Politecnico di Torino

Rethinking the Boundary of Industrial Zones--Taking Bihu Industrial Zone as an Example

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Index

Abstract

Our project is located in Bihu Town, Lishui City, Zhejiang Province, China. The area is composed of many villages of different sizes. Due to the urbanization process intensified the industrialization of Bihu Town, the original infrastructure has not been upgraded due to historical and geographic reasons. Continue to deteriorate. The uncontrolled expansion of industrial land to primitive villages, the original urban fabric is destroyed by the large-scale spatial form, and at the same time public space (road greening, parks, squares, chronic systems) is severely lacking.

Our research aims to investigate the relationship between industrial land and the original city, and suggest that the reasonable range of urban expansion should be controlled within a moderate boundary. From this we put forward a corresponding strategy. Urban green corridors redefine the boundaries of industrial zones based on controlling industrial expansion; reusing empty land to create green cities and public space; green lines establish effective infrastructure connections.

Chapter 00 Perface: China's industrialization

The timeline of China's industrialization

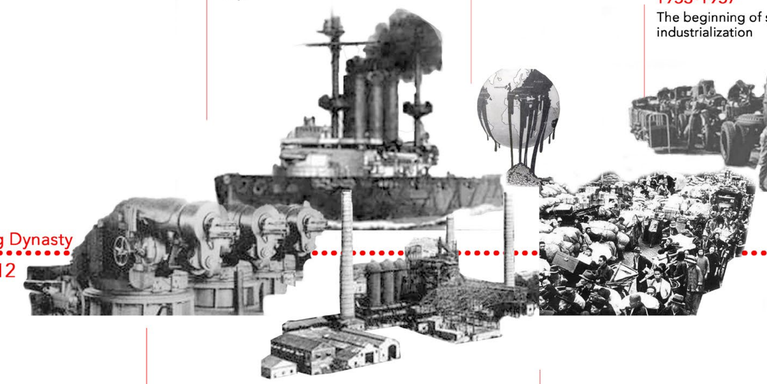
Late Qing Dynasty
1840-1912

1861
The Westernization Movement started industrialization

1894-1895
Promoting industrialization after the failure of the Sino-Japanese War

1911-1912
The Revolution of 1911 set off an industrial boom

1914-1918
During the First World War, China's national industry obtained a short-term opportunity for development



1931-1950
During the War of Resistance Against Japan and the War of Liberation, the national industry was shrinking day by day

1953-1957
The beginning of socialist industrialization

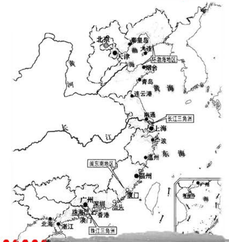
1956-1966
Initially establish a complete industrial system

1966-1978
Industrial development regressed during the Cultural Revolution

1978
After the reform and opening up, the industry began to develop by leaps and bounds

Urban industrialization

1949
After the war, the urbanization process in coastal areas was dominated by industrialization

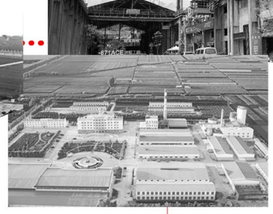


Mid 1980s
The rise of township enterprises

Rural industrialization

1992-1996
Southern talks and the establishment of market economic system goals, rural industrialization has entered a period of rapid development.

2004
The factory migrated from the city, the factory was transformed into a creative park



2004
The urban industry migrated to the surrounding countryside, and the influx of new enterprises promoted the industrialization of the countryside

2006
Coastal cities are gradually turning to the tertiary industry

2018
China's new first-tier cities have begun reindustrialization

Fig.1, The timeline of China's industrialization, Authors(2021)

Chapter 00 Perface: China's industrialization

Urban industrialization

Industrialization and urbanization development

At the beginning of the founding of the People's Republic of my country, the level of urbanization and industrialization in China was quite low. At that time, the urban-rural differentiation was very obvious, and the main part of urban development was concentrated in a few coastal cities. In 1949, there were only 132 cities nationwide, with a total urban population of 39,490,500, of which nearly 70% were located in coastal areas. In 1952, the restoration of the national economy was completed. The number of cities nationwide increased to 153, and the urban population increased to 47.88 million. At this time, the urban population only accounted for 8.3% of the total population of the country. At that time, China was still a typical agricultural country, with a relatively low proportion of industrial output in the GDP, about 12.6%, and industrialization was still in its infancy. In order to establish a modern industrial system and promote the rapid growth of the national economy, China has chosen the mode of giving priority to the development of heavy industry.

This development model is a non-equilibrium model, which inhibits the development of labor-intensive light industry and tertiary industry, and distorts China’ s industrial structure, making urban non-agricultural employment opportunities extremely limited, causing China’ s surplus labor force to fail to achieve peace Capital was fully and effectively integrated and failed to drive the transfer of rural surplus labor to the industrial sector and cities. As a result, industrialization continued to advance while urbanization stalled. In this context, traditionally, the wave of labor transfer from agriculture to non-agricultural industries caused by the extensive development of industrialization is impossible. While industrialization continues to advance, urbanization has stagnated.

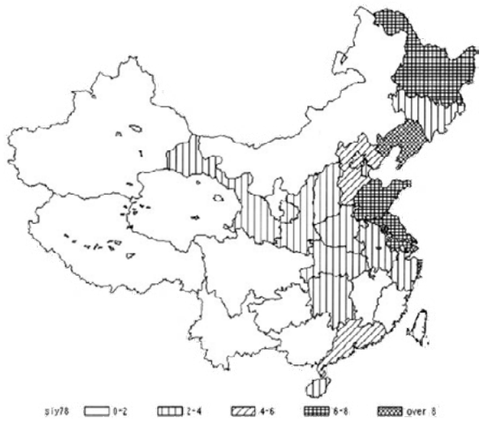


Fig.2, Distribution of Industrial Proportion in Various Provinces in 1978, exuezhe(2021)

Preliminary coordination of industrialization and urbanization development

In order to solve the problems of lagging economic development and serious economic structural imbalance, my country began to adjust the economic development model based on Soviet experience (planned economy and priority development of heavy industry). The major change in economic development strategy opened up the coordinated development of industrialization and urbanization in my country. New era. Since the reform and opening up, China has begun to attach importance to the various proportional relationships between consumption and accumulation, light industry and heavy industry, demand structure and output structure, and has begun to gradually reverse the imbalance of the industrial structure. In accordance with market demand and consumption orientation, gradually reduce the proportion of heavy industry development and give priority to the development of light industry and tertiary industry.
Since the reform and opening up, the country’ s township and village enterprises have "emerged suddenly." In 1978, the output value of township and village enterprises accounted for less than 25.3% of the total output value of rural society. By 1987, it exceeded the total agricultural output value for the first time, that is, the output value of township enterprises accounted for 52.4% of the total output value of rural society. After more than ten years of development, starting in the early 1990s, with the continuous development of China’ s industrialization, the rural surplus labor force began to transfer to non-agricultural industries at a scale and speed of 20-30 million per year, and this resulted in a split between industrialization and rural areas. After a change, more and more rural laborers began to separate from the land and entered urban life, and some rural residents began to integrate into China's industrialization process. In 2009, China's urbanization rate reached 46.59%, exceeding the industrialization level of 46.34% for the first time.

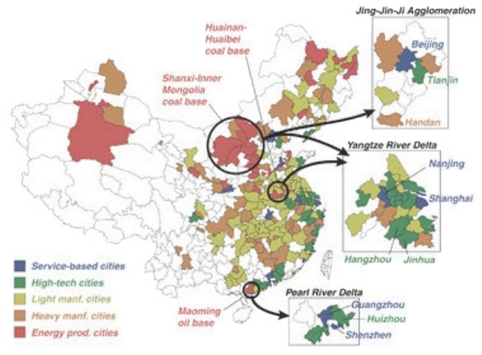


Fig.3, Classification of cities in different stages of industrialization, Science Advances(2021)

Chapter 00 Perface: China's industrialization

Urban industrialization

Urban industrial relocation

Since the 1950s and 1960s, with the development of urban economy, the population and industrial layout of most large cities in the world have undergone tremendous changes, and the labor force and manufacturing industry have shifted from the central area of the large city to the suburbs and even the surrounding small towns. . In recent years, with the continuous advancement of my country's urbanization process and the accelerated development of cities, the speed of industrial suburbanization in big cities is also accelerating (Jinan et al., 2005), and the issue of industrial relocation has become more and more important. For example, Beijing, Shanghai, Guangzhou and other megacities have successively renovated their old urban areas, implemented the strategy of "retreating two into three", and made substantial adjustments to the original industrial layout and industrial land to promote the gradual expansion of industrial enterprises in the urban centers to the suburbs and surrounding small cities. Urban transfer. Since the market mechanism has become the main method of most resource allocation, and the degree of marketization of land resources is far lower than other resources such as commodities, the industrial relocation of our country is also facing special contradictions in the process of land market transformation. Therefore, how to handle the relationship between urban residents, government and enterprises in the process of urban development, establish and improve the land market mechanism under the guidance of government planning, and the optimal use and adjustment of urban land are all major theoretical and practical issues.

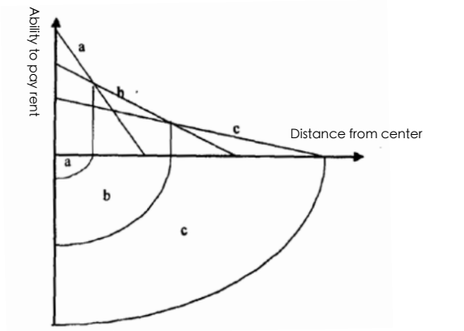


Fig.4, Optimal use structure of urban land, Economic Management(2007)

Motivation for relocation

The main reason why the government decides to adjust the original industrial layout when preferences change. Since the reform and opening up, the government quickly realized that the development strategy in the era of planned economy did not fully meet the needs of the city's advantages and functions, so it made major adjustments to economic development and urban planning. Transition from the pursuit of a productive city and a complete modern industrial base to the development of an economy that suits the characteristics of the city and the construction of a city. Relocate these small industrial enterprises with outdated technical equipment, poor economic benefits, and serious disturbances to the people. Some adjustments were made to the previously scattered industrial enterprises, and the relocated enterprises were guided to enter the industrial park.

The factory has insufficient capacity to pay rent in the city center. Industrial hazards: Land bottleneck, environmental pollution, poor willingness of farmers to transfer, insufficient urban functions

Comparison of different stages of industrial relocation in Beijing

	1985-1995	1996-20021	2002- Now
Relocation purpose	pollution and nuisance	Pollution disturbs residents, layout adjustment	Structural adjustment, urban positioning, metropolitan construction
Enterprise size	small business	all sizes	all sizes
Enterprise nature	Municipal enterprises	Mainly municipal enterprises	Multiple ownership companies
Relocation method	Original site, original scale	planning area · encourage concentration	Strictly implement the overall urban planning and encourage cross-regional migration
Subsidy policy	unclear	relocation allowance*	Relocation subsidies, support for technological transformation, and encouragement of product upgrades
Land Policy	unclear	Agreement transfer	Tender, Auction, Listing
Relocation effect	Business operations deteriorate New environmental pollution	Business improvement Pollution is more concentrated	Business operations are improved and pollution is controlled

Fig.5, Comparison of different stages of industrial relocation in Beijing, Economic Management(2007)

Relocation method

The vast majority of small industrial enterprises in Wei Inner City. The relocation method adopted the relocation of the original factory to the outer city at that time, and the scale of the land used by the enterprise was not. The second stage unifies industrial relocation with urban industrial development and urban construction. There are guidance plans for the relocation of enterprises and the scale of land use. The third stage breaks through the previous practice of relocation inside and outside the city, and realizes cross-regional industrial relocation.

Chapter 01 Overview: industrialization and urbanization in Zhejiang

Industrial development

Zhejiang Industrialization

In terms of resources, Zhejiang is a typical province with small resources! Its comprehensive index of per capita resource possession is only 11.5% of that of the whole country, only slightly higher than Shanghai and Tianjin, ranking third in the bottom of the country, especially some basic mineral resources. Energy and arable land are very scarce.
From a geographical point of view, although Zhejiang is coastal, like Fujian, it has long been on the front line of national defense against Taiwan. Unlike Guangdong, it is adjacent to Hong Kong and Macau.
From the perspective of national investment, due to resources, national defense and other reasons, Zhejiang received very little national investment. For example, taking the state-owned sector capital construction investment as an example, between 1953 and 1978, Zhejiang received only 9.89 billion yuan in total investment. , Ranking fifth in the country, only higher than Tibet, Ningxia, Qinghai, and Fujian. Even after the reform and opening up, the state’ s investment in Zhejiang is far below the national average level has not changed.

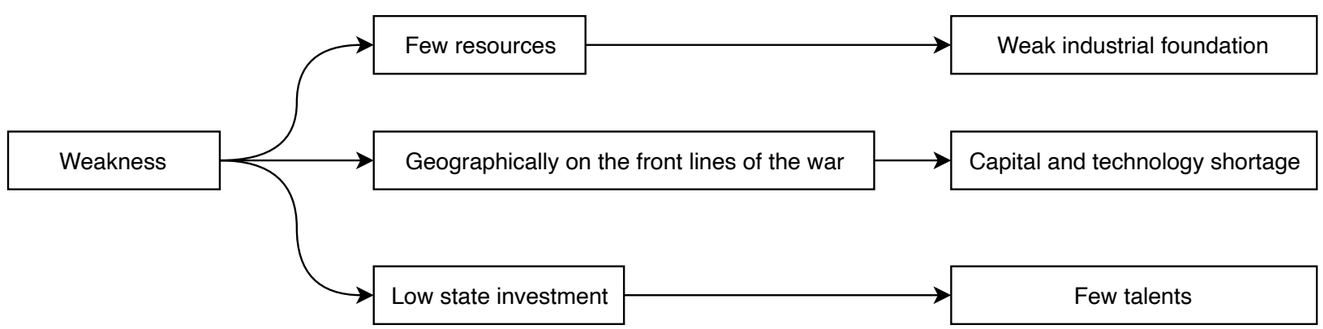


Fig.6, Zhejiang's industrial weakness, Authors(2021)

Zhejiang’ s industrialization started from light industry and gradually formed a large market for small commodities. Due to the influence of the Soviet model, my country’ s traditional industrialization model started from heavy industry. Zhejiang has poor natural conditions and low state-owned investment. This has forced Zhejiang to choose industries that are not very dependent on capital and natural conditions in the choice of industrialized industries. Light and textile industry, and then developed into clothing and manufacturing processing industry, small and medium enterprises across Zhejiang through enterprise clusters.

Zhejiang’ s industrialization started in the countryside and gradually formed distinctive regional industries. The industrialization of most countries in the world was urban industrialization from the beginning, and my country’ s traditional industrialization is actually the same. Zhejiang promotes the industrialization of the province through rural industrialization, and has developed a professional market and block industries that promote each other to develop regional characteristic economies and county economies. On the road to industrialization, which occupies an important position in the province’ s economy, the initial stage of rural industrialization in Zhejiang began with the production of small commodities. After that, Zhejiang has realized the connection between small commodities and large markets by cultivating the market, promoting the joint development of specialized market characteristic industries and small and medium-sized cities and towns.

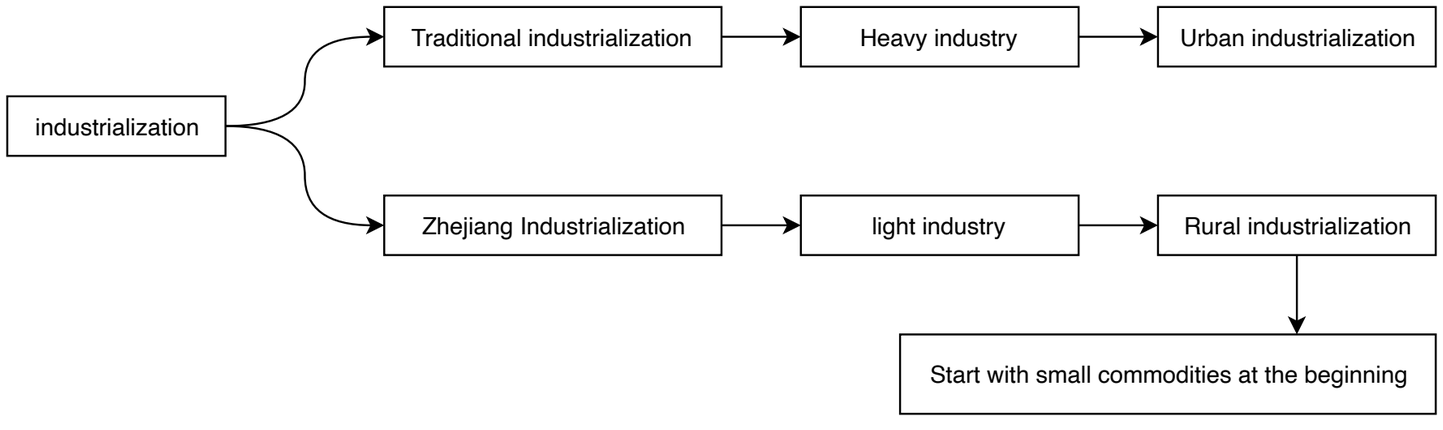


Fig.7, Comparison of Industrial Development in Zhejiang, Authors(2021)

Chapter 01 Overview: industrialization and urbanization in Zhejiang

Industrial development

Zhejiang's unique industrialization road

The first type is represented by northeastern Zhejiang. Northeast Zhejiang has a superior geographical location, with a good industrial and urban infrastructure. With massive investment from the government, collectives and foreign capital as the driving force, a dual-industry system has been formed: one is the urban industrial system, which concentrates the main heavy and chemical industries and high-tech industries in the province; the other is the rural industrial system, which has light and textile industries in the country Comparative Advantage. At the same time, a two-way urbanization movement has been formed: first, large cities (Hangzhou, Ningbo) have accelerated their agglomeration and radiation; second, small towns have accelerated their formation. The prosperity of rural industries and small towns in this area is the result of the interaction between the external forces radiated by big cities, including Shanghai, and the internal forces of local rural industries. With the joint promotion and strong support of urban and rural industries, a large number of urban economic structures And the economic status has undergone significant changes. Some small towns have developed into small and medium-sized cities, and the industrial economic strength of some small and medium-sized cities exceeds that of some old industrial cities in China.

The second type is represented by Southeastern Zhejiang. Including the vast areas of Wenzhou, Taizhou, and Jinhua, historically limited by geographical environment, the central city infrastructure and urban industry have weak agglomeration and radiation. Rural industrialization in these areas
, With individual, private enterprises and joint-stock enterprises developed on this basis as the main investment body, and relying on the small towns with widely distributed professional markets as an important support; the population transfer is based on leaving the land without leaving the country, leaving the land and leaving the country, moving on-site and off-site The coexistence of migration is a characteristic; the driving force of urbanization mainly comes from the thrust of the countryside rather than the suction of the city. On the basis of the revitalization of industry and commerce in towns and villages, a new road for the development of small towns, represented by Longgang, has emerged, where "a city is built by farmers and the people". In a typical sense, this type of industrialization and urbanization development has the most Zhejiang characteristics.

Fig.8, Radiation areas of different central cities in Zhejiang Province, Authors(2021)

Chapter 01 Overview: industrialization and urbanization in Zhejiang

Zhejiang's urbanization process

In the early stage of reform and opening up, the urbanization development of Zhejiang Province at this stage was mainly spontaneously promoted by private forces. It was a typical bottom-up urbanization model. Rural industrialization became the original driving force of urbanization. In the 1980s, the private economy, township industry and commerce promoted the rapid rise of small towns across Zhejiang.

Fig.9, Old light industrial factory, Source from Website

In 1998, centering on the central city strategy to promote the further development of industry and optimize the industrial layout, many places built industrial parks and economic development zones to promote industrialization through urbanization.

Fig.10, Central city, Source from Website

In 2006, some central cities in Zhejiang Province underwent urban transformation and functional enhancement, and new explorations were made in the regional and urban planning system. Urban agglomeration

Fig.11, Urban agglomeration, Source from Website

Chapter 01 Overview: industrialization and urbanization in Zhejiang

Zhejiang's urbanization process

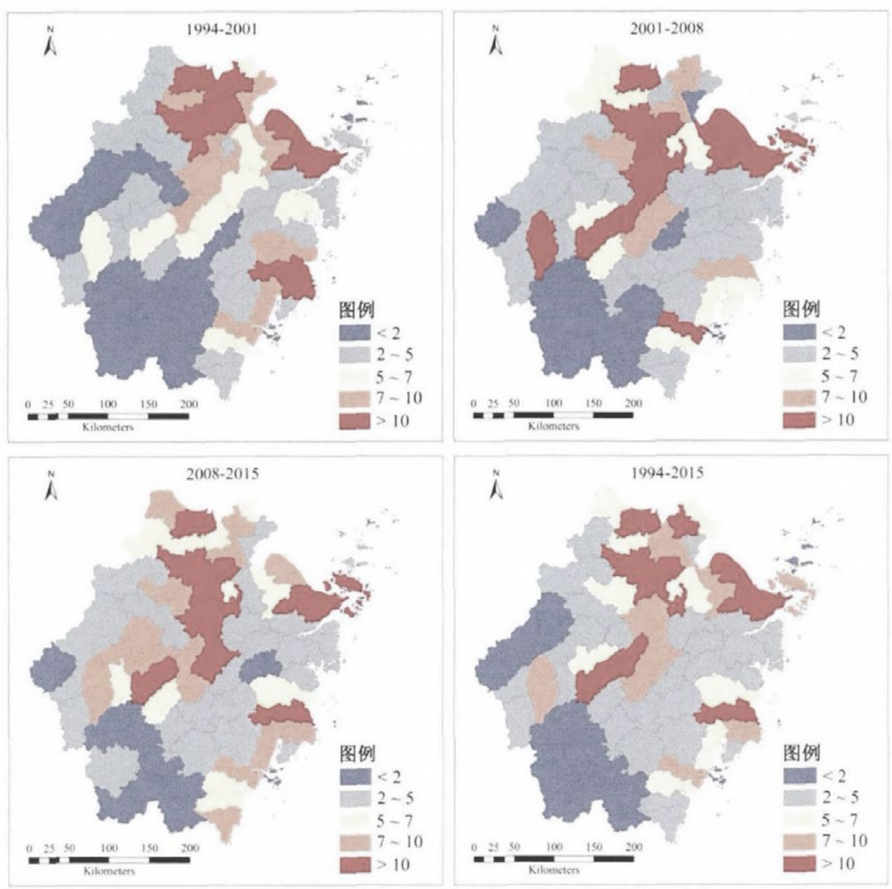


Fig.12, 1994-2015 Construction Land Increment Index, Multivariate and multiscale analysis of spatiotemporal patterns of urbanization and urban expansion simulation, Zhou Ye(2019)

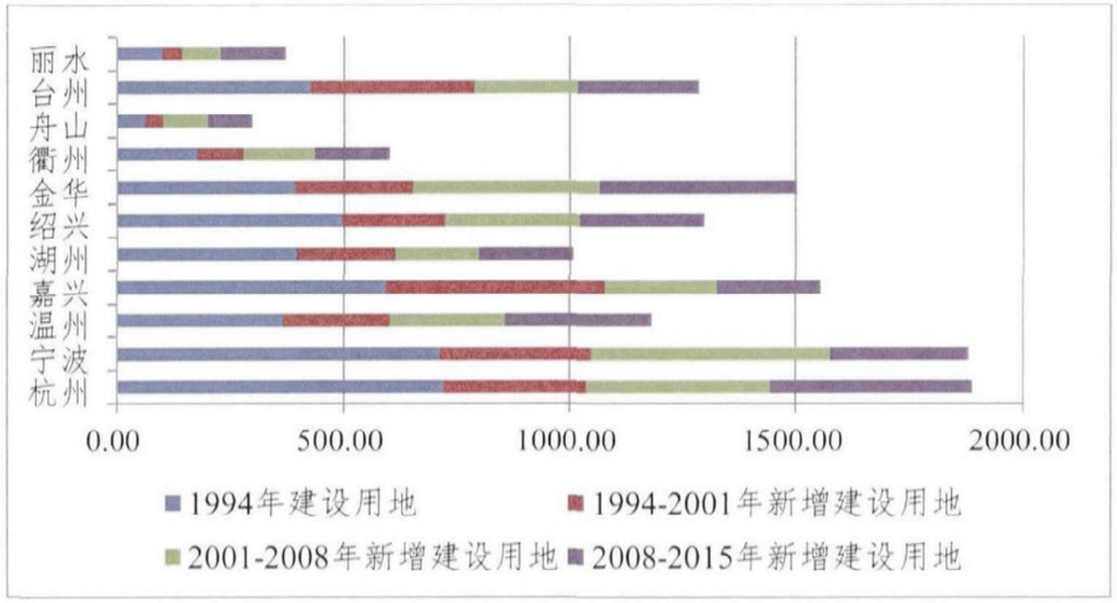


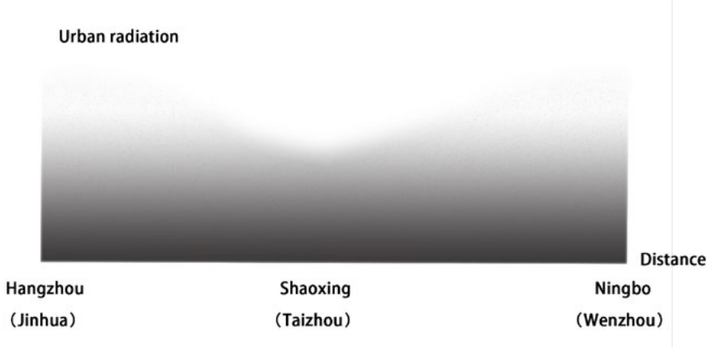
Fig.12-1, The growth of construction land area at different stages in 11 cities in Zhejiang , Multivariate and multiscale analysis of spatiotemporal patterns of urbanization and urban expansion simulation, Zhou Ye(2019)

The construction land area growth index shows a relatively stable distribution of 4 centers for high-speed expansion

1. The North Zhejiang Plain takes the urban area of Hangzhou as the center of rapid expansion, spreading to the surrounding areas
2. Take Ningbo urban area as the center of high-speed expansion and expand to surrounding areas
3. The Central Zhejiang Basin takes Jinhua urban area as the center of expansion
4. The coastal area of Taizhou, Wenzhou, is centered on Taizhou urban area.

Chapter 01 Overview: industrialization and urbanization in Zhejiang

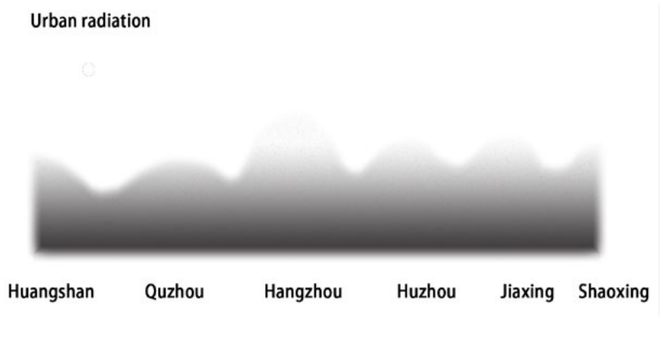
Regional Urbanization



Central City

The central city is the core city of the metropolitan area. The central cities of Zhejiang Province are Hangzhou, Ningbo, Jinhua and Wenzhou. Through the radiation of the central city, the middle city has been developed to a large extent and formed a common area. The northeast area of Zhejiang, the southeast area.

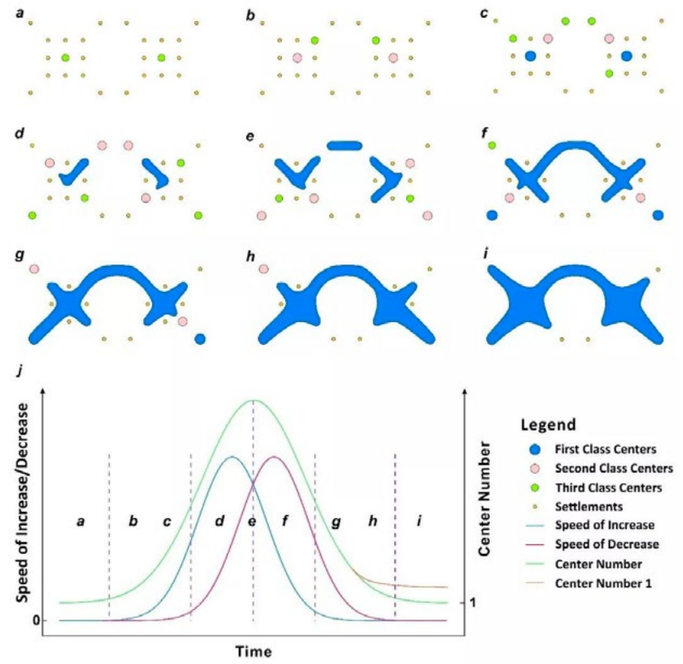
Fig.13, Degree of Radiation Ability of Central City, Authors(2021)



Urban agglomeration

The Hangzhou metropolitan area connects Huzhou, Jiaxing, Shaoxing, Quzhou and Huangshan with Hangzhou as the center. Through the urban connection, the regional scope is wider and the development is closer. Can better promote urbanization.

Fig.14, Degree of Radiation Ability of Urban agglomeration, Authors(2021)



Studying and revealing the changing laws of urban agglomerations in the context of rapid urbanization has important reference value for maintaining, laying out and developing regional multi-center structures. The study takes the connected construction land area as the center candidate, the number of centers as the measure of regional polycentricity, and fully considers the hierarchical characteristics of the urban system and the cross-scale characteristics of the urban expansion process.

Fig.15, Urbanization to Regionalization Path, Source from Website

Chapter 01 Overview: industrialization and urbanization in Zhejiang

Regional Urbanization

The future of Lishui

From the perspective of Zhejiang Province, the two economies of Hangzhou are both located in the north of Zhejiang and have limited influence on the development of southwestern Zhejiang. The radial belts of the two central cities of Wenzhou and Jinhua are weak, and it is difficult to cover the southwestern area of Zhejiang. Therefore, in order to promote the development of southwestern Zhejiang, it is very important for Lishui to become a regional central city.

With the development of Lishui City, local industries and industries that migrated from Hangzhou, Ningbo, and Wenzhou have made Lishui's industry gradually rise. From industrialization to promote urbanization, industrialization and related issues, Lishui City will face huge challenges.

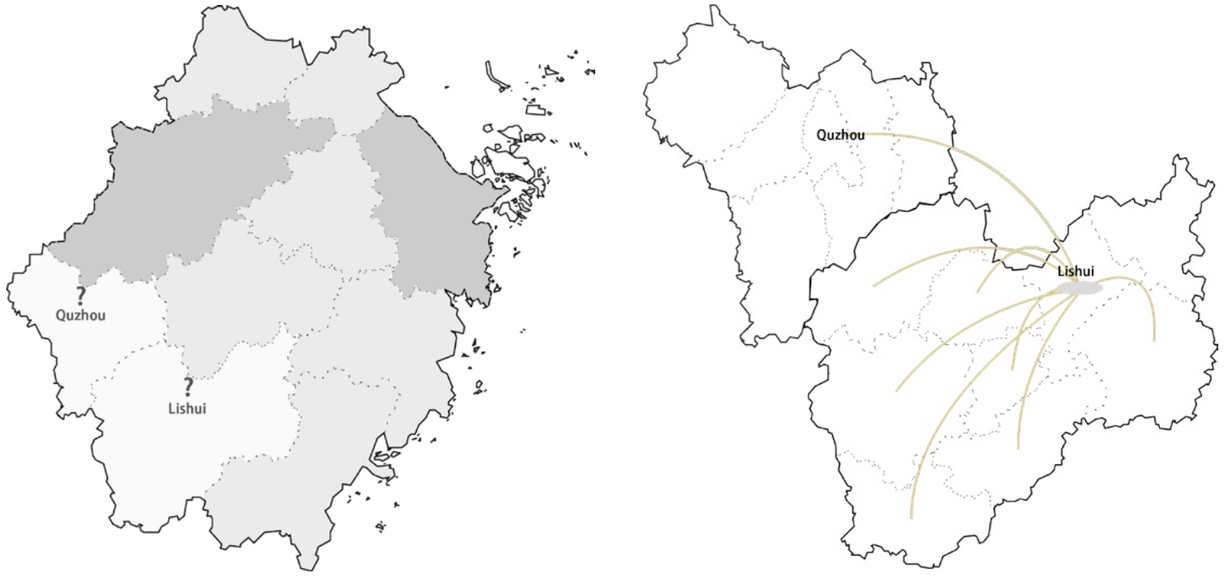
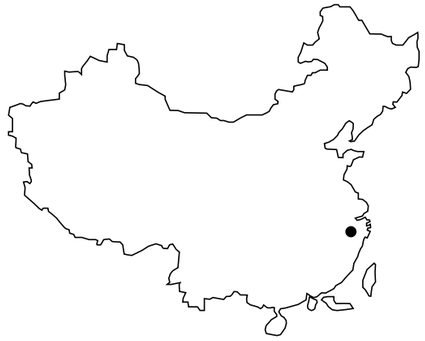


Fig.16, Lishui and Quzhou, Source from Website

Chapter 02 Survey in Lishui bihu town

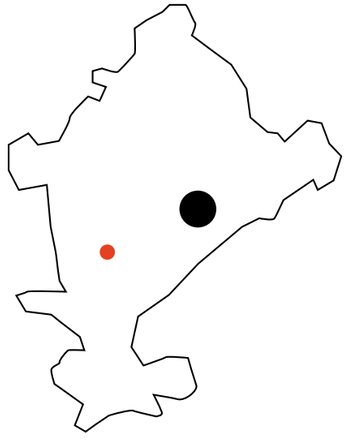
Location of Lishui

Lishui is located in the southwest of Zhejiang Province. As a relatively backward urbanization level in Zhejiang Province, this area is the central city in the southwest region of Zhejiang Province for the future development of Zhejiang Province. Lishui City will start to develop vigorously, and urbanization and industrialization are developing in harmony. Therefore, the urbanization and industrialization path of Lishui City is in line with the development path of other regions in Zhejiang Province. Therefore, the problems caused by industrialization are imminent.

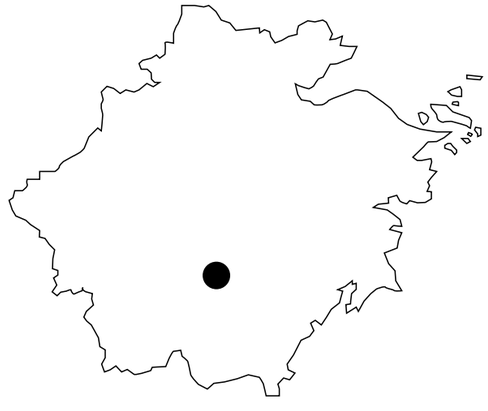


China

Zhejiang



Bihu



Lishui

Fig.17, Location of Bihu, Source from Website

Chapter 02 Survey in Lishui bihu town

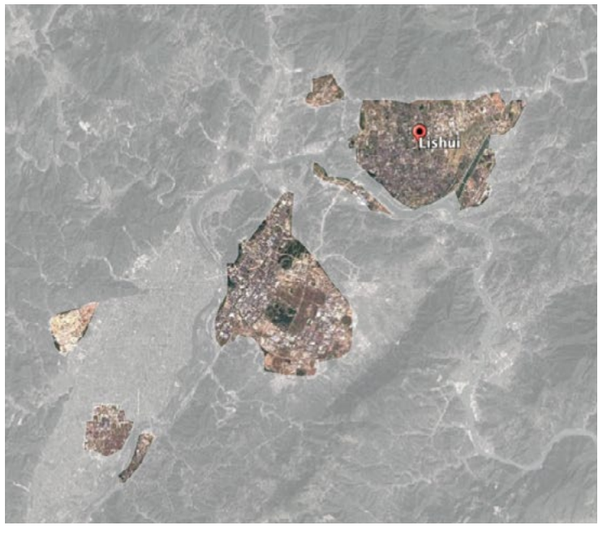
The urbanization process of Lishui

From the trajectory of urban development, it can be seen that from 2000 to 2013, the central urban land development of "one river and two cities" has become increasingly mature, and the need for urban expansion space has become increasingly urgent. Since 2013, Bihu Town has become the most potential location in Lishui's central urban area to expand to the southwest.

1984

2002

2011



2020

Fig.18, Expansion of Lishui, Google Earth Pro(2021)

Chapter 02 Survey in Lishui bihu town

Survey in bitu town

Bihu Town is located in Bihu Basin, Lishui City, Lishui City. Bihu Basin is the largest valley impact plain in the Oujiang River Basin. Bihu Plain has the contiguous development space closest to the main urban area. Bihu Town Industrial Park and Wanyang Low Carbon Town are regarded as the best locations for Lishui's industrial development.

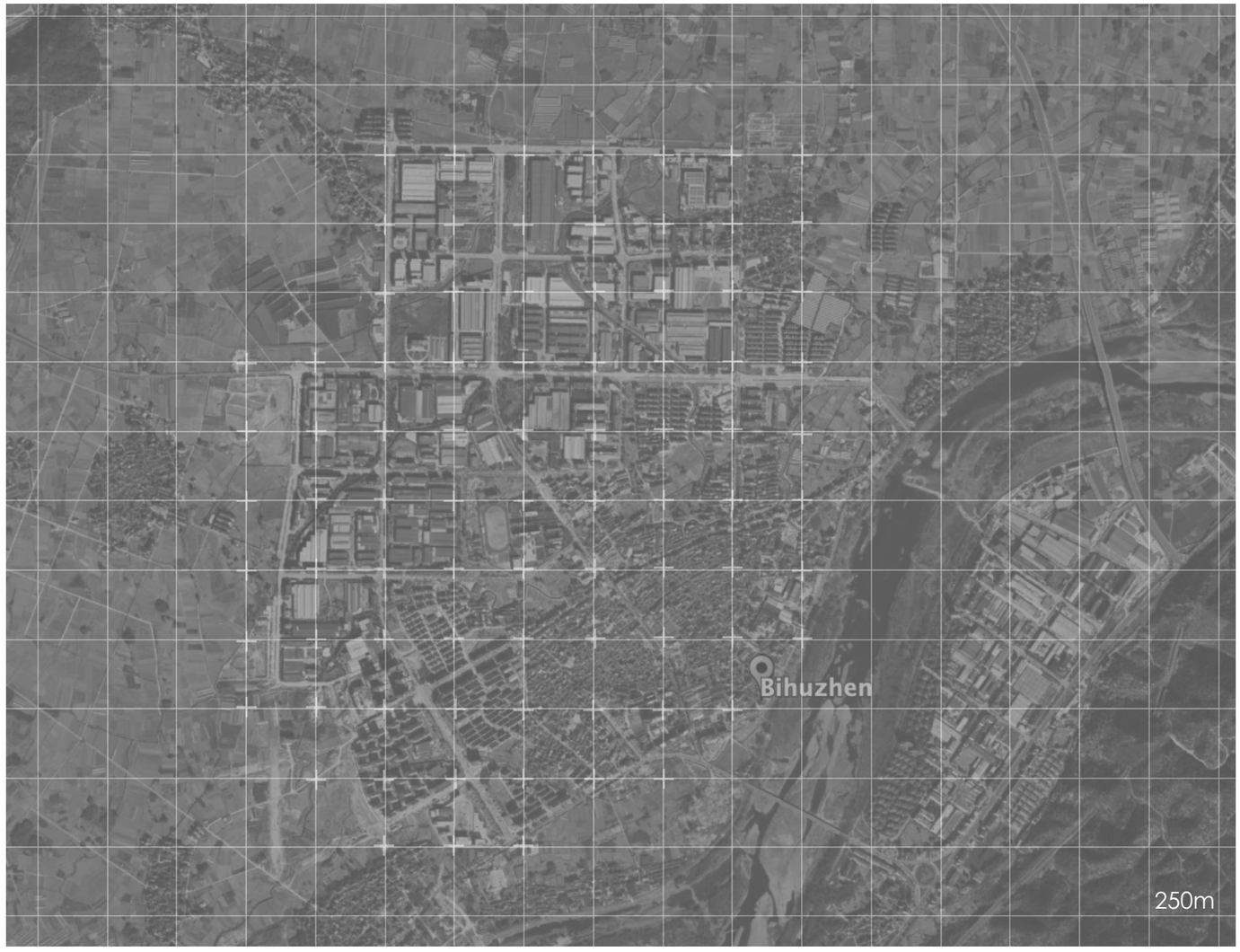
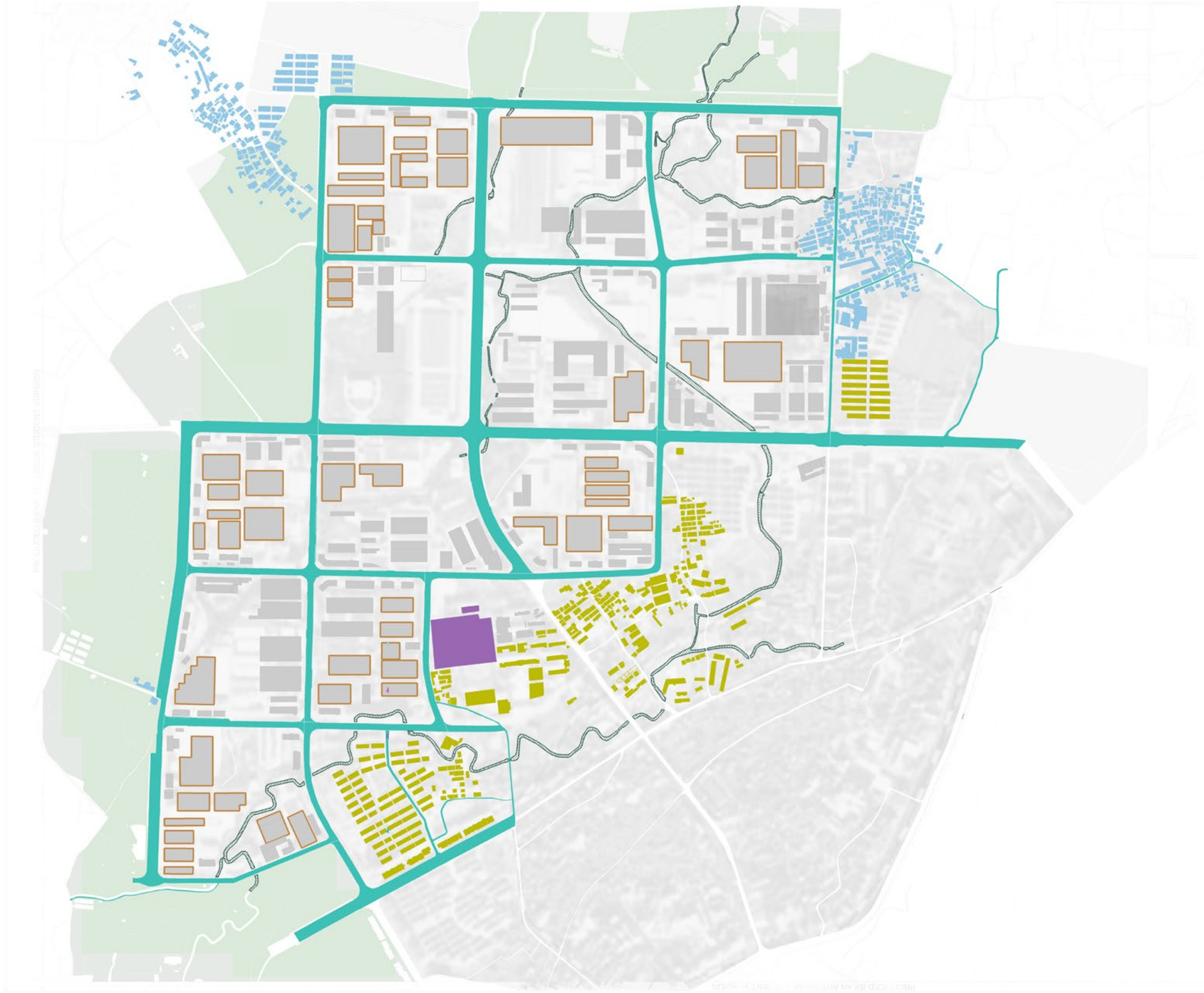


Fig.19, Location of Bihu, Google Earth Pro(2021)

Chapter 02 Survey in Lishui bihu town



Industrial Edge Map

The town of Bihu has a complex environmental composition, with different elements interlinked to form the surrounding environment around the periphery of the industrial area, such as farmland, villages, wetlands, woods, the main town, etc.,and separated from them by the mian road as a 'border'.

As the industry expands, so does the 'border', which acts as a wall that separates the industrial area from its surroundings and evolves into a cancerous cell that continues to encroach on the land of the Lishui Valley, causing great harm to the farmland, the countryside and the natural environment.

Fig.20, Bihu Industrial Zone, Authors(2021)

Chapter 02 Survey in Lishui bihu town

A. Monotonous function of the Bihu

Shortage of facilities, green space and squares

Rapid industrialisation has led to factories being built out in large numbers at the expense of public activity spaces. Both workers and citizens lack enough space for daily shopping, exhibitions, sports, leisure, etc.

Green space is also insufficient for normal living needs, accounting for only 2.7% of the entire BIHU town area, or less than 2 square metres per person.

Large amount of empty space exists

There is a large amount of vacant land in the town of BIHU, including sites waiting to be built on and land that is deserted. Most of this vacant land is used to store rubbish or as private land to grow some vegetables, which is very under-utilised and results in serious waste.

Complex compositional relationships

The town is divided into two parts: the industrial area and the main town, which consists mainly of flats and houses to meet the housing needs of workers and citizens, and is surrounded by several villages and surrounded by nature and farmland.

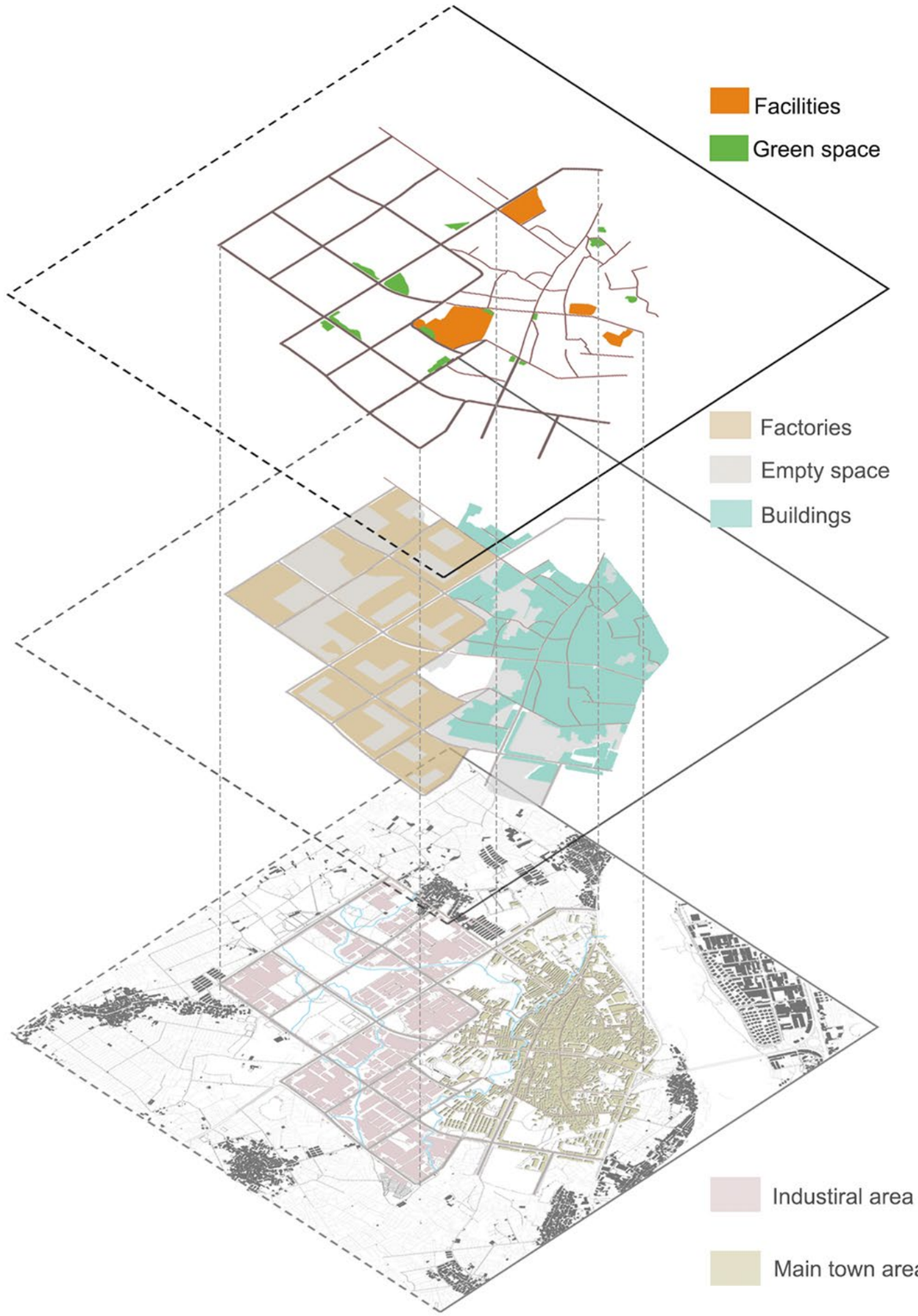
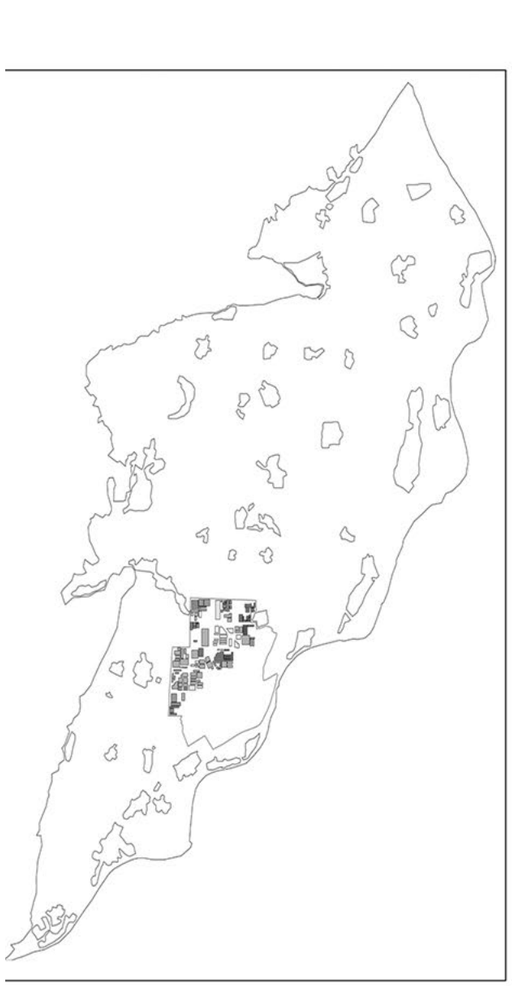


Fig.21, Site analysis, Authors(2021)

Chaos and disorder

The current characteristics of the BIHU industrial area show that the rapid industrialisation process has led to a confusing layout of the industrial area, both in terms of industrial classification and the rational use of the site. Firstly, the industrial area contains a large number of vacant and wasteland sites that cannot be used properly within a short period of time. This not only destroys the original environment, but also affects the entire industrial area due to the pollution caused by the accumulation of waste.

Secondly, it is common for new factories to be built and for existing ones to be abandoned resulting in the appearance of many abandoned buildings. The centre of gravity of the industrial area is gradually shifting towards the north and west, with a large number of vacant factories appearing in the southern part of the industrial area, close to the main town area, where a special ring of vacant land and factories has redefined the boundaries of the industrial area.



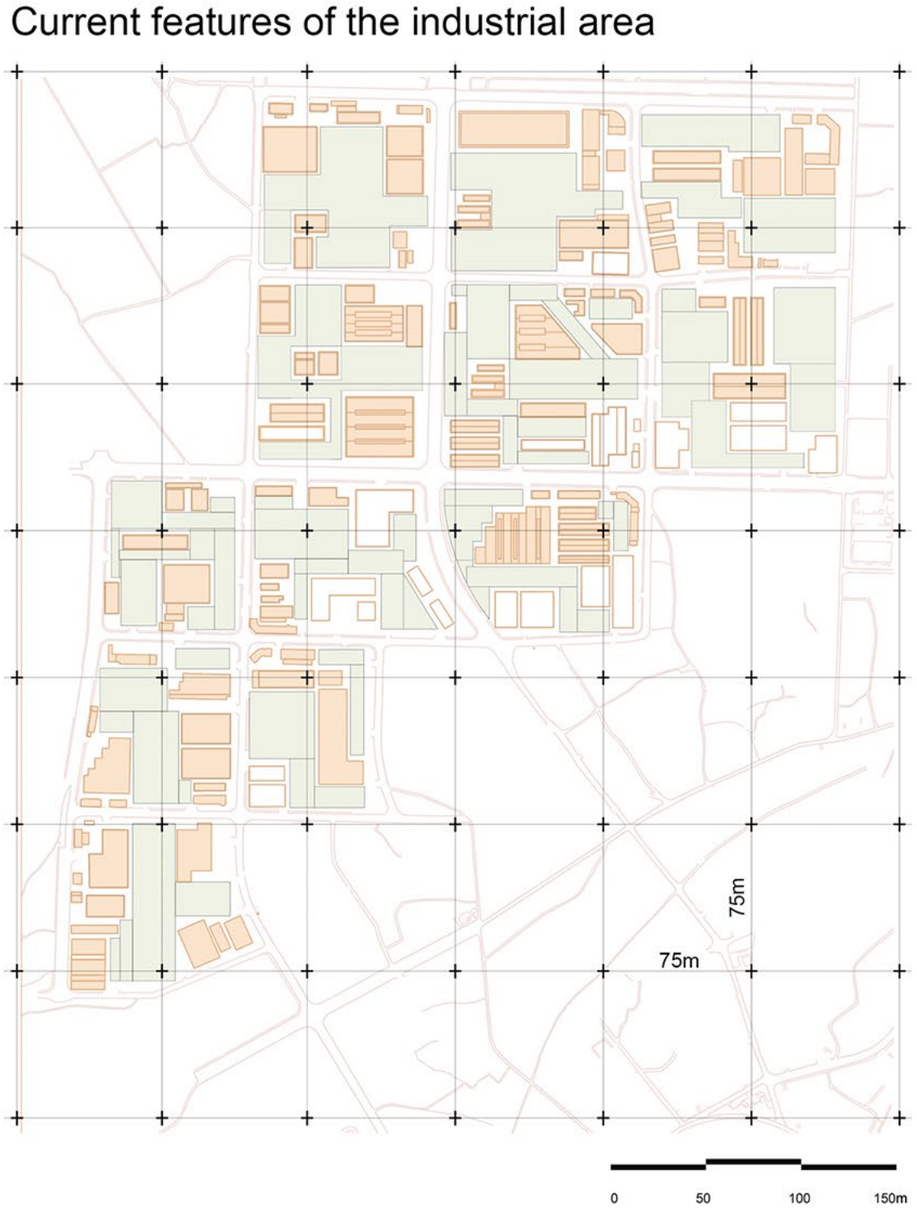


Fig.22, Analysis of industrial area, Authors(2021)

Chapter 02 Survey in Lishui bihu town

Backward logistics system

The chaotic logistics system has resulted in large trucks taking up most of the main roads in BIHU, again because the factories are so spread out, resulting in very little use of the logistics system by the same type of factory, and trucks may even have to make a trip around BIHU. What’ s more, the annual rate of traffic accidents in BIHU is gradually increasing, especially in the case of pedestrians being hit by trucks, which is a major safety hazard due to the lack of separation between vehicular traffic and the human form.

Waste land

Garbage dump

Empty space

Trucks

Fig.23, Site Photos, Photoed by Zhang Feng(2021)

B. Unhealthy expansion of the Industiral area

The industry of Bihu Town started to develop in 2008, and the industrial zone gradually expanded to the northwest. Since 2017, the expansion has gradually accelerated, and the original villages around Bihu Town and the natural and farmland areas in the middle of Bihu Town have been transformed into industrial areas. The rapid development of industrial areas has inhibited the sustainable development of the main town area, resulting in the entire town as if it only serves the industrial area, which is called a tool for industrial expansion.

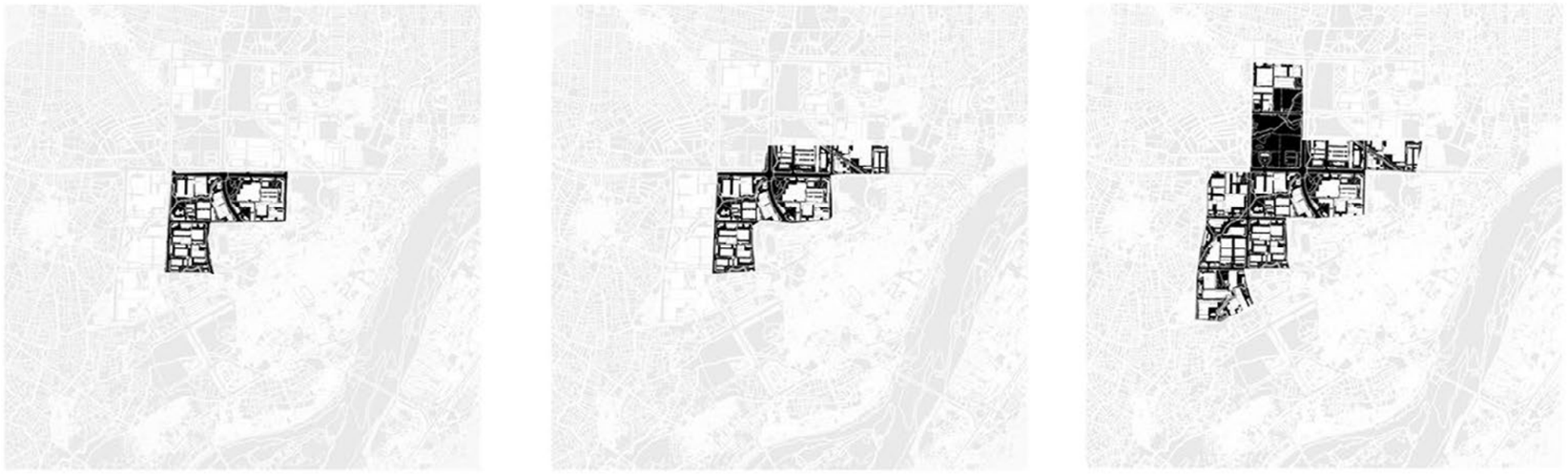


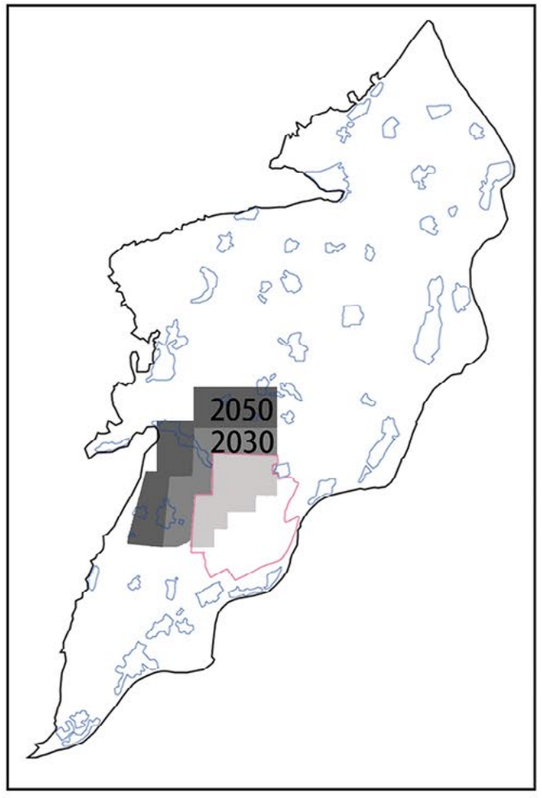
Fig.24, Expansion of bihu industrial area, Authors(2021)

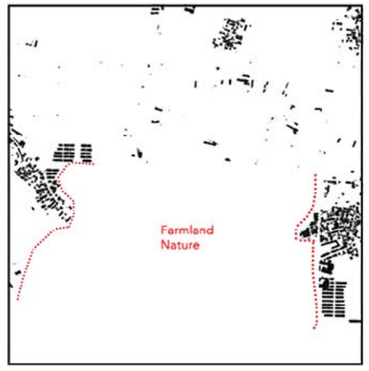
2021

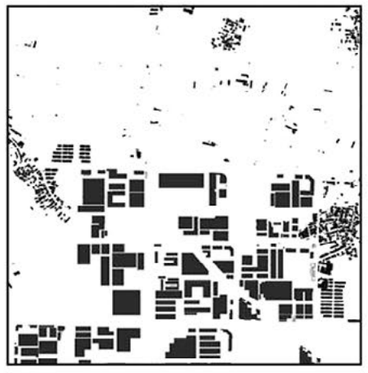
2030

2050

villages Factory Factory(new build) Farmland Nature environment







Engulfment and expansion

Lishui valley is mainly composed of farmland, natural environment and rural areas. The rapid expansion of industrial zones has led to an increase in the area of industrial land, and the gradual depletion of natural resources and farmland. The village is gradually surrounded by factories in the future.

Villagers with agriculture as their leading industry will be greatly affected in the future, the loss of arable land, the occupation of public land, and even the destruction of the entire urban fabric of bihu。

Fig.25, Engulfment and expansion in Bihu, Authors(2021)

Pollution

The industry in Bihu Town is dominated by food processing, manufacturing and chemical industries. Among them, polluting industries are mainly concentrated in the north and west. The production of fertilizers and other organic chemical products causes soil and water pollution. Manufacturing produces a lot of noise.

Water pollution

Air pollution

Soil pollution

Noise pollution

Fig.26, pollution from industry, Source from website

Chapter 03 Case studies

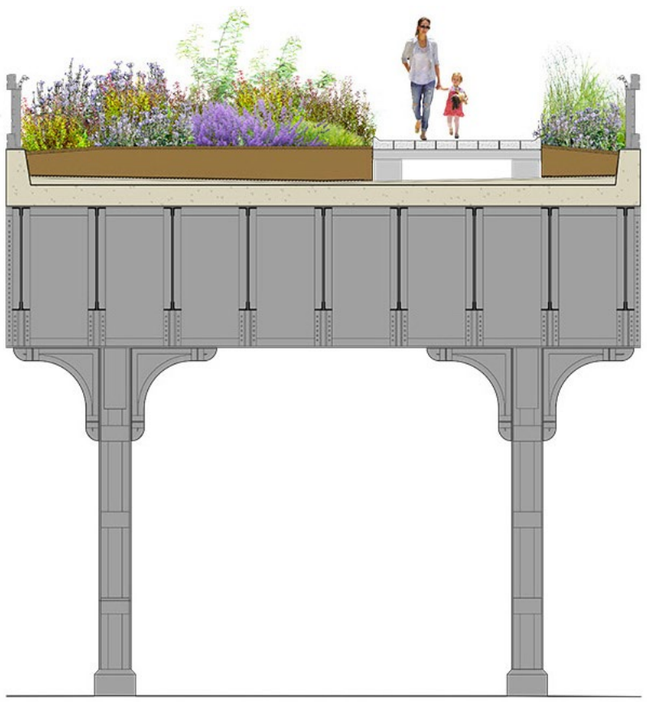
Spur High Line

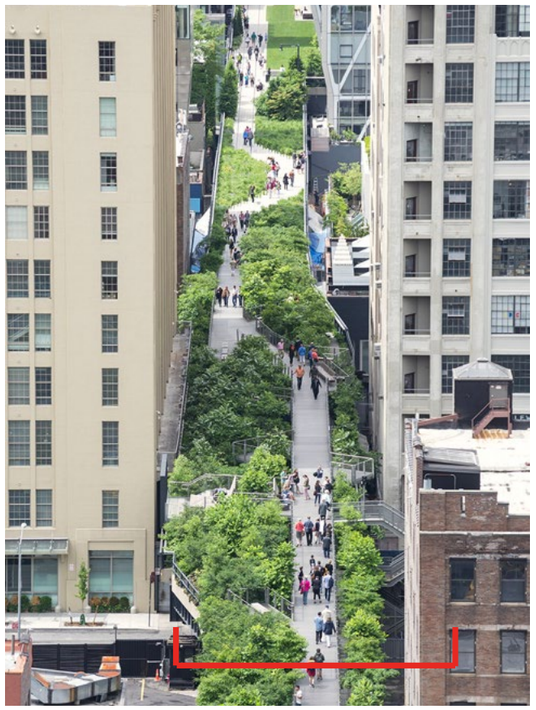
The High Line Park in New York is a linear sky garden located on the west side of Midtown Manhattan, New York. It is a classic case of the reuse of urban abandoned facilities.
Originally built in 1930, a railway freight line connecting the meatpacking area and the Hudson Harbor on Thirty-Fourth Street, with a total length of about 2.4 kilometers, a height of about 9.1 meters above the ground, spanning 22 blocks, was discontinued in 1980. , was abandoned for more than 30 years and was once in danger of demolition.
Under the vigorous protection of the "Friends of the High Line" organization in New York, the High Line finally survived and built a unique sky garden greenway.

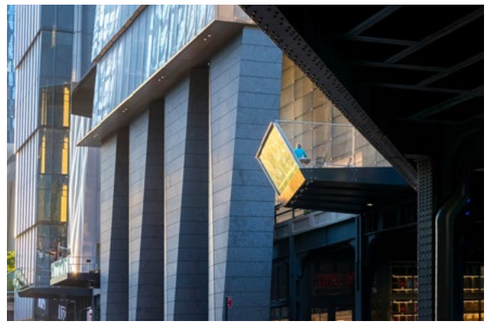
Protection and inheritance of urban culture

1. Respect for the history of the city. Due to the preservation of the High Line railway site, the High Line Park has become a "monument" of the industrialization history of the West Side of New York; The "Friends" group overturned the proposal to demolish the High Line Railway and promoted the planning and construction of the park. It can be said that the High Line Park has maintained close ties with local residents from the origin, bidding, design and implementation of the project, and is bringing great benefits to New Yorkers. At the same time, a wonderful public space also carries the memory of the city. 3. Respect for the site is proposed in the design, and the preservation and reinterpretation of the structural characteristics is the key to its transformation into a park. The park not only preserves and reinterprets some of the railway tracks, but also preserves the ruins of some of the factory buildings. These scenes record, tell and convey the history of the site.

Fig.27, High line, Source from Website







The viewing platform

The landscaped passage

High Line Plinth seating area

A theatre-like experience

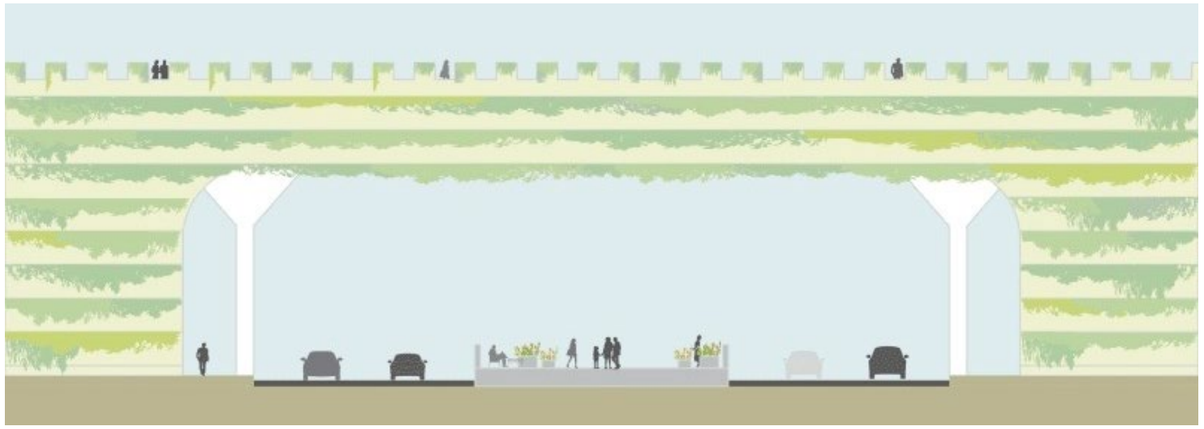
Through a special "agri-tecture" strategy, the Spur project digitizes the surface of the High Line into discrete paving and planting units, 1.5 miles of pavement combined from 100% hardscape to 100% flexible A rich transition to the botanical landscape. The paving system consists of spliced precast concrete slabs with open interfaces that allow weeds to grow in the pavement gaps. The slender paving units are narrowed at both ends to blend in with vegetation, creating a unique look of a "disappearing road". This strategy transforms the park into a place that incorporates wild vegetation, farming spaces and social functions.

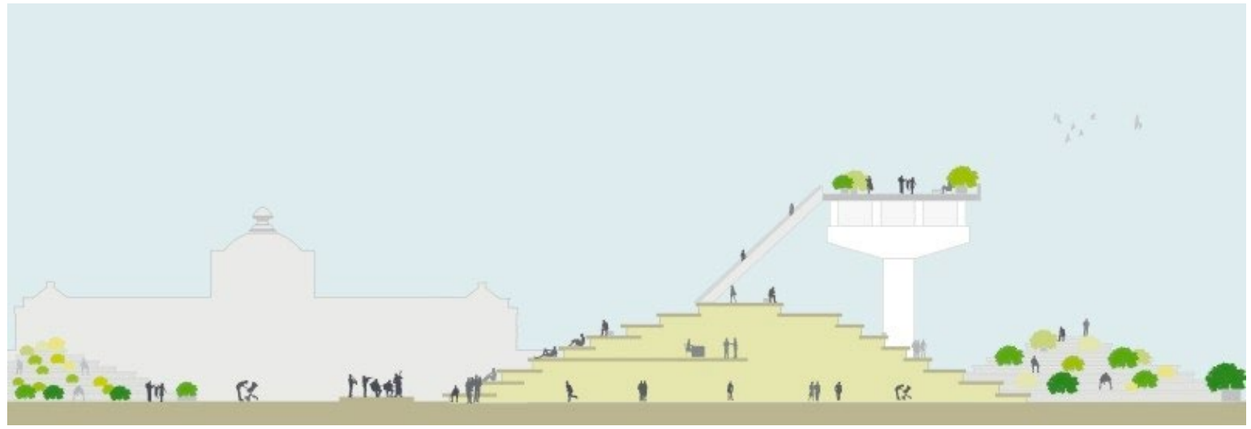
Fig.28, High line, Source from Website

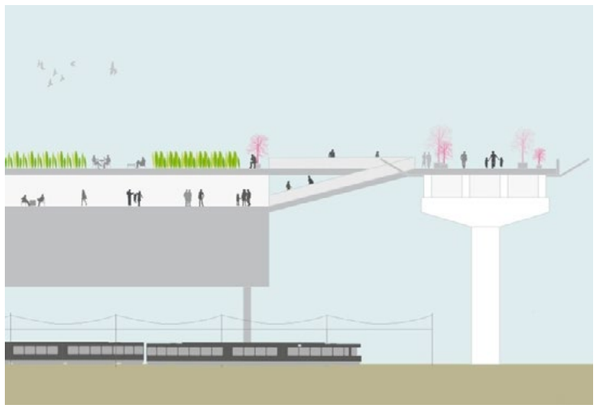
Seoullo skygarden

Seoullo, the Korean name for Skygarden translates to ‘towards Seoul’ and ‘Seoul Street’, while 7017 marks the overpass’ construction year of 1970, and its new function as a public walkway in 2017. The pedestrianised viaduct next to Seoul's main station is the next step towards making the city and especially the central station district, greener, friendlier and more attractive, whilst connecting all patches of green in the wider area.

Fig.29, Seoullo skygarden, Source from Website



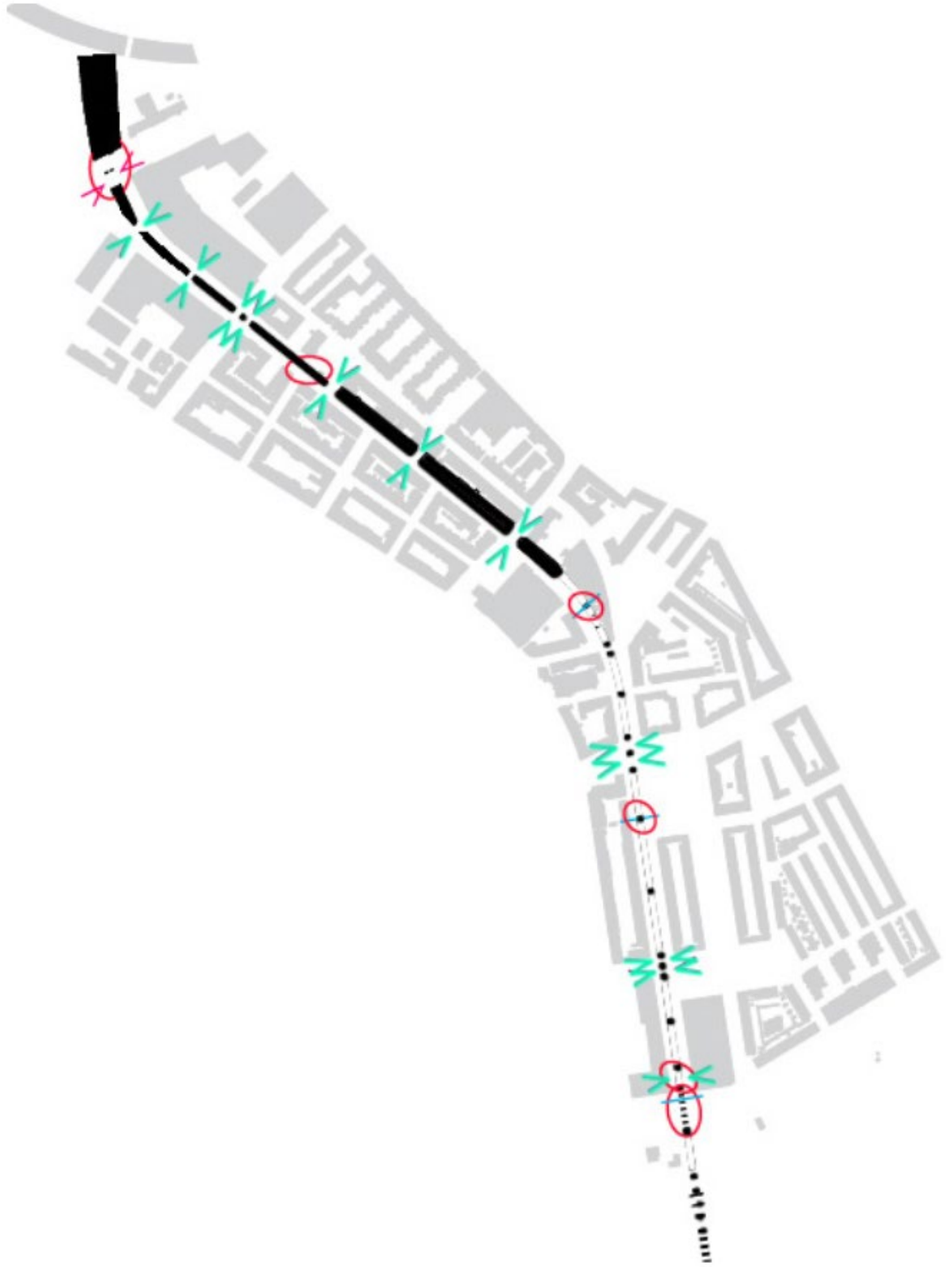




The entire highway has also been transformed into a public 983-meter-long sky garden, planted with 50 species of plants including trees, shrubs and flowers, maintained through 645 tree pools. In total, the park will include 24,000 newly planted plants (trees, shrubs and flowers), many of which will gradually reach certain heights over the next decade.
City dwellers are closely connected to nature while offering a superb view of Seoul Station and Sungnyemun Gate. The sky garden is not only an educational botanical garden, but also an urban nursery that breeds various species. In the future, as the plants grow and flourish, the relocation of some plants in the future will allow the greenness to gradually extend to other corners of the city.

New bridges and stairs will connect the viaduct with hotels, shops and gardens. Various stairs, elevators, footbridges, escalators and other facilities will connect the sky garden with the city, forming a resilient relationship with the surrounding urban texture. Plants are raised in some places, and there are shops, galleries, tea rooms, theaters, information centers, maintenance facilities, restaurants and many other functions below.

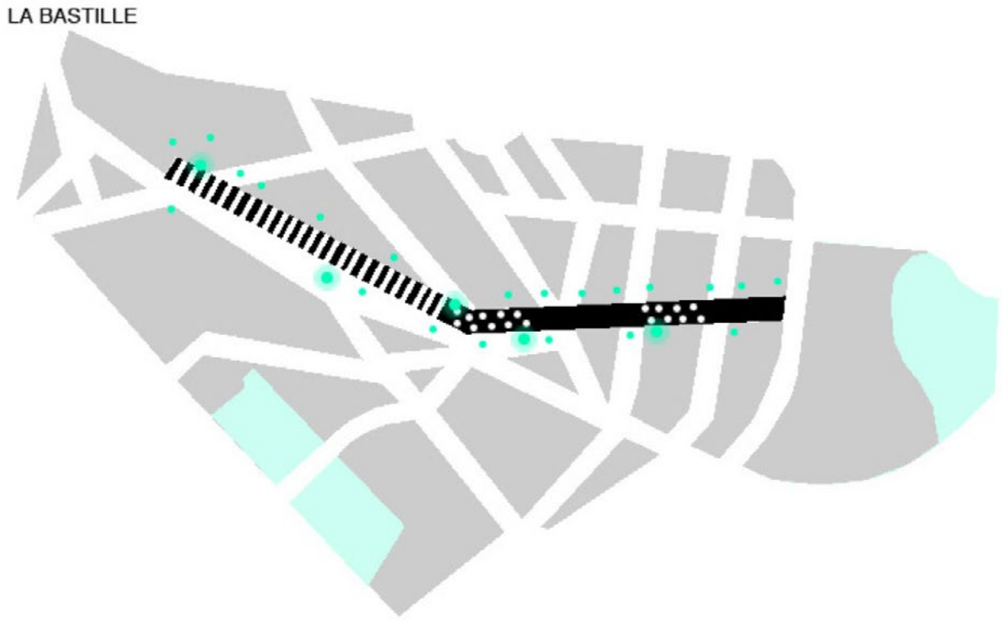
Fig.30, Seoullo skygarden, Source from Website



De Hofbogen

The “key word” of this proposal is “Transformation”, taking historical and classic elements and making them become something new. We want to reinvent a railway structure in a new urban axis that responds to both public and private uses through the creation of a house, shops and public park, as well as private gardens that accompany the residences. The proposal seeks to generate a link between what is below and what is above through spatial, physical and visual relationships not only of the public space but of a whole system of uses that makes the axis a real pole of transformation. Thus the line becomes a block, a building, a garden, a trade that develops in a three-dimensional way. The result of this is an infinite range of possibilities that through the right combination of elements can generate a new urban settlement system. At ground level, relations are generated with the road, trade and production activities. In a first elevation the roof is born as a public space, that is the park. This crosses with a second elevation that responds to homes and offices. The proposal thus responds to a stratigraphy of use and spatial condition that reinvents a typical element of European cities such as the railway system.

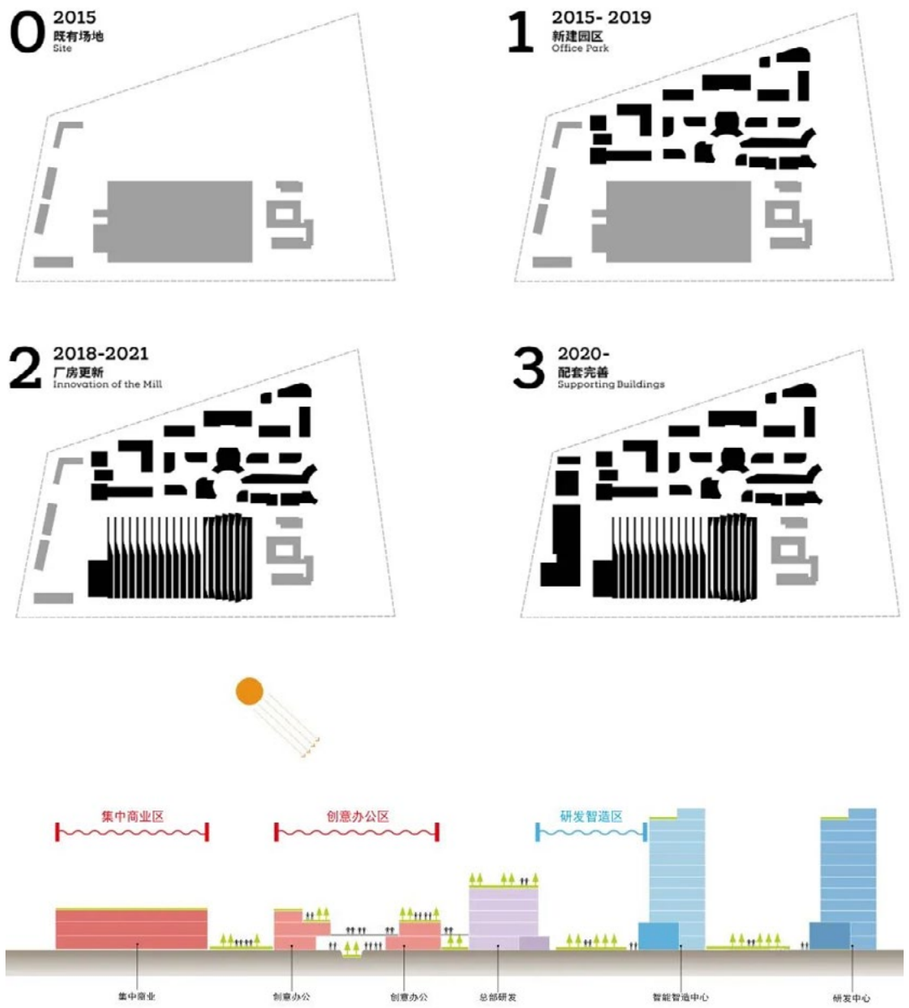
Fig.31,De Hofbogen, Metamorfosi del Trincerone, Astrid Safina



Promenade Plantee

The first elevated park in the world, as part of the redevelopment not only of the ancient railway line, which connected the Bastille races to La Varenne-Saint-Maur, but of an entire part of the city. The tree-lined avenue, nine meters wide, takes place in the heart of Paris. It starts near the Opera Bastille, from the Viaduc des Arts. The large arches that supported the railway viaduct and which today house art and craft shops, and then becomes a path at ground level and even goes down seven meters below the road level in the last stretch, known as "Promenade Verte" . The park here is further doubled, leaving the possibility of continuing on foot, or with a separate path for bicycles. The initial straight path, geometric and defined, eventually becomes a sort of humid cave in which the spontaneous vegetation grown in the years of abandonment of a railway tunnel has been maintained and integrated, giving the environment a natural and uncultivated aspect. . Even the gardens, created in empty and abandoned areas and which are linked to the promenade, are varied and treated differently through the use of terraced systems and large open spaces that offer contrast with the pedestrian staircase. The architectural elements along the route are the sign that unites the different types of spaces where different atmospheres are highlighted through the use of vegetation, thus allowing open views towards the city or closed towards the interior of the park. To the original route are added several point parks such as the Red Park which highlighting a stratigraphy of interventions.

Fig.32, Promenade Plantee, Metamorfosi del Trincerone, Astrid Safina



Xizi Smart Industrial Park: From Industrial Plant to Comprehensive Community

The development of Xizi Smart Industrial Park originated from the relocation of Hangzhou's urban industries. The production line of the boiler plant will be relocated to Chongxian again, and the old factory building will become an "industrial relic". The old factory building and its surrounding land will be developed into a "smart industrial park" and become an important part of Dingqiao Smart Town. The design tasks include the renovation plan of the old factory building in Dingqiao, Hangguo and the new plan of the surrounding stock land. The challenges faced by architects can be summarized into two aspects: one is to avoid the homogenization and suburbanization of large-scale "industrial parks" and return to an "urbanity" in space; the other is to properly formulate a strategy for the renewal of old factories , trying to continue the old industrial memory while realizing the improvement of land value. The architect proposes two strategies. One is to put commercial formats and basic facilities in the old factory buildings to stimulate the value of the land and serve the surrounding areas; the other is to transform the "scale" while retaining the atmosphere of the industrial building, making it a truly pleasant commercial space.
The entire land of 21.5 hectares will be constructed in three phases, with extremely rich functional formats. The land on the north side of the old factory building is the first phase, which accommodates the intelligent manufacturing center, R&D center, creative office, art center, etc.; the old factory building is updated into the second phase, which can accommodate warehouse supermarkets, centralized commerce, and parking buildings through functional regeneration; The side is the third phase, and the pilot plant required for the construction of the composite era is built.

Fig.33, Xizi Smart Industrial Park, Source from Website

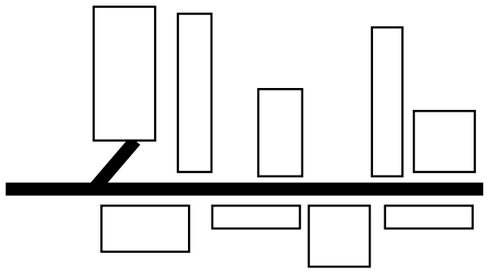
The compound, Jewellery Quarter, Stuart Holt, England

The compound, a disused textile factory, has been fully refurbished into a cinema, studio and apartments by local award-winning RIBA-winning firm Javelin Block. Founded by Stuart Holt, Javelin Block specializes in the adaptive reuse of the city's industrial heritage, transforming it while preserving its historic appearance and scale.
Sunlight pours down from the 35-meter high ceiling, lighting up the entire interior space, while factory lights, steel-framed glass walls, metal fence walkways and exposed ceiling beams tell the story of the textile factory’ s past.
The renovated The Compound has an area of about 830 square meters and is planned as an office, studio, bar, 25-seat cinema, three independent apartments, and is also a good place for many advertisements, cinematography or photo shoots, including the great director Speer. Berg's works, Ready Player One, Red Bull, Microsoft, and Facebook ads have all been shot here.

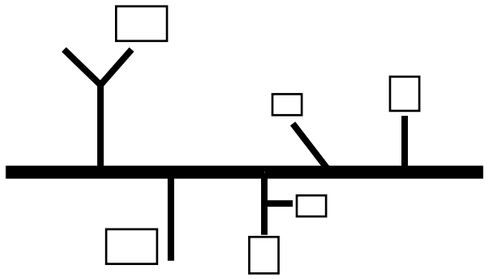
Fig.34, The compound, Source from Website

Linear Park

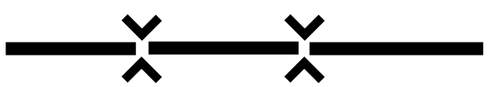
Analysis of linear parks in cities at different scales, summarizing the principles and kneeling. It is used as a guide and reference for the design of linear park spaces in the city.



The main axis, based on the old railway, passes through different areas of the city, distributing different urban spaces on both sides, while creating new gathering spaces in the linear park



This type of linear park has many irregular branch paths, trying to connect different spaces more widely, it can better adapt to different urban textures and urban environments.

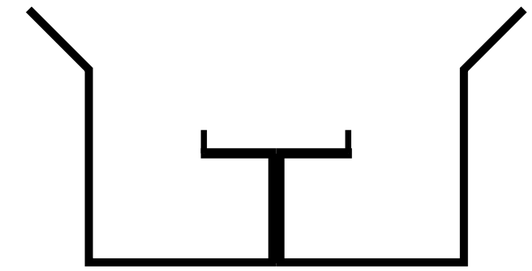


This type of linear park is based on the old railway. When the main axis cannot be adjusted, flexible entrances are set up based on different blocks to connect the linear park.

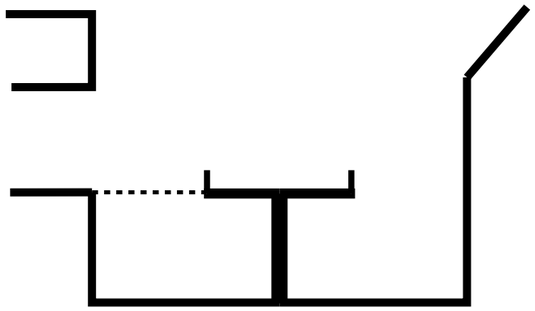
Fig.35, Analysis of Linear Park, Authors(2021)

Strategy of Linear Park Connection

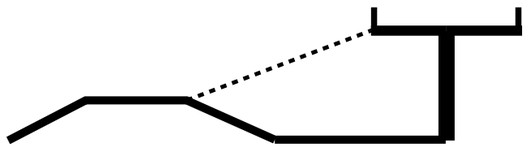
Exploration of Spatial Strategies for Connecting the High Line to Architecture, Public Space and Residential Areas



The linear park cuts across the block without a direct connection to the building. There are elevator and stair entrances that allow people to enter the High Line Park, which can form a unique perspective of the landscape.

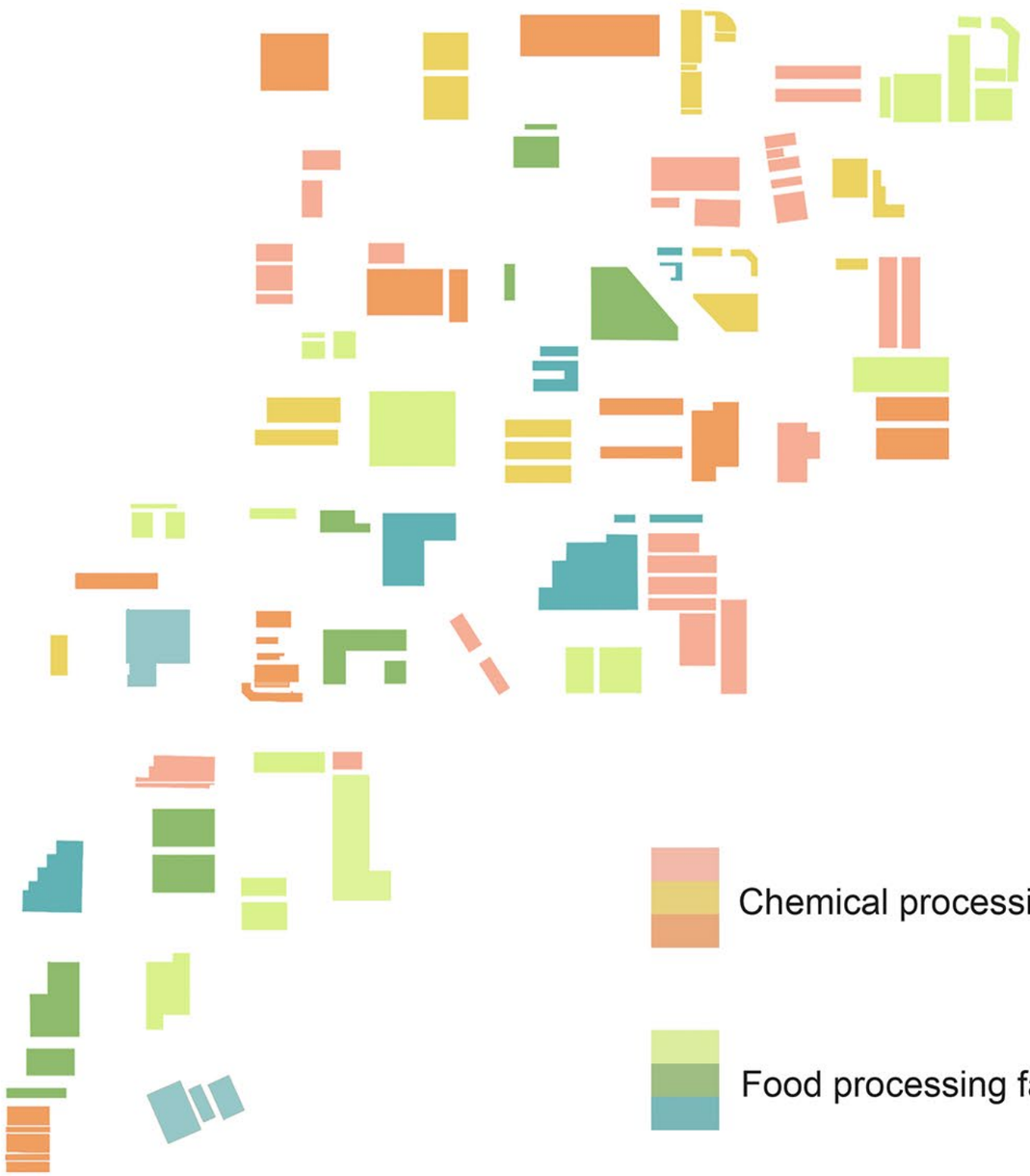


The High Line and various facilities are connected by stairs of the same height. The viewing platform of the building, the green roof of the building, and the open public space as a connecting part



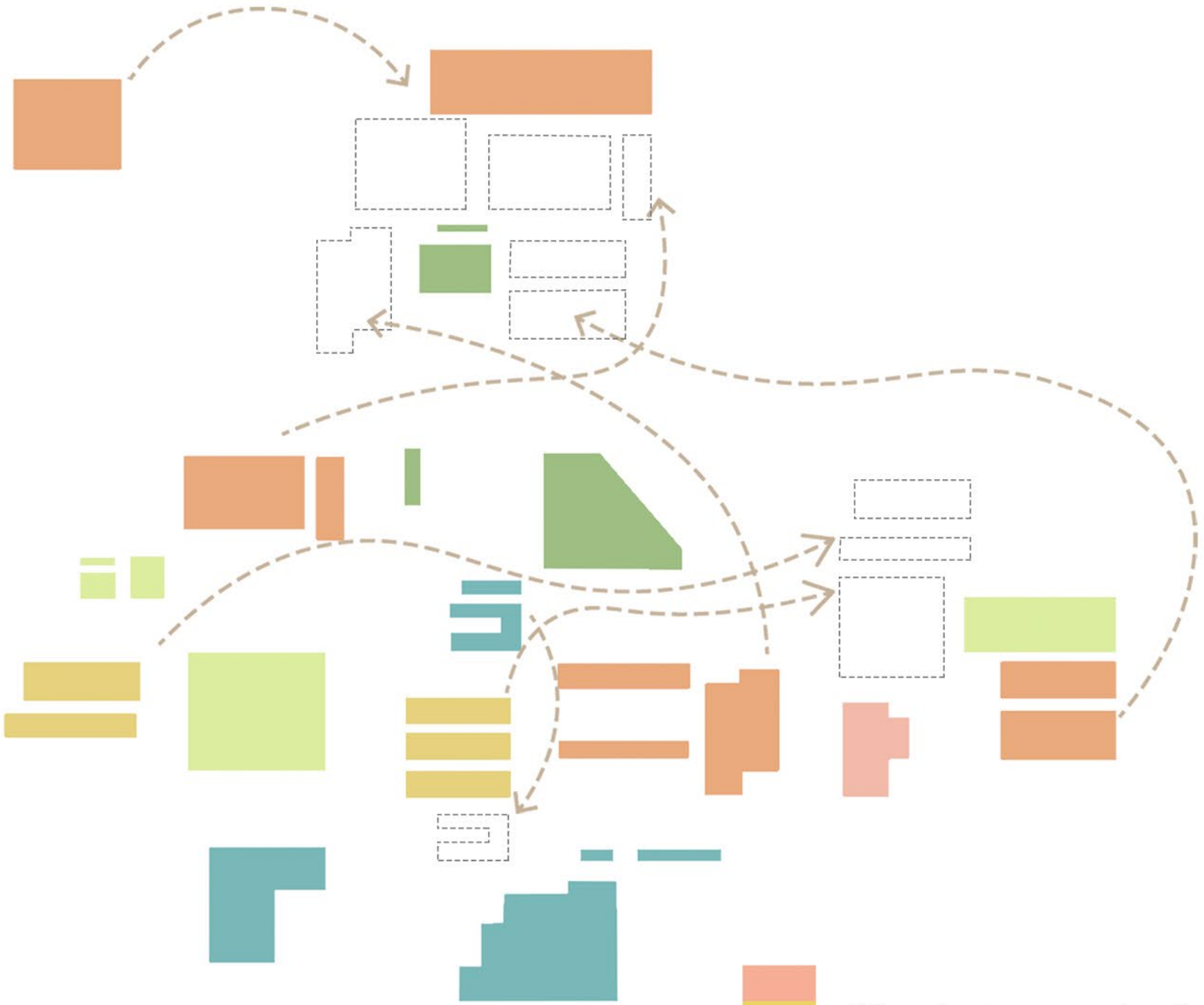
The linear park connects the open public spaces, parks, squares and sports facilities along the line. At the same time, the High Line Park is connected with them through stairs, elevators and other facilities.

Fig.36, Strategy of Linear Park, Authors(2021)



BIHU Town has a wide range of industrial categories, involving manufacturing, food processing, chemical processing and so on. The polluting industries are concentrated in the west and north, close to agricultural areas and nearby villages. The rest of the industries are mainly concentrated in the southern part of the industrial area, near the main town area.

The distribution of industries in the same category is very scattered and not lumped together. This has a great impact not only on the transport of products and raw materials, but also on the production process.



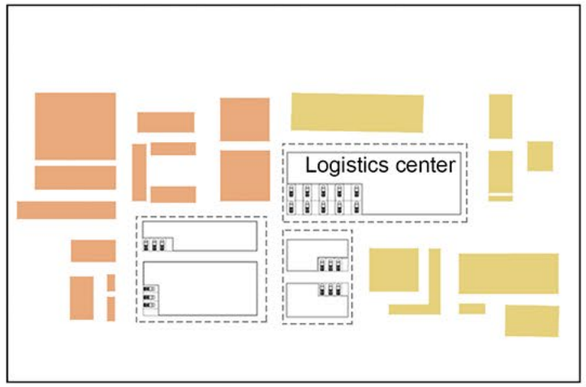
Chemical processing factiries (pollution)

Food processing factiries (No pollution)

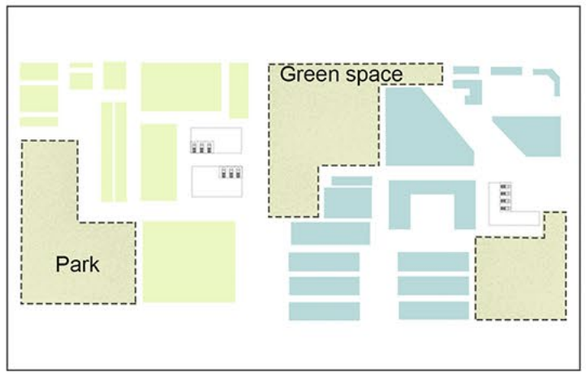
The original industrial plan was very scattered and not centrally located in the same categories, requiring a number of factories to be re-located. With a large factory in the same category as the new core, medium and small factories of the same type from other areas were attracted to relocate to the periphery, eventually forming a complete industrial park.

This increases the use of open space, improves productivity and frees up more space for the inclusion of other functions.

Chapter 04 Design practice in bihu town



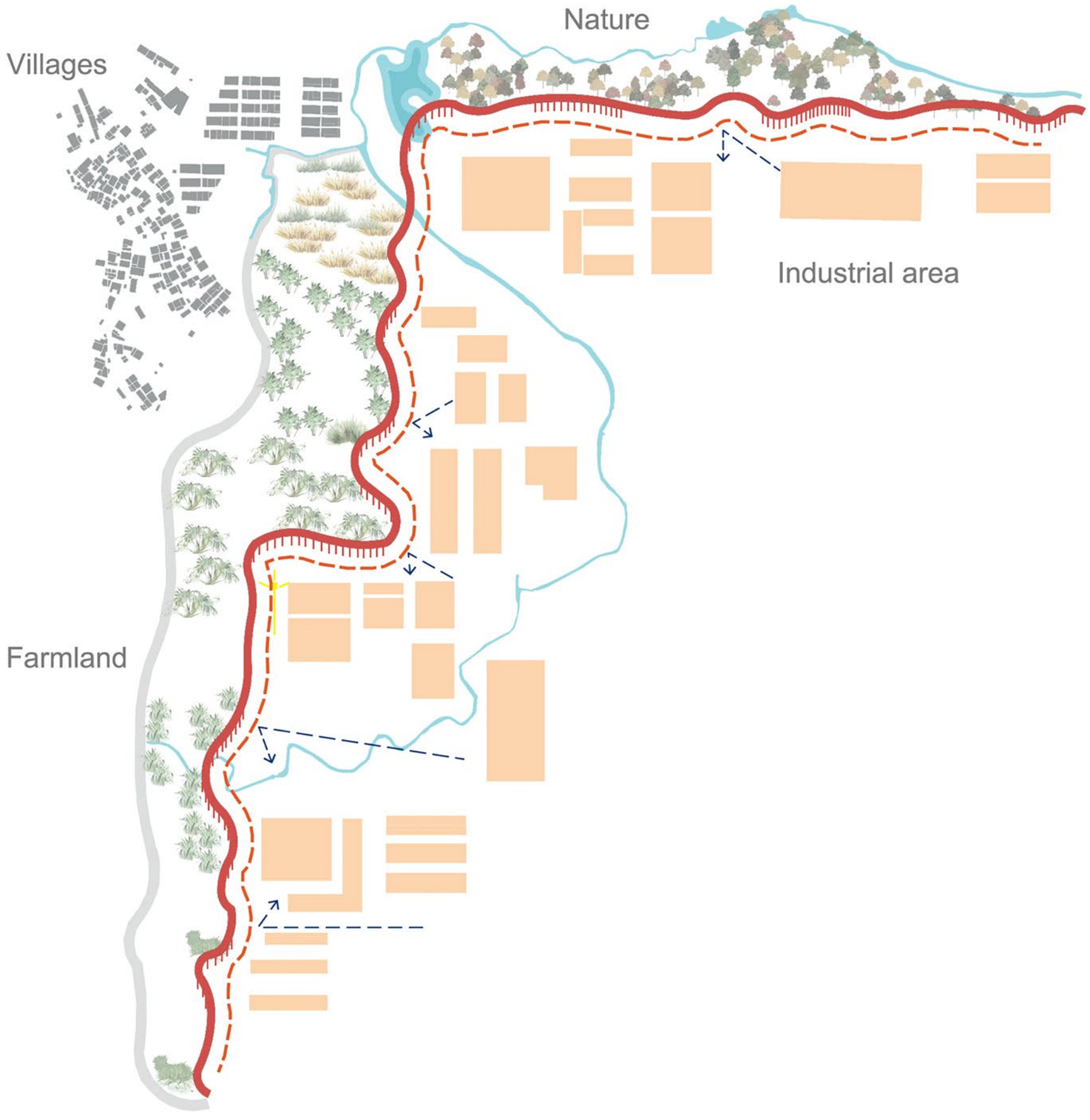
The inclusion of logistics centres in centralised industrial park has improved the utilisation of transport resources and raw materials, and logistics transport has gone from chaos to order.



The inclusion of green space / park in the empty space not only provides leisure space for workers and citizens, but also has a buffering and absorption effect on the pollution generated by the factory.

The monotony of the town's function is compensated by the transformation of already abandoned buildings and factories left behind after relocation into facilities for the use of BIHU citizens and workers.

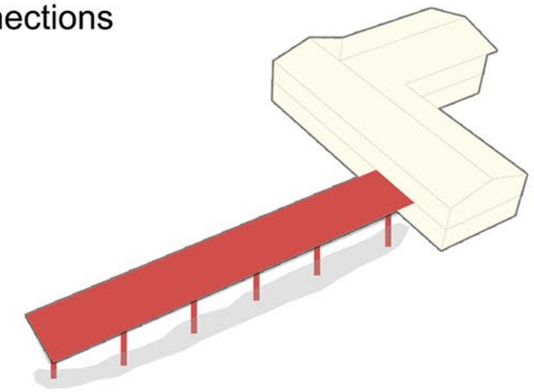
The sky lane has effectively prevented the continued expansion of the industrial area and protected the surrounding farmland, nature and traditional villages from being swallowed up.



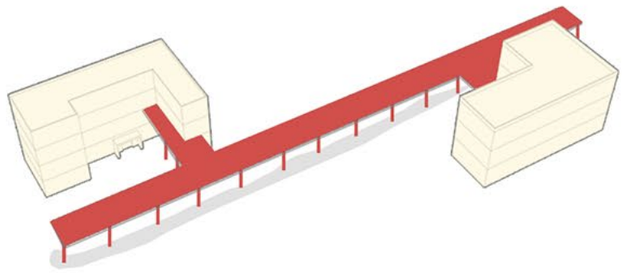
Chapter 04 Design practice in bihu town

• Fucntions of Sky lane

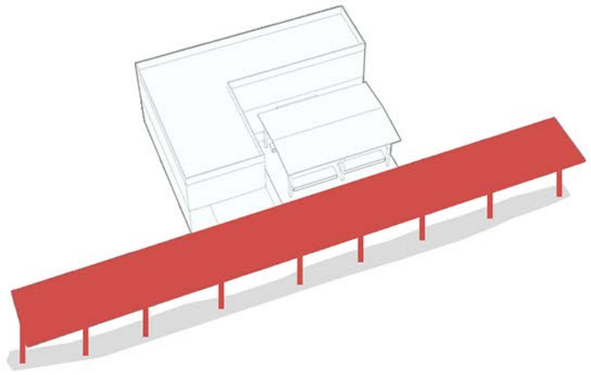
Connections



TO Factories



TO Buildings

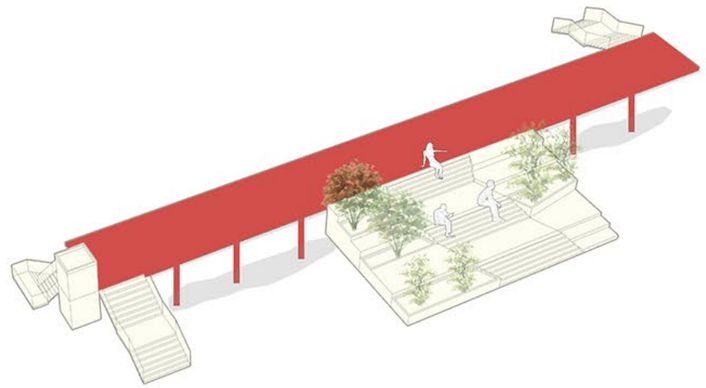


TO Facilities

Traffic

Walking

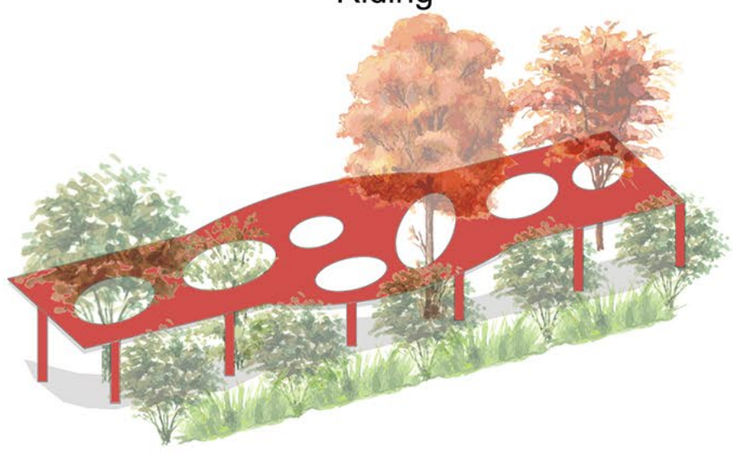
Riding



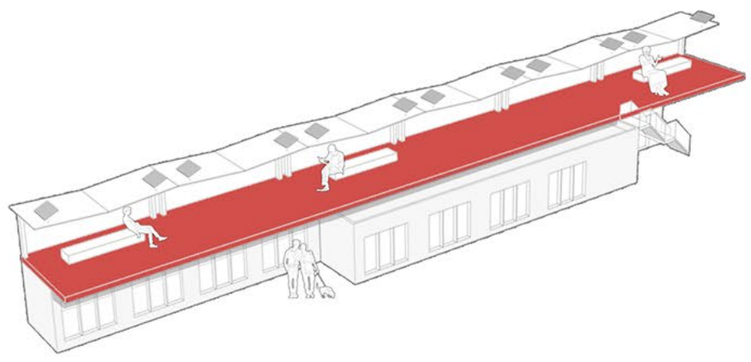
Stairs

Landscape

Sightseeing



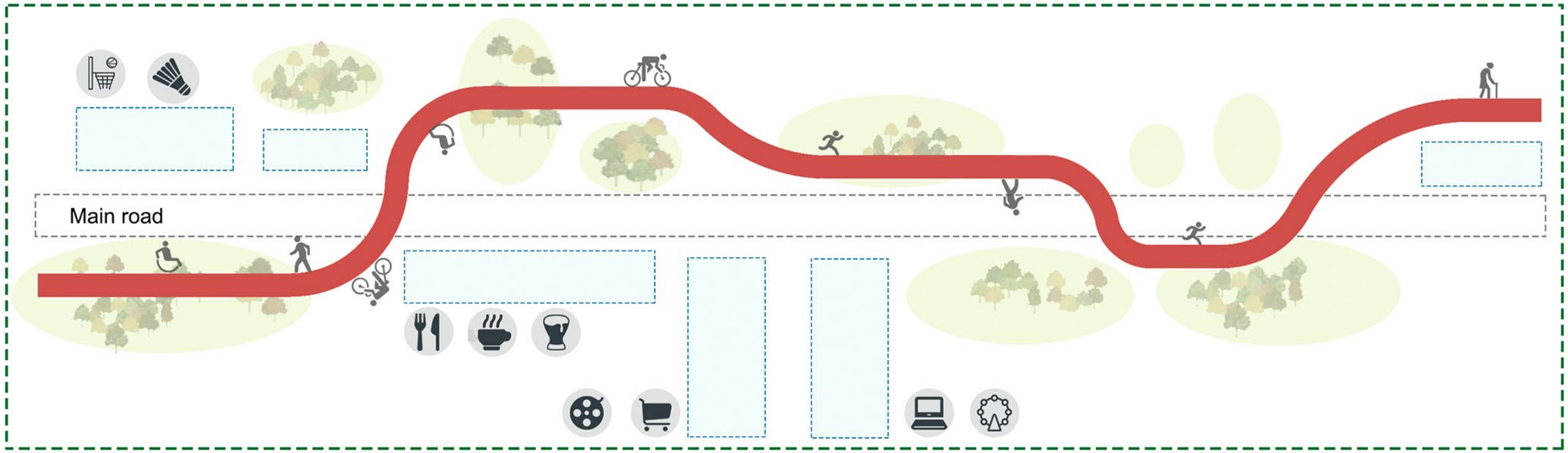
Barrier



Rest&Facilities

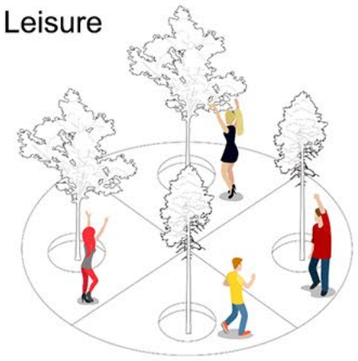
Chapter 04 Design practice in bihu town

Green belt

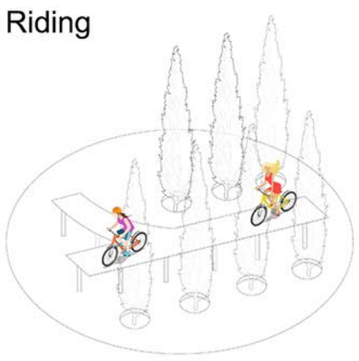


Facilities Park&Green public space Sky lane

Leisure



Riding



Dinner

Sport

Rest

Walking

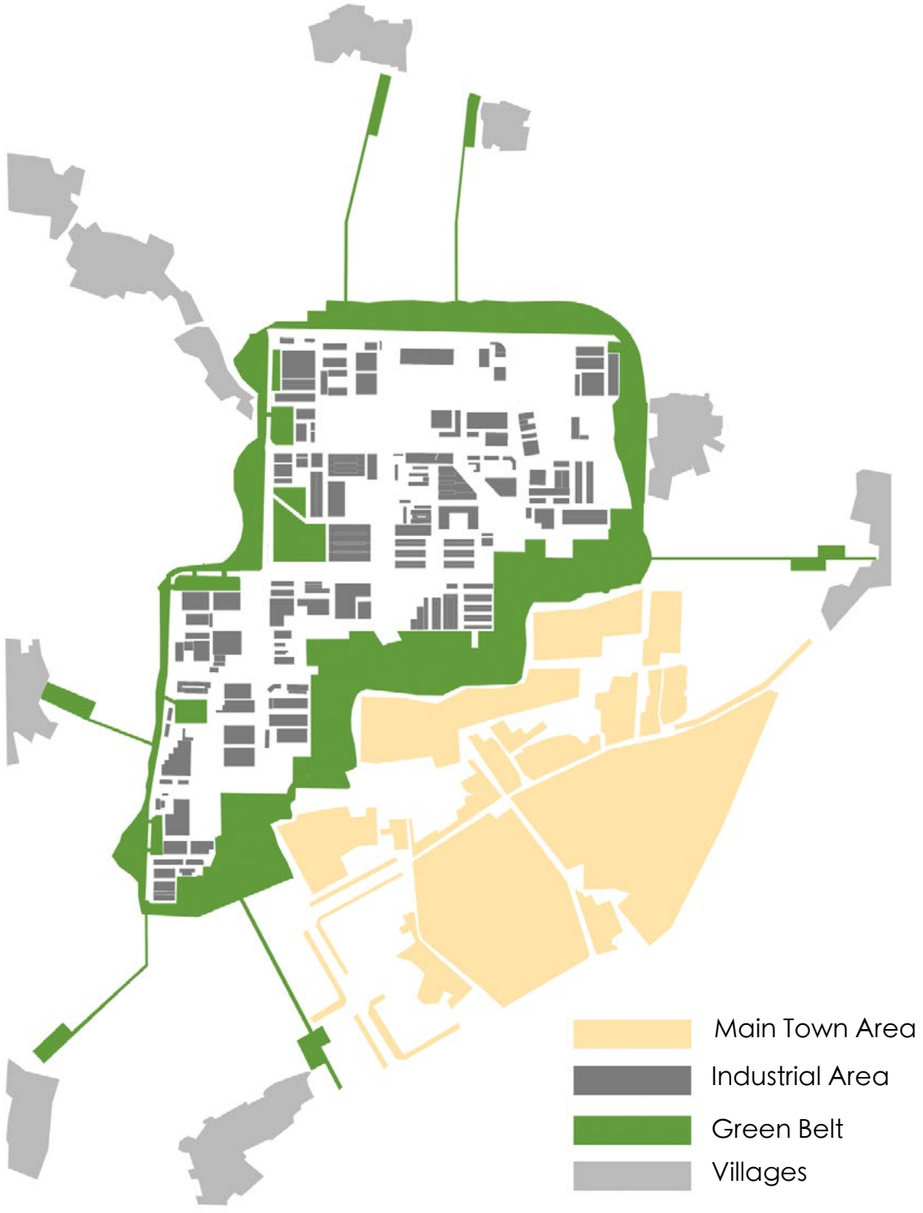
Shopping

Disco

Based on the unhealthy expansion of industrial areas and the monotony of the town and the occupied public space. By limiting the sprawl through the sky lane and transforming some of the factories and vacant land, more space is released to serve the industries and at the same time the citizens and villagers.

The new boundary, consisting of the sky lane, the facilities and the green space, forms a new system——green belt . The new boundary not only breaks down the isolation of the industrial area from the surrounding area and provides a more convenient means of transport (separating people from the logistics system), but also enhances the services of the entire BIHU town, such as shopping, exhibitions, sports, etc.

In addition, the Green Belt system discusses the relationship between the surrounding villages and towns, re-establishing the previous relationship through the establishment of a logistics system and easy access to transport and more suitable ways for farmers to work.



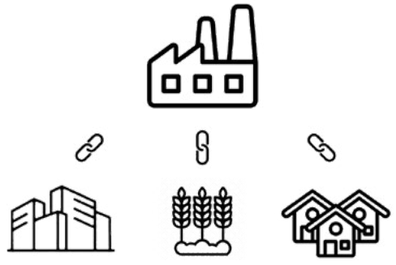
Why is a green belt

For industrial expansion in the context of industrialization, we improve and redefine the boundaries of industrial areas through the green belt system. Re-establish links between industry and agriculture (rural) and the main town area. The design intention is to influence the relationship between the above three through the sky lane, facilities and green public space in the green belt, so that the industrialization of the town becomes a positive factor, so as to have a healthy impact on the surrounding space.

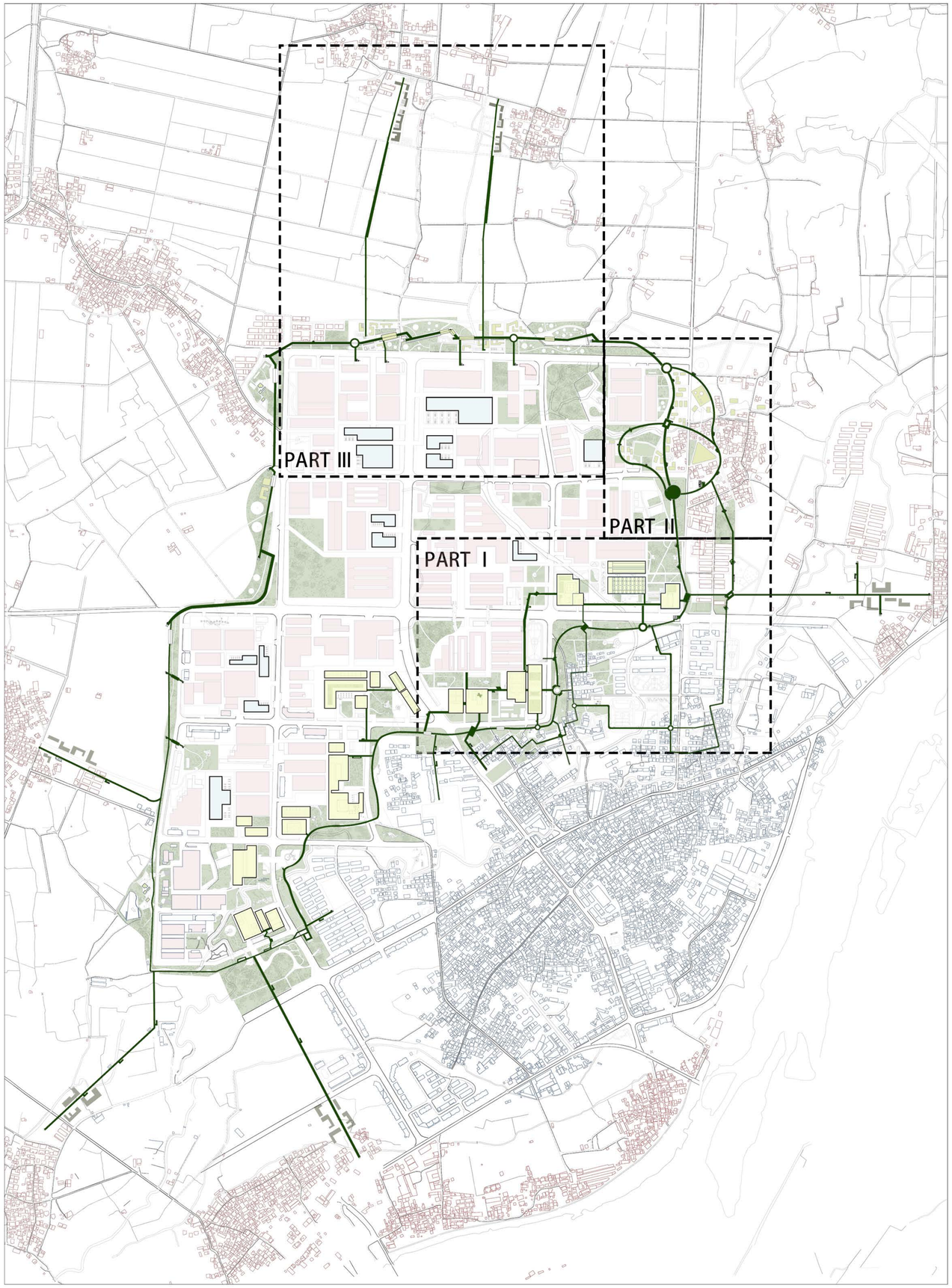
Limination of unhealthy expansion of industry

Renovate industry area into open public space to citizen and farmer

Between industirlal area and main town area, between industirlal area and villages(nearby), between nature/ farmland&villages(around)



BIHU TOWN



FACTORIES

GREEN SPACE

LOGISTICS CENTER

FACILITIES(Transformed by abandoned factories)

SKY LANE

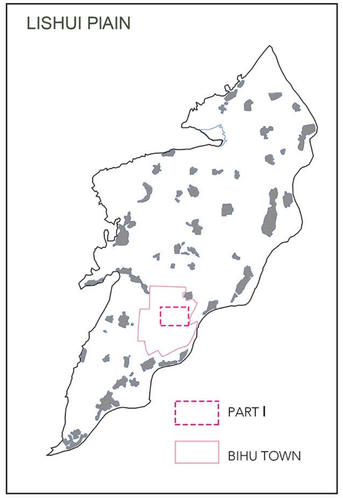
PART I Industrial Area& Main town Area

PART II Industrial Area & Villages(nearby)

PART III Industrial Area & Nature/Farmland&Villages(around)

The Green Belt system is used to re-establish the relationship between the internal area and the surrounding area, dividing the area into three types and circling a part of each area to represent the design treatment of the whole area, named PART 1, PART 2 and PART 3.

Part I: Industry and Town



Factories

Buildings

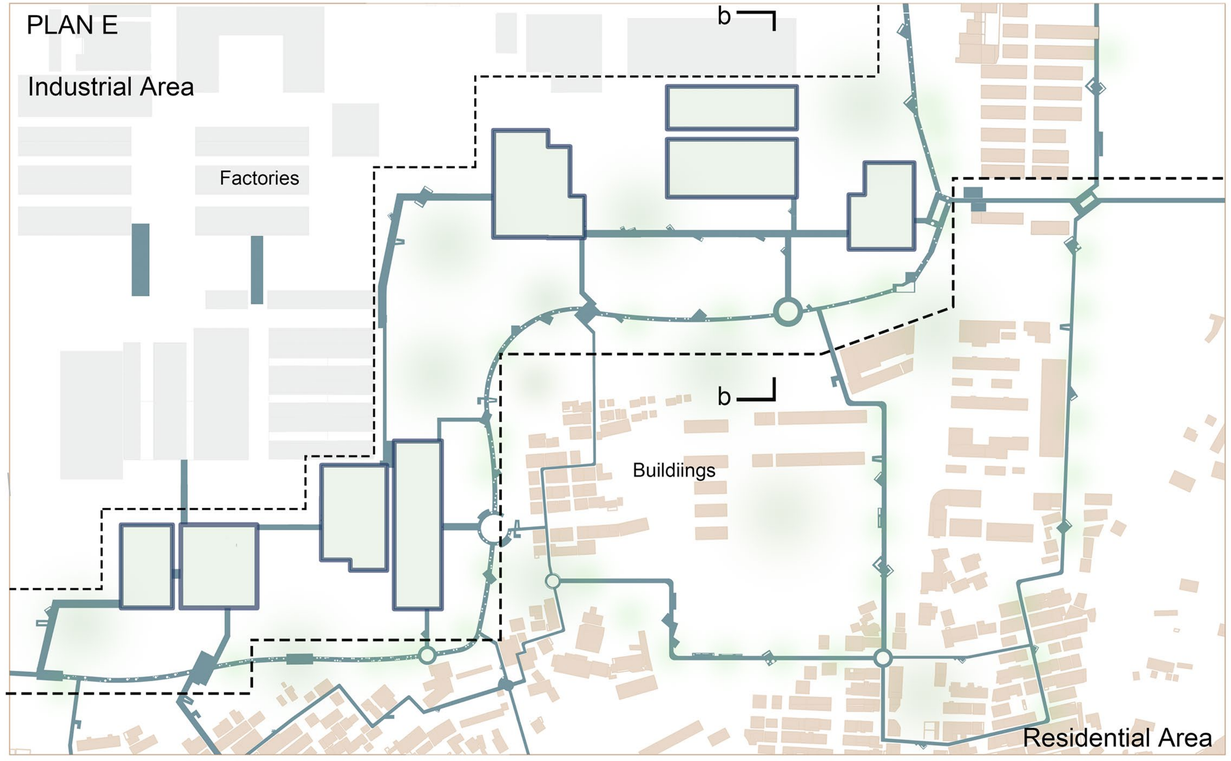
Green belt

Sky lane

Green space/park

Facilities
(Transformed by factory)

Range of Green belt



Green belt Sky lane of Green

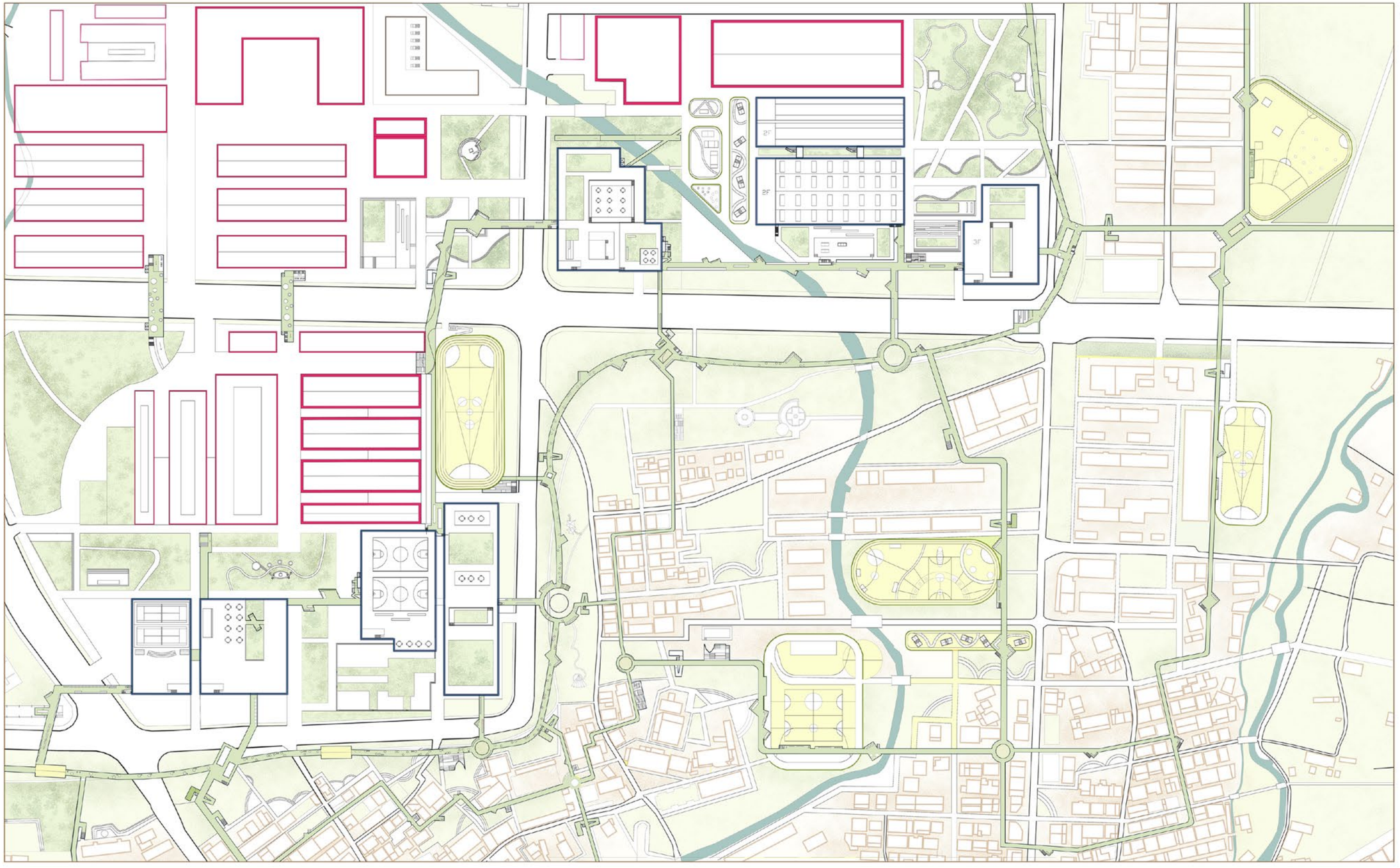
Contains Facilities

BIHU town is a key industrial town in LISHUI City, but the pursuit of rapid industrialization has led to an imbalance in the development of the town, with rapid industrial development but a loss of vitality in other facilities such as shopping malls, exhibition centers, stadiums, etc.

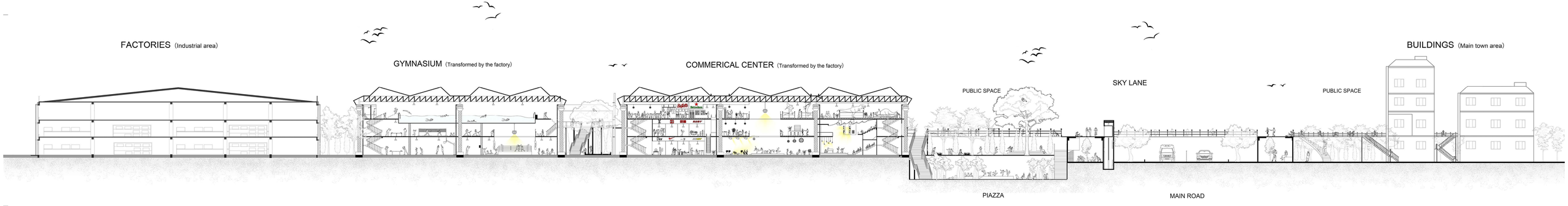
Due to the irrational development method, a large amount of wasteland is left in industrial areas, and even the same type of industrial buildings are scattered all over the place. This has resulted in a great waste of resources. Therefore, it is necessary to integrate the same type of industries together and set up a large logistics center for unified management. In this way, the abandoned factory buildings, especially those near the residential areas, are transformed into facilities for the residents of the town, and the vacant land and wasteland are transformed into green public space/park, and connected together by a sky lane to form a green belt system, which enriches the life of the residents of the town.

Sky lane will also be extended inside the residential area and integrated with the local park, which will not only provide transportation but also tour and visit the scenery along the way and allow residents to quickly reach the places they want to go, greatly facilitating their daily travel and play.

Part I: Industry and Town

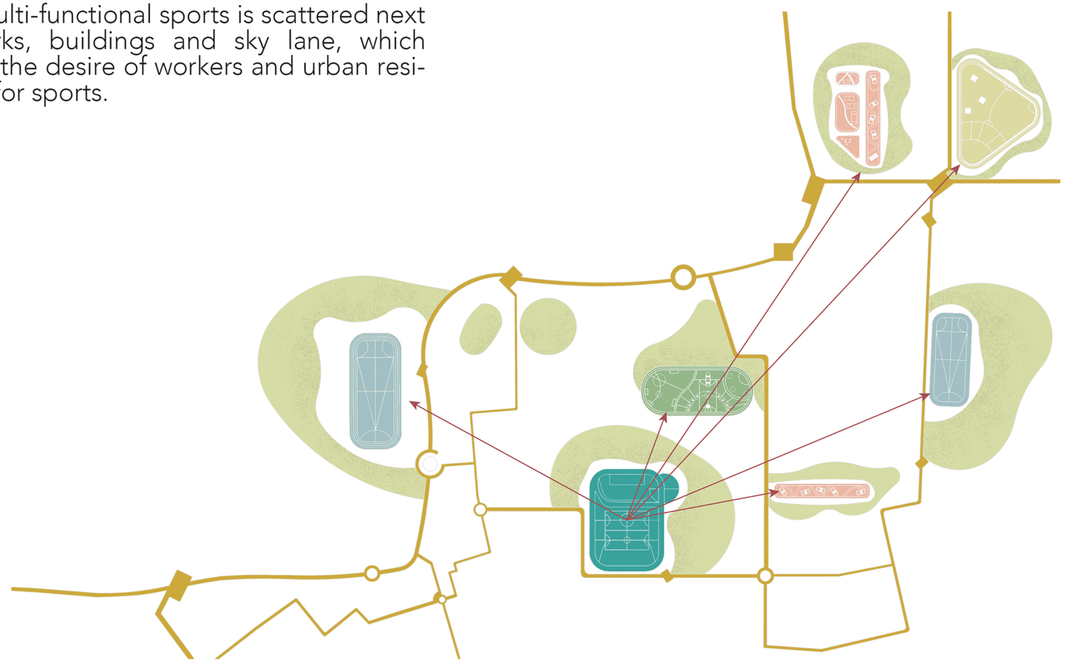


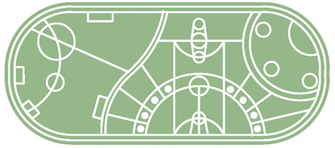
Plan E　Section b-b

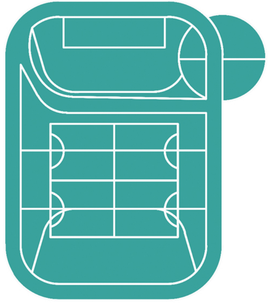


MULTI-FUNCTIONAL ASPORTS CONCEPT

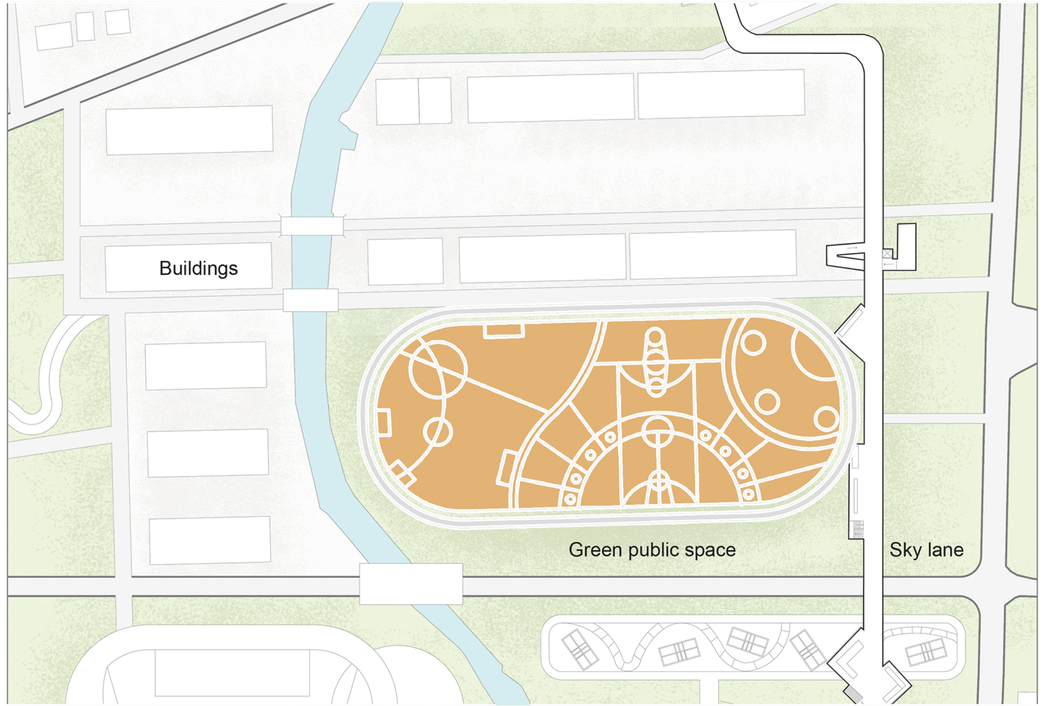
The multi-functional sports is scattered next to parks, buildings and sky lane, which meets the desire of workers and urban residents for sports.



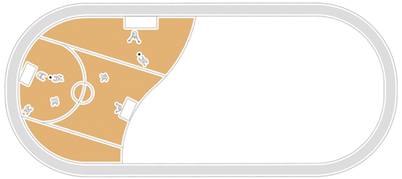




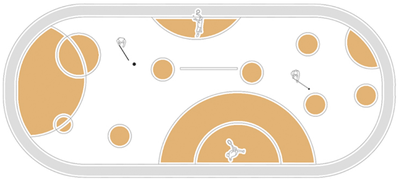
BALL SPORTS



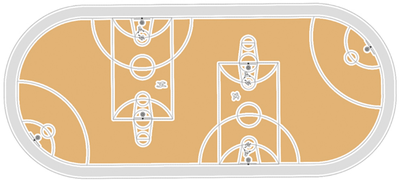
Program specofocations:



Soccer



Golf-ball

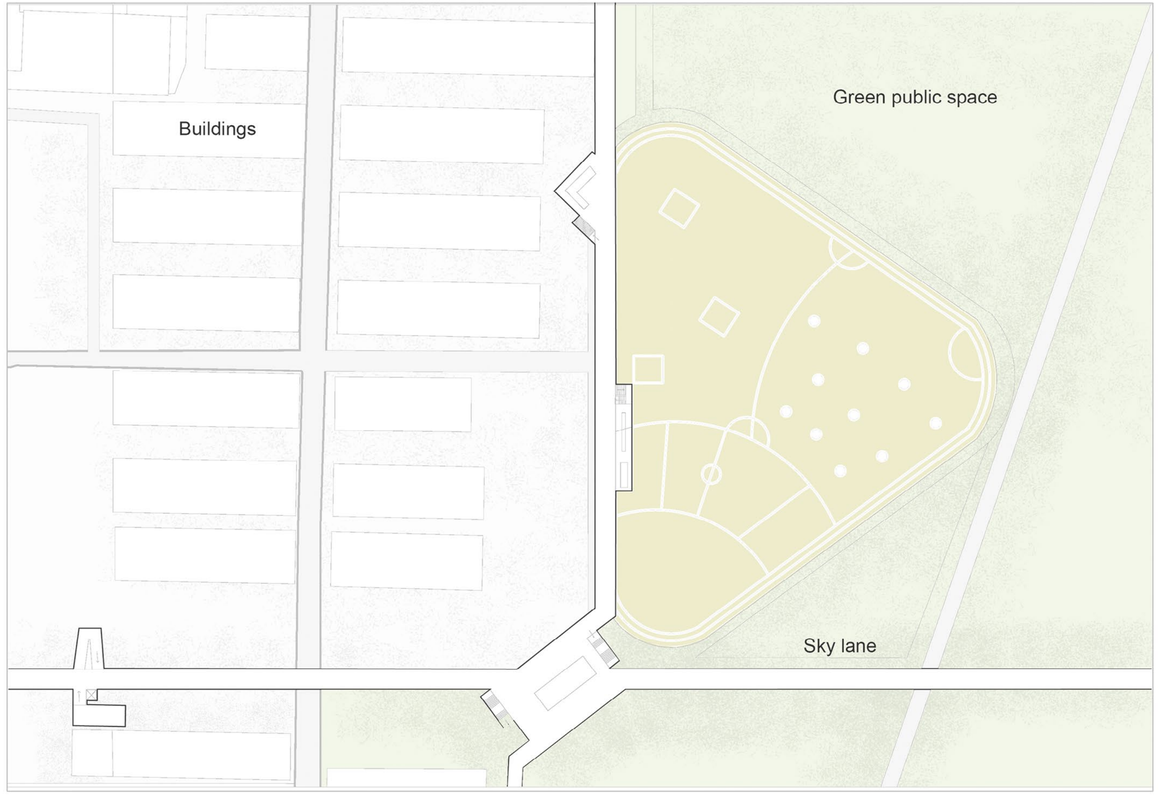


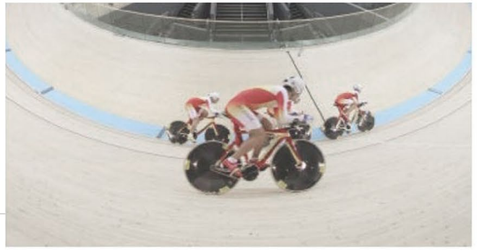
Basketball

Bubble-soccer

Part I: Industry and Town

RECYCLING&RUNNING SPORTS





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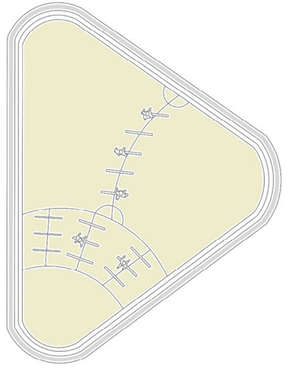
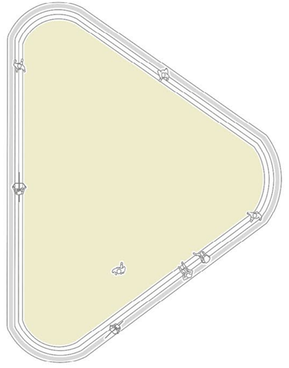
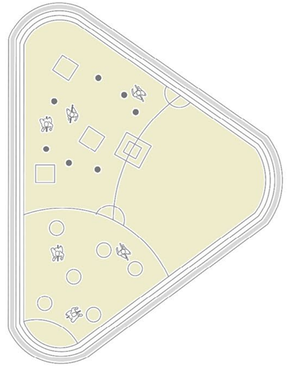


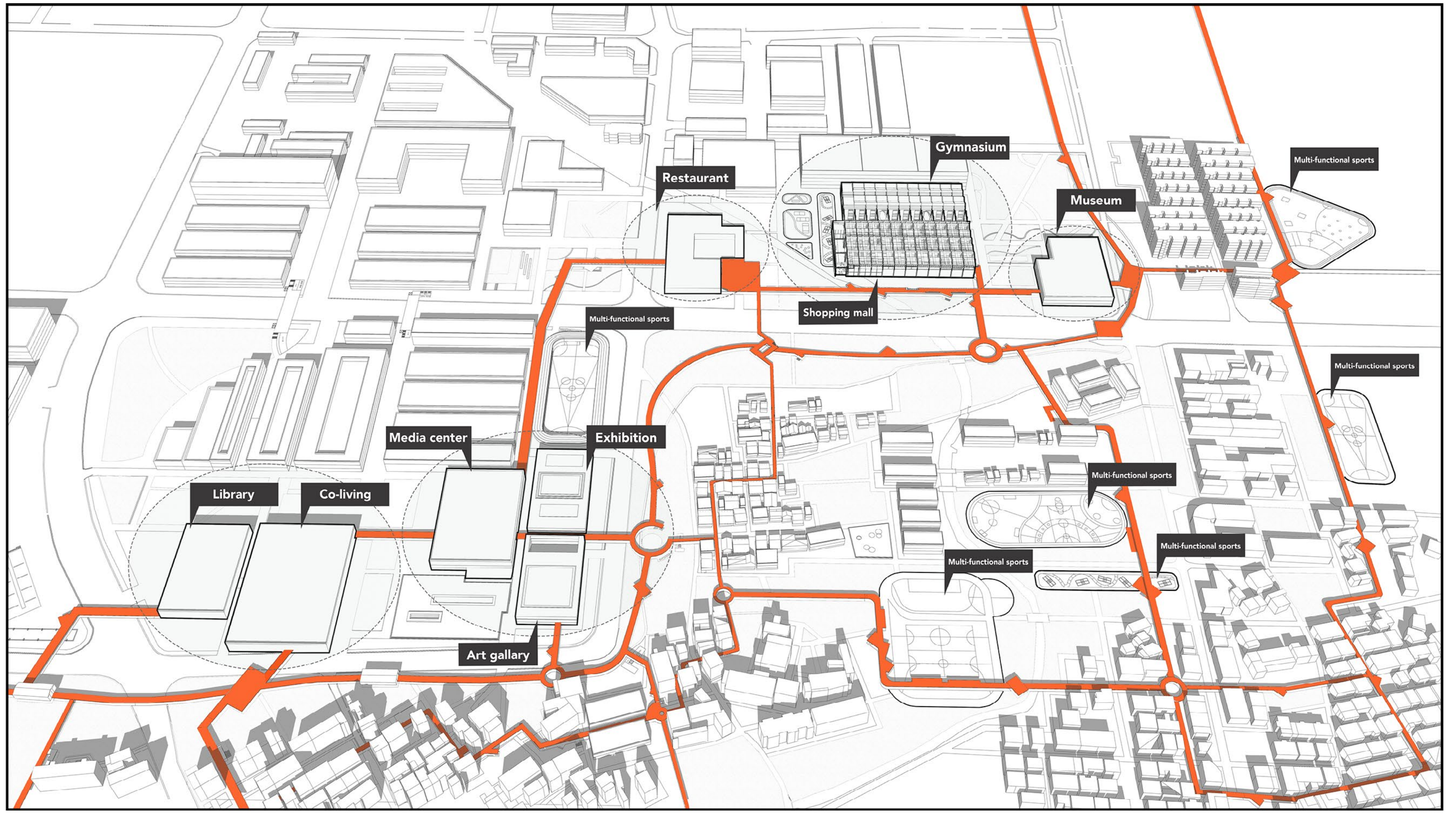
Hurdles



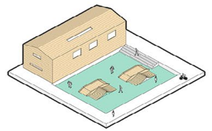
Tandem racing



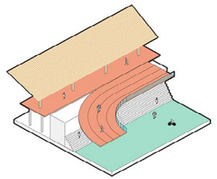
Velodrame



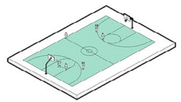
Sports Strategy



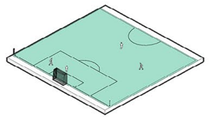
Extrema sport



Football & Jog



Basketball



Street Football

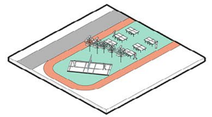
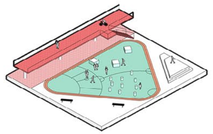
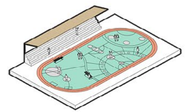


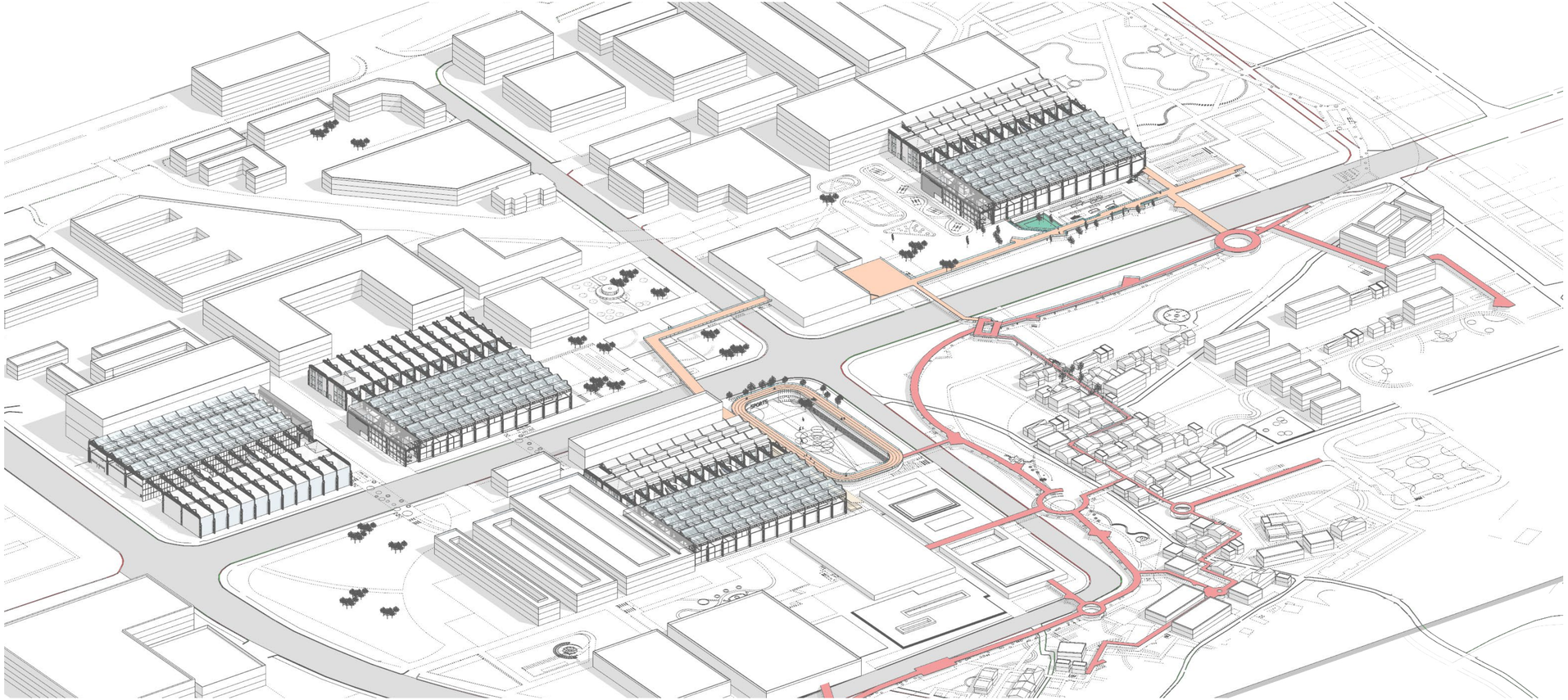
Table tennis

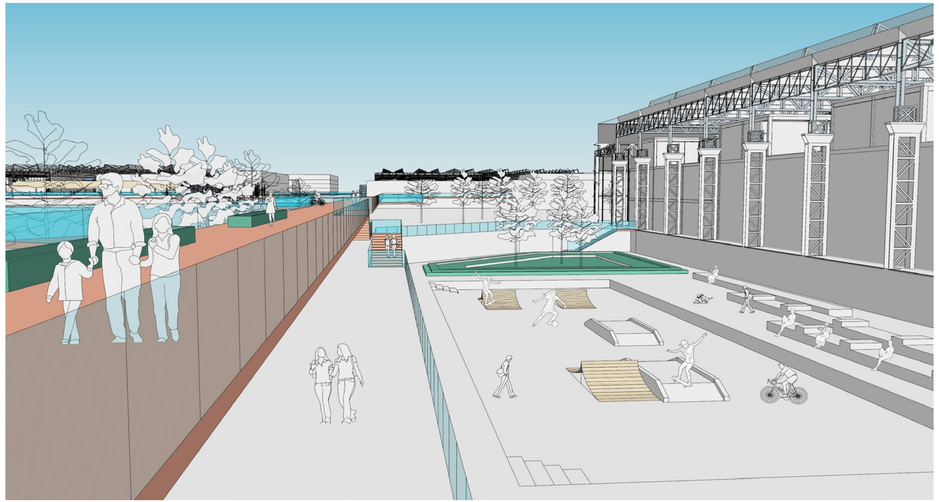


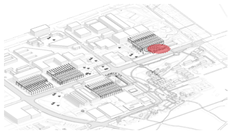
Playground & bicycle

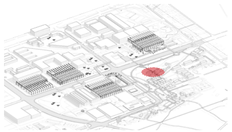


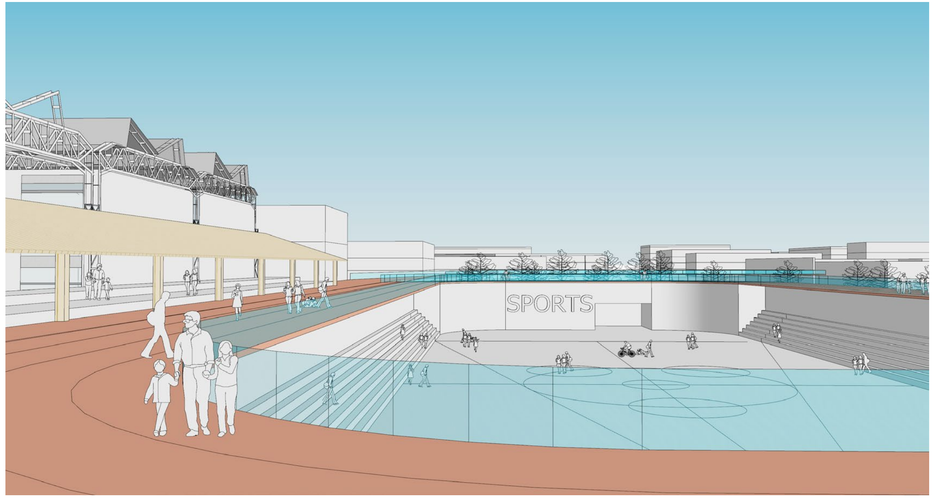
Playground

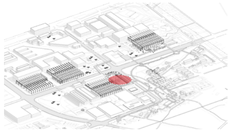

SPORTS

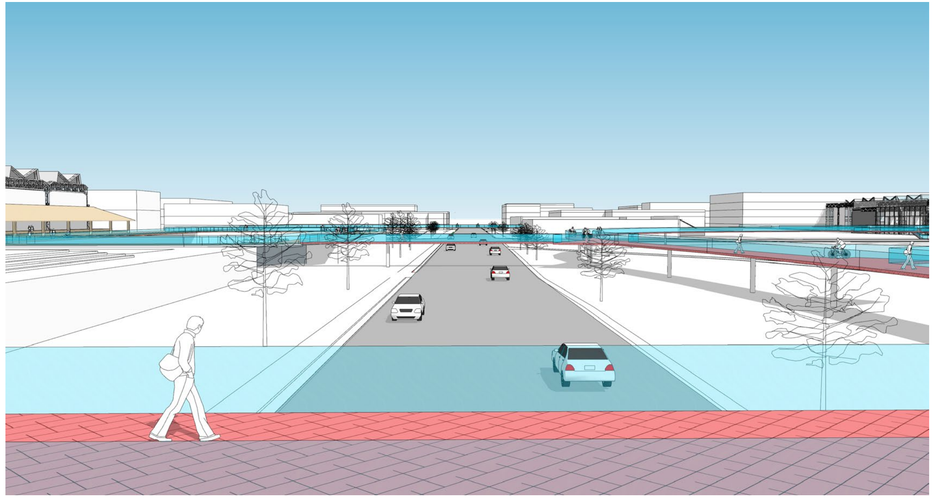


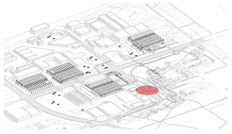





SPORTS

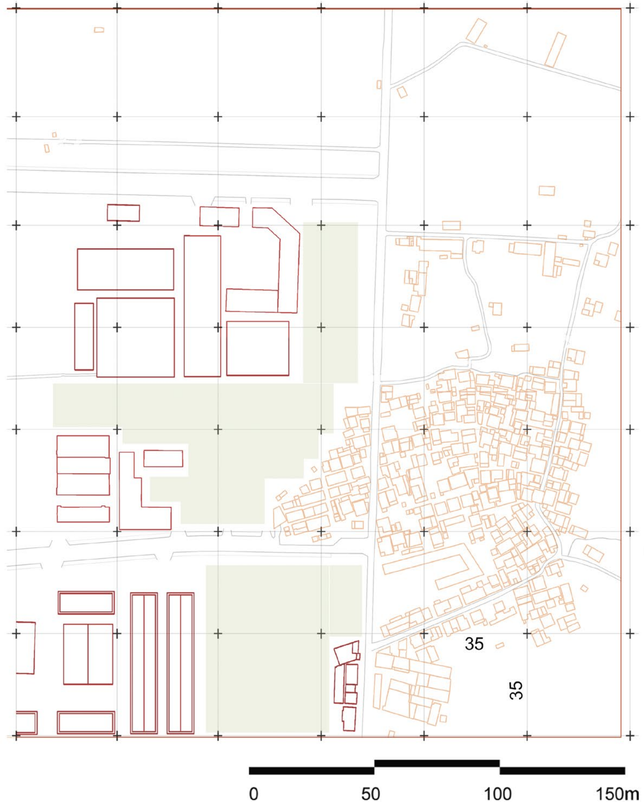


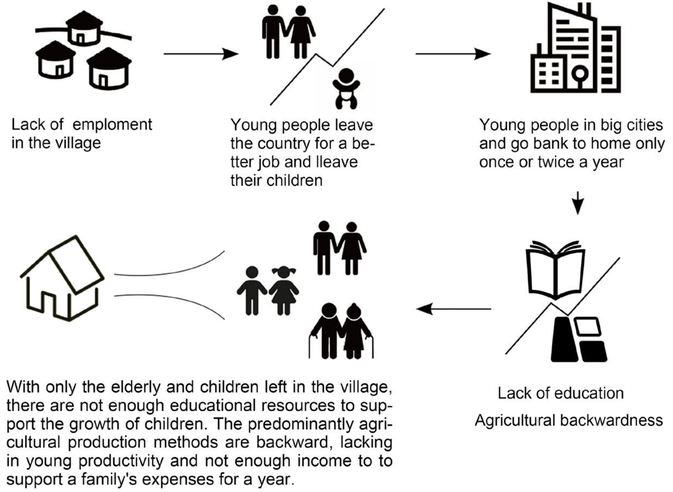


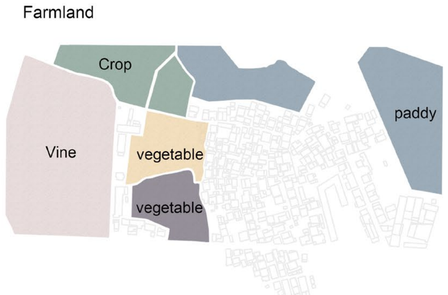


Part II: Industry and Villages

Current features of the neighbour village(ZHAO village)








Backward production methods


Lack of pubic space


School closed

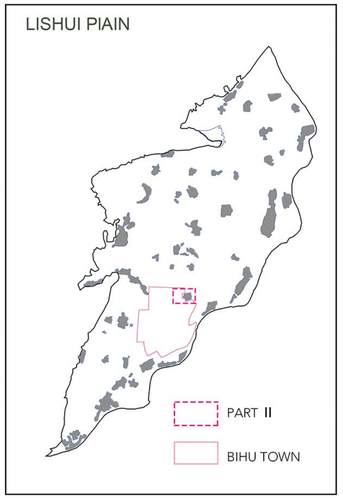

Lack of young workforce


Large amount of wasteland


Surrounded by factories

Agriculture, ZHAO VILLAGE's primary industry, is diverse but low yielding and low earning, just enough for self-sufficiency. Workshops and young workers need to be added to improve production efficiency and to make agricultural products for sale to increase the income of villagers.

Part II: Industry and Villages



Factories

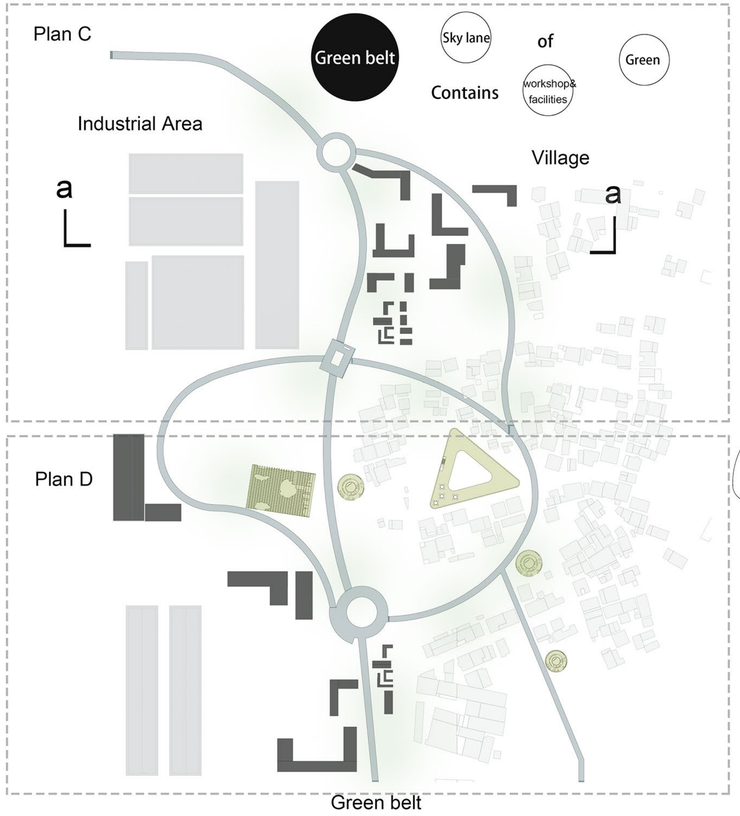
Village

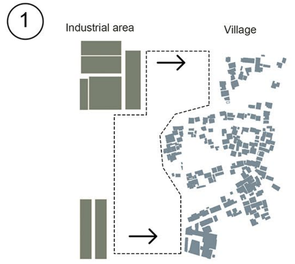
Green belt

Sky lane&parks

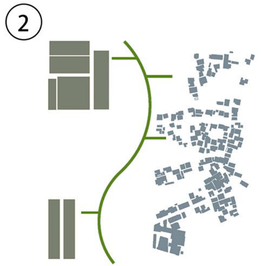
workshop&facilities

Education&Public space

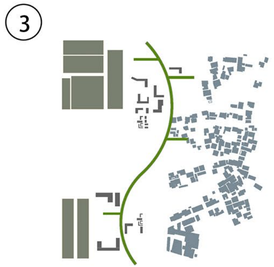




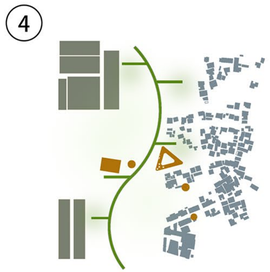
The expansion of the industrial area has swallowed up the land of the neighbouring villages and destroyed the natural environment, resulting in the two parts of the connection becoming wasteland.



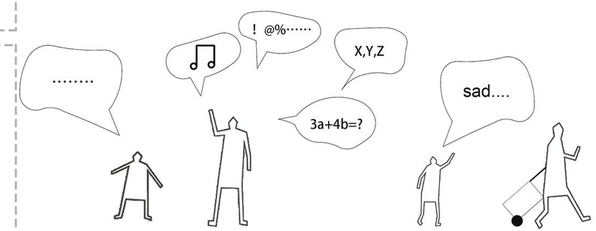
The inclusion of the sky lane is a realistic impediment to further expansion of the industrial area and has both a pedestrian function and a ride lane function, connecting other parts of the bihu.



Faced with the backwardness of rural production methods and the difficulty of selling agricultural products to the outside world, workshops and retail stalls have been added to upgrade the old backward methods.



Adding green spaces and parks for outdoor activities for workers and villagers. The addition of facilities compensates for the lack of functionality in the countryside, increases the fun and convenience of the villagers' daily life and is equally applicable to factory workers.

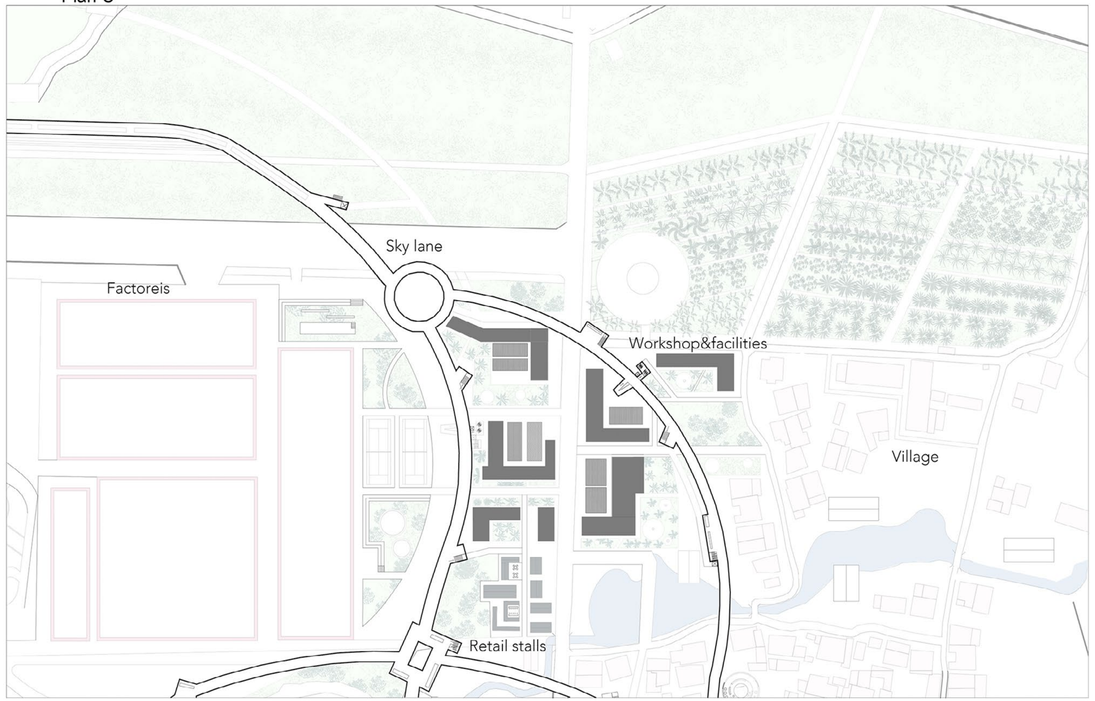


I have made educational buildings a key co-function in the facilities, which also represent the difficulties faced by much of rural China. The large number of young people moving into the cities and not wanting to return to their hometowns has caused local development, including the education sector, to lag behind. There are no schools for local children to attend and the traditional folk culture of the village is gradually losing its heritage.

In the towns, however, the children have no access to nature. This is why the educational buildings are interconnected with the town and countryside through the sky lane in the green belt, with workshops and facilities to rejuvenate the countryside.

Part II: Industry and Villages

Plan C

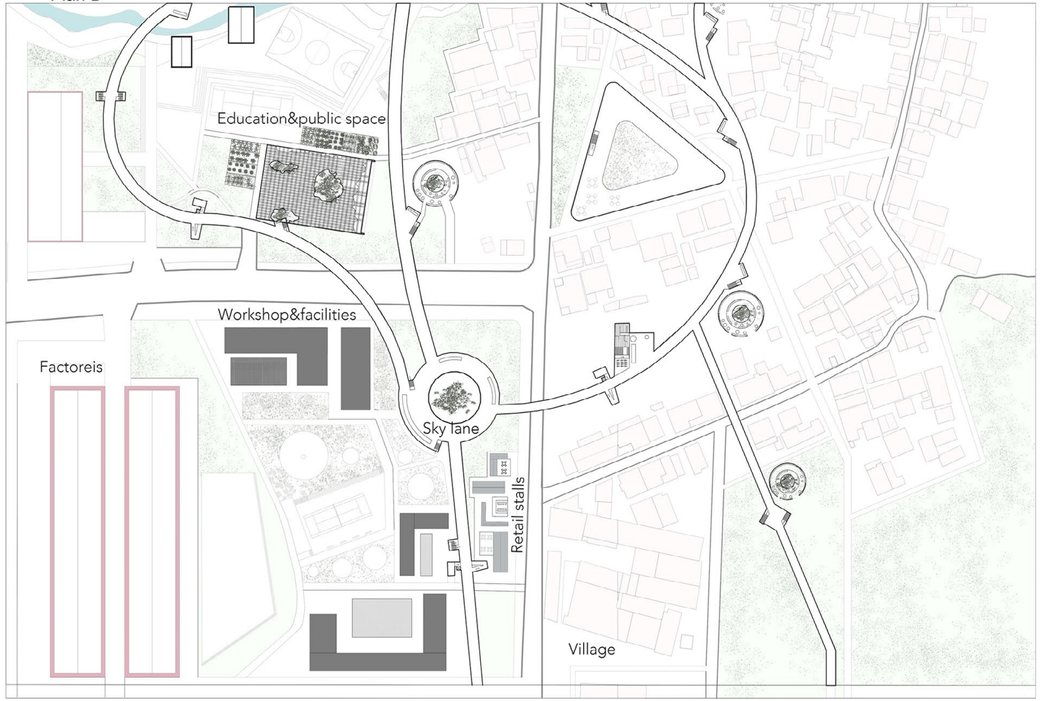


N

Village
Factoreis
Sky lane
Workshop&facilities
Retail stalls

0 50 100 150m

Plan D

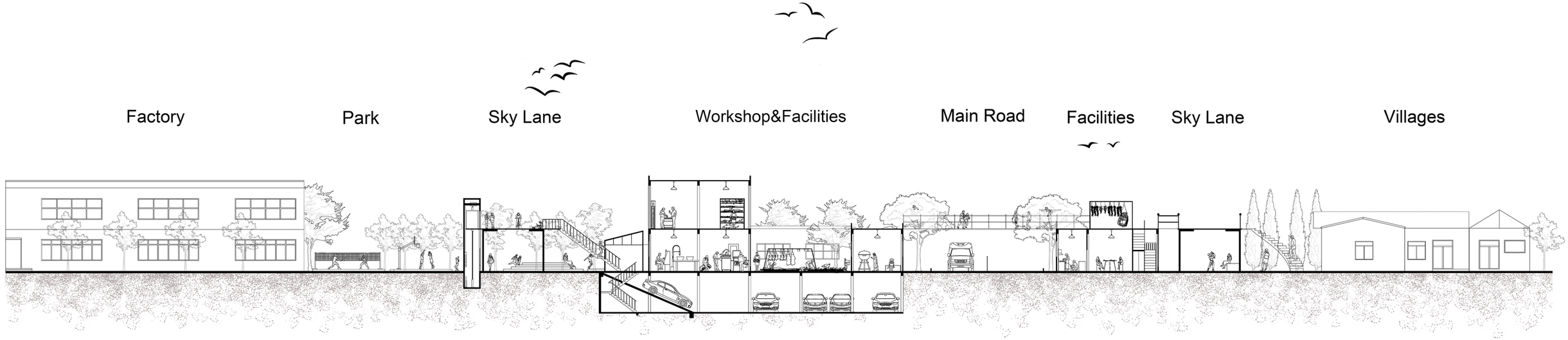


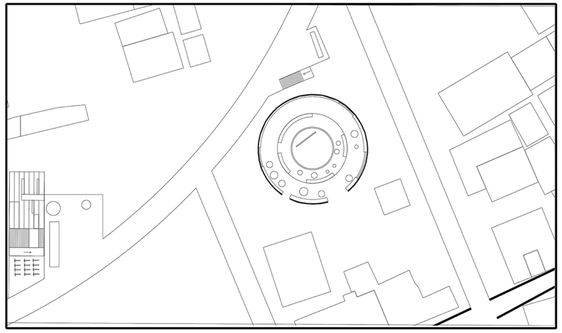
N

Village
Factoreis
Sky lane
Workshop&facilities
Retail stalls
Education&public space

0 50 100 150m

Plan C　Section a-a





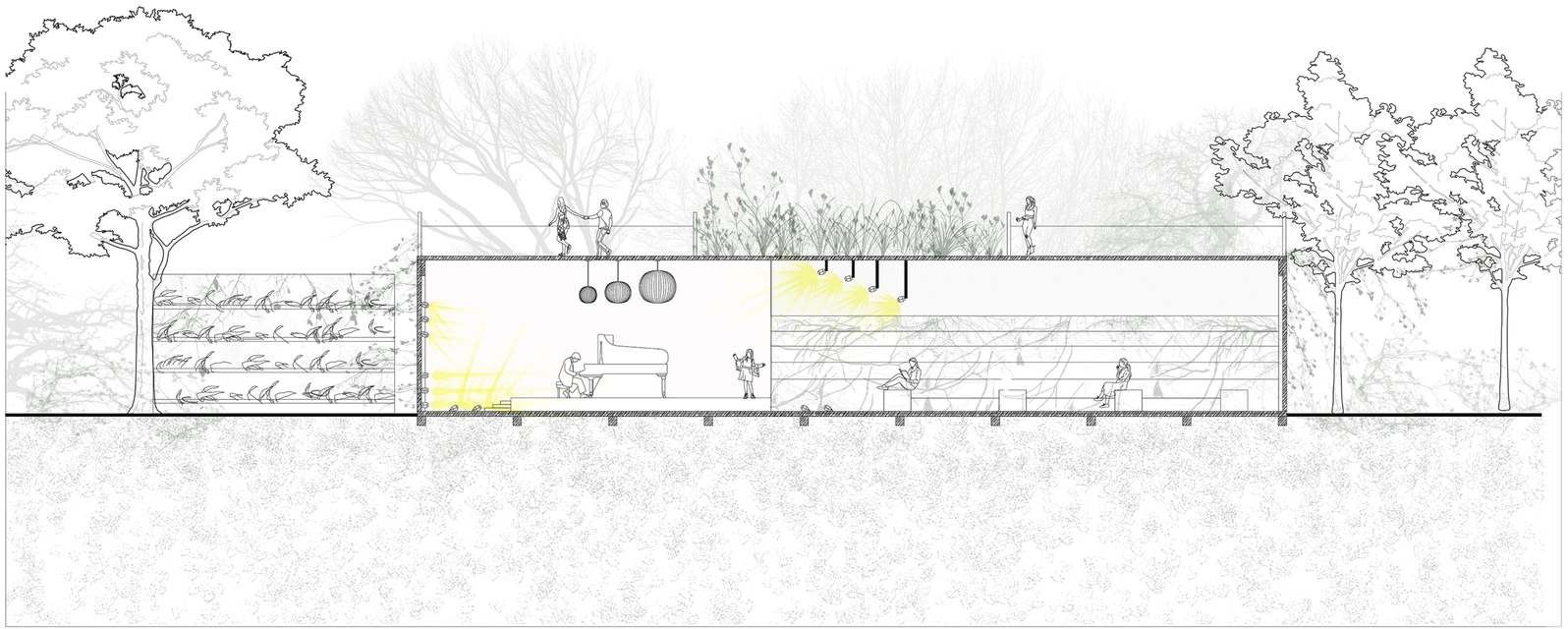
Tall trees are a special natural resource. We hope to use the atmosphere created by the big trees to conduct lectures on traditional Chinese culture. Older people in the village who are educated and workers in the factories can become teachers. This will go some way to remedying the lack of educational function in the village community.

The village has a history of over 200 years and continues to pass down traditional theatre culture, so the building has been set up for folklore theatre education-related activities and as a space for the daily activities of the villagers. It is used as a classroom for children to learn theatre as well as for other local folklore activities. To a large extent, it provides a place of learning and entertainment for the local elderly and children.

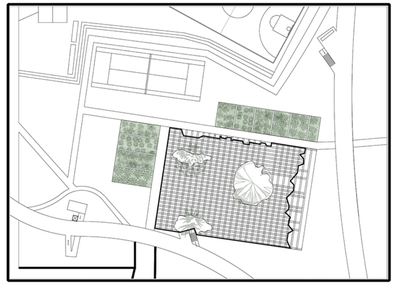
Textile

Vine

Wood



The most traditional folk custom in the village is drama.Many kinds of drama have a history of more than 200 years.Learning drama is the inheritance of the village tradition



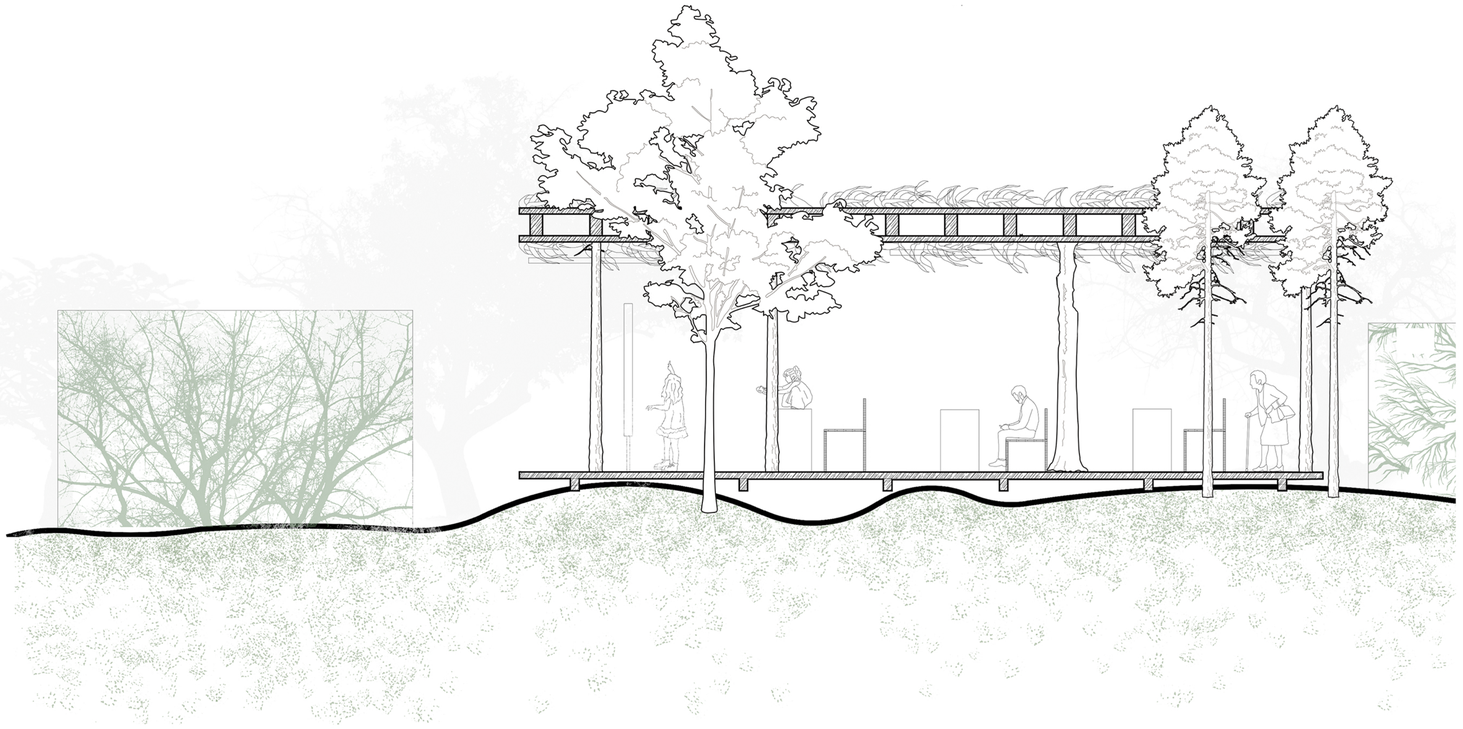
Vine crops are a major cash crop in the bihu countryside and this local industry can be used to teach children about the labour of growing and picking crops. The structure of the classroom is based on a grid roof combined with pillars, covered with vines, and the original trees on the site will become the pillars of the classroom. The final shape is irregular but interesting.

Grove

Vine

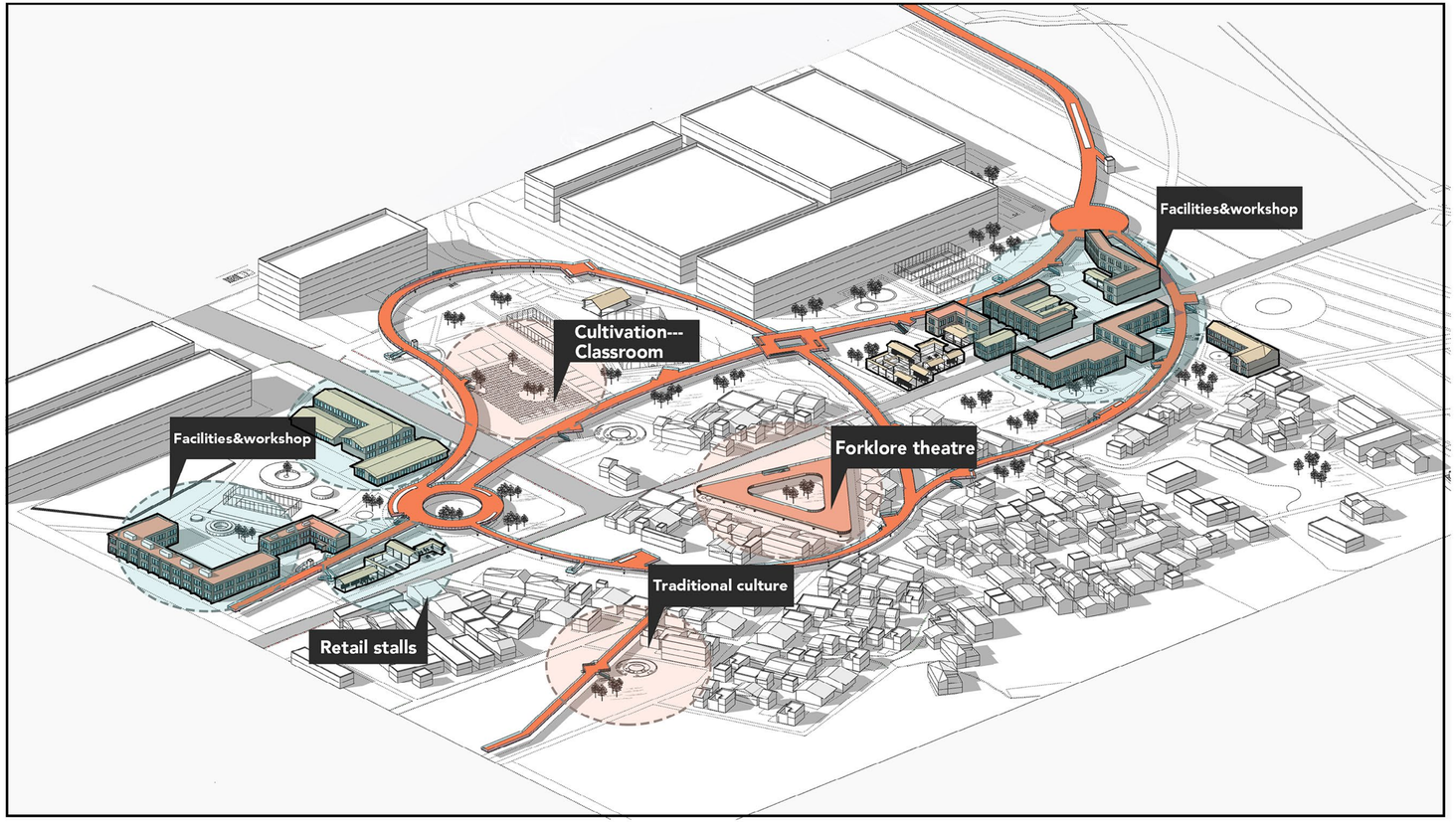
Wood

Crop

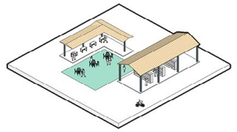


Cultivation is essential and in the future development of the village but it's also a common activity in rural. The design is adjusted according to the terrain and trees of the village.

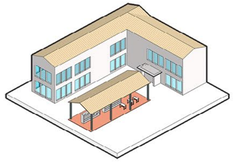
Part II: Industry and Villages



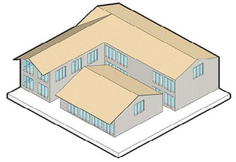
Workshop & Facilities Strategy



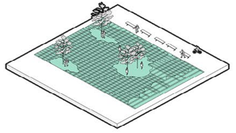
Retail stalls



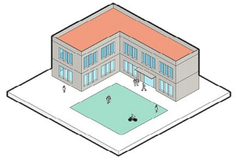
Workshop & Retail stalls



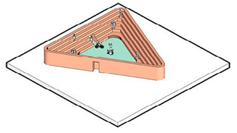
Workshop & Facilities



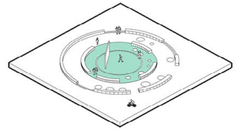
Cultivation



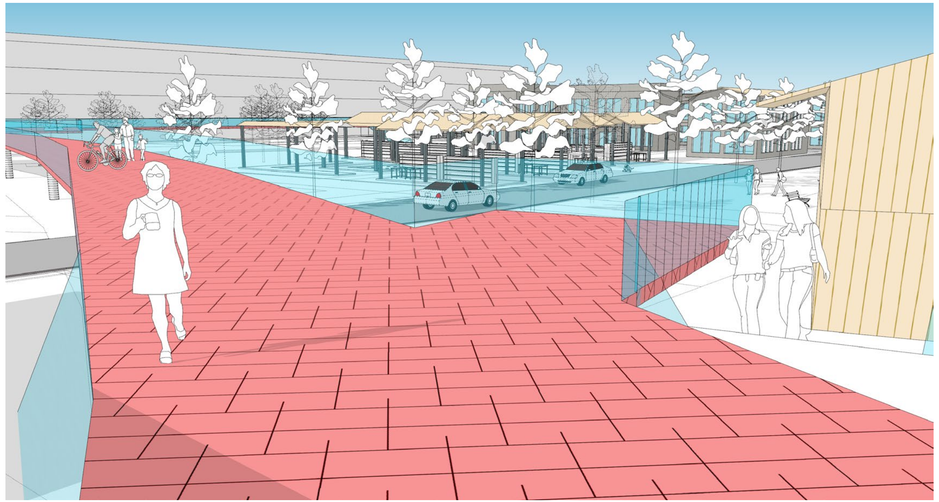
Workshop



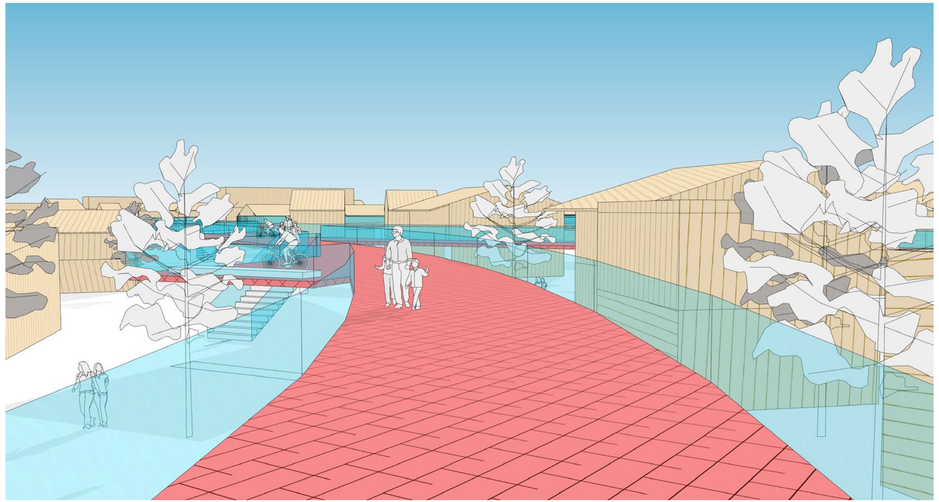
Forklore theatre

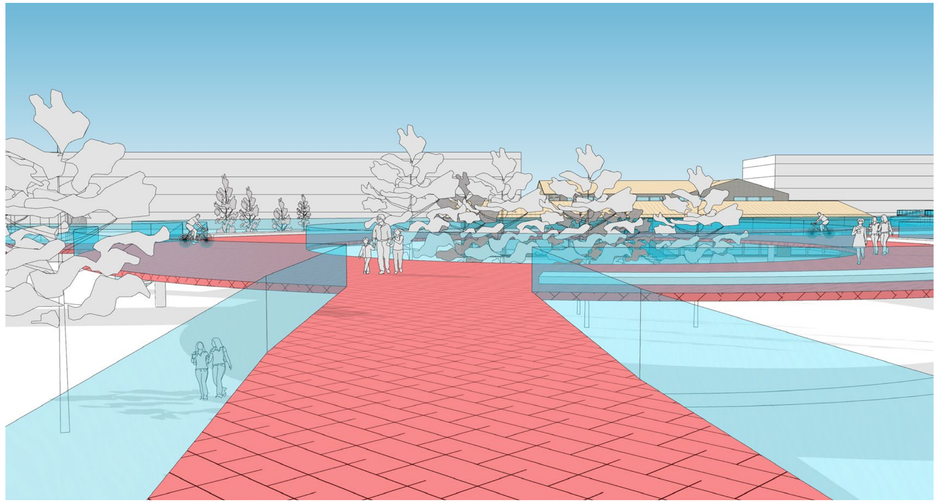


Traditional culture



Part II: Industry and Villages





Part III: Industry and Farmland, Nature, Near Villages

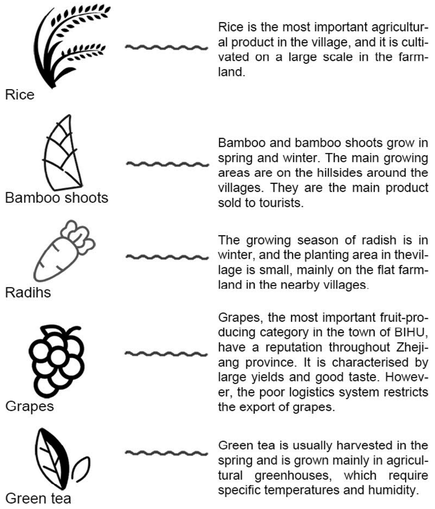
Current features of the around villages,farmland and nature

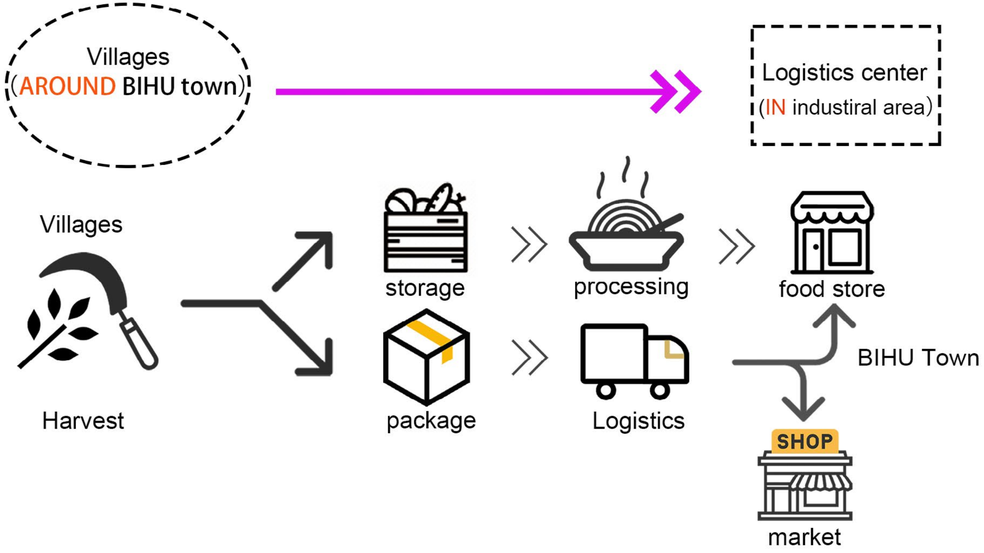
Large areas of agriculture

Villages around the BIHU town

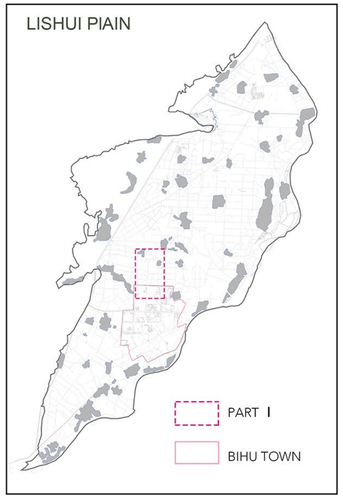
Nature environment

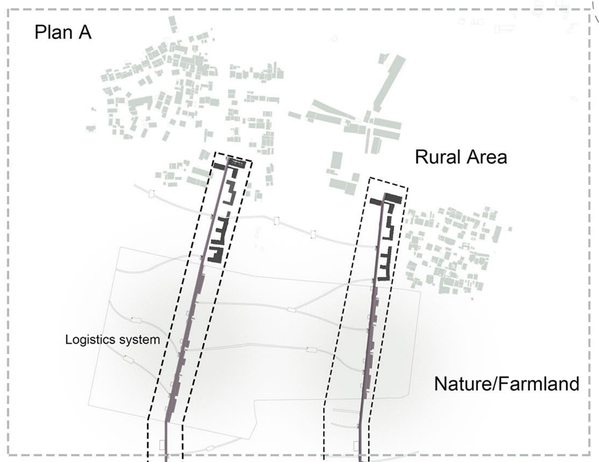
The rural areas around the town of Bihu are predominantly agricultural and agro-processing based, relying on farmland and small traditional workshops to meet normal production needs. However, outdated production methods and outdated production equipment make it difficult to meet the growing material needs and there is no effective logistics system to support the import of essential goods and export of surplus agricultural products, which is a problem faced by many rural areas in China.

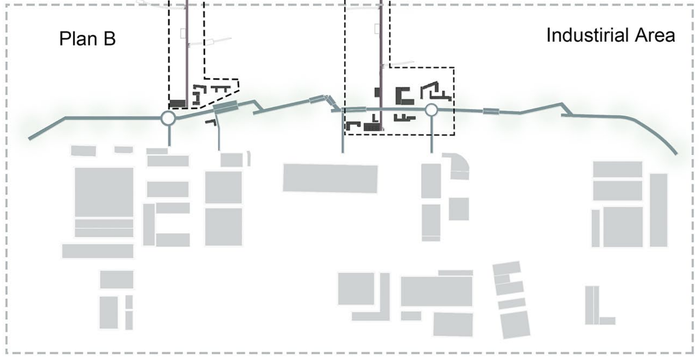


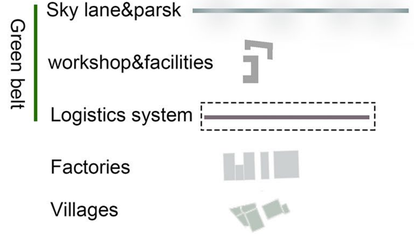


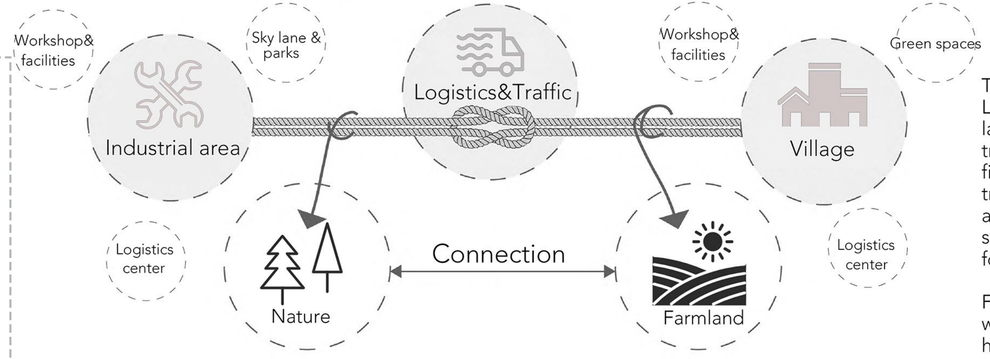
Part III: Industry and Farmland, Nature, Near Villages











The town of BIHU is located in the middle of the LISUI valley and is surrounded by farmland, villages and natural surroundings. The rural industry is mainly based on agriculture, handicrafts or fishing. I consider the northern part of the industrial area, the farmland, the natural environment and the rural areas where agriculture is the mainstay as the main target and discuss the border form together as a whole. PART III

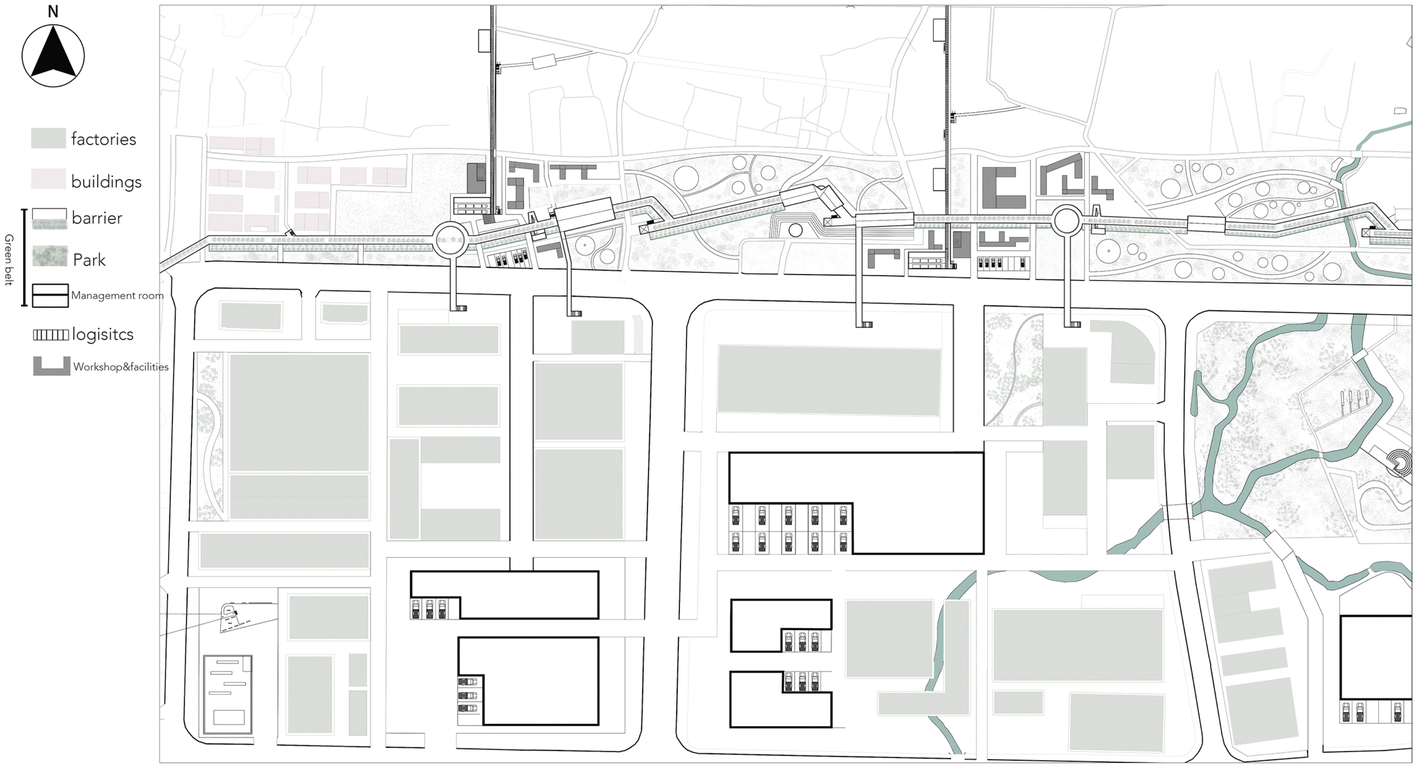
Firstly, the logistics system connects the village with the logistics center in the industrial area and has the function of transportation and goods transport, and secondly, it has the function of temporary storage, processing and rest for farmers when passing through the farmland. Workshops and facilities are added to the village to improve productivity and the standard of living of the villagers.

Secondly, a green belt is added to the periphery of the industrial area, which contains a park/green public space, a barrier, and a management office. Since most of the factories in the northern part of the industrial zone are polluting enterprises, the barrier is needed to stop the spread of pollution. The park/green public space provides a good resting place for workers as an outdoor activity space and landscape.

Part III: Industry and Farmland, Nature, Near Villages

PLAN A

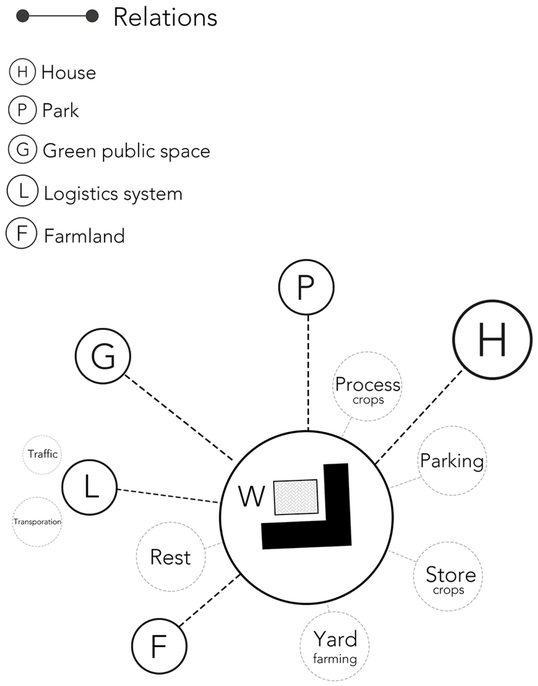
PLAN B

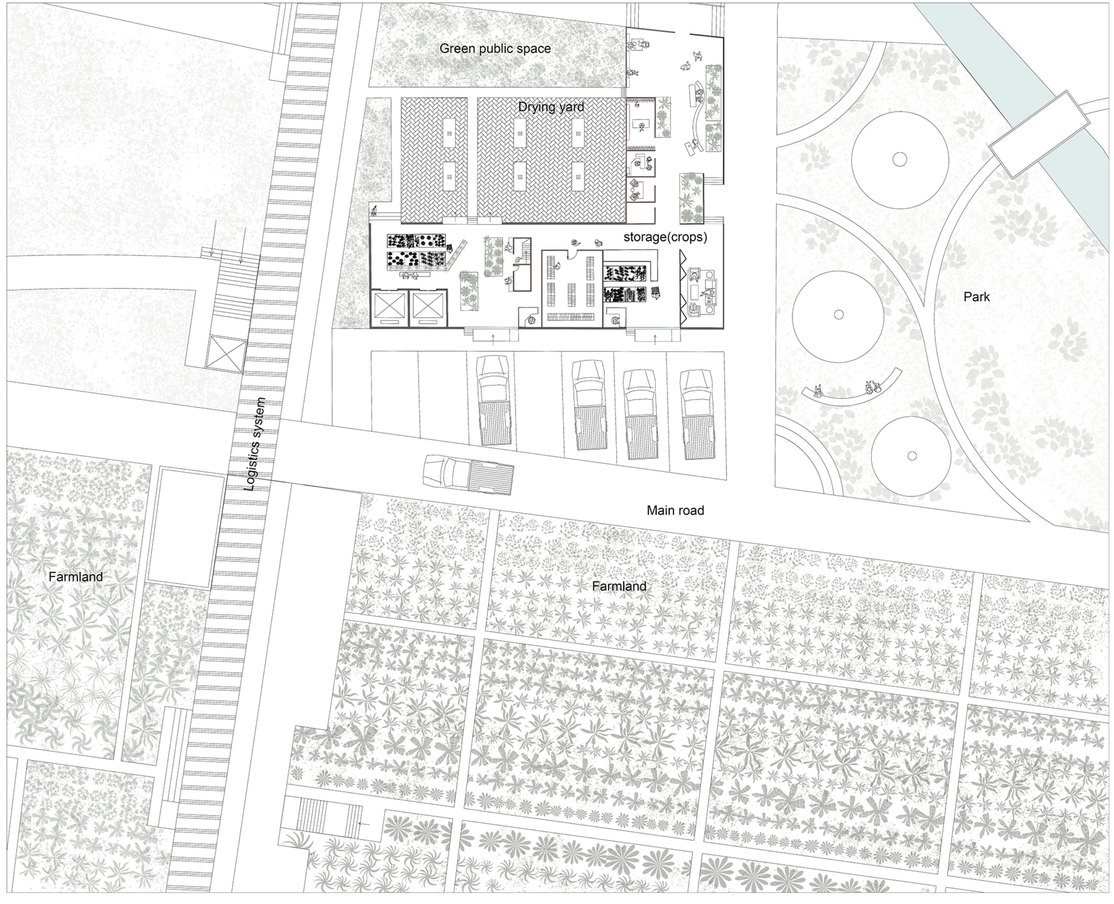


Part III: Industry and Farmland, Nature, Near Villages

Rural Area

As an important source of food for farmers and raw material for agricultural processing, crops need a large storage space. Crop storage is a great way to keep crops fresh, regardless of the season of the year. Stored crops can be used by farmers for their own consumption or as raw material to be sent to workshop for processing.



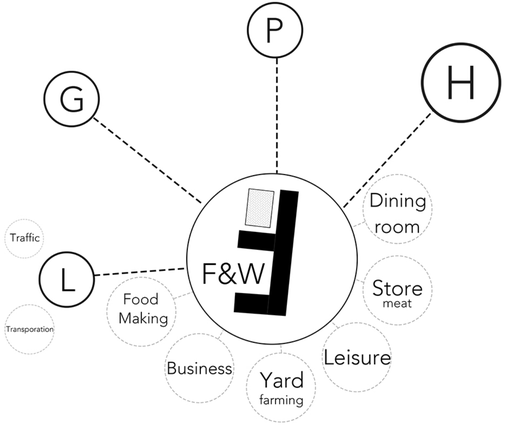


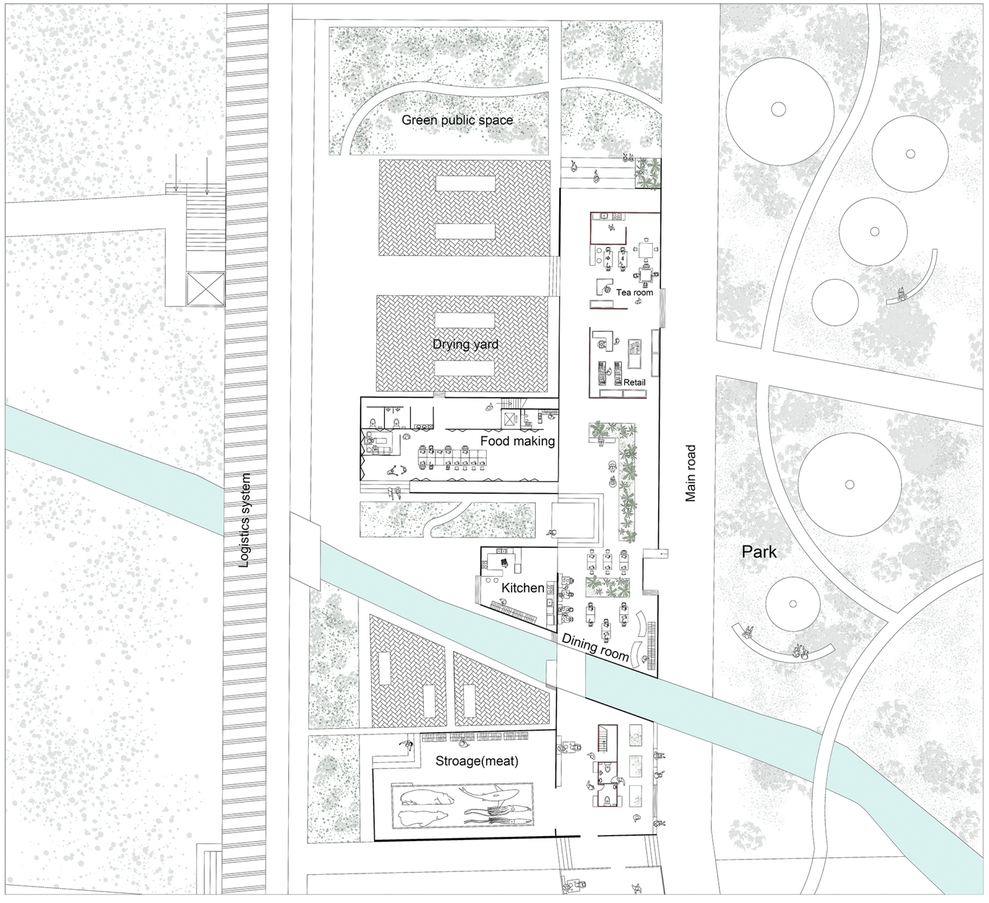
Part III: Industry and Farmland, Nature, Near Villages

In China, the rapid urbanisation process has neglected the upgrading of rural production methods and the construction of related facilities, so most of China's rural development is relatively backward. Villagers who want to experience shopping and food can only go to the nearby towns. Therefore, it is important to include facilities in the design to meet the daily needs of the villagers.

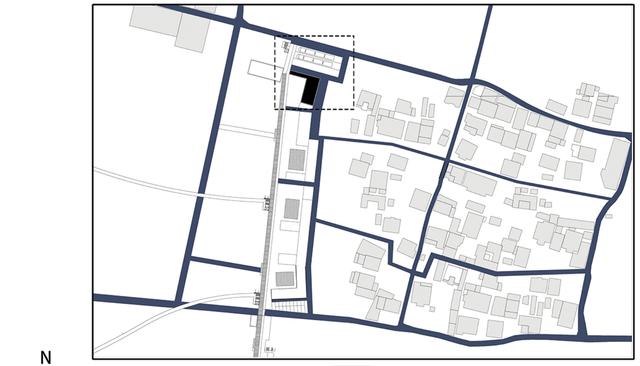
Relations

- (H) House
- (P) Park
- (G) Green public space
- (L) Logistics system
- (F) Facilities&workshop



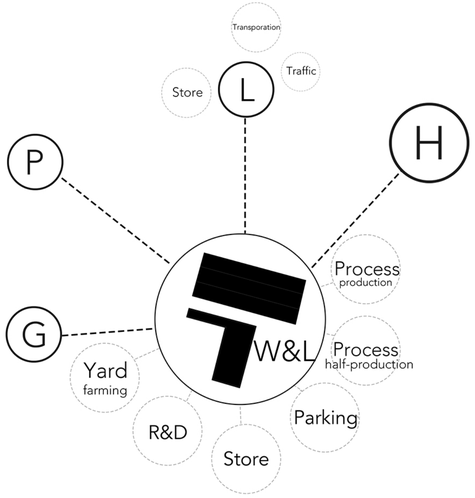


Part III: Industry and Farmland, Nature, Near Villages

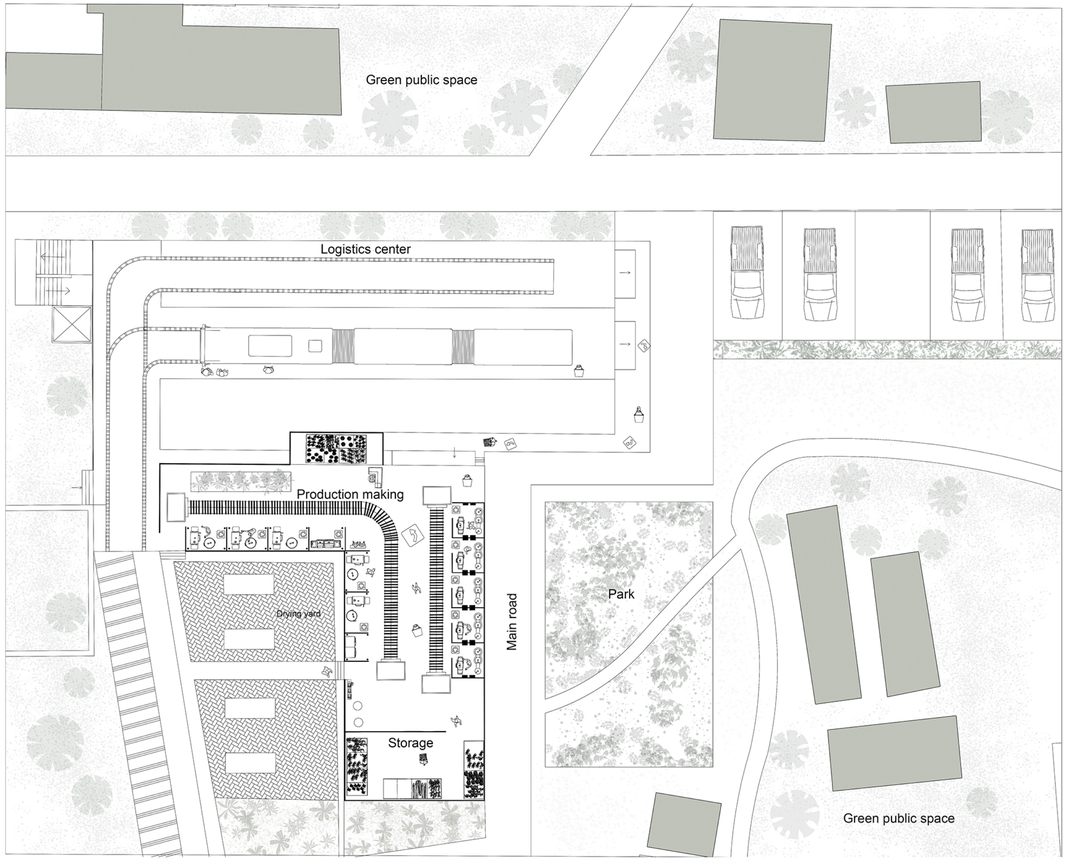


Relations

- (H) House
- (P) Park
- (G) Green public space
- (L) Logistics center
- (W) Workshop

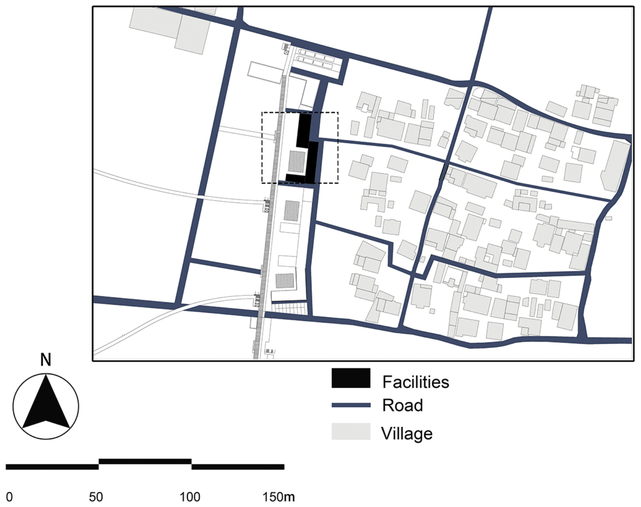


The Lishui Valley, where BIHU is located, is rich in natural resources and the villagers rely on agriculture and farming as their main source of income, but production methods are outdated and inefficient. By joining the workshop, the traditional manual production method has been replaced by an industrial assembly line, which has improved production efficiency and made full use of the labour force in the countryside, and the processed agricultural products are self-sufficient and transported to the town of Bihu for sale by using the logistics system, to increasing the income of the farmers and villagers



Part III: Industry and Farmland, Nature, Near Villages

Rural Area

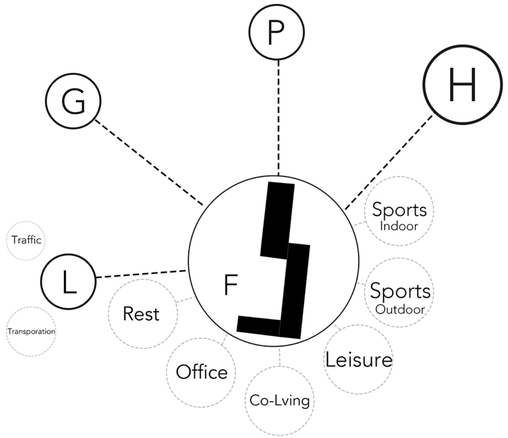


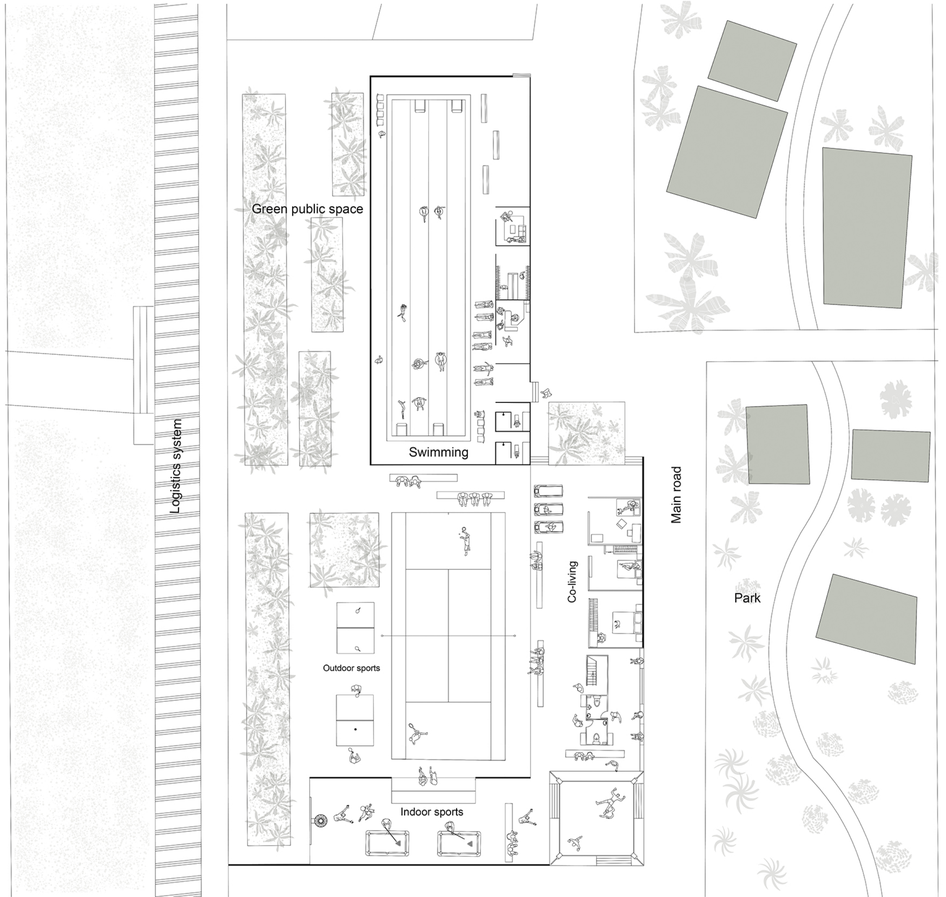
Most rural Chinese have very monotonous forms of daily recreation, and for economic reasons lack sufficient facilities to support the daily recreational activities of the villagers. In particular, sports facilities are lacking in rural areas.

Because of the upgrading of production methods and the growth of economic incomes, the inclusion of co-living is aimed at providing accommodation for young people working in workshops.

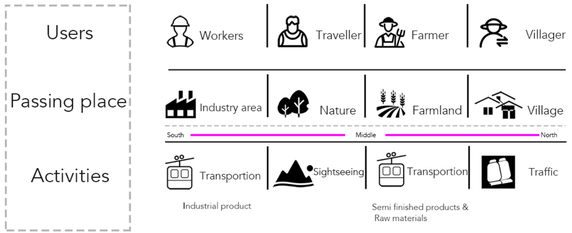
Relations

- (H) House
- (P) Park
- (G) Green public space
- (L) Logistics system
- (F) Facilities

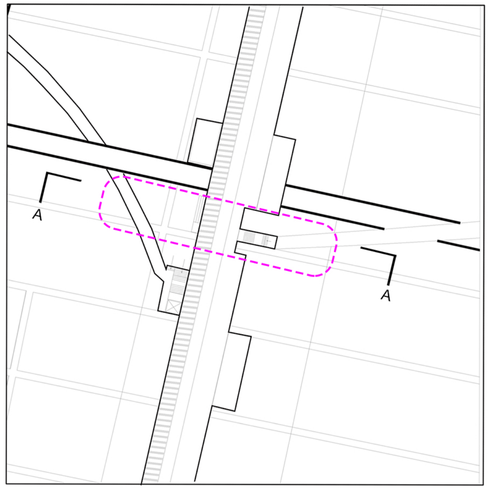




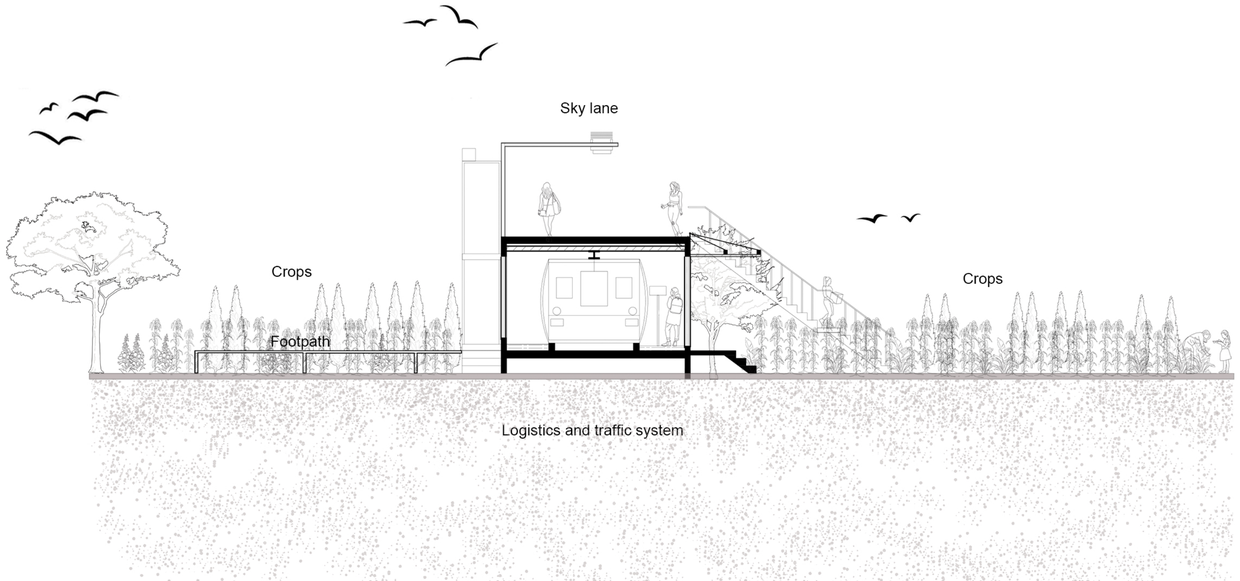
Logistics System TYPE I



TYPE III consists mainly of a sky lane and a logistics system. It has the function of transporting products, transportation and a scenic tour. It also connects the village and the industrial area, making it very convenient for daily life and production.

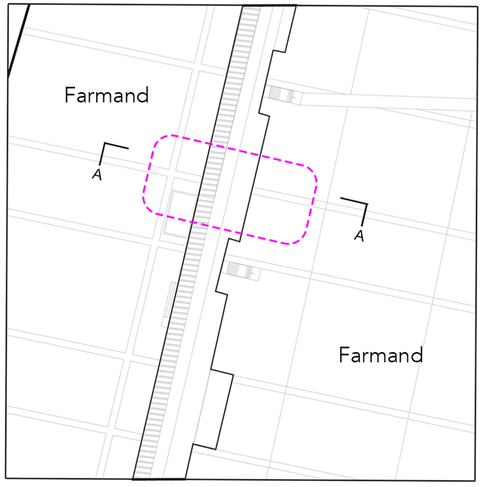


TYPE I Section

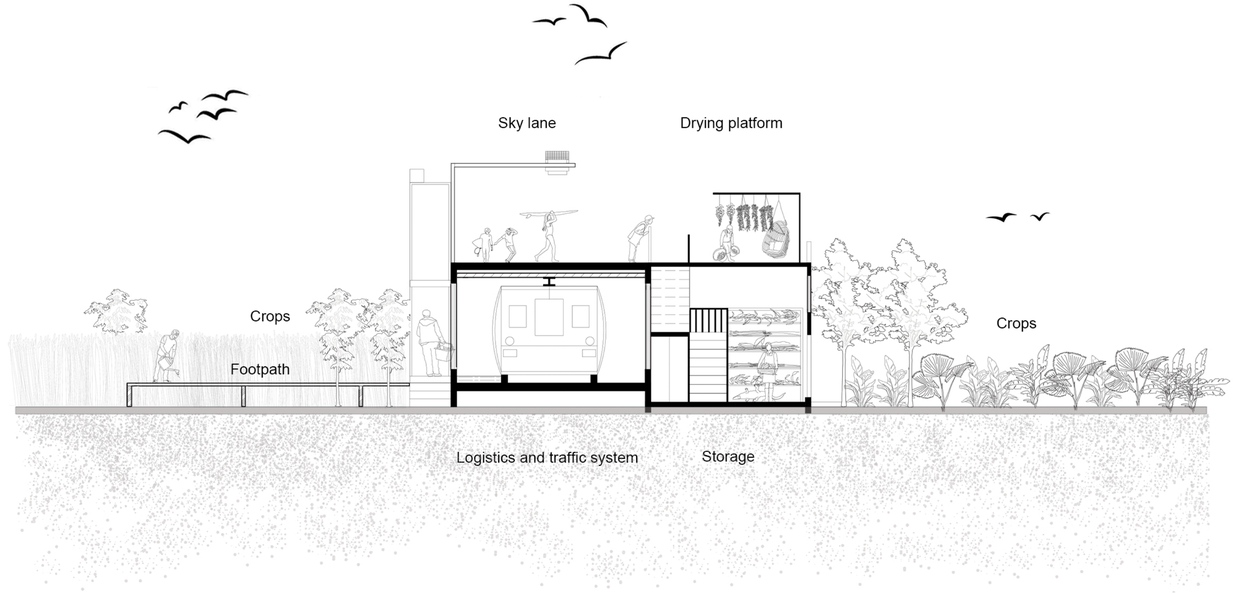


Logistics System TYPE II

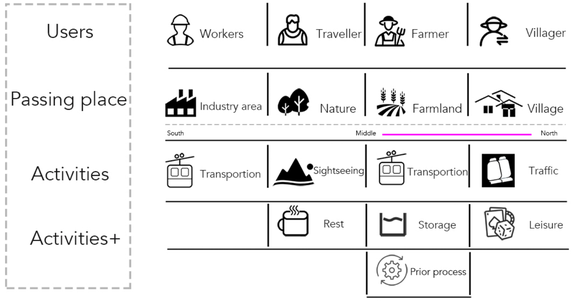
TYPE II which is mainly located on farmland, adds storage functions and a small workshop compared to the first type of system, which facilitates the farmers' farming process from growing crops to storage and transportation and finally to the finished product.



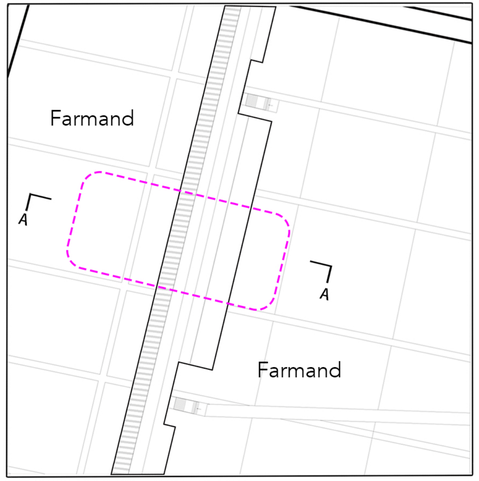
TYPE II Section



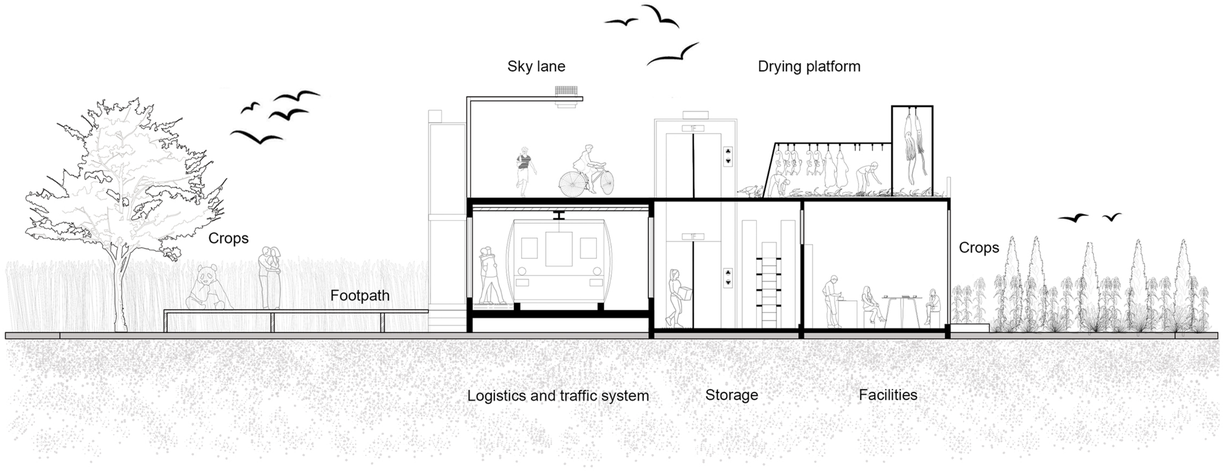
Logistics System TYPE III



TYPE III adds leisure functions such as lounges and tea rooms in comparison to the first two systems. Resting spaces are provided for pedestrians and farmers.

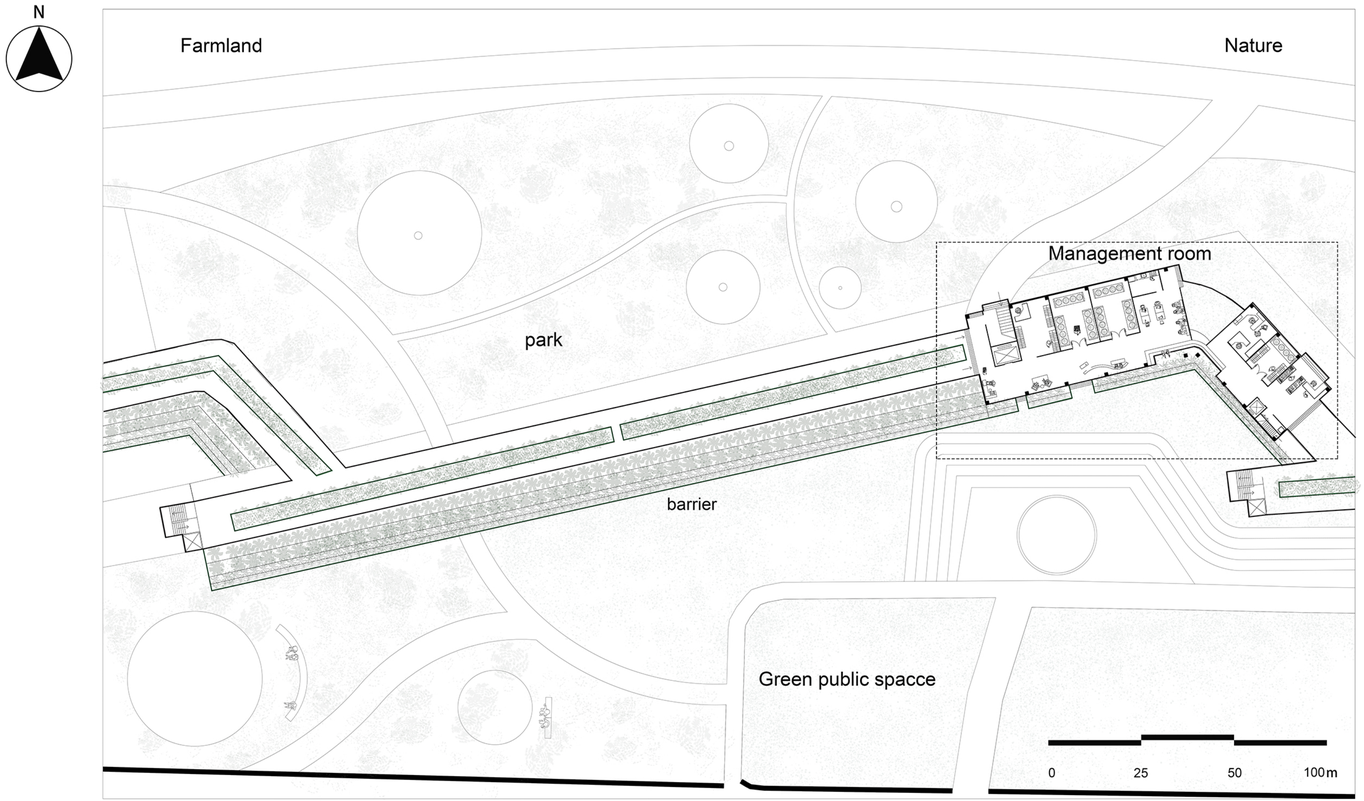


TYPE III Section

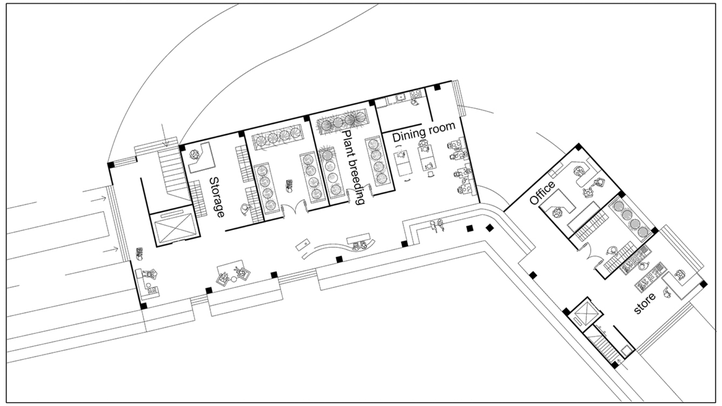


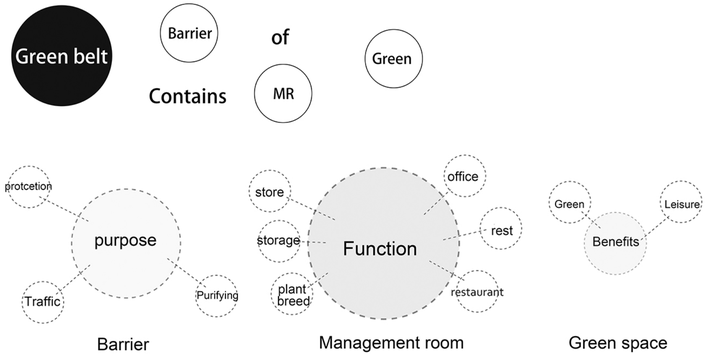
Part III: Industry and Farmland, Nature, Near Villages

Plan of Green Belt



Plan of Management room

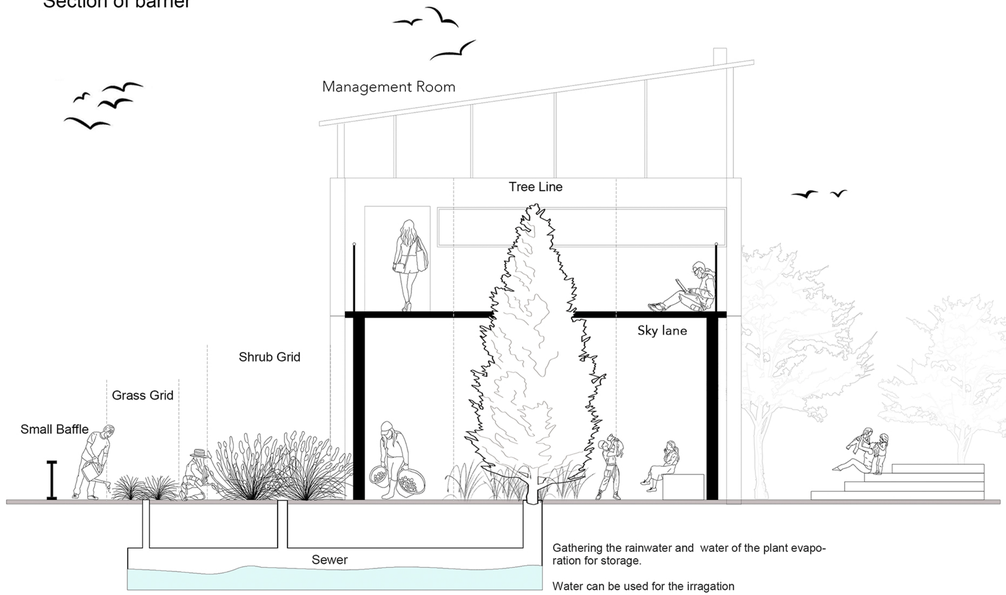




The Green Belt is a important component of Part I, providing a barrier to the spread of pollution from factories, open space such as green spaces and parks, and pedestrian and cycling as the main means of transport. It consists of barriers, management rooms and green space. The green belt is also an important node in part I, linking the logistics system to the industrial area and preventing the expansion of the industrial area into the nature/-farmland area.

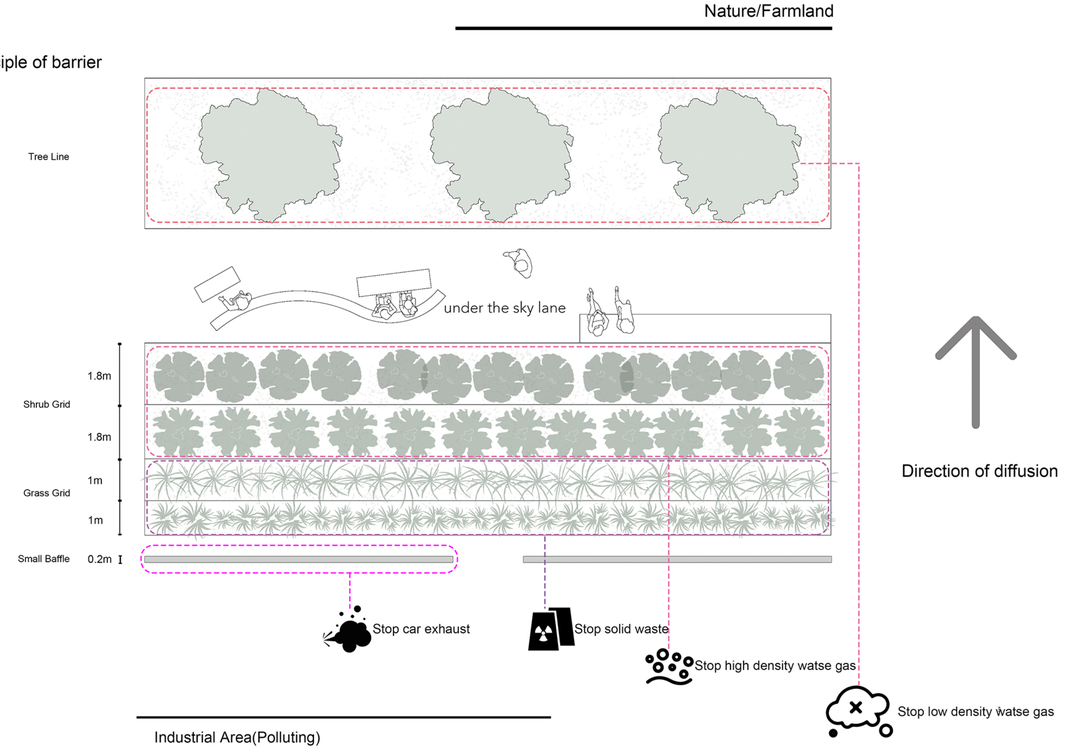
Part III: Industry and Farmland, Nature, Near Villages

Section of barrier

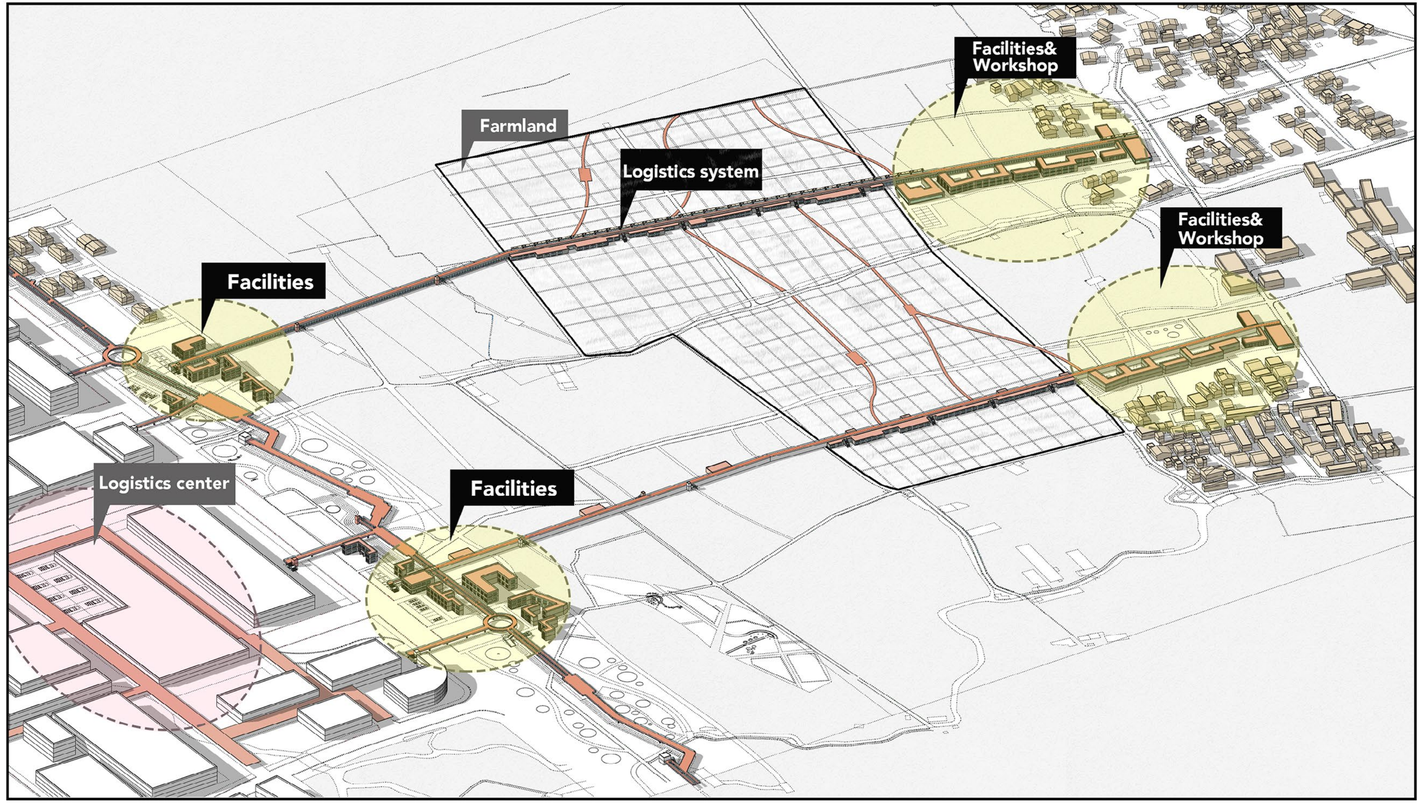


The combination of plants and sky lane form a barrier system to block the spread of pollutants from industrial areas to farmland or nature. Plants are the best natural material to keep out car emissions and industrial waste. barriers combined with parks and green spaces form a green belt which not only provides a landscape and recreational area but also protects the environment to a greater extent.

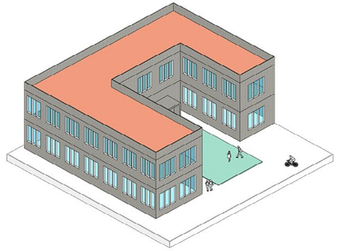
Principle of barrier



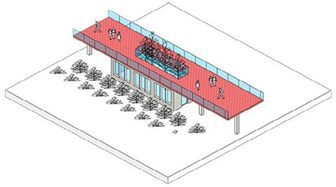
Part III: Industry and Farmland, Nature, Near Villages



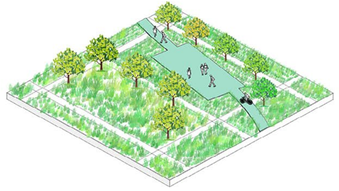
Logistics system & Sky line Strategy



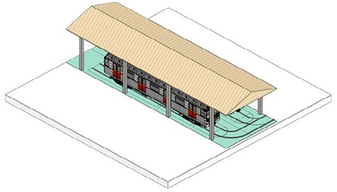
Workshop & Facilities



Management Room & Sky Line

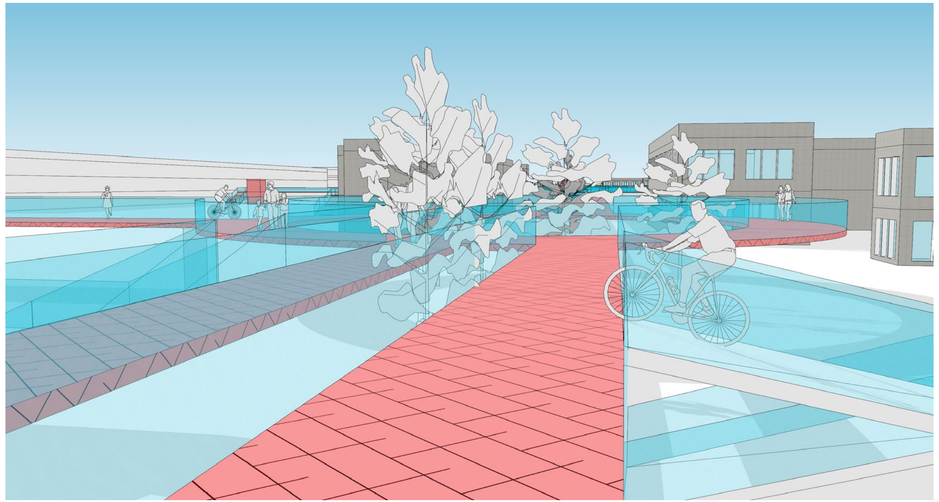


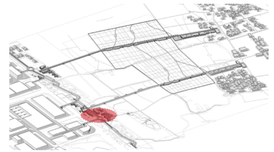
Farmland



Logistics and Traffic System

Part III: Industry and Farmland, Nature, Near Villages





Bibliography & Figures

List of Bibliography

I. Article& Journal

Zhang Ye. (2019). Multivariate and multiscale analysis of spatiotemporal patterns of urbanization and urban expansion simulation[D].Zhejiang University,DOI:10.27461/d.cnki.gzjdx.2019.000606

Wu Chao. (2013). Research on the Influencing Factors and Development Path of Urbanization[D]. Zhejiang University of Technology.

Guo Minyan. (2012). The urbanization strategy evolution and theoretical exploration of Zhejiang Province [D]. Zhejiang University, 2013.

Zhang Qianqian. Research on the mode and path of industrialization development in underdeveloped areas [D]. Zhejiang Normal University.

Hu Yang. (2014). Research on the mechanism and path of the simultaneous development of industrialization, urbanization and agricultural modernization in Zhejiang [D]. Party School of the Zhejiang Provincial Committee of the Communist Party of China.

Wu Yizhou, Wu Cifang, Wang Lin. (2009). Luo Wenbin.A Study on the Regional Differences and Mechanisms of New Industrialization in Zhejiang Province[J]. Geographic Science, 29(04):508-514.

Yu Wenhua. (2015). Research on the simultaneous development of industrialization, informatization, urbanization and agricultural modernization in Zhejiang Province[J].Management and Management, (03):98-100.DOI:10.16517/j.cnki.cn12-1034/f.2015.03. 026.

Zhou Bijian. (2004). Discussion on the development path of industrialization and urbanization in Zhejiang[J].Zhejiang Economy, 1999(02):30-31.

Li Jianliang. (2004). On Zhejiang Industrialization and Its Demonstration Value [J]. Guihai Lun Cong, 2004(03): 34-36.

Zhang Youlin. (2005). Chen Zhaoxia. Rational thinking on regional cultural spirit and regional economic development——Also on the formation mechanism of "Zhejiang Industrialization Model" [J]. Zhejiang Social Sciences, 2005(03): 13-18. DOI: 10.14167 /j.zjss.2005.03.002.

Fu Xiaoxia. (2007). Wei Houkai, Wu Lixue. Motives, methods and effects of urban industrial relocation—taking Beijing as an example [J]. Economic Management, 2007(21):66-71.DOI:10.19616/j.cnki.bmj.2007.21.015.

Ding Cuicui. (2013). Historical investigation and thinking on the coordinated development of China's industrialization and urbanization [J]. Southern Finance, 2013(10): 54-59.

Zhao Wei. (2009). Industrialization and Urbanization: Analysis of Three Coastal Regional Models and Their Evolution Mechanisms [J]. Social Science Front, 2009(11):74-81.

II. Website

Wuhan University Urbanization Research Office. (2018). Multicenter spatiotemporal dynamics of urban agglomerations: a new urbanization hypothesis, From https://www.sohu.com/a/258356517_692608

List of Figures