyanhui

Traditional wall drawing of daily Life in Linpan.
Source: Heyanhui

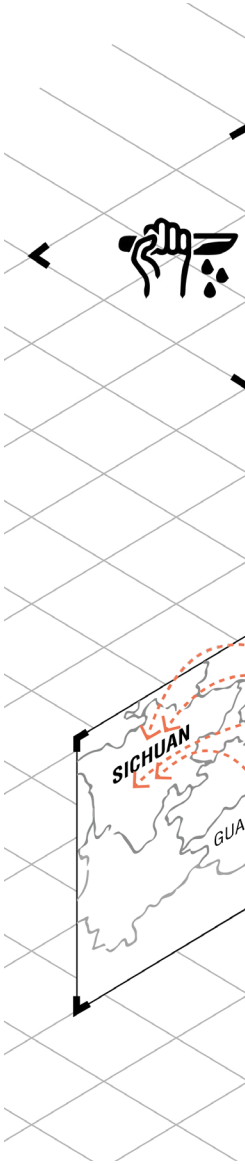
Linpan formation



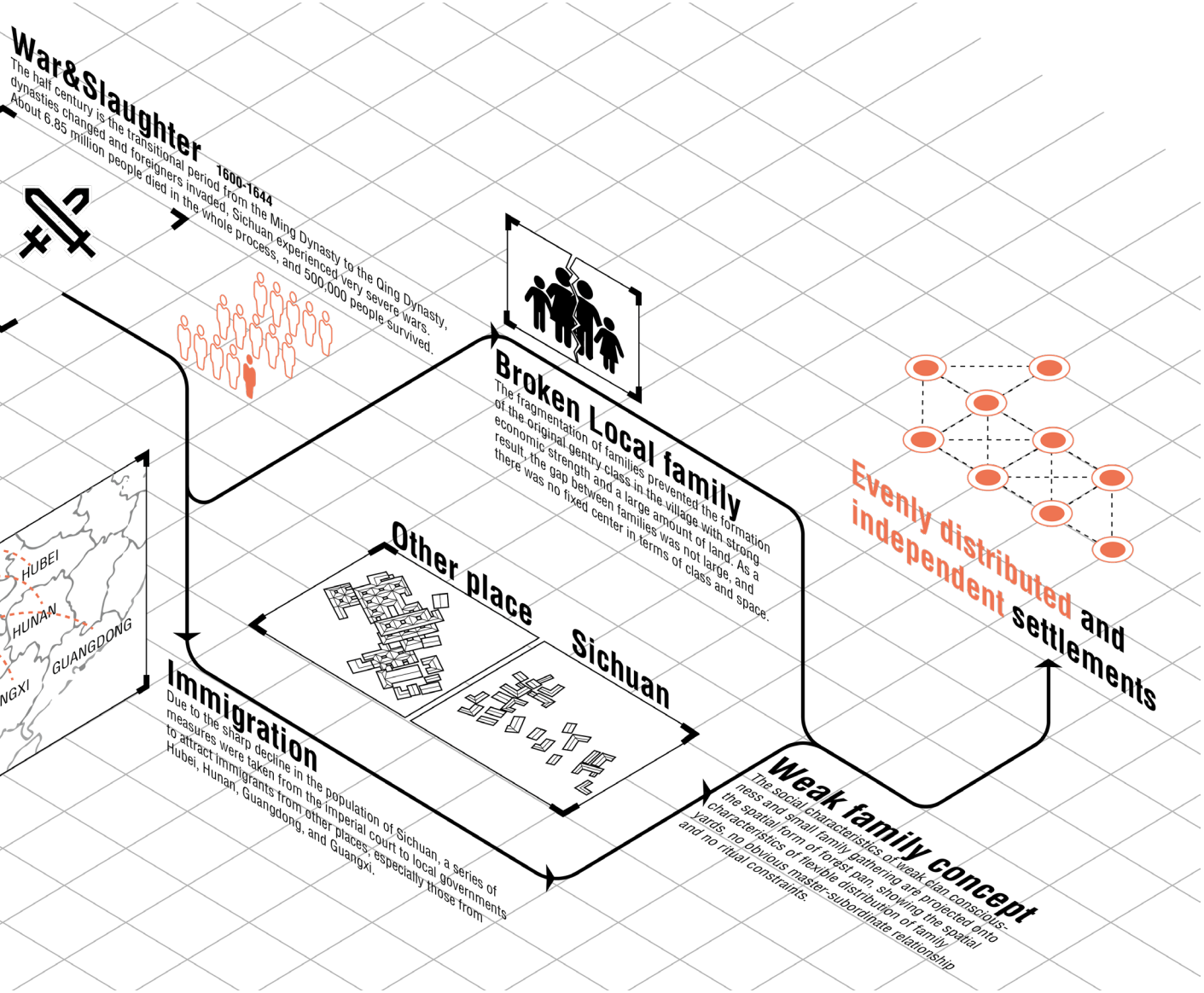
Chengdu Plain is surrounded by mountains on three sides. The flat terrain of the plain allows for a uniform distribution of Linpan. Due to the climate being humid and rainy all year round, adaptations in architecture have evolved to accommodate frequent rainfall.

In the 17th century, China experienced significant upheaval, including foreign invasions and a drastic population decline in Sichuan province, where approximately 6.5 billion people perished, leaving only half a million survivors amid the intense conflicts. To boost the population, the government encouraged immigration to Sichuan, with many newcomers being exiles and impoverished individuals. Additionally, the native families had been greatly disrupted by the war, resulting in weaker family bonds. Consequently, the distribution of dwellings (Linpans) became more uniform, characterized by similar specifications.

In summary, it is learned that the formation of Linpan is a comprehensive product of climate, topography and historical factors.



1 Basic terrain information
2 Temperarture and amount of rainfall in Chengdu Plain
Source: Google Earth


War&Slaughter
1600-1644
The half century is the transitional period from the Ming Dynasty to the Qing Dynasty, dynasties changed and foreigners invaded. Sichuan experienced very severe wars. About 6.85 million people died in the whole process, and 500,000 people survived.
Broken Local family
The fragmentation of families prevented the formation of the original gentry class in the village with strong economic strength and a large amount of land. As a result, the gap between families was not large, and there was no fixed center in terms of class and space.
Other place
Sichuan
Immigration
Due to the sharp decline in the population of Sichuan, a series of measures were taken from the imperial court to local governments to attract immigrants from other places, especially those from Hubei, Hunan, Guangdong, and Guangxi.
HUBEI
HUNAN
GUANGDONG
NGXI
Weak family concept
The social characteristics of weak clan consciousness and small family gathering are projected onto the spatial form of forest pan, showing the spatial characteristics of flexible distribution of family yards, no obvious master-subordinate relationship and no ritual constraints.
Evenly distributed and independent settlements

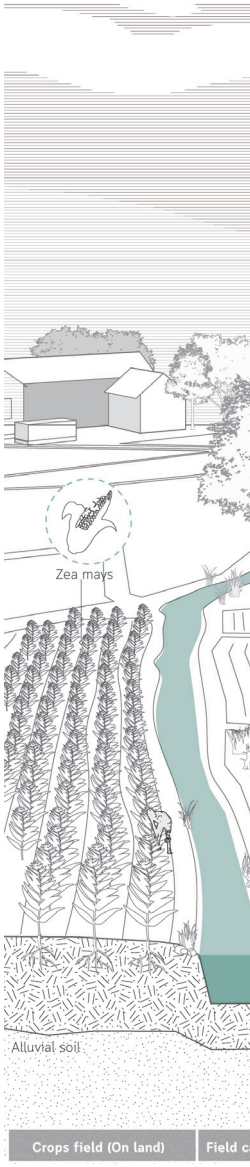
Why Heritage?

Inner circulation
Within the Linpan system, people, field, water and forests are interdependent. For example, people use the wood of forests to make fires and build houses. The forest serves as a barrier and a place for people to rest. Human and livestock manure will in turn fertilize the forest. In this way, Linpan forms a whole circular system of energy, material, (maybe emotion). People can live self-sufficiently in Linpan.

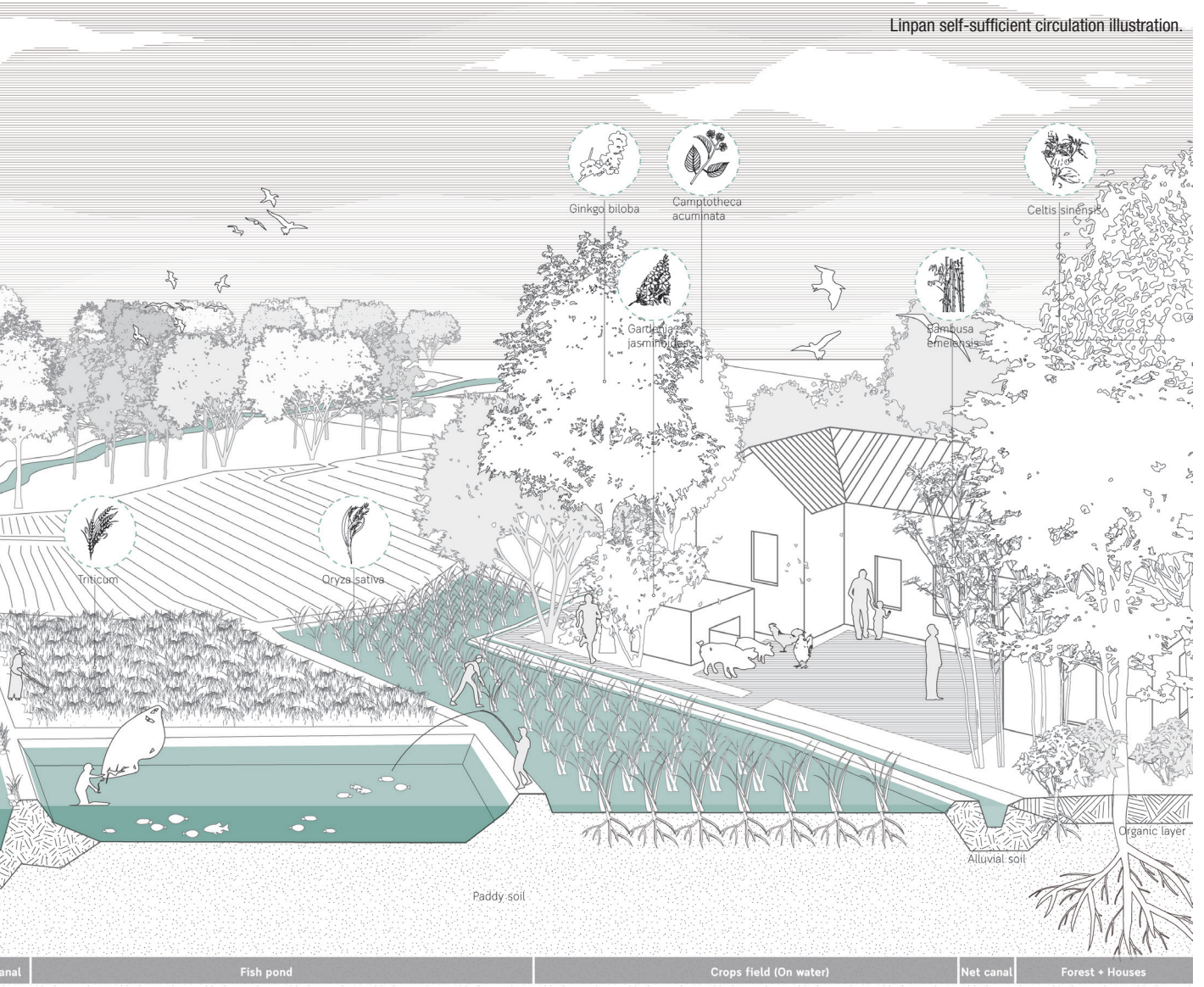
Landscape Values
The Dujiangyan water system comprises diverse material elements, such as farmland, irrigation canal engineering, and Linpan landscapes, serving multiple ecological, production, and daily life functions. In terms of non-material aspects, the Linpan area carries rich historical and cultural memories due to its long history of production and life.

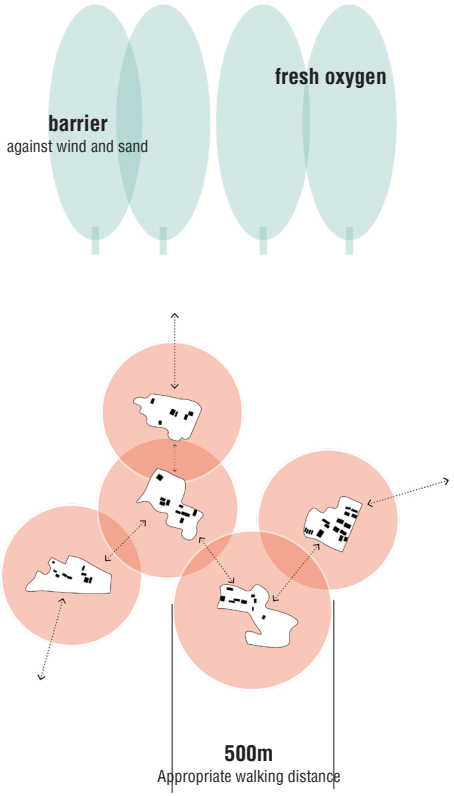
Heritage Values
The core irrigation area of Dujiangyan boasts a millennia-old legacy of irrigation and agriculture, with the Linpan landscape evolving over thousands of years, bearing witness to the area's historical transformations. Each element and overall character of the Linpan serves as a historical witness, evoking long-term regional memories.

Production Values
The Dujiangyan Core Irrigation District, despite its high population density and forest distribution, efficiently caters to residents' production and living needs. The Linpan economy exemplifies a traditional, small-scale peasant economy, with intensive rice cultivation yielding excellent economic benefits. While traditional methods have faced short-term challenges, their sustainable land use models, complex field and forest production systems, and potential for future appreciation remain intact. Linpan's livability is shaped by its spacing, typically 200-500 meters, promoting a close-knit community. The surrounding forests provide essential benefits,



Linpan self-sufficient circulation illustration.





Linpan features: Tree barrier and Homogeneous distribution.

offering wind protection, sunshade, and a steady supply of oxygen.

Ecological Values

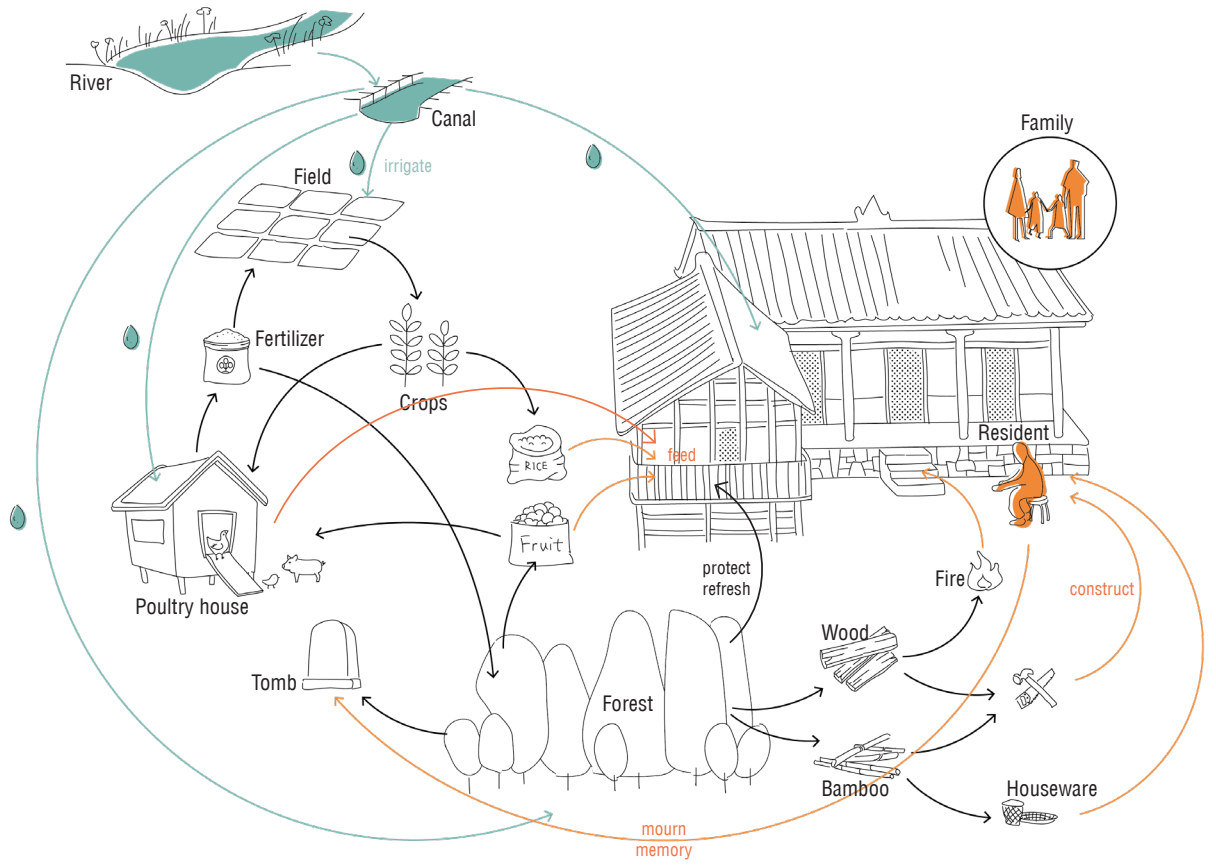
The core irrigation area's upstream location significantly influences downstream water and soil conditions in western Sichuan plain, serving as a vital ecological barrier. Traditional forests within the area maintain regional carbon and oxygen balances, purify the air, regulate the climate, uphold soil functions, conserve water sources, and safeguard biodiversity.

The ongoing coexistence of humans and forests in Linpan is a testament to the enduring harmony between people and nature. These organic ecological practices hold value for future generations to embrace and evolve. Within the Linpan framework, the symbiotic relationship between people, fields, water, and forests remains integral.

Ethnographic and Identity Values

The Dujiangyan water system exemplifies the remarkable interaction between residents and their environment in western Sichuan plain. It transformed a region prone to flooding into a thriving agricultural hub, establishing a harmonious Linpan-field-weir-and-canal landscape system. These unique spatial forms and lifestyles define the area and contribute significantly to residents' sense of belonging.

Linpan features unique traditional architecture using local materials like small green tile roofs and bamboo-woven walls. The rich bamboo forests have given rise to a thriving bamboo culture, with residents skilled in crafting everyday items through bamboo weaving.



Traditional circulation within a Linpan.

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4

THE PRESENT:
Challenge & Opportunity

Macro Current Situation
Micro Current Situation
Ongoing positive changes
Problem Fields

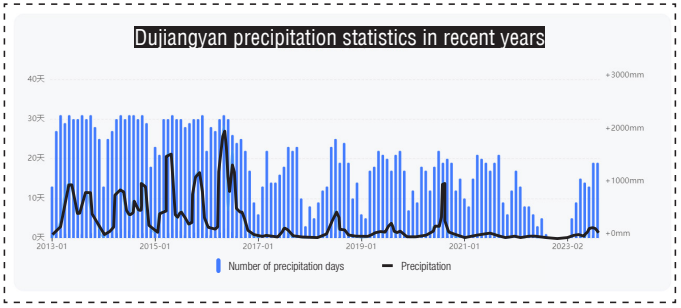
"In the face of this transformation, the rural heritage landscape is at a crossroads, grappling with unique problems that require prompt attention and innovative solutions."

Macro Current Situation.
Chengdu Plain

Ecological instability

The Linpan area is facing the deterioration of the ecological environment and the imbalance of the ecological system, among which the seasonal water shortage and floods have the most serious impact on the local ecology.

As can be seen from the graph shown on the left, average monthly precipitation in Dujiangyan maintains normal fluctuations until 2017, but shows an overall downward trend after 2017, and even the peak summer precipitation disappears between 2021 and 2023.



1Flood in 2020. Photo by Zhangziqing.
2 Earthquake in 2008. Photo by Wangfan.
3 Drought in 2022. Photo by Fuzhong.

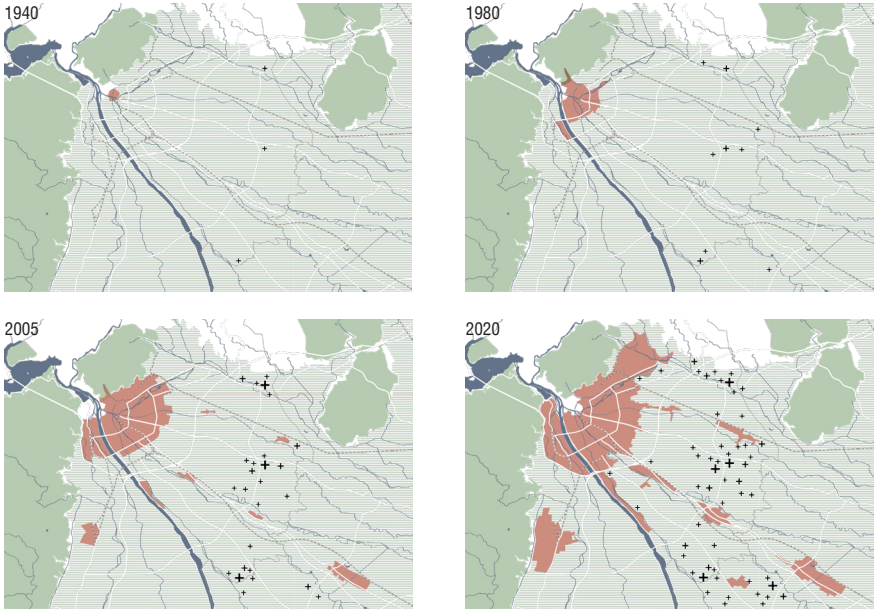
Urban expansion

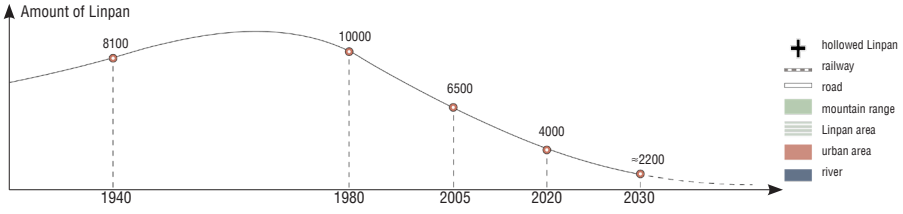
Since the founding of the People Republic of China in 1949, the urban area of Dujiangyan has been expanding steadily. Especially after year 2000, the economy has taken off and China has entered a large-scale urbanization process, and Dujiangyan is no exception.

It can be seen from the figure that, from 1940 to 2020, the area of Dujiangyan urban area expanded more than ten times. What followed was the reduction in the area and number of Linpan: from 12000 to 4000. In 2020, the number of Linpans decreased to one-sixth of its peak in 1980s.

Analysing the trajectory of urban expansion, it can be found that the urban area of Dujiangyan mainly expands along rivers and main roads, and has a tendency to be connected to the surrounding satellite towns.

Urban expansion in Dujiangyan city since 1940.





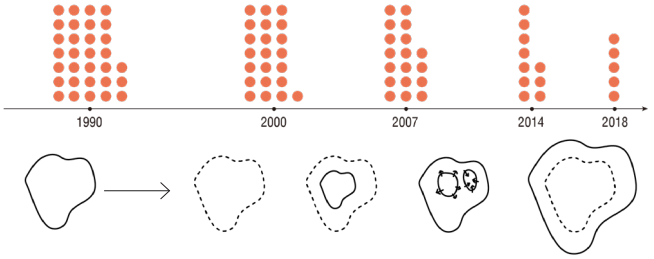
Linpan declination in Chengdu Plain since 1940.

No more Linpan?

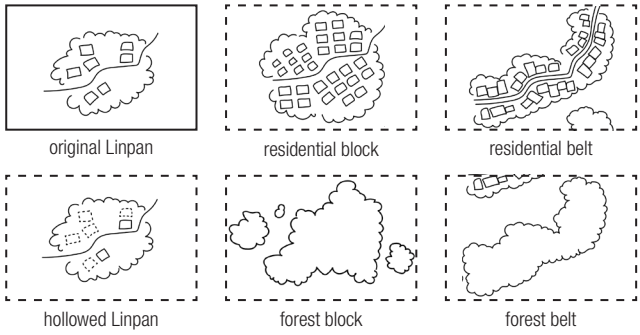
In the context of urbanization, Linpan has also undergone many evolutions. The existing Linpans are scattered, sometimes densely packed and sometimes dispersed. The distribution is unevenly spaced, resulting in the uneven Linpan system size. The existing infrastructure is not complete and it is difficult to cover all Linpans, which also hinders the development of Linpans.

It can be summarized from the satellite map that the spatial pattern of Linpan has mainly seen three kinds of changes: shrinkage, merge and disappearance.

In the shrink Linpans, It is also common to see disrepaired, oddly styled buildings and deserted woods that have been left unattended. The Linpans that eventually disappear went through the process of shrinkage first. Merge often happens when a certain base try to occupy the whole space, such as a massive apartment or an economic forest. This was especially common after the earthquake in 2008. In order to quickly resettle the survivors, the government built many new high-rise buildings, and the original Linpan of the residents were left idle. A deformed Linpan will no longer maintain its original Linpan form and therefore cannot be called a Linpan. According to the increase or decrease of their specific internal composition, they can be categorized into five types of space as shown in the diagram.



Current Linpan environment problems.
Source: Time of Day·History of Chengdu.

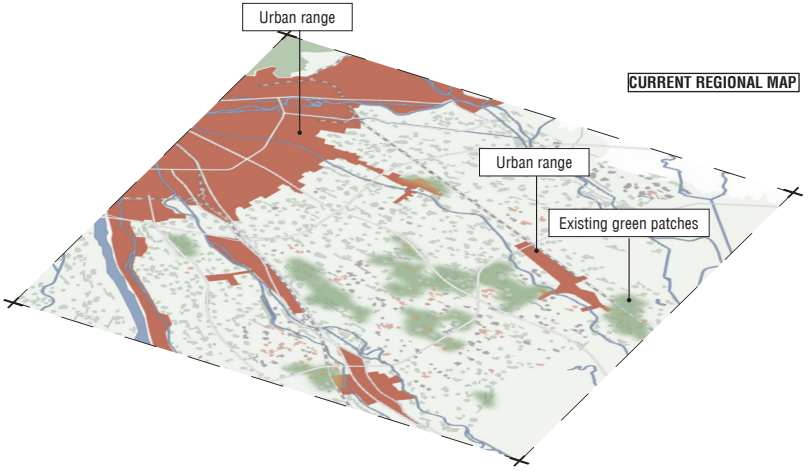


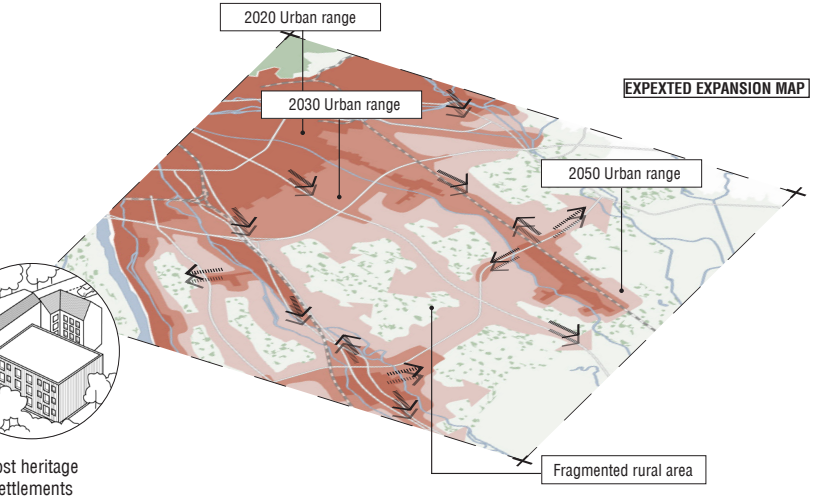
Linpan developing process.

Conclusion

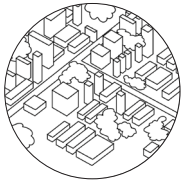
Based on the town expansion patterns derived from the analysis and the current rate of urban development, I have projected a map of the distribution of towns and cities on the Chengdu Plain over the next five years and the next ten years. It can be seen that the future plains of Western Sichuan will be fragmented into unlinked patches by connected towns and large infrastructures, which will have a negative impact on the preservation of the Linpan, the daily lives of the local people, and the integrity of the ecosystem.

1



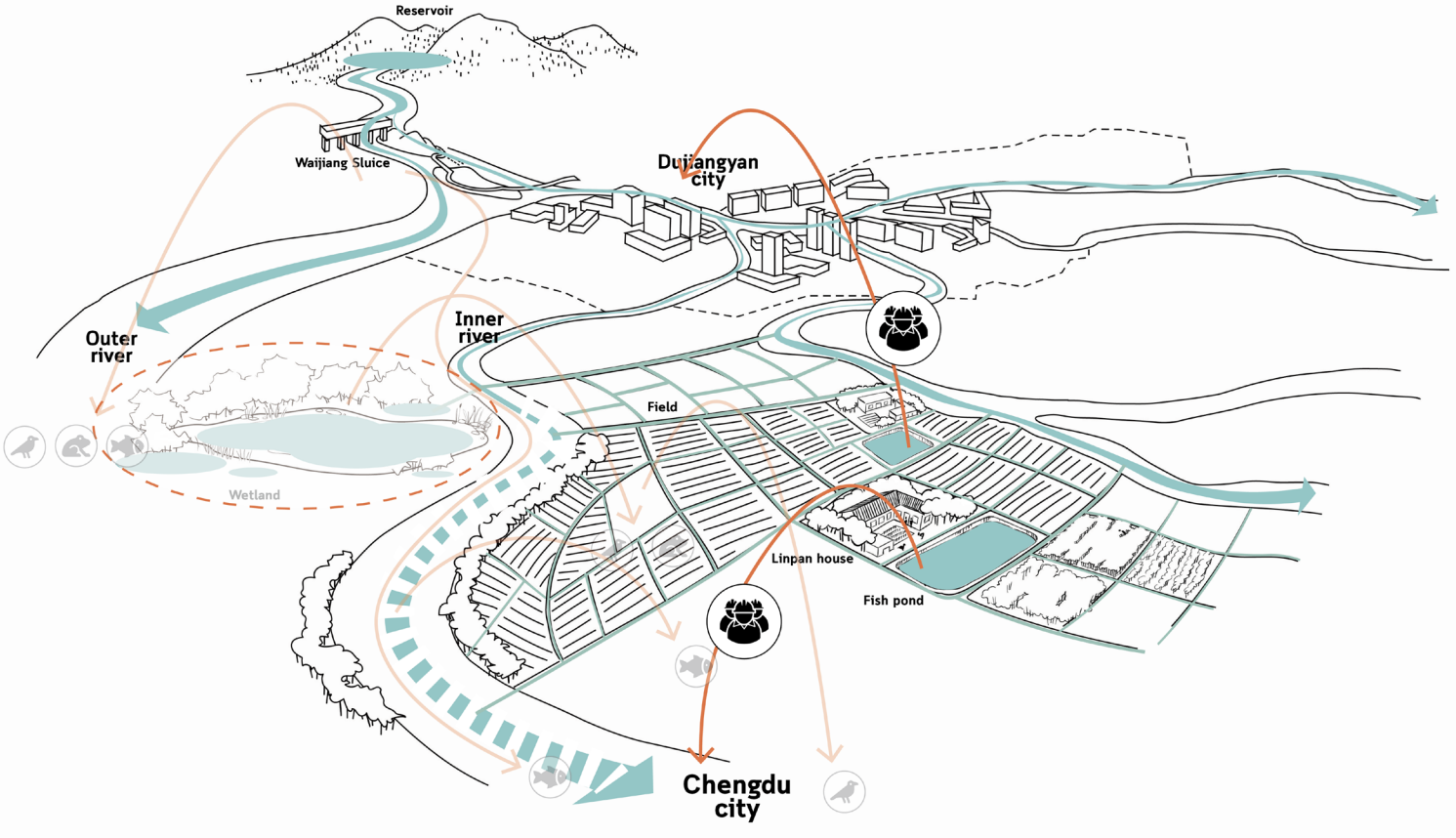


Ecological Deterioration



Massive Urbanization

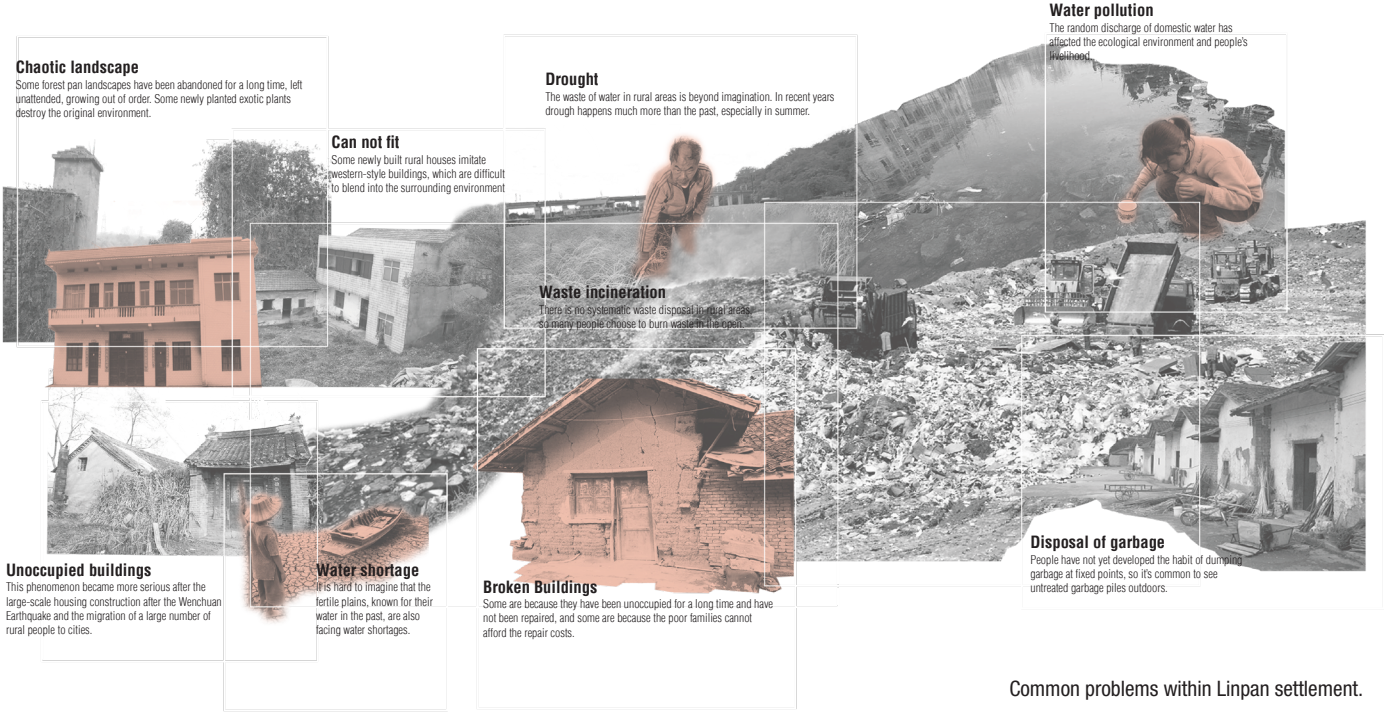
Lost heritage settlements



Current Circulation on the whole Chengdu Plain.

Micro Current Situation.
Linpan

Signs of Linpan decline can also be seen everywhere within Linpan, the smallest spatial scale unit. This collage illustrates several prevalent issues within Linpan settlements, which reflect the challenges faced by these rural communities. These challenges encompass a disorganized and cluttered landscape, the absence of native vegetation, the presence of dilapidated or unattractive structures, improper waste disposal methods such as burning, insufficiencies in the water supply, and concerns regarding water pollution. These collective problems paint a complex picture of the issues confronting Linpan communities in their daily lives and their impact on the overall quality of life in these unique rural settings.

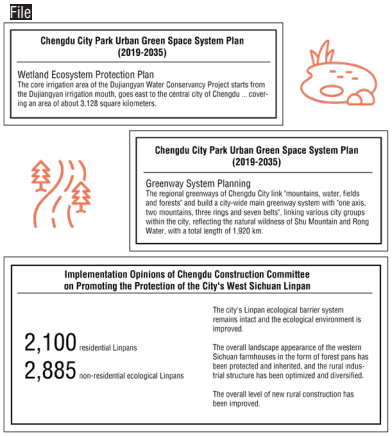


Common problems within Linpan settlement.

Ongoing Positive Changes.

Fortunately, some actions to save Linpan are already underway. First of all, the local government has introduced some policies to revitalize forest pans and the surrounding environment, clarified ecological red lines, and restricted the area and quantity of forest pans that can be renovated. At the same time, in the official urban planning of Dujiangyan County, a plan was proposed to expand the central urban area along the river and carefully avoid densely forested areas.

In addition, for each Linpan, local residents also have already been spontaneously exploring a lot of new functions and possibilities of Linpan in different fields, such as running cafes, hotels, etc. It can also be said that Linpan's innovation is also people's exploration and attempt at sources of income other than agriculture.



1. Pension
2. Farmhouse restaurant
3. Cafe
4. Market
5. Fishery
6. Plantation forest

Problem fields.

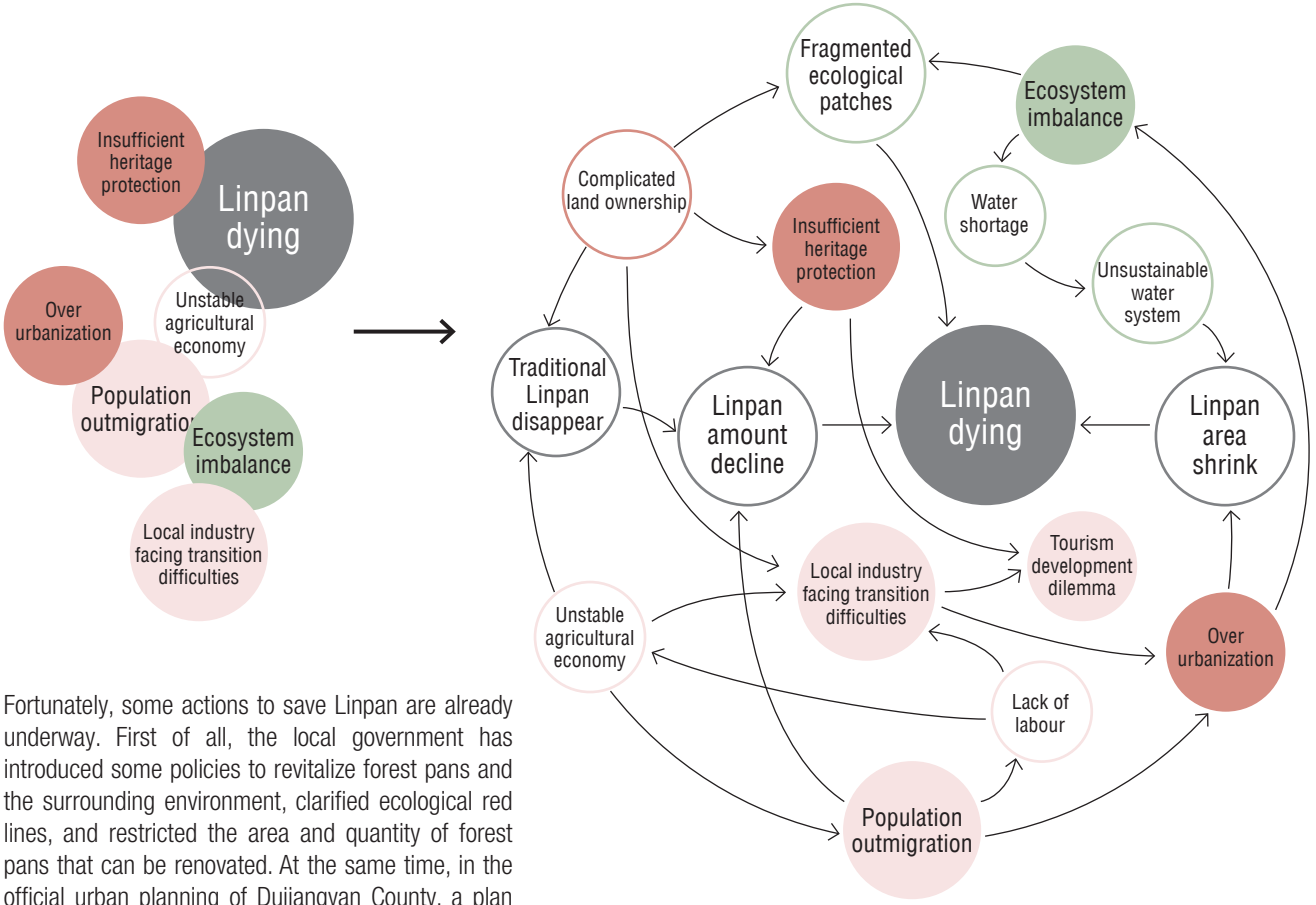


Fig. 1-1 Chengdu Plain Linpan settlement.
Source: Time of Day·History of Chengdu

Fortunately, some actions to save Linpan are already underway. First of all, the local government has introduced some policies to revitalize forest pans and the surrounding environment, clarified ecological red lines, and restricted the area and quantity of forest pans that can be renovated. At the same time, in the official urban planning of Dujiangyan County, a plan was proposed to expand the central urban area along the river and carefully avoid densely forested areas.

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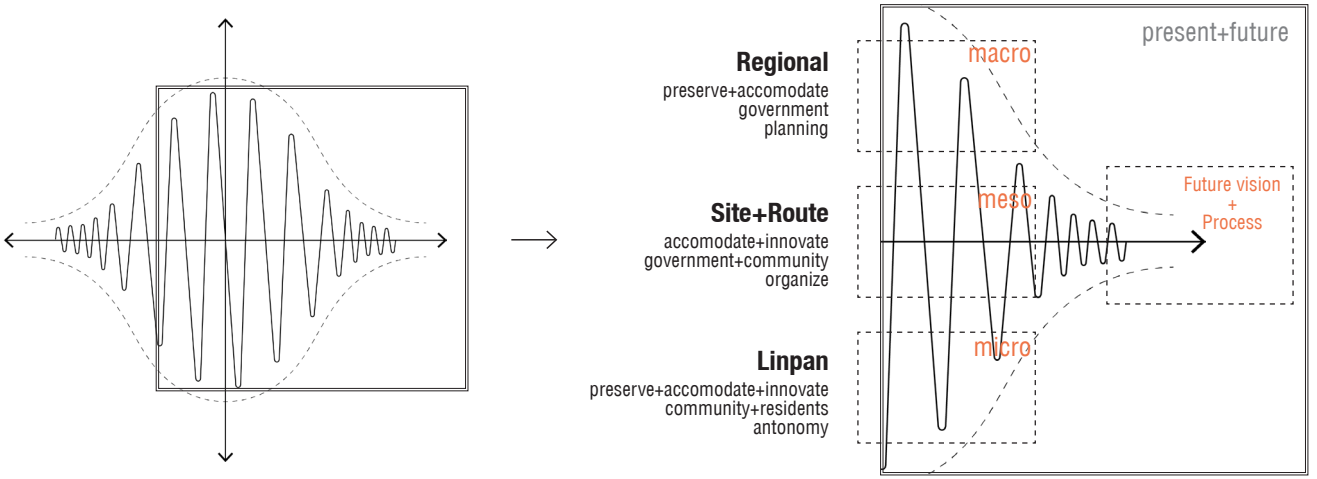
5

THE PRESENT:
Conceptual Design

Narrative structure
Linpan Transformation
Regional Planning
Route&Site Design

Narrative structure.



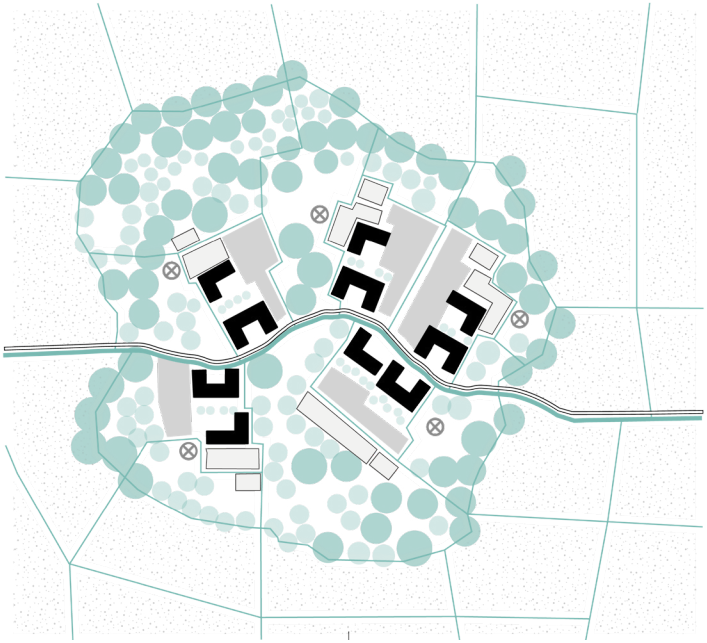
Like many rural heritage landscapes in China, the originally self-sufficient Linpan landscape system becomes fragile and faces multiple threats. Preserving the Linpan heritage landscape requires landscape measures that enhance adaptability to the present context, which might involve incorporating spatial strategies and design solutions to increase flexibility. This chapter integrates and refines the knowledge learned in the previous chapters into design concepts and spatial strategies, and plans future development at multiple time stages and scales.

Starting from the smallest unit of the whole Chengdu Plain system - Linpan, based on the existing materials and internal circulation of Linpan, series of adaptive and innovative transformations were applied on Linpan. Three different types of new Linpans (Modern Linpan, Ecological Linpan, Urban Linpan) are designed for coping with different typical situations with reference to residents' opinions. The complex ownership of the site also ensures the multiple assistance of many parties. It is advocated to promote and implement the mode of government funding - community publicity - residents' self-help throughout the whole process.

After the design of different types of Linpans is completed, their spatial layout requires to be considered and fixed. Consequently, it is vital to zoom out to the entire Chengdu Plain region, viewing it

as a holistic system. The blue-green structure is the foundation of Linpan. however current ecosystem as a whole is relatively fragile. Refering to the urban expansion laws summarized in previous studies and existing blue-green structure and Linpan distribution, A blue-green ecological network could be build to fix the vulnerability. At the same time, the specific characteristics of the three types of Linpans provided solid ground to arrange the distribution blocks for different types of forest disk renewal.

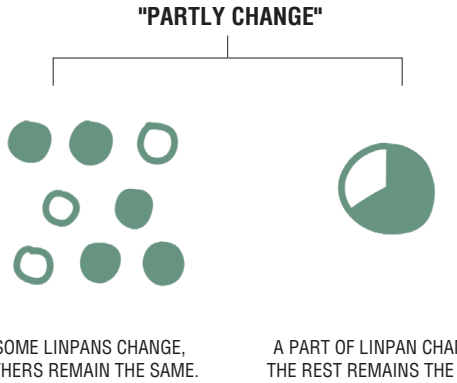
Linpan Transformation.



farmland
courtyard house
vegetable garden
poultry house
tomb
waterway
unpaved road

Linpan settlement Plan.

0 10m

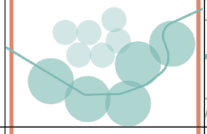
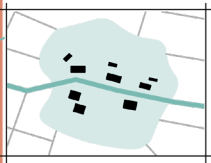
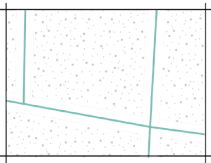
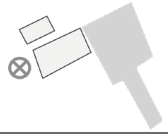


Partly Change

In response to the inadequacy of traditional Linpans in adapting to the contemporary context, pursuing innovation while preserving their essence emerges as a viable approach.

The Linpan serves as a rural residential unit exclusively for residents, which has resulted in the haphazard and unplanned Linpan transformation on the Chengdu Plain. This occurrence is not unique, as widespread renovations in other Chinese rural areas have often

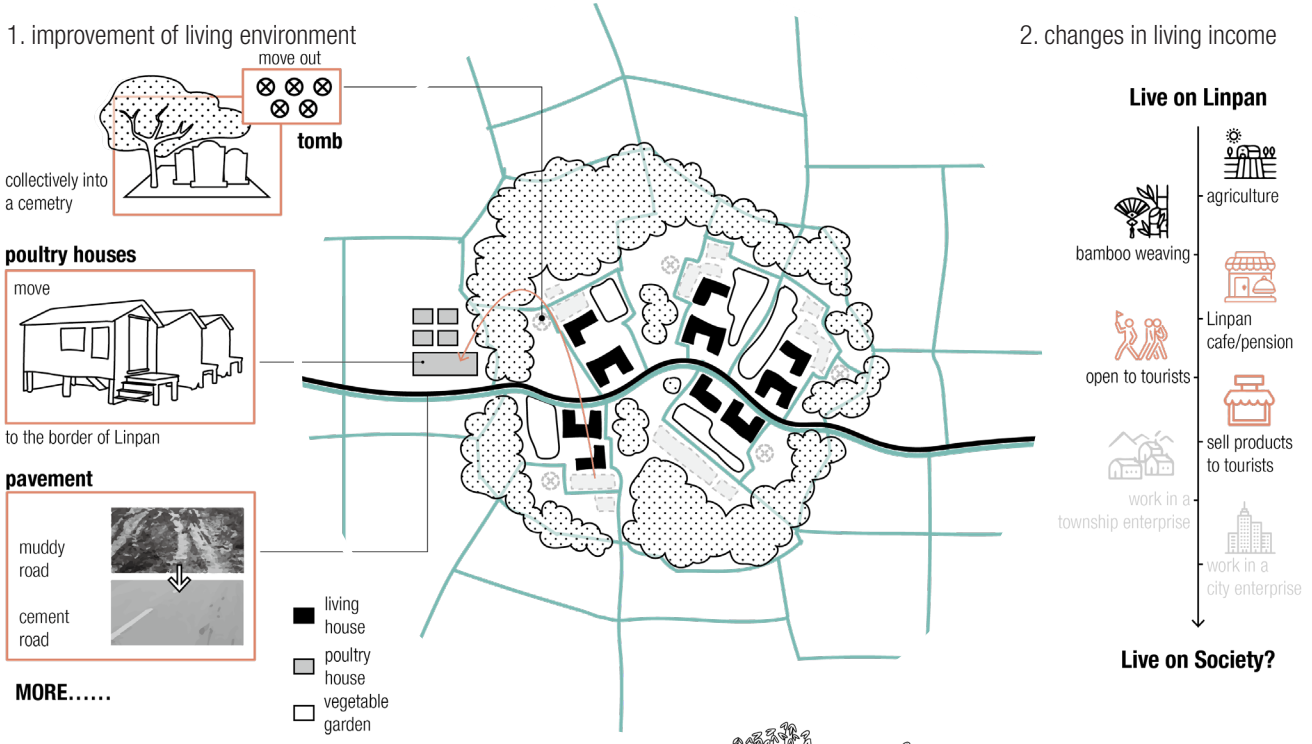
Most essencial feature

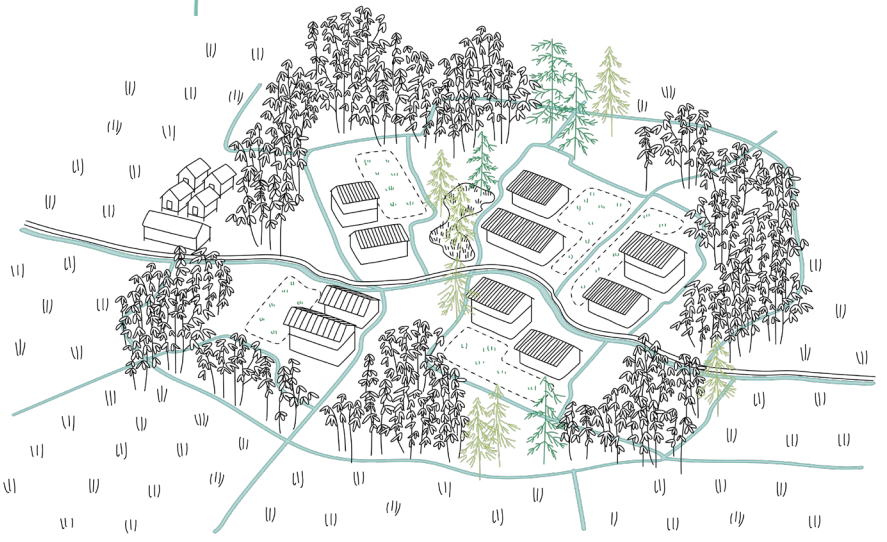
Linpan transformation types	Forest-aqua landscape	Linpan structure	Family based	Agriculture	Lifestyle&landuse
					
0. Traditional Linpan	Keep	Keep	Keep	Keep	Keep
1. Modern Linpan	Keep	Keep	Keep	Keep	Change
2. Ecological Linpan	Keep	Keep	Keep	Change	Change
3. Urban Linpan	Keep	Keep	Change	Change	Change

overlooked the independent choices of residents. ()To maintain the ecological integrity of the Linpan landscape on the Chengdu Plain region while respecting individual resident preferences, the "partly change" Linpan renovation plan has been devised. The term "partly change" denotes a selective approach, where some elements undergo modification while others remain untouched. Consequently, the specific changes will be based on the overall regional planning, current quality of Linpan, and personal preferences of the residents.

The elemental components of Linpans—forest-aqua landscape, Linpan structure, family base, agriculture, lifestyle, and land use—constitute the fundamental aspects subject to modification or preservation. This approach results in three distinct models of Linpan transformation, achieved by altering specific elements while retaining others: modern Linpan, ecological Linpan, urban Linpan.

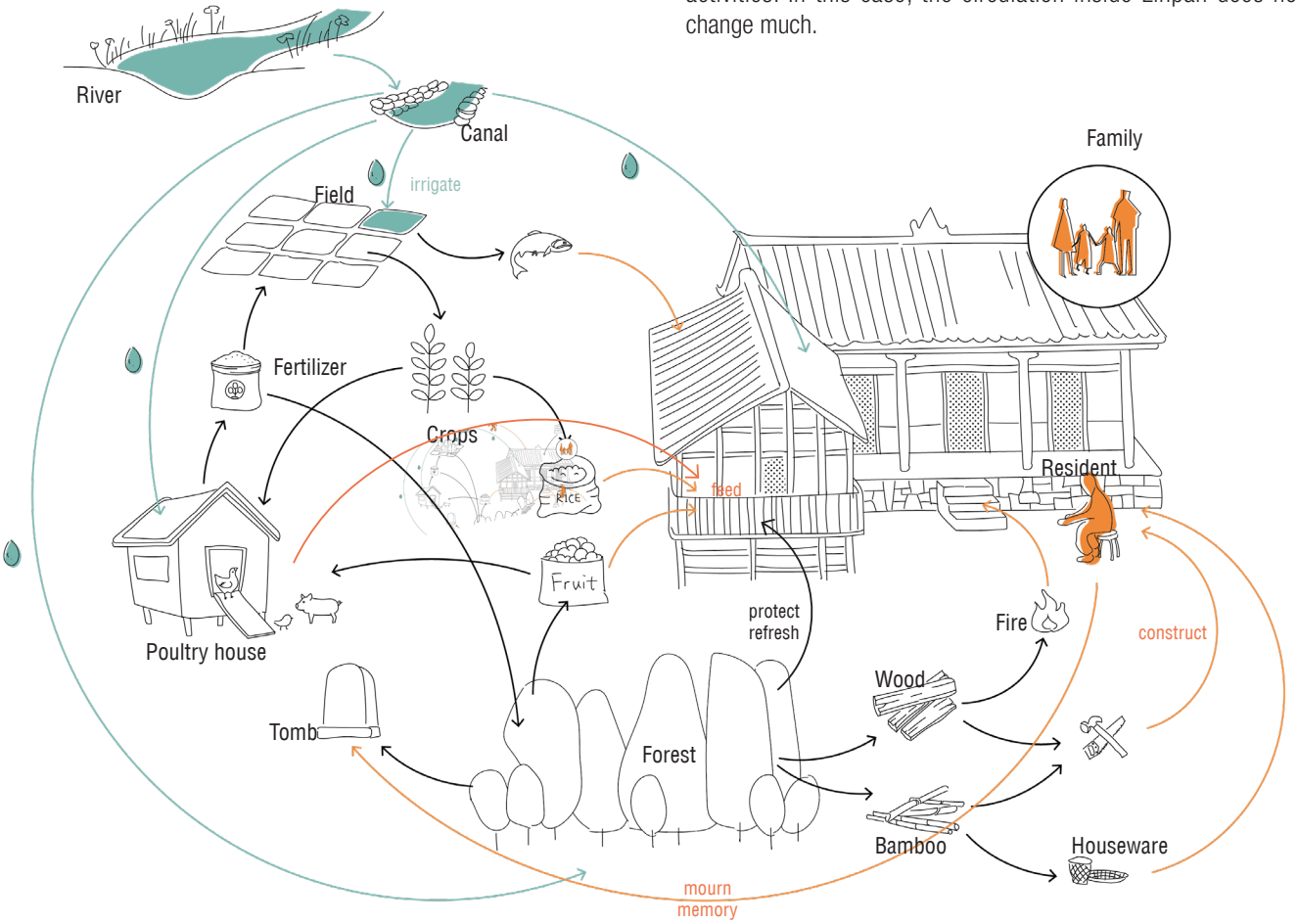
TYPE 1: Modern Linpan



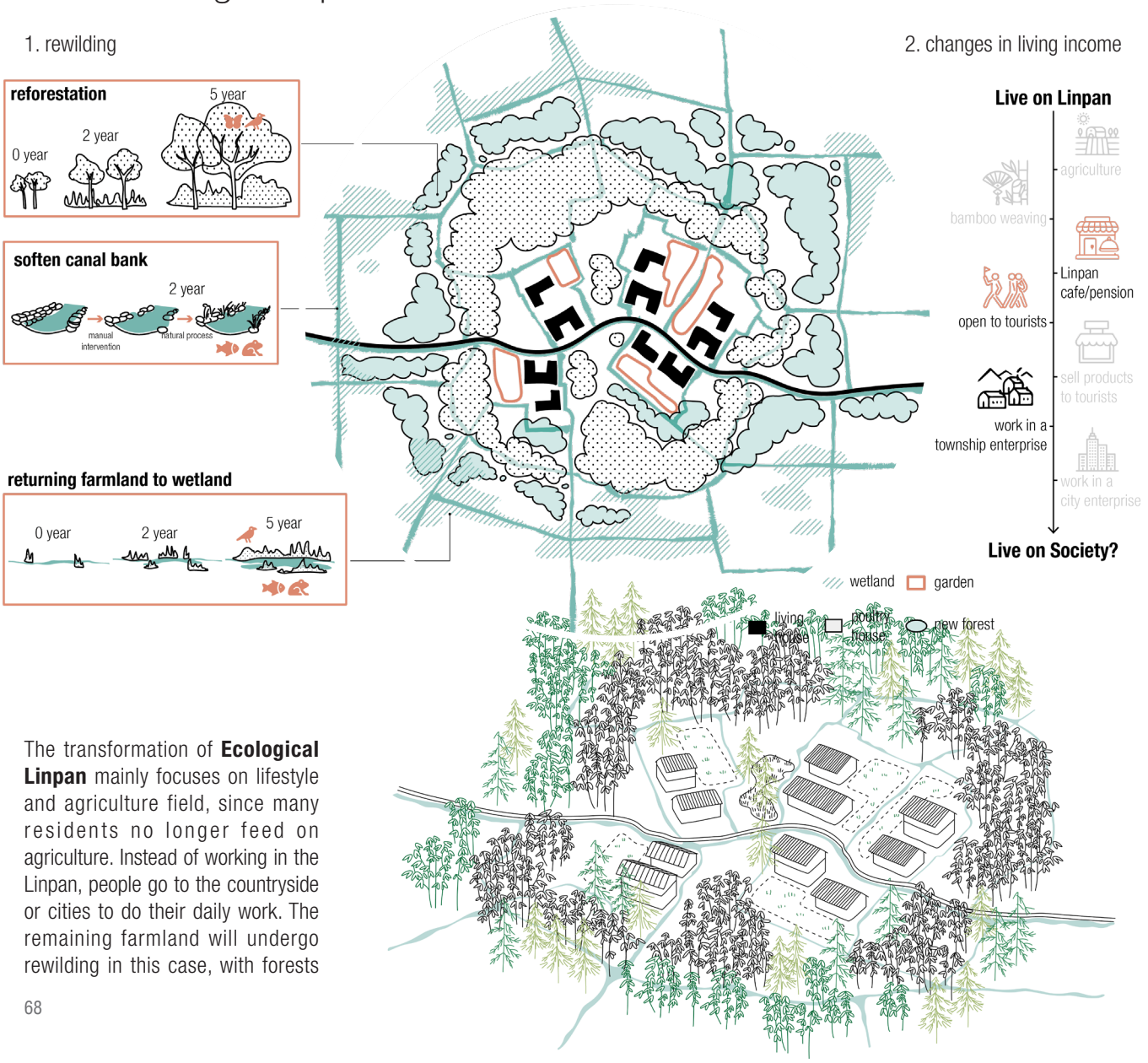


The transformation of **Modern Linpan** mainly focuses on lifestyle and land use, starting from improving the living environment and changing the way of living income. The former includes relocating the tombs and poultry pens, improving infrastructure (roads, irrigation canals, buildings) and increasing green space and

activity space. The latter means that while relying on agriculture to make a living, residents can participate in tourism-related business activities. In this case, the circulation inside Linpan does not change much.

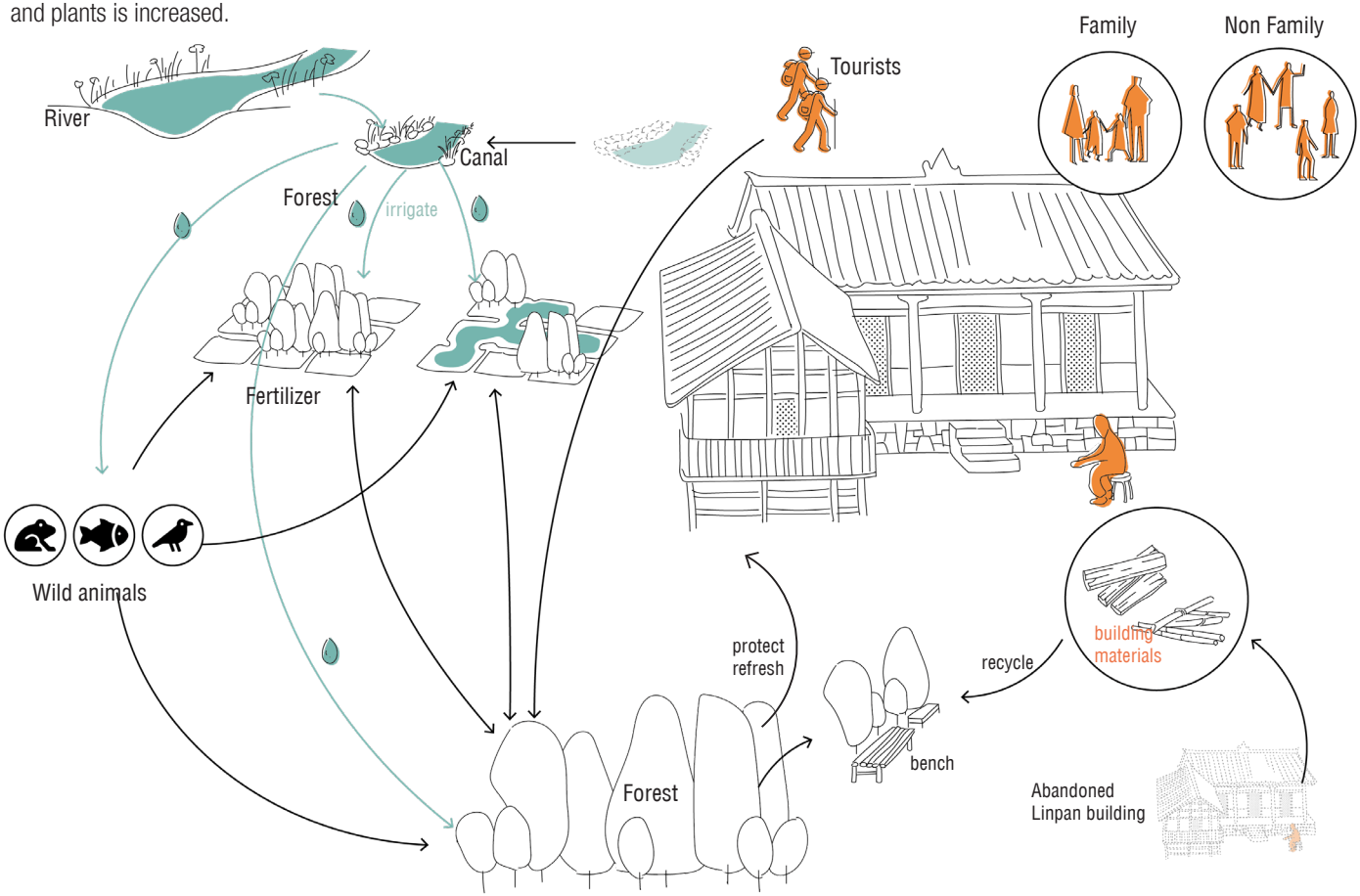


TYPE 2: Ecological Linpan



The transformation of **Ecological Linpan** mainly focuses on lifestyle and agriculture field, since many residents no longer feed on agriculture. Instead of working in the Linpan, people go to the countryside or cities to do their daily work. The remaining farmland will undergo rewilding in this case, with forests

expanding, irrigation canals de-hardening, and wetlands gradually forming. In the internal circulation of the forest plate, agriculture-related links are reduced and the material flow between animals and plants is increased.



TYPE 3: Urban Linpan

1. Main function: residence

residents

family based → diverse community

buildings

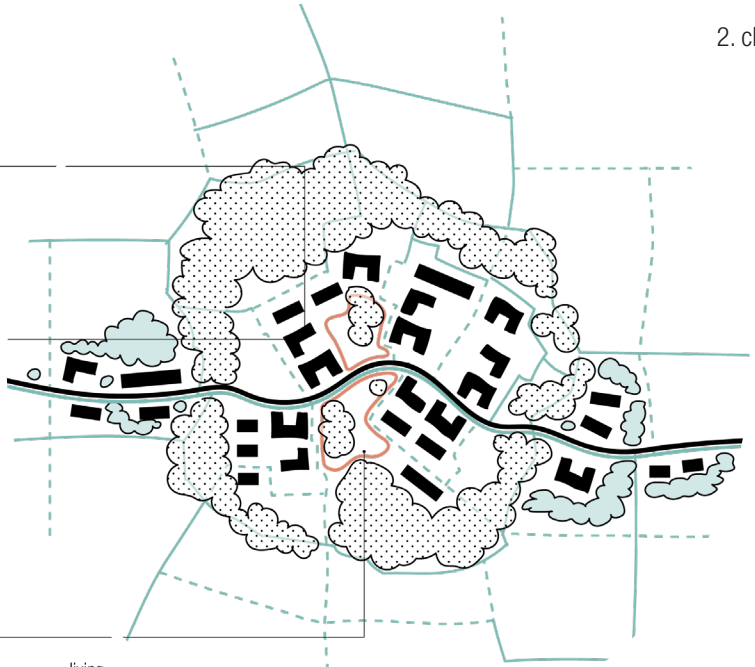
style →

restriction ≤15m ≤4stories

buildings≤25
residents≤120
Plot Ratio≤0.7

activities

rest, gather, play, meet

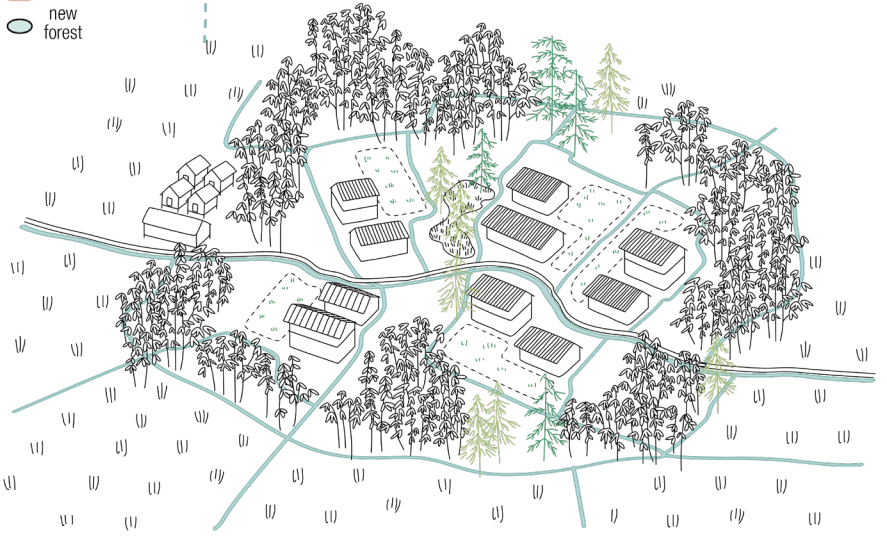


2. changes in living income

Live on Linpan

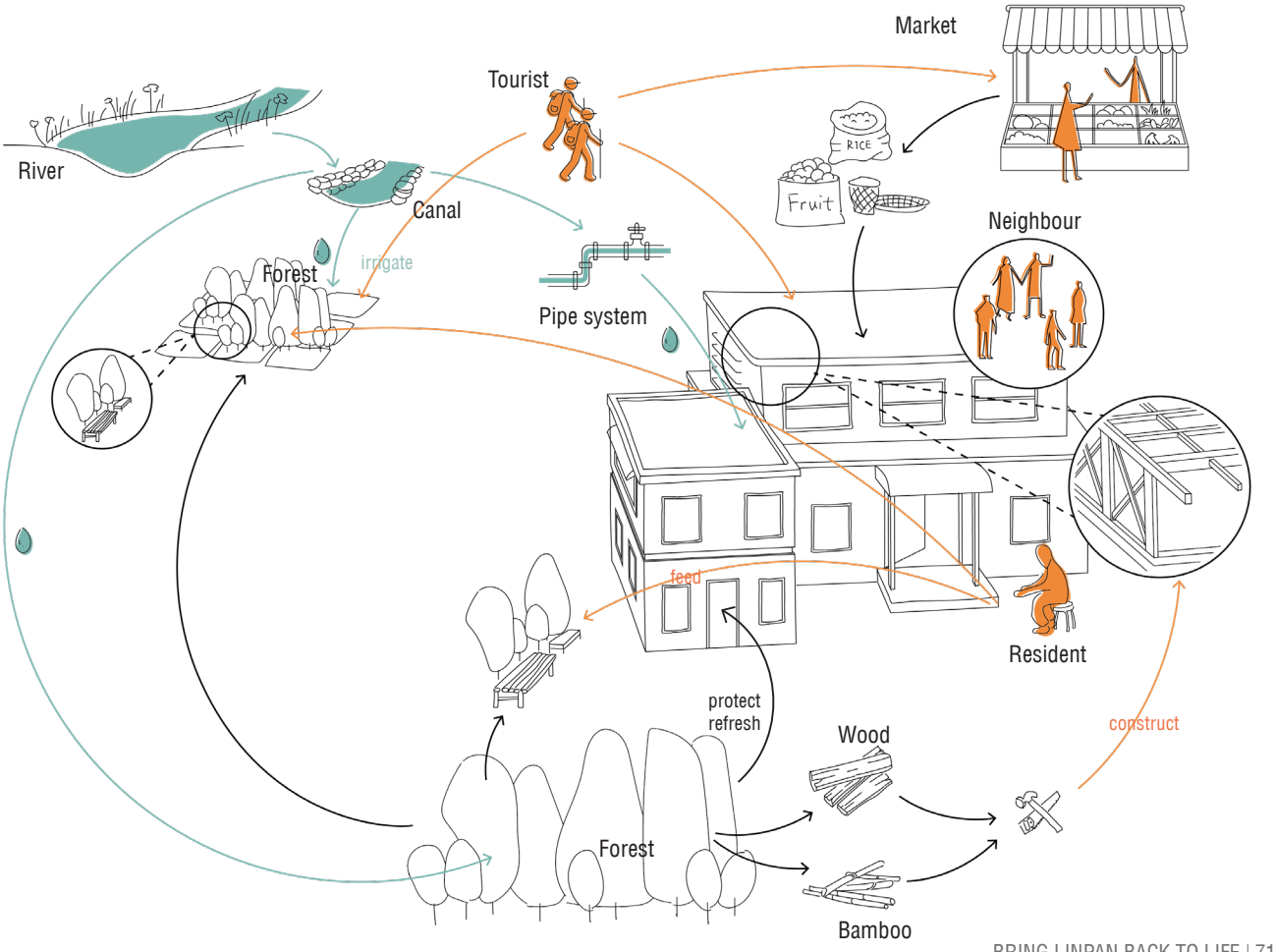
- agriculture
- bamboo weaving
- Linpan cafe/pension
- open to tourists
- sell products to tourists
- work in a township enterprise
- work in a city enterprise

Live on Society?



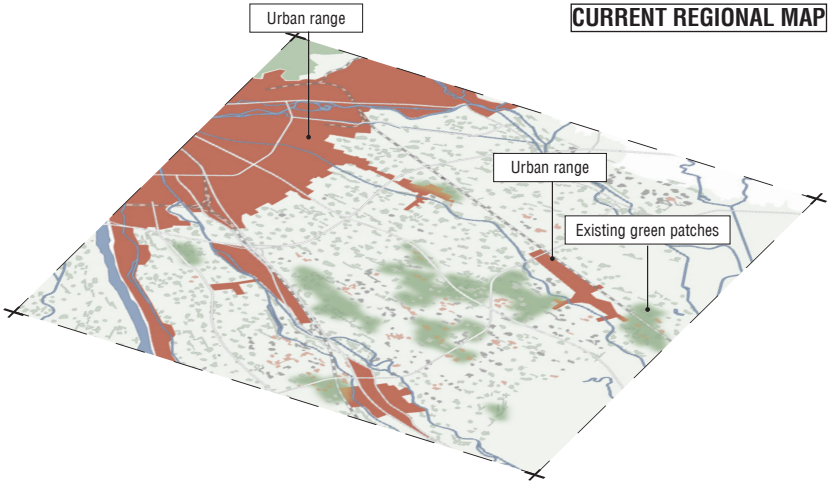
The transformation of **Urban Linpan** mainly focuses on lifestyle, agriculture and family base. Linpan gradually grow into a new form of apartment, accommodating residents from different family. A Linpan is rather like a neighbourhood than a family house, It can generally accommodate 15-30 families and

up to 150 people. More activity space and entertainment facilities were introduced. As a circular system, Linpan exchanges materials with the outside world more frequently.

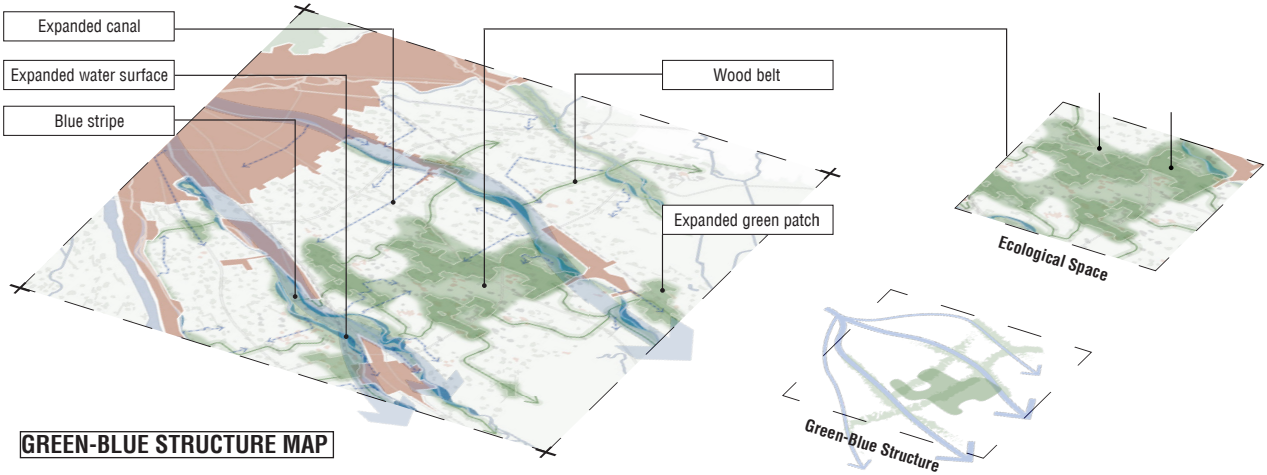


Regional Planning.
Ideal vision

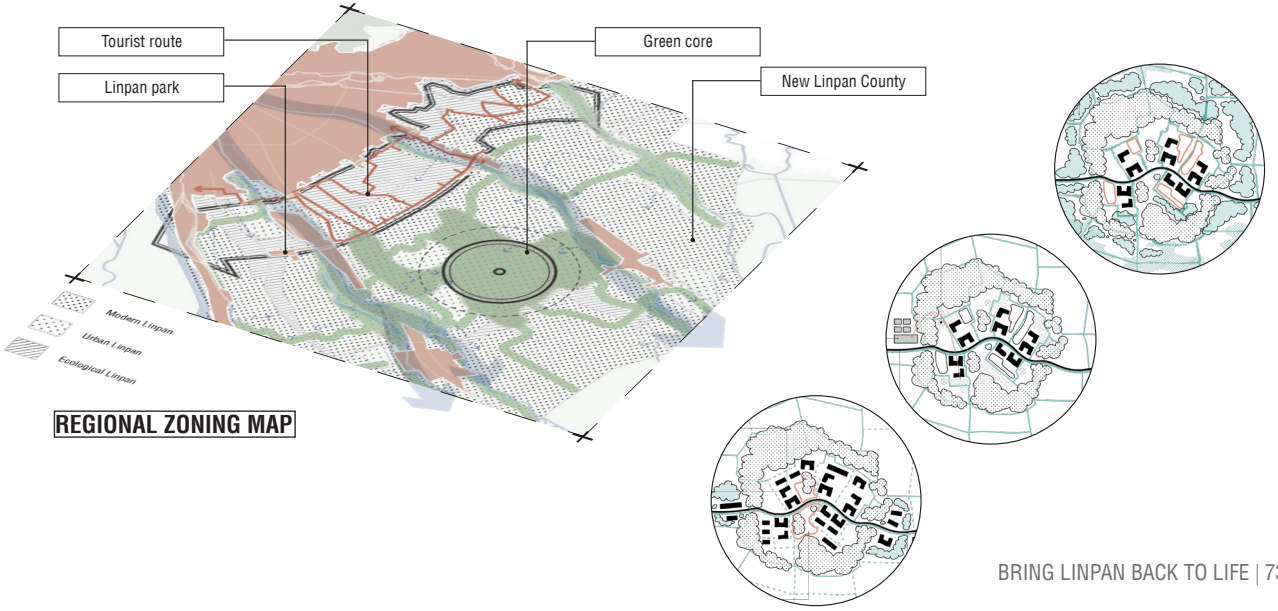
Reasonable overall regional planning of spatial layout is the key to protecting traditional Linpan heritage and promoting local ecological restoration and economic development. Although the current concentrated flow of population to cities has led to the rapid expansion of cities, which to a certain extent threatens the living space and development prospects of rural areas, urban and rural areas are not binary oppositions in terms of space and content. It is more responsive when viewed as an overall system. The design concept of holistic landscape. Properly limiting urban expansion through rational spatial layout is to achieve balance and common development between the two.



At the smallest unit - Linpan - level, the forest-aqua landscape is the most basic feature, and the same is true at the scale of the entire region. Based on the original water system and forest, a flexible blue-green network system is implemented to forge a resilient and climate-resistant future. Building upon this foundation, the distribution plan integrates various Linpans with the blue-green network, delineating three distinct zones: the Linpan protection zone (Linpan Park), the nature protection zone (Green Core), and the Linpan independent exploration zone (New Linpan County). These zones correspond to the thematic domains of tradition, ecology, and development, respectively.



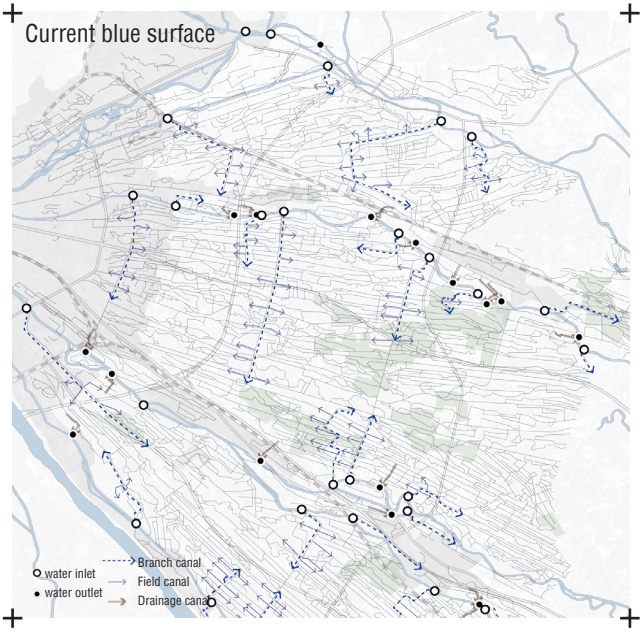
GREEN-BLUE STRUCTURE MAP

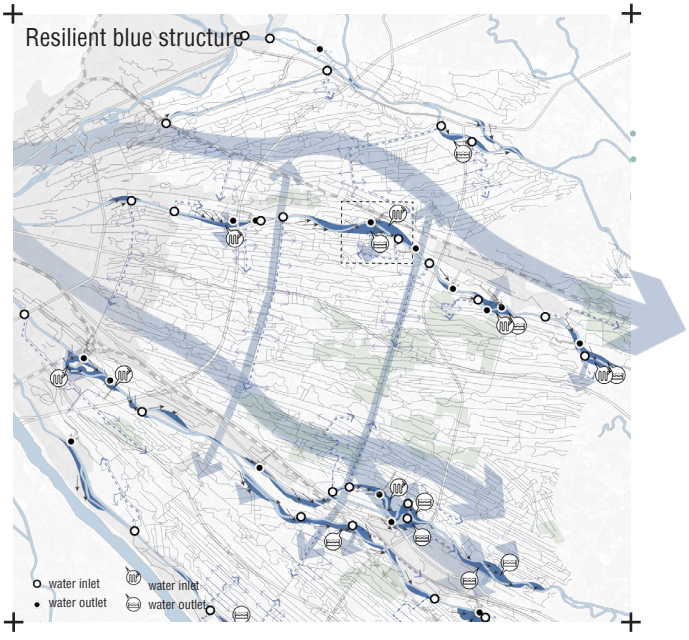


REGIONAL ZONING MAP

Blue system

Originating from the upstream of Dujiangyan, a network of four rivers and tens of thousands of irrigation canals intricately intertwines to form a water system network spreading acorss the Chengdu Plain. Enhancing the resilience and sustainability of these water systems is imperative to address the challenges posed by future climate change. The initial step involves top-down planning to delineate the comprehensive structure, as illustrated in the figure. Subsequently, bottom-up strategies and measures are proposed to appropriately widen and soften the river banks of the main river channels, and to set up purification areas at the water inlets and outlets.





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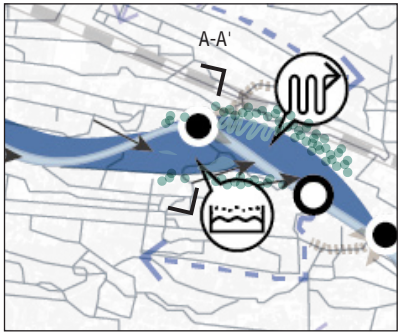
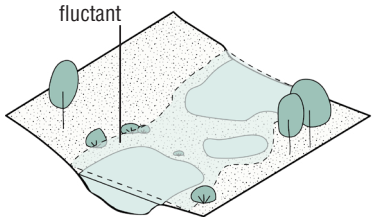
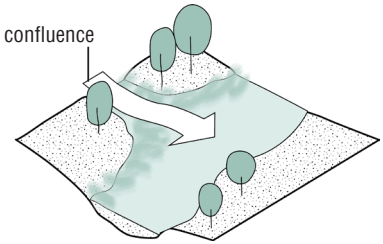
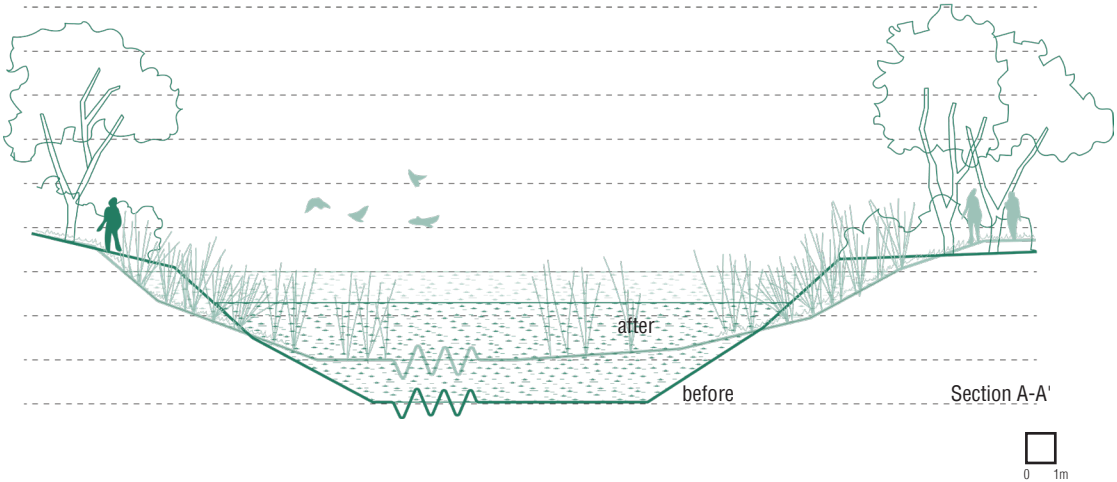


Water resilience



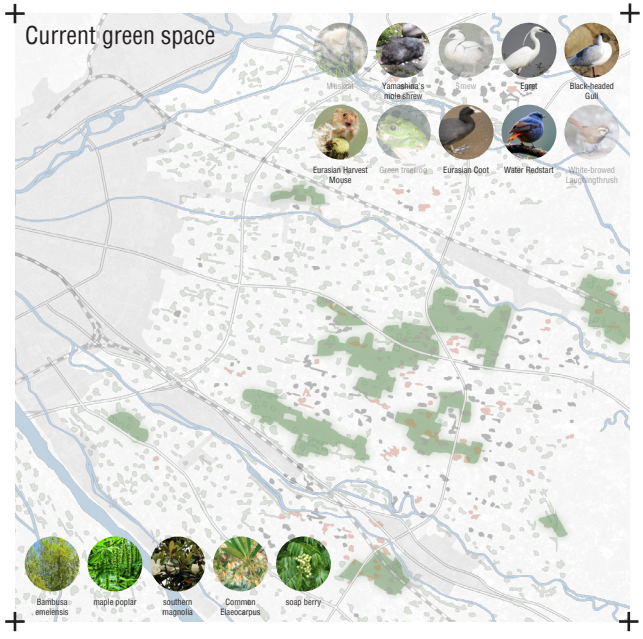
Water purification

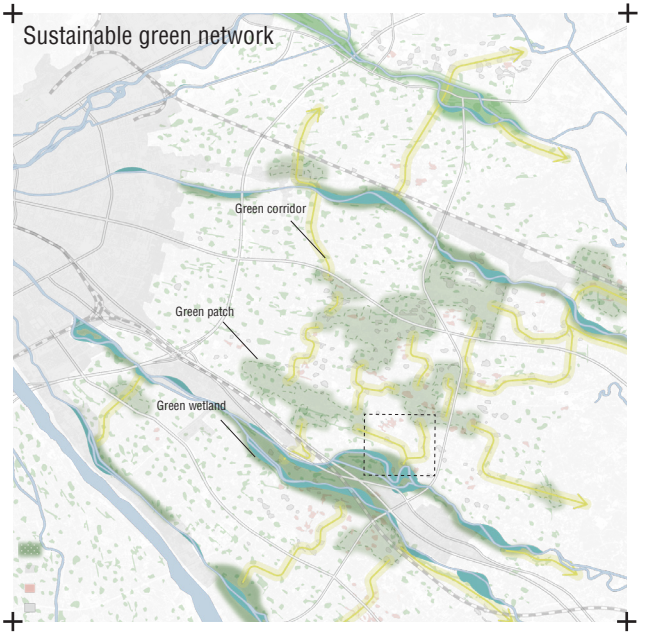




Green system

The forest constitutes a fundamental component of the environment, playing a crucial role in protecting residents' living conditions and contributing significantly to natural ecology. The interdependence of the water system and the forest system is evident. The ecological enhancement of the water system is beneficial to the forest system, while simultaneously, the forest system also requires transformation to feedback to the water system. Initially, the focus remains on the comprehensive spatial arrangement, according to the existing green spaces. This involves integrating the ecological core with green corridors and rivers to establish a cohesive green network.





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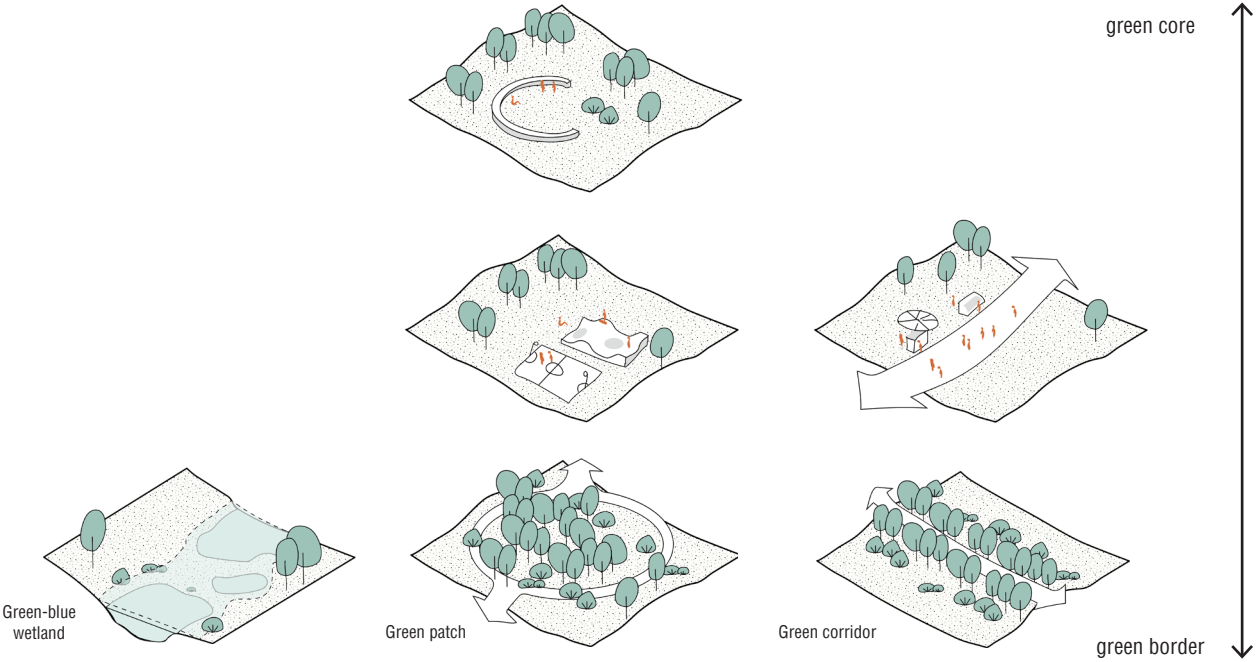
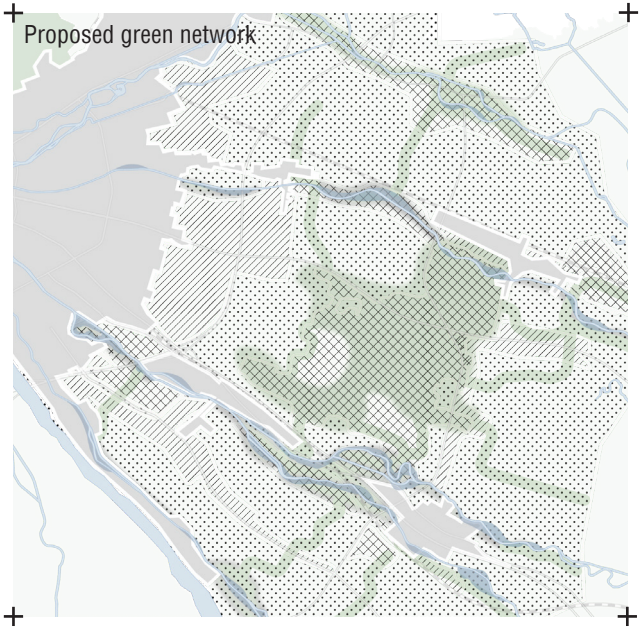
The placement of green corridors was determined by assessing the distribution of abandoned Linpan patches and the positioning of current green areas. Key research areas within this framework include the preservation of native vegetation and animal habitats, alongside the rewilding of Linpan.



As mentioned in the previous article, when people leave Linpan—whether due to persuing a new life in the city other than their hometown or due to the impact of the 2008 earthquake—Linpan undergoes a natural rewilding process without human intervention. Vegetation is no longer pruned and grows freely, gradually covering the traces of human life. As irrigation canals are no longer used, aquatic plants will gradually take over the channels starting from the ends of the irrigation canal network. This transformation leads to increased biodiversity in left-over Linpans, including insects, amphibians, migratory birds, and more. Notably, more frequent traces of biological activity will be witnessed on the peripheries of ecological patches.

Linpan system



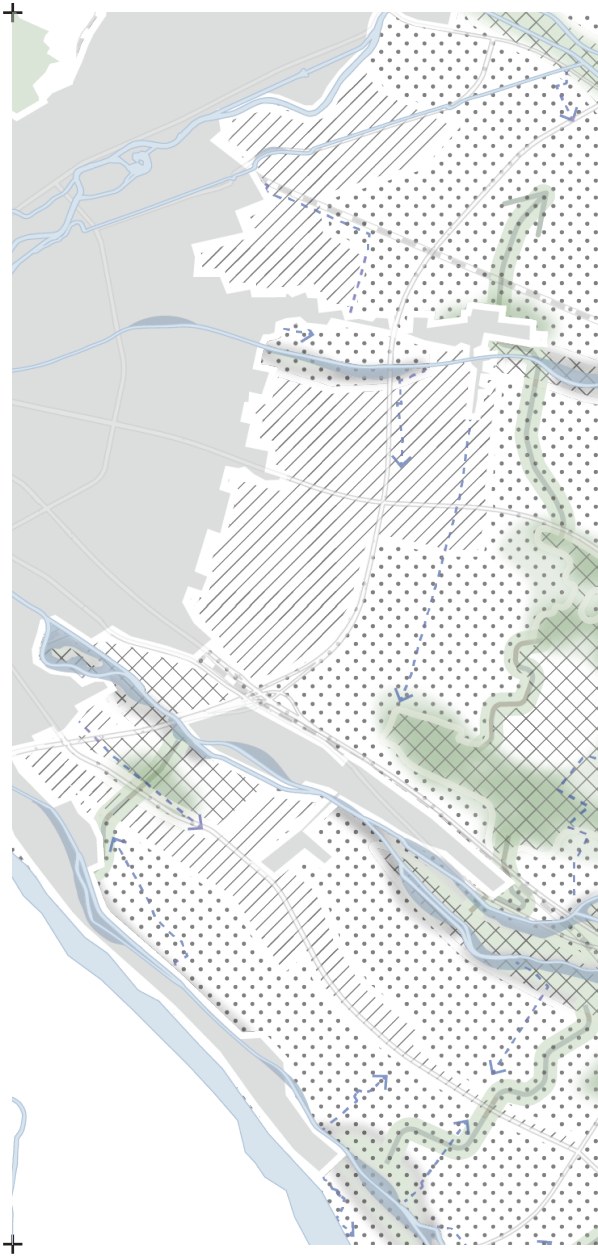
3 kinds of Linpan	Distribution
Modern Linpan	Well-presrved Linpans
Ecological Linpan	With green patches and along river
Urban Linpan	Along the City border/ Main infrastructure

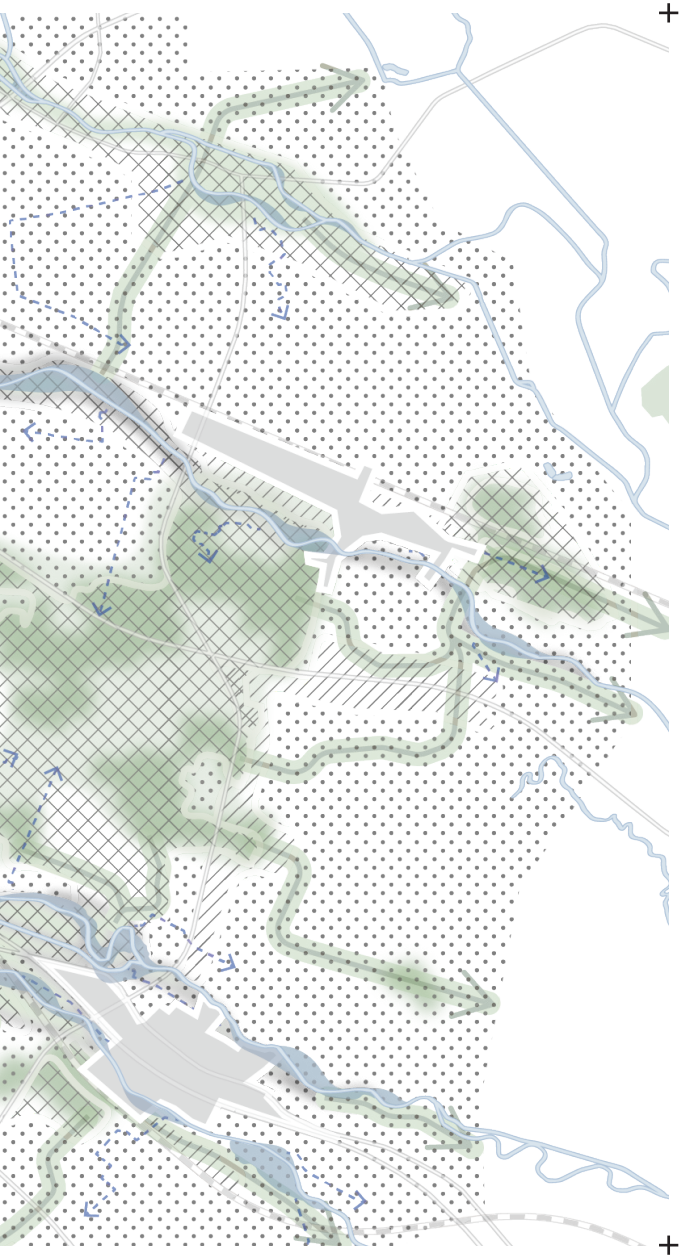
Based on the previous Linpan type inventory, I have categorized them into three distinct types. To assess the level of transformation of traditional forests, the initial step involves examining the distribution of urban forests. Considering the frequent commuting requirements of residents, urban Linpans are predominantly situated along the city's periphery and aligned with major traffic arteries. Ecological Linpans are primarily found in proximity to green corridors and patches, serving as a transitional buffer zone between the natural green core and conventional rural areas. Modern Linpans, preserving traditional characteristics to the greatest extent, constitute the most prevalent category and are widespread across the entire Chengdu Plain.

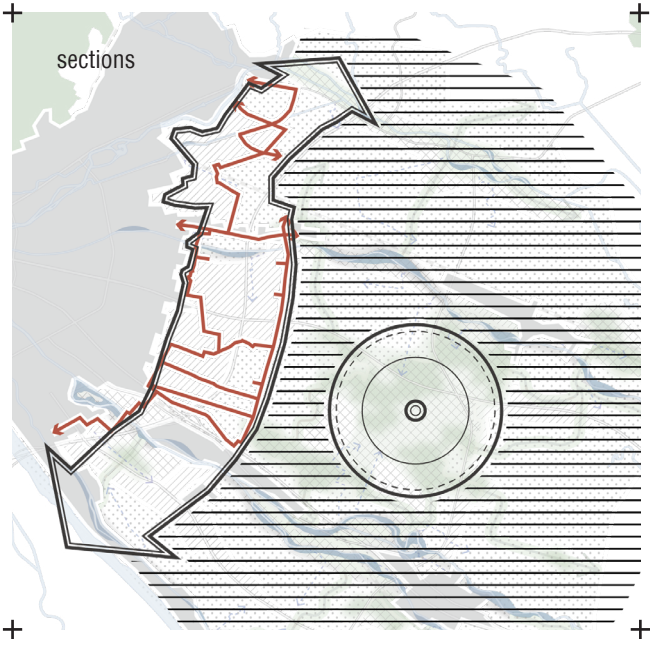
0 1km

Regional mapping

Following the analysis and design of the blue-green network and the distribution maps for various forest types in the Chengdu Plain, a comprehensive regional planning map can be obtained through integration. Integration, in this context, does not mean simple superposition, but more like overwriting. The spatial dimension takes on a new significance as multiple functional meanings converge. In accordance with the planned spatial layout, the functional zoning of the area can be redefined.



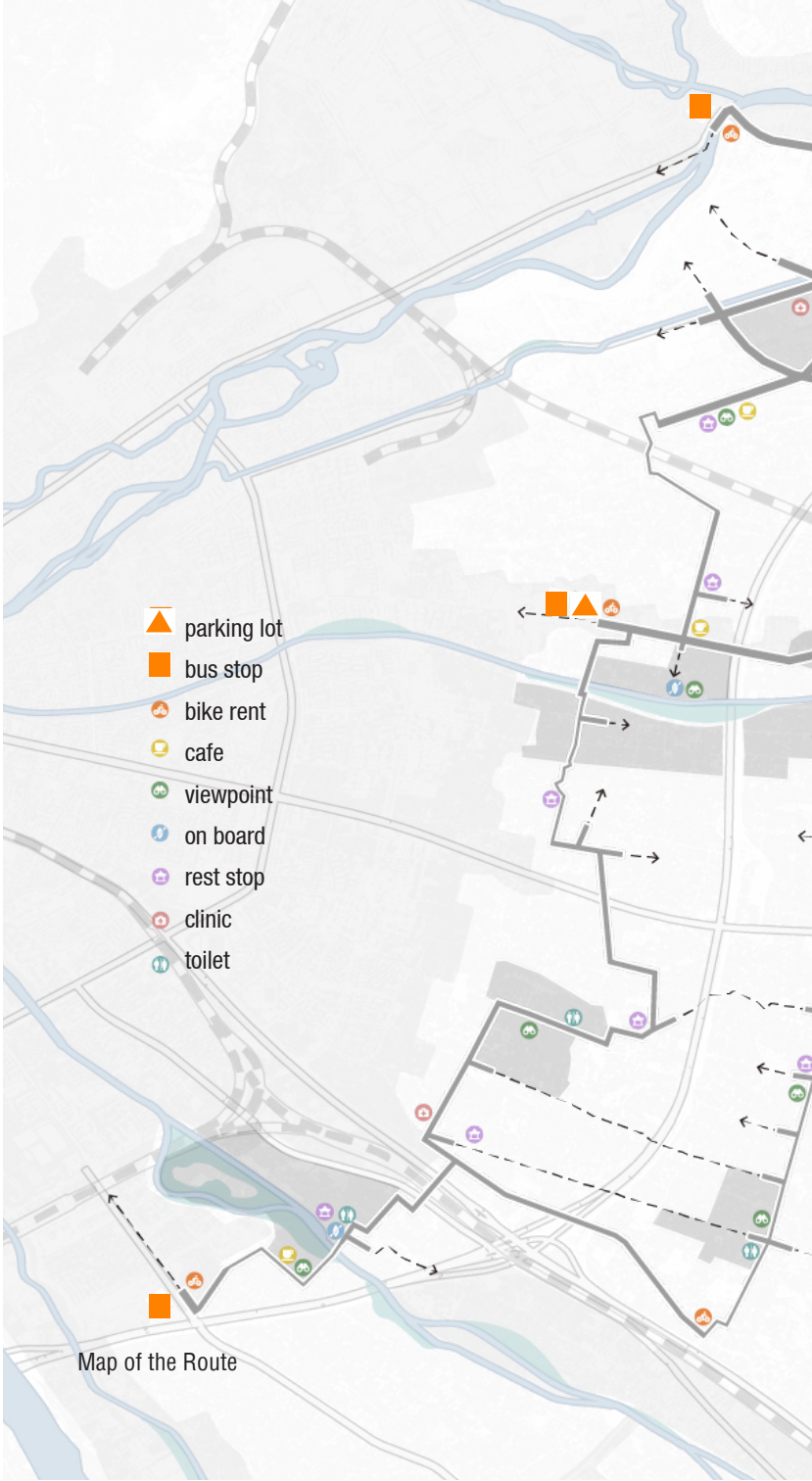




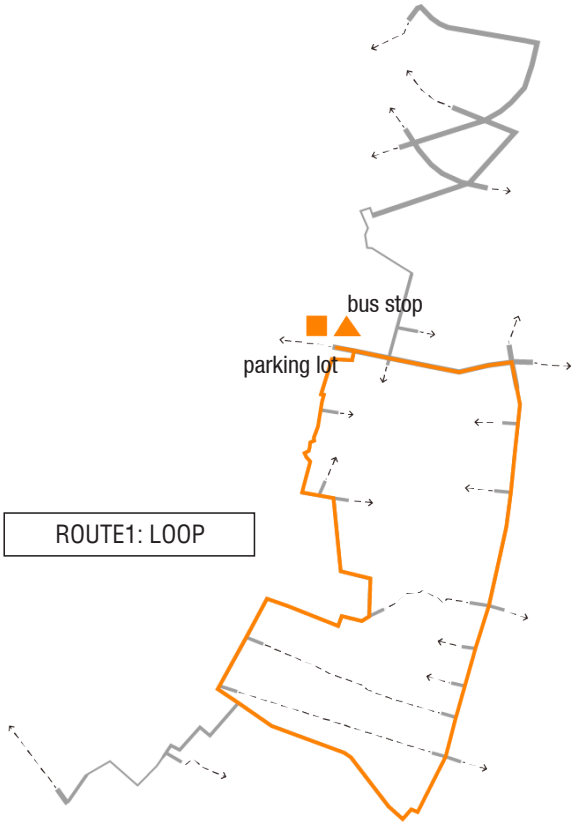
Functionality is shaped by human needs. In contemplating the tourism development around Dujiangyan, the consideration extends beyond local residents to include tourists. Simultaneously, the strip area in close proximity to the city primarily accommodates commuting residents. Here, a designated space is provided for tourists to immerse themselves in the forest, unwind, and engage in recreational activities. The strip area close to the city is where most residents who need to commute live, but also is a Linpan Reserve Park, providing tourists with a space to dive into Linpan while relaxing and having fun. A tourist route is designed to connect many scenic spots alongside. A little further away is the green core with ecological forest as the main body and surrounded by ecological Linpans. This is also a place where biological activity is more frequent and human traces are reduced.

Route Design.
Ideal vision

This map shows the Linpan viewing route outside the Dujiangyan city. Taking into account different tour needs, means of transportation and starting points, two options are set: loop route and line route. Both riding a bike and walking is fine. If you take a bus, you can get off at the southern or northern end of the route and follow the north-south path. You can appreciate the natural scenery of Linpan and learn about the traditional Linpan settlements during the whole trip. If you drive there, you can get off at the parking spot in the middle and take a walking tour. Around the starting point, you are able to visit the Linpan Museum Garden, where you can enjoy the scenery of Linpan and understand the history of Linpan. A little to the east is Juyuan Town, where you can deeply experience the daily life of Linpan residents. If you ever cross the Baitiao River ecological bank, you can board a boat here and take a boat trip along the river.

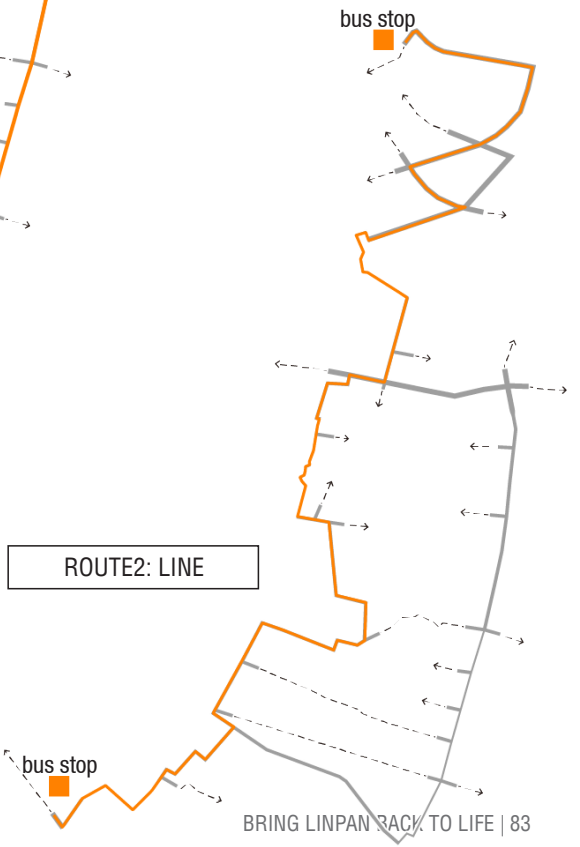


Map of the Route



ROUTE1: LOOP

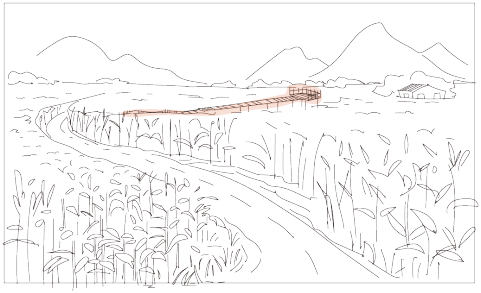
The total length of this road is about 15 kilometers. It takes about 4 hours to walk and 1 hour to cycle. The visit and stay add 2-4 hours to this. Coming either by bus or car is fine. During the tour, you can also choose to take a boat trip to enjoy the Linpan landscape from different angles.

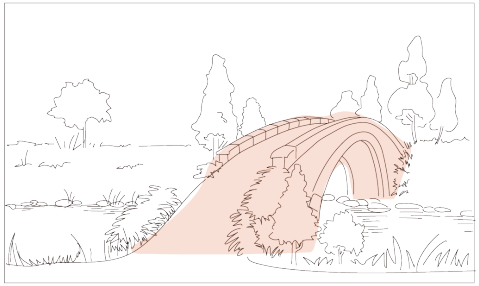


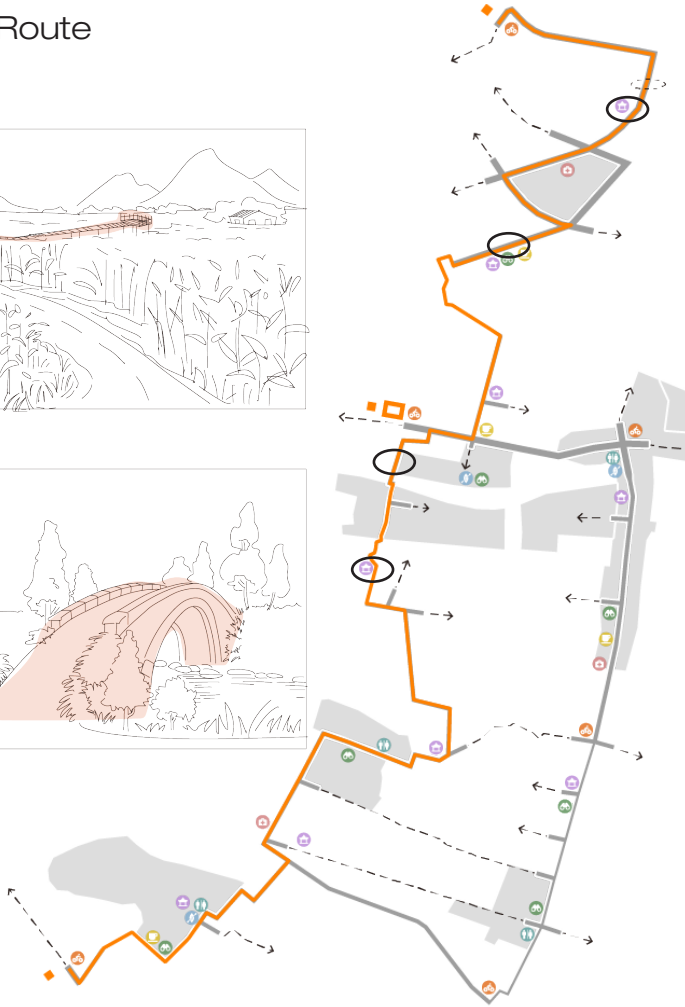
ROUTE2: LINE

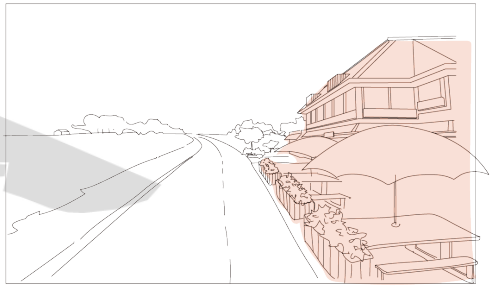
The total length of this route is about 14 kilometers. It takes about 3.5 hours to walk and 1 hour to cycle. The visit and stay add 2-4 hours to this. It is recommended to come by bus.

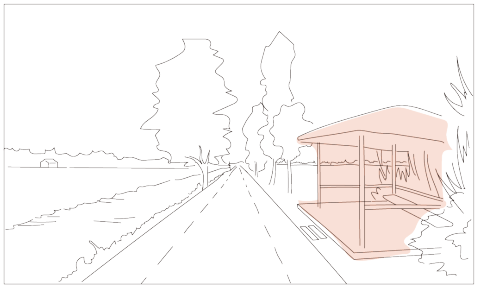
Along the Route











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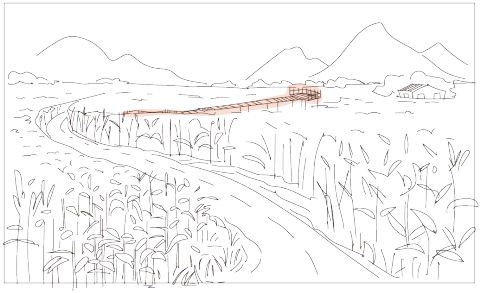
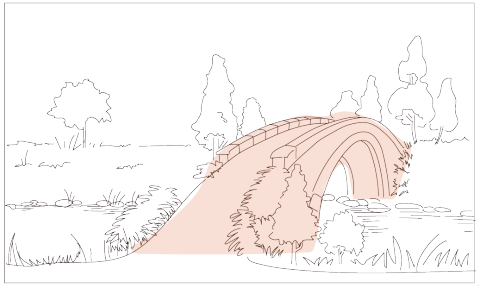
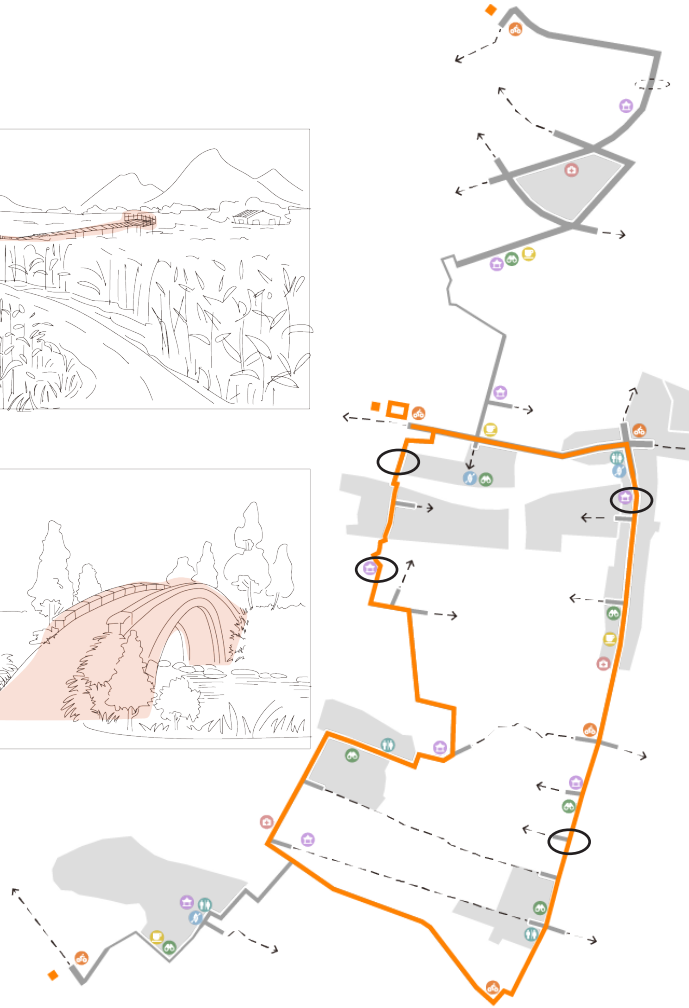
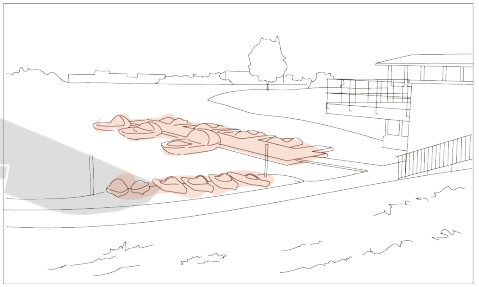
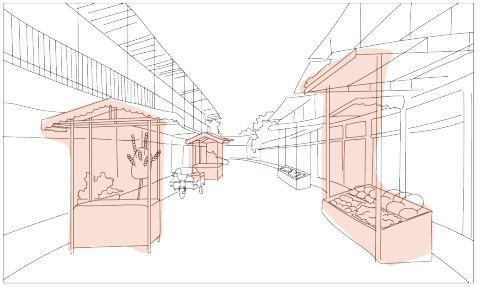










Route itself

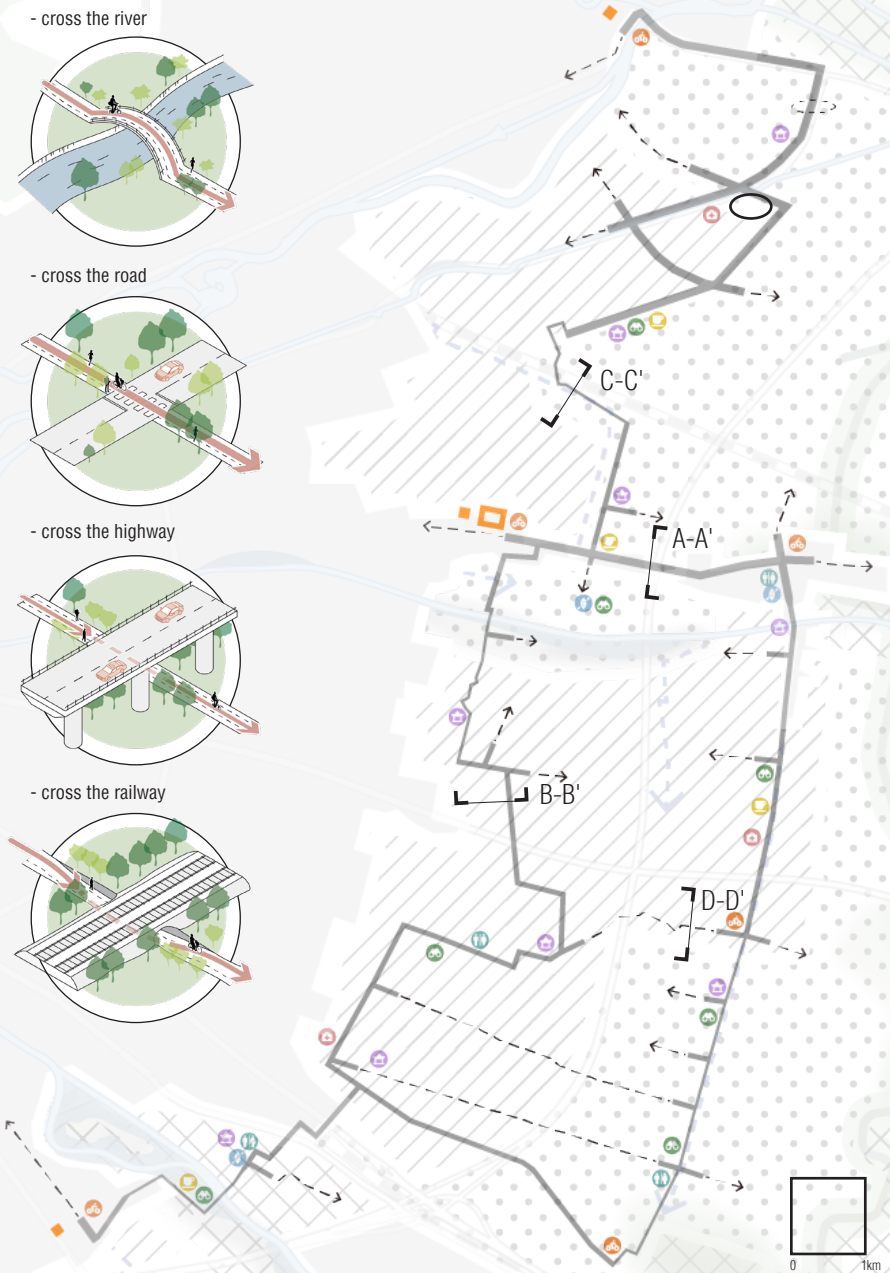
Next, the structure and hierarchy of the route itself will be explained. There are four levels of roads, the main differences being width, number of lanes and accessible vehicles. Correspondingly, road sections that are more functional for traveling together will be wider and even have motor vehicle lanes, while road sections that are more suitable for tourists to enjoy will be relatively narrow, and the scenery on the roadside will also be different. When walking along, you will cross rivers, railways, elevated roads, and roads many times. I also researched, classified, and designed the ways in which intersections intersected.

- cross the river

- cross the road

- cross the highway

- cross the railway

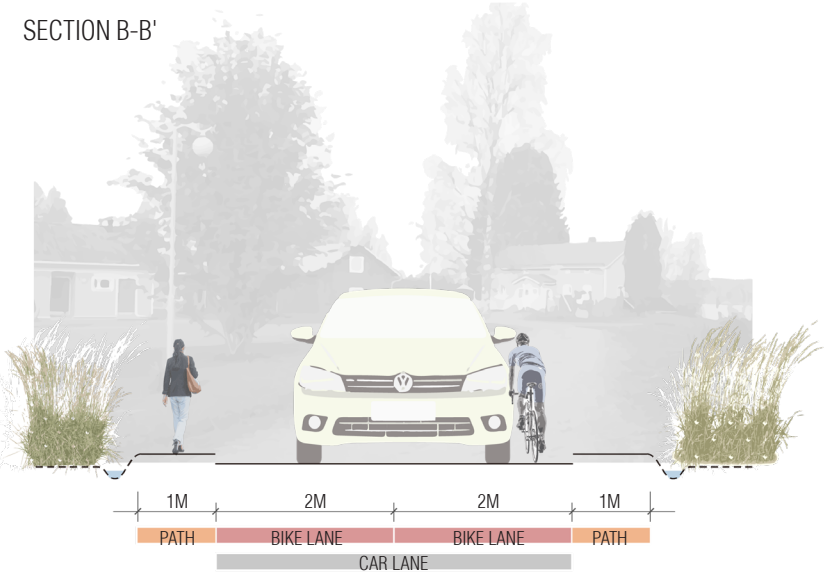


Road Classification

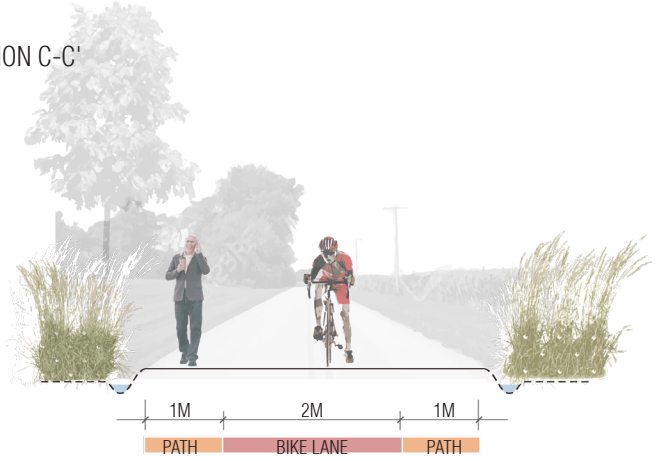
对比度拉高

SECTION A-A'

SECTION B-B'

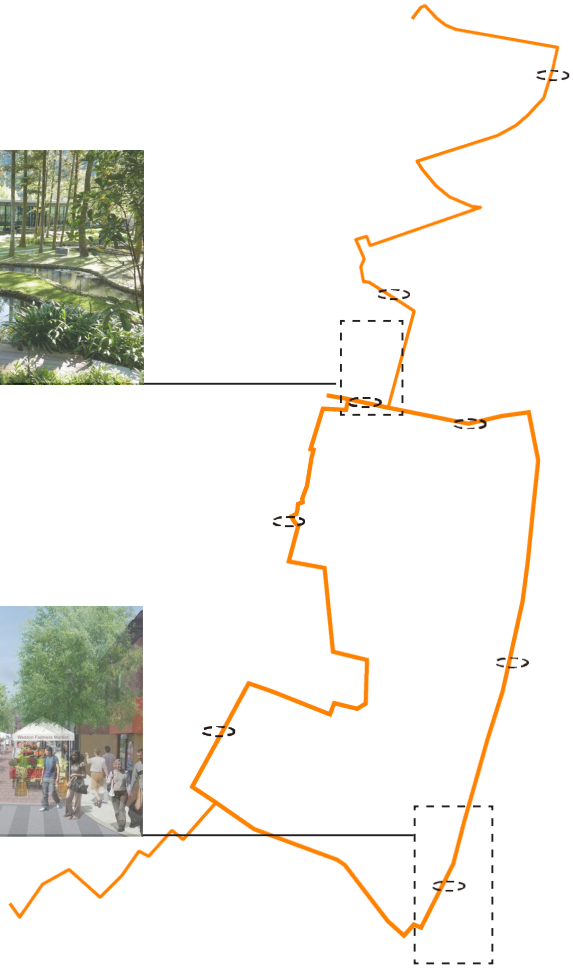


SECTION C-C'



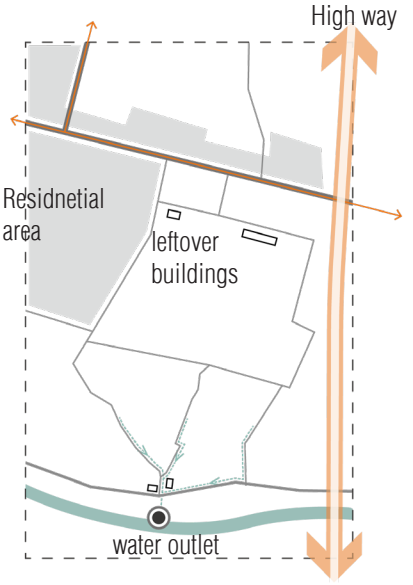
Site Design.
Zoom in

In order to combine regional planning with the new design of Linpan, I will select two visitable Linpan blocks along the way as examples to further enlarge the details of Linpan and deepen the scenery of Linpan. One of them is the Linpan Museum Garden, which both routes pass through. Here you can fully understand the culture and history of Linpan and feel the scenery of Linpan. The other one is to go deeper into the Linpan street market in the traditional Linpan area and experience the daily work of Linpan residents and the local market.

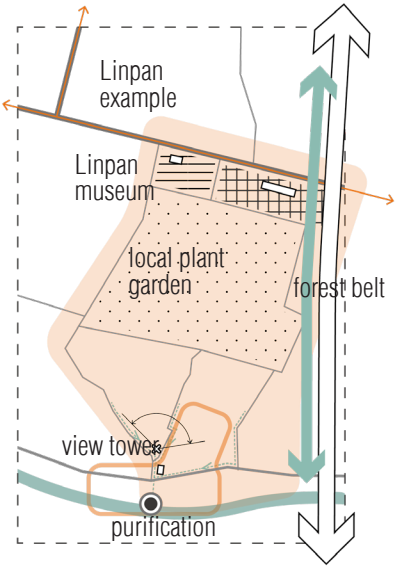


Site1: Open-air Linpan Museum

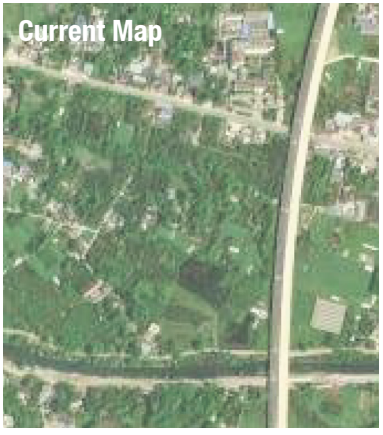
Linpan Museum Garden is divided into three main sections, Linpan Museum, Linpan Garden, and revetment water purification area. Linpan Museum was transformed from the original Linpan. It mainly displays the history of Linpan, Linpan characteristics, and residents' lives. The large forest area on the south side serves as the forest garden, which displays the common natural features of forest vegetation. It also serves as a display garden for native plants, listing more than 20 types of vegetation. The river bank at the intersection of the irrigation channel and the river has been ecologically treated, and the wastewater discharged from the channel flows through the ecological wetland and then flows into the river. Visitors to this point can also board a boat on the river bank and enjoy a short journey along the river.

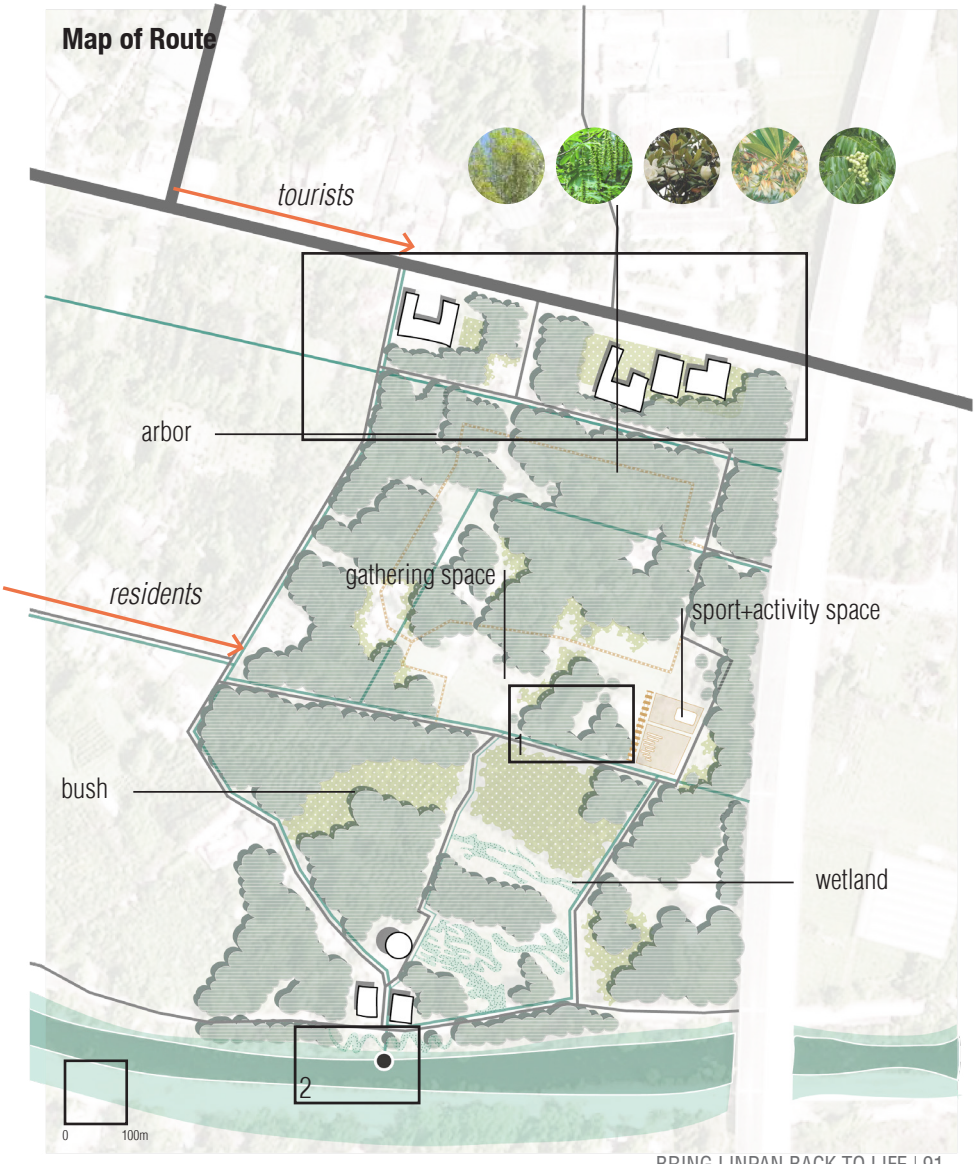


current



proposed


Current Map

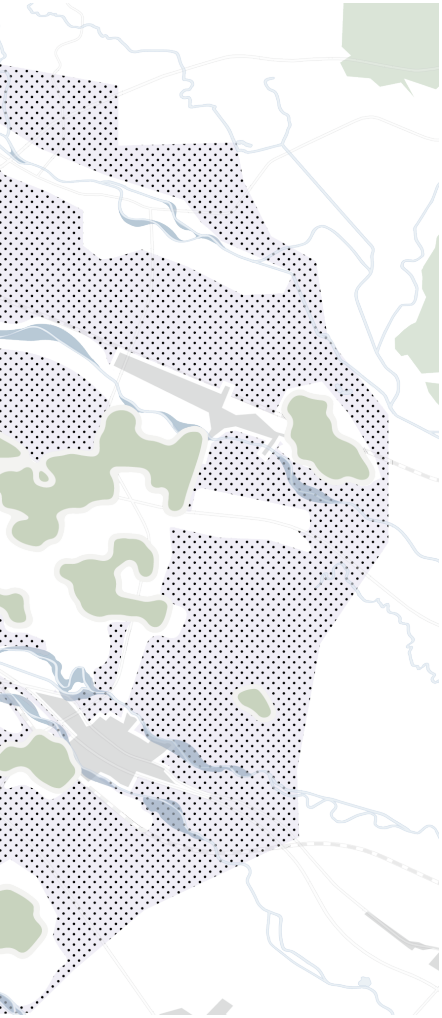

Map of Route
tourists
arbor
residents
gathering space
sport+activity space
1
bush
wetland
2
0
100m

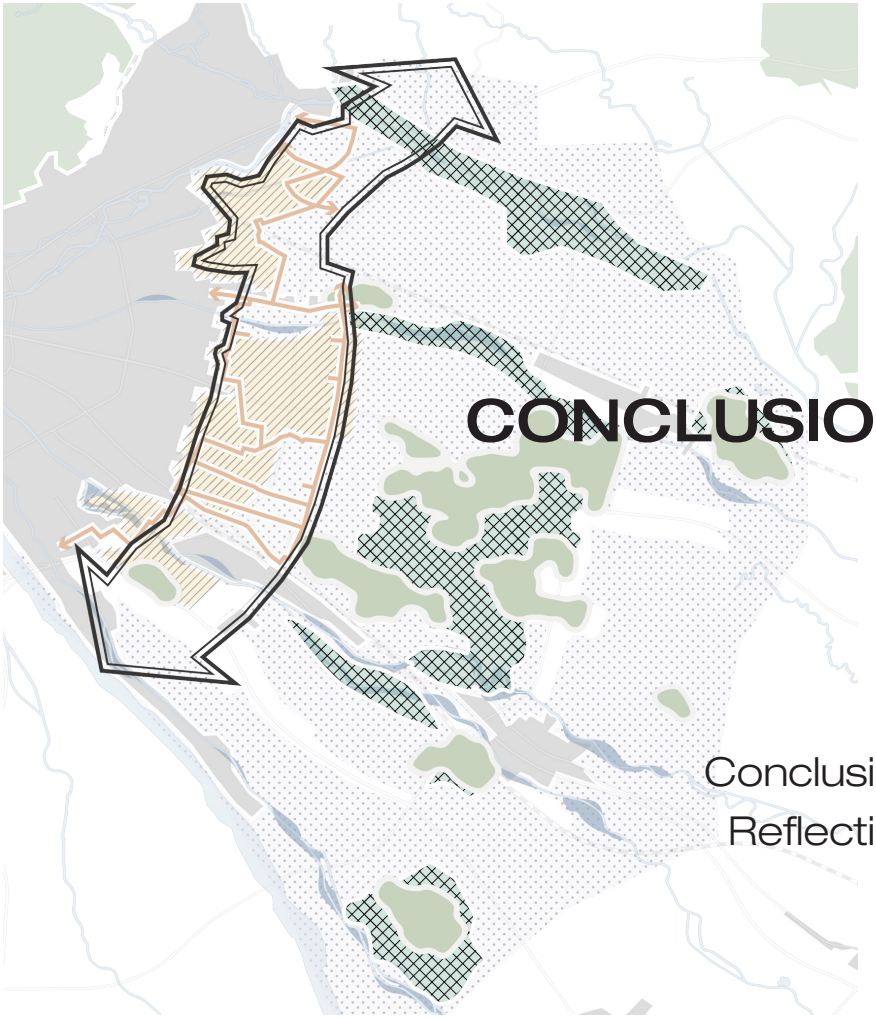

More wild animals
bench
gathering
space
new path
rewilding
canal
Wetlands

6

5-YEAR PLAN:
GREEN CORE+URBAN LINPAN

10-YEAR PLAN:
ROUTE+MODERN L





CONCLUSION

Conclusion
Reflection

LINPAN

20-YEAR PLAN:
RESERVE PARK+ECOLOGICAL LINPAN

Conclusion

- How does the Linpan landscape work, and what is its quality?
A Linpan is a harmonious blend of dwellings, trees, water, and fields, shaping a quintessential rural landscape. Within the Linpan system, people, field, water and forests are interdependent. For example, people use the wood of forests to make fires and build houses. The forest serves as a barrier and a place for people to rest. Human and livestock manure will in turn fertilize the forest. In this way, Linpan forms a whole circular system of energy, material, (maybe emotion). People can live self-sufficiently in Linpan.
The quality of Linpan is from four aspects of values.
1. Landscape values: As an independent unit, Linpan is a harmonious integration of Sichuan folk houses, trees, water and fields, shaping a typical rural landscape and possessing regional characteristics.
2. Heritage values: The Linpan area carries rich historical and cultural memories due to its long history of production and life.
3. Ecological values: The entire Chengdu Plain presents unique ecological settlements born out of the interaction between human activities and natural conditions.
4. Production values: The sustainable land use models, complex field and forest production systems, and most importantly, the compact irrigation system feed the people and fertile the whole land.

- What are the (negative) impacts of the rapid urbanization that has occurred (and will continue to occur) on the Linpan rural landscape?
1. Ecological instability: The Linpan area is facing the deterioration of the ecological environment and the imbalance of the ecological system, among which the seasonal water shortage and floods have the most serious impact on the local ecology.
2. Urban encroachment: The area of Dujiangyan urban area expanded more than ten times while the number of Linpans decreased to one-sixth of its peak. The small-scale peasant economy has been unable to support the development of the region. A large number of young people have left the countryside and flowed into the city, which hinders industrial development.

-Is preserving parts of the landscape and transforming others by keeping the circular quality of the Linpan viable?
According to the holistic landscape concept, a landscape is a system that is greater than the sum of its parts. Therefore, as a rural heritage landscape, a part of the Linpan has been changed due to the objective reasons of the development of the times, it is logical to adjust and change the rest of the parts accordingly in order to make the whole system work better. However, the prerequisite for the transformation of the Linpan is to ensure that the core quality of Linpan remains intact, i.e., the core circle of the forest plate system can still play its own value today.
By studying the interrelationships between the internal and the external, and by controlling the extent and content of the changes according to the wishes of the residents and the conditions of the forest, we can realize the good functioning of a new type of forest plate after moderate changes.

-What landscape architecture means can enable Linpan's landscape to cope with future urbanization?
1. Plan and design

In the Linpan area, there needs to be an overall plan for urban-rural distribution layout. This can unify the direction of the design. Whereas Linpan rural landscapes consist of various attractions used by members of the community, which are usually transformed from traditional Linpan. These will be developed through the specific spatial design, vegetation design, and irrigation water system design to achieve the realization. The renovation of Linpan has been specifically categorized into three different design types: modern Linpan, urban Linpan, and ecological Linpan.

2. organize and connect

The Linpan area is divided into three zones according to the function and environmental atmosphere, including ecological zone, semi-urban zone and traditional zone. In different zones, different Linpan spaces are set up for people to visit and enjoy, and accordingly, Linpan reserve park and Linpan appreciation routes are designed to connect all these points. Road design and visual design also become a focus.

- How these landscape means will influence and shape the future of Linpan rural landscape?

1. From the perspective of urban and rural development:

In the short term, it eases urban and rural land tension and prevents further loss of population in the Linpan area. The introduction of new production modes (tourism, commerce, manufacturing) increases employment opportunities, gives local residents more choices and further promotes the overall development of the region.

2. From the perspective of the ecological environment:

Through the preservation of core ecological patches, the establishment of ecological corridors and the transformation of the structure of ecological Linpans, the whole ecosystem is layered and resilient. In the long run, even if some parts of the system cannot be realized due to practical reasons (e.g., only a few residents choose to transform their settlement into an ecological Linpan), the lack or offsetting of them will not affect the overall ecological situation of the area as the whole ecosystem has already been established and has a certain degree of resilience and adaptability.

3. From the perspective of traditional heritage: Linpan, as a living cultural heritage, is preserved in the form of individuals and communities. The preservation of individuals includes the spatial structure of the forest, forest architecture, operation mode, and daily life, while the preservation of the community lies more in the distribution, organizational form, historical and cultural background of the forest, etc. Linpan is the identifying attribute of the site for outsiders, and it is the identity and belonging of the indigenous people. The entire process of Linpan's transformation and protection mobilized the participation of people from the bottom to government agencies, gave communities and individuals a sense of identity and inheritance, and promoted the protection of Linpan's traditional heritage. Perhaps this project will encounter opposition and resistance initially, but in the long run, this will be a long-term "cultural heritage" education course that will last for generations.

Reflection

-What is the relation between your graduation project topic, your master track (Ar, Ur, BT, LA, MBE), and your master programme (MSc AUBS)?

My graduation thesis primarily delves into the realm of traditional landscape heritage, specifically examining how it evolves in response to urban development's impact. Landscape heritage encompasses the narratives of a circular water system, particularly the intricate connections between water and the community, water and various landscape components. The significance of investigating and studying Linpan lies in comprehending its internal circulation system, which includes the flow of water, trees, agriculture, livestock, and human life, intricately intertwined with the concept of FLOWSCAPE. A landscape isn't merely a static display of several elements; it thrives within a continuous state of flow and transformation.

Simultaneously, water emerges as a key element within the landscape of Linpan. In the historical stories of Linpan's development, water serves as the cause of Linpan's formation, the sculptor of its physical contours, the carrier of its internal dynamics, and the wellspring of vitality for the community. The exploration of Linpan's essence is closely linked to an in-depth examination of its water systems.

- How did your research influence your design/recommendations and how did the design/recommendations influence your research?

When confronted with an unfamiliar site, my first approach involves gathering basic information, such as its geographical location, climate, topography, historical evolution, and so on. Especially in the process of studying the past, I've learned a lot of landscape design and treatment methods from the experience summary of predecessors. These insights have served as a wellspring of inspiration, gradually shaping the design concepts forming in my mind.

For example, when I saw people in the past using bamboo to build houses, I searched for the benefits of bamboo houses and came up with the idea of incorporating such practices into my designs. Of course, due to the difference in historical background, transform ation and adaptation is necessary. This adaptation process led to in-depth research into the structural aspects of these buildings and the daily requirements of residents.

It can be asserted that research not only provides me with a theoretical foundation but also serves as a source of design inspiratio. Moreover, the challenges encountered during the design phase in turn promote the depth and breadth of research.

-How do you assess the value of your way of working (your approach, your used methods, used methodology)?

The essence of the holistic landscape is a systems view that connects natural systems and human systems. When studying an entire landscape, we view it as a whole, a system that is greater than the sum of its parts. In terms of scale, landscapes need to be studied at larger temporal and spatial scales. The entire process of studying spatial changes in landscapes at different scales is a systematic scan, aiming to identify overlooked influencing factors and internal connections. This method helped me clarify the relationship and evolution of different systems within the Linpan landscape. At the same time, the timeline expresses not only the rewriting of the landscape in time sequence, but also the attitude

orientation of the landscape designer - conservative or radical towards historical traces, optimistic or unoptimistic about future (industrial) development. It's a good reminder for me to find a balance between the two and make the best choice.

-How do you assess the academic and societal value, scope and implication of your graduation project, including ethical aspects?
Speaking of Linpan itself, it's valuable, because of its circularity, to cherish and protect such cultural heritage, and actively participate in its construction and development. Many villages facing similar rural problems might be inspired from my solutions. In this project, I aim to highlight three key aspects: the vanishing cultural heritage, the elderly population left in rural areas, and the rejuvenation of living environments through community involvement. My goal is to draw social awareness to the first two issues because attention is crucial for initiating any change. Additionally, I aspire to offer a model for community-driven living environment improvements, empowering residents through education, advocating for decentralization of government authority, and enhancing local residents' autonomy. At a time when socialization is hard to stop, I hope my proposal can help preserve the memory of the site and the traces these water communities. A single case may also release deeply thinking and raising awareness of the preservation of cultural heritage.

-How do you assess the value of the transferability of your project results?
In my graduation project, the core theme is about the formation of space is closely linked with user groups and lifestyle. Numerous natural and social factors have shaped and influenced space over time. The existence and activation of space is closely related to its meaning, and landscapes that have lost their meaning, or that do not have sufficient meaning, will be rapidly replaced over time. The dilemma of heritage landscape is a common topic in landscape architecture: what role a landscape architect can play in helping a site preserve its past memory and create new memory in a modern context? The relevant methods and principles can be selectively applied to landscape design facing the same problems, contributing to the whole discipline of landscape architecture.
This can be a common challenge for many traditional rural settlements or heritage landscapes. My graduation is exploring the possibility to extend the life of certain spatial composition of traditional landscape (Linpan) by restructuring or re-enabling. This may enrich the cases and solutions of the landscape architecture discipline in this regard.

-How do you reflect on your work process and draw conclusions from your own experience?
For me personally, the process of preparing for P4 this time is more complicated and arduous than the last time. Still the same, I need to do a better job in organizing my time. But more important than time management is sorting out my emotions. Only when my emotions are not affected can I organize my time better and be more efficient, and thus, allowing me to explore creative ideas, refine the concepts, and produce high-quality designs.