Politecnico di Milano

School of Architecture Urban Planning Construction Engineering
MSc Sustainable Architecture and Landscape design
A.A. 22/23

POLITECNICO
MILANO 1863

URBAN AGRICULTURE
SHARED COMMUNITY

Supervisor: prof. Motti Matteo
Authors: Yutong Xie, Qi Liu, Chaoyan Zhang

Abstract

China is a large agricultural country, with thousands years of labouring history condensed into its agrarian civilisation. With China's transition from agrarian to urbanisation, formerly arable land has become land for construction, rural people have become urbanites, and their mode of production has been replaced by new production methods that outlaw traditional farming. Rural people have lost their farmland and moved into concrete apartment buildings, with a significant increase in material living standards on the one hand. However, most of those who have lost their farmland are elderly people who live in the countryside, who have left their farmland and are unable to go to the big cities to work and live like the young people, but have to live in small cities with nothing to do and no satisfaction in their spiritual world.

Moreover, as urbanisation accelerates and the urban–rural divide increases, a large number of young people are drifting to the big cities, with a high vacancy rate of housing in small cities, a shortage of labour and an increasingly serious problem of ageing. These are the problems that many small cities are facing as China's urbanisation progresses to the present day, and they need to be addressed urgently.

Improving the current situation of small cities, establishing a model of urban development with a close integration of nature and city, making more young people willing to return to small cities to develop, and exploring the integration of agricultural natural landscape and urban human landscape within the city are the next priorities we need to focus on for China's urban development.

Abstract

La Cina è un grande Paese agricolo, con una storia millenaria di lavoro condensata nella sua civilt à agraria. Con la transizione della Cina dall'agricoltura all'urbanizzazione, i terreni precedentemente coltivabili sono diventati terreni edificabili, le popolazioni rurali sono diventate urbane e il loro modo di produzione è stato sostituito da nuovi metodi di produzione che bandiscono l'agricoltura tradizionale. Le popolazioni rurali hanno perso i loro terreni agricoli e si sono trasferite in condomini di cemento, con un significativo aumento del tenore di vita materiale da un lato. Tuttavia, la maggior parte di coloro che hanno perso i terreni agricoli sono anziani che vivono in campagna, che hanno lasciato i loro terreni agricoli e non possono andare nelle grandi citt à per lavorare e vivere come i giovani, ma devono vivere in piccole citt à senza nulla da fare e senza alcuna soddisfazione nel loro mondo spirituale.

Inoltre, con l'accelerazione dell'urbanizzazione e l'aumento del divario urbano–rurale, un gran numero di giovani si sta spostando verso le grandi citt à , con un alto tasso di alloggi sfitti nelle piccole citt à , una carenza di manodopera e un problema sempre pi ù grave di invecchiamento. Questi sono i problemi che molte piccole citt à si trovano ad affrontare con il progredire dell'urbanizzazione cinese e che devono essere affrontati con urgenza.

Migliorare l'attuale situazione delle piccole citt à , stabilire un modello di sviluppo urbano con una stretta integrazione tra natura e citt à , far s ì che un maggior numero di giovani sia disposto a tornare nelle piccole citt à per svilupparsi ed esplorare l'integrazione tra paesaggio naturale agricolo e paesaggio umano urbano all'interno della citt à sono le prossime priorit à su cui dobbiamo concentrarci per lo sviluppo urbano della Cina.

Key words

–Garden City – Urban Farmland – Shared Farmland – Shared Communities – Shared Streets – Agricultural Community Organisations – Architectural Design – Sustainable Design – Slow City

"We would like to thank our supervisor Motti Matteo for his amazing support and inspiration throughout the process of this master thesis."

感谢我们的导师 Motti Matteo 在这篇硕士论文的创作过程中给予了我们极大的支持和启发

- Yutong Xie, Qi Liu, Chaoyan Zhang
June, 2023

Content

Theory of Garden City

Ebenezer Howard and "Garden city"

Ebenezer Howard was a British social reformer best known for his idea of the 'garden city', which he put forward in 1898, in his book 'To–Morrow: A Peaceful Path to Real Reform'.

In the mid–nineteenth century, with the massive accumulation of urban resources and thus the development of urbanisation in the West through industrialisation, the influx of more and more rural people into the cities caused the paralysis of the original not very well–built urban system, a series of urbanisation problems, the deterioration of the urban living environment and the natural environment, and the accumulation of sharp social conflicts, creating the birth of the garden city theory.

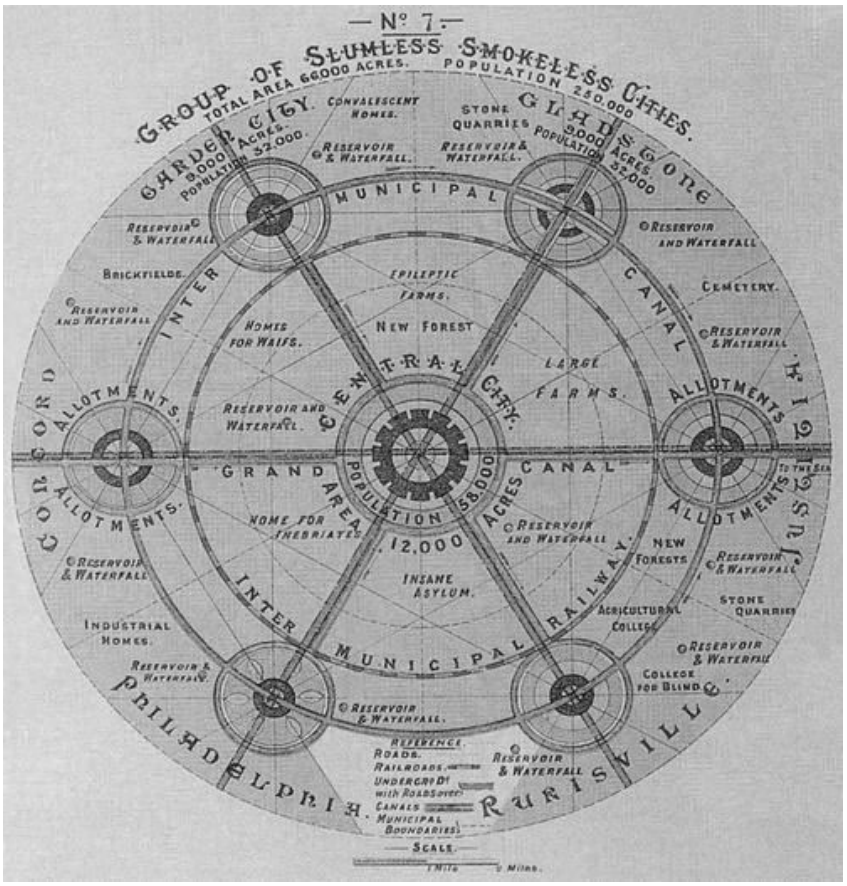


Figure 1. General plan for a "Garden–City"
https://victorianweb.org/art/architecture/suburbs/1.html

Howard's vision of the garden city was of a self–contained, planned community surrounded by a green belt and with a population of around 30,000 people. His idea was to create a balance between urban and rural living, with ample green space, fresh air and agricultural land, while also providing all the amenities of a modern city. Howard believed that the Garden City would solve many of the social and economic problems of his time, including overcrowding, pollution and poverty. He envisaged that garden cities would be economically self–sufficient, with a mixture of industry and agriculture, and would be designed to promote a sense of community and social cohesion. in 1919 the Field City Planning Association and Howard provided a short definition of a field city: 'A field city is a town designed for the arrangement of a healthy living industry, on a scale likely to accommodate a variety of social life, but not It is a town of a size that has the potential to accommodate a variety of social life, but is not too large; formally the whole town is surrounded by a rural belt; and all the land is publicly owned or held in trust for the community.

The core idea of the idyllic city is the integration of urban and rural areas, combining the good parts of urban life with the good natural environment of rural life while following ecological principles, to achieve a human environment that is both convenient and beautiful, which is the essence of the garden city theory.

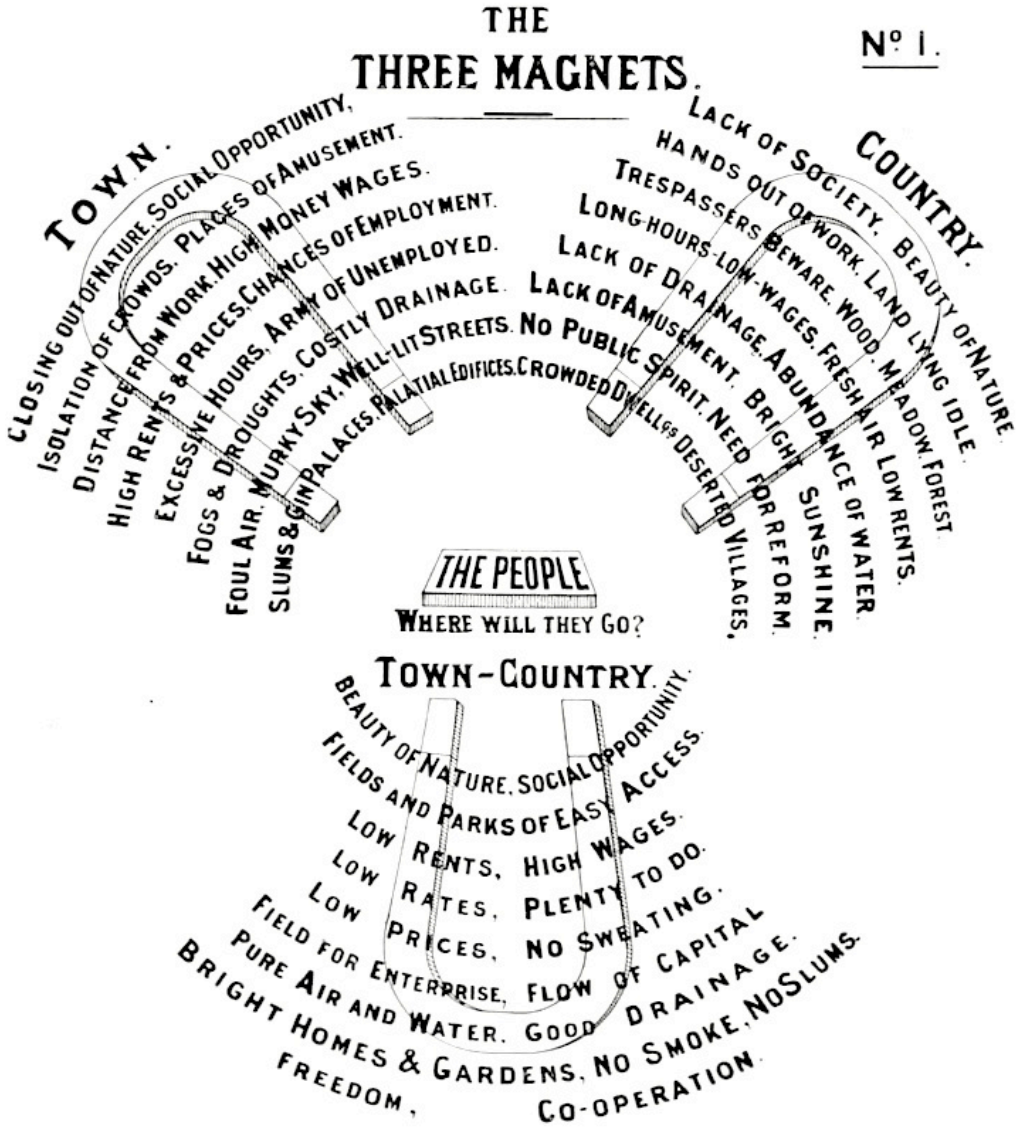


Figure 2. Ebenezer Howard's "Three Magnets" diagram
https://victorianweb.org/art/architecture/suburbs/1.html

Bruno Taut and Gross–Siedlungen

Bruno Taut, a renowned German architect and town planner, was a key figure in the German architectural movement of the early 20th century, Expressionism, and his designs for Gross–Siedlungen reflect this aesthetic. taut designed inexpensive and friendly flats for 'the people'. Although the socially responsible architect had to achieve high density housing on a small scale, he arranged spacious, green internal courtyards between residential areas.

The Hufeisensiedlung ('horseshoe settlement'), officially known as Großsiedlung Britz, is a large residential area in Berlin, located in the Ortsteil district. Taking into account the architectural situation in relation to past ideas and the strong demand for mass housing in the 1920s, the architect Bruno Taut set out to move away from the traditional bourgeois conception of architecture and to provide affordable buildings for people. And marked by an optimal day–heat orientation and a modern and rational plan, he was able to respond positively to the needs of the masses. Important features of his design are the interpenetration between green and architecture, blended in an open vision in which the vegetation of the small garden in front of the flats represents the rise of a carefully inserted connecting link between the ground and the abruptness of the building, and the remarkable colour sensitivity of each residential unit with a certain colour scheme, which can be seen above all in the horseshoe–shaped building where the smooth white stucco of the floor of the house is combined with the the blue of the bases alternating with the red of the entrances, column bases and corners: the exteriors of the other buildings also follow this spatial colour game adding colour and vibrancy to the high–density housing.

Figure 3. Bruno Taut, Britz Horseshoe Estate, 1922
http://architectuul.com/architecture/view_image/britz–horseshoe–estate/488

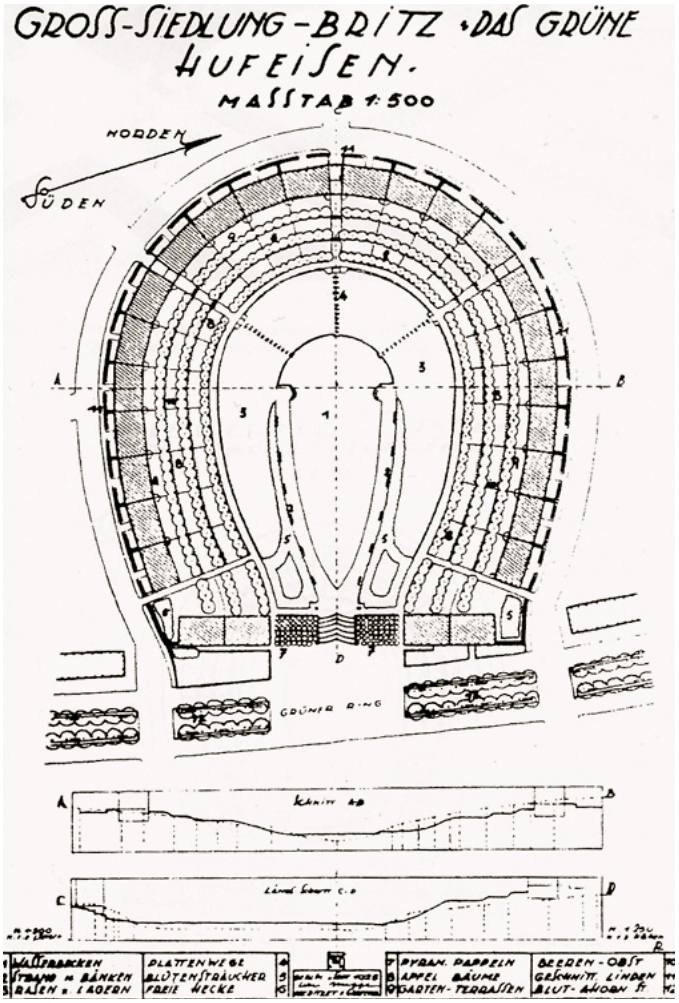


Figure 4. Bruno Taut, Britz Horseshoe Estate, Masterplan
http://www.hufeisensiedlung.info/geschichte/bau–der–siedlung/oeffentliche–gruenanlagen.html

The Onkel–Toms–H ü tte Siedlung, built in 1926–31 in the Zehlendorf district of Berlin, is another example of Taut's work on Gross–Siedlungen. It consists of 2,000 flats in a variety of building types, including row houses, garden flats and high–rise buildings. The development has been designed as an independent community with a range of facilities including shops, schools and sports facilities. The buildings feature Taute's signature bright colours and geometric shapes, with elements of nature and green space incorporated into the design.

Figure 5. Bruno Taut, Onkel–Toms–H ü tte Siedlung, Masterplan
https://letsmakearthistory.tumblr.com/post/137569829397/denkmalwert–waldsiedlung–onkeltoms–h%C3%BCtte

CONTEMPORARY REINTERACTION

Shenyang Architectural University

Location: Shenyang, China
Project Classify: Landscape
Project Scale: 21ha
Design Time: 2003
Chief Designer: Kongjian Yu, Xiaoye Han, Yi Han

Many of the new campuses that have developed in China over the last few decades have sprung up in the midst of formerly productive farmland, with flowers and neatly trimmed lawns replacing rice crops and wheat saplings, and wide roads and polished square paving replacing ridge drains. The landscape design of the Shenyang University of Architecture campus is a very innovative attempt, and the design of the campus offers a new interpretation of agriculture and the campus environment.

The new Shenyang University of Architecture campus was built on a flat site, originally used for rice cultivation, with abundant water resources for native crops and a small number of vineyards and fruit trees in the east. The landscape design team, represented by landscape architect Yu Kongjian, used rice, local crops and native wild plants extensively in the construction based on the characteristics of the site. Combining crops with the most economical elements of the area, the most natural design elements were used as the base for the new campus landscape. Rice, together with buckwheat and winter wheat, form a distinctive green landscape on the campus.

The Shenyang University of Architecture's paddy field landscape combines agricultural production and urbanised landscaping, providing a new model for campus landscape construction and a close integration of Chinese agricultural and campus cultures.

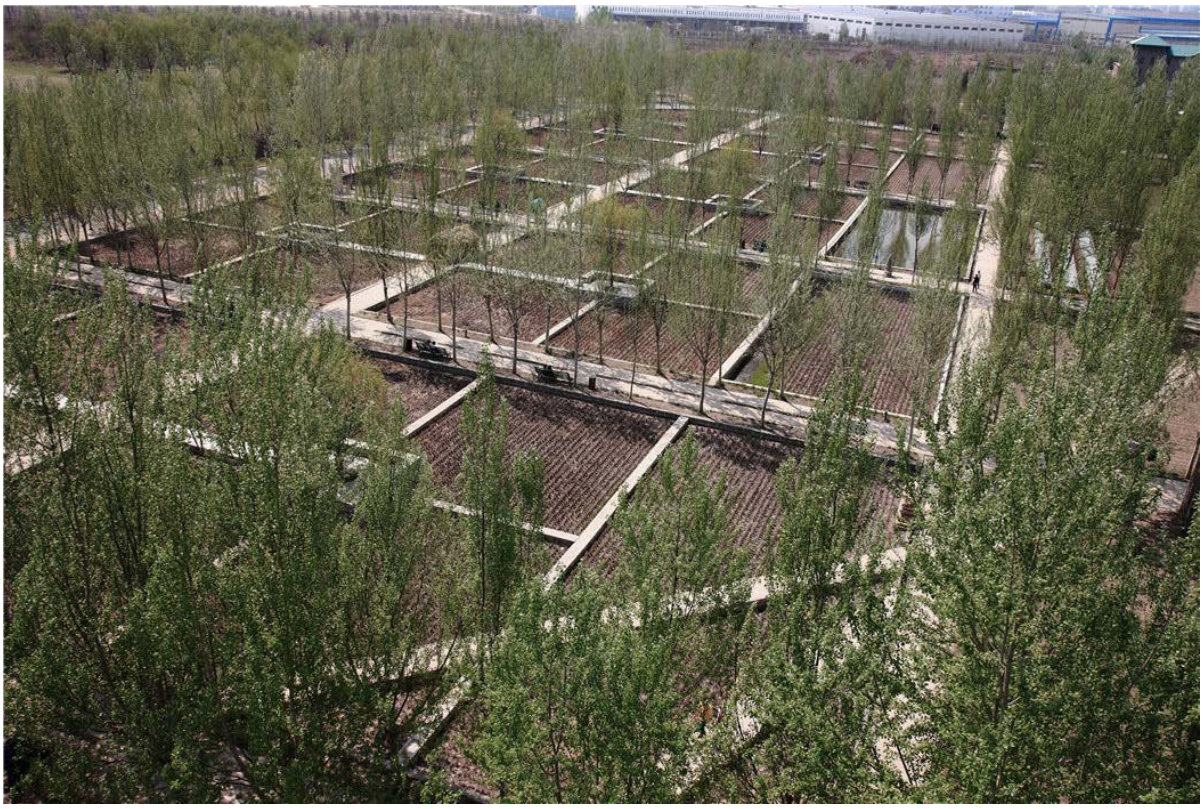


Figure 6. The landscape in Shenyang Architectural University
https://www.turenscape.com/en/project/detail/324.html

Figure 7. Students reading books in a paddy field landscape
https://www.turenscape.com/en/project/detail/324.html

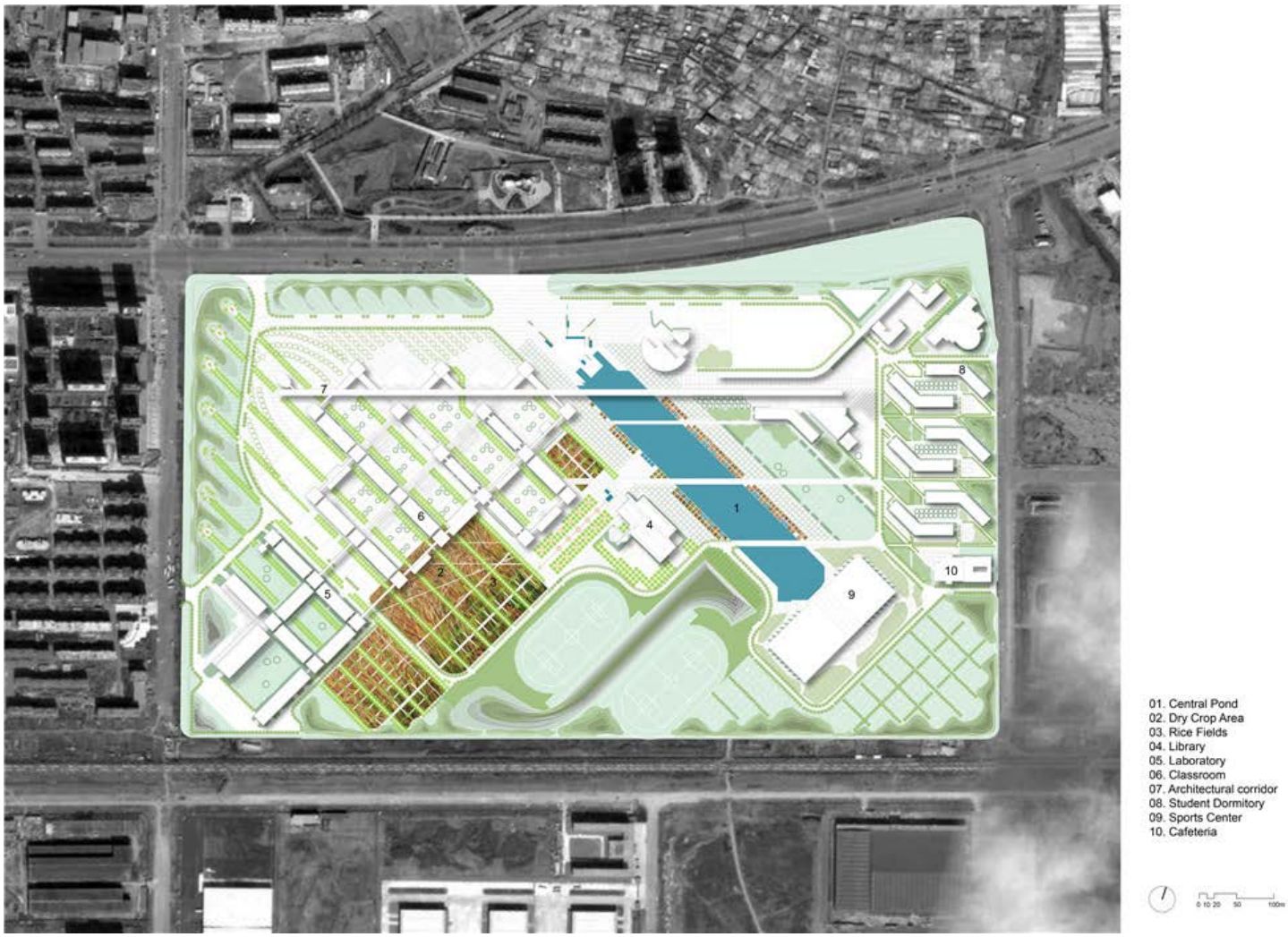


Figure 8. The masterplan of Shenyang Architectural University
https://www.turenscape.com/en/project/detail/324.html

Brondby Haveby

Location: Copenhagen, Denmark
Project Classify: Landscape
Design Time: 1964
Chief Designer: Erik Mygind

Brøndby Haveby is a garden city in Brøndby Municipality, Denmark. Founded in 1960, it is known for its well–manicured gardens, colourful houses and community spirit. The designers built the utopian garden city on the traditional model of an 18th century Danish village.

The garden city consists of small, individually owned plots of land on which residents can grow their own vegetables, flowers and other plants, and the houses in Brøndby Haveby are also unique in that they are designed to blend in with the surrounding landscape, many of them having thatched roofs and half–timbered facades.

In addition to the gardens and houses, Brøndby Haveby also has a community centre, a playground and a small lake. The community centre serves as a meeting place for the residents and hosts events such as concerts, dances and festivals.

Overall, Brøndby Haveby offers a peaceful and idyllic setting for those who enjoy gardening and have a strong sense of community.

Figure 9. The aerial view of Brondby Haveby
https://www.turenscape.com/en/project/detail/324.html

Letchworth Garden City

The first "garden city"
Location: England
Design Time: 1903
Chief Designer: Ebenezer Howard, Raymond Unwin, Barry Parker

Howard outlined his ideas in a book published in 1898, entitled 'Tomorrow: The Road to Peace for Real Reform'. In it, he set out his vision of a new type of settlement, the 'garden city', whose benefits were twofold.

They would combine the best parts of town and country without any of the disadvantages – as he skilfully illustrated in his famous book 'The Three Magnets' – but they would also be developed by a private company and handed over to a community trust, which would take the profits generated by the development of the town, rather than leaving individual landowners to enrich themselves. They would be reinvested back into the town for the benefit of its citizens.

He emphasised the importance of transport infrastructure, creating an interconnected cluster of smoke–free, slum–free towns and introducing the now familiar concept of zoning – putting factories, green spaces, workers' housing and shops in their own separate areas. The garden city will be surrounded by a countryside strip, providing both food for the town and access to the countryside.

Figure 10. The aerial view of Letchworth,2009
©Historic England Archive

Figure 11,12,13. Houses off Lytton Avenue, 2017
©Historic England Archive
https://artsandculture.google.com/entity/m01z2vx?hl=zh

Sources:
https://www.houseplanninghelp.com/do-garden-cities-just-become-cities-over-time/
https://www.discover-letchworth.com/visiting/a-brief-history-of-letchworth
https://www.letchworth.com/sites/default/files/documents/2019-07/NLP%20Report.PDF
https://www.slideshare.net/NayanaD123/garden-city-movement
https://artsandculture.google.com/entity/m01z2vx?hl=zh

Case Study: Wuhai

Location

Figure 14. Location

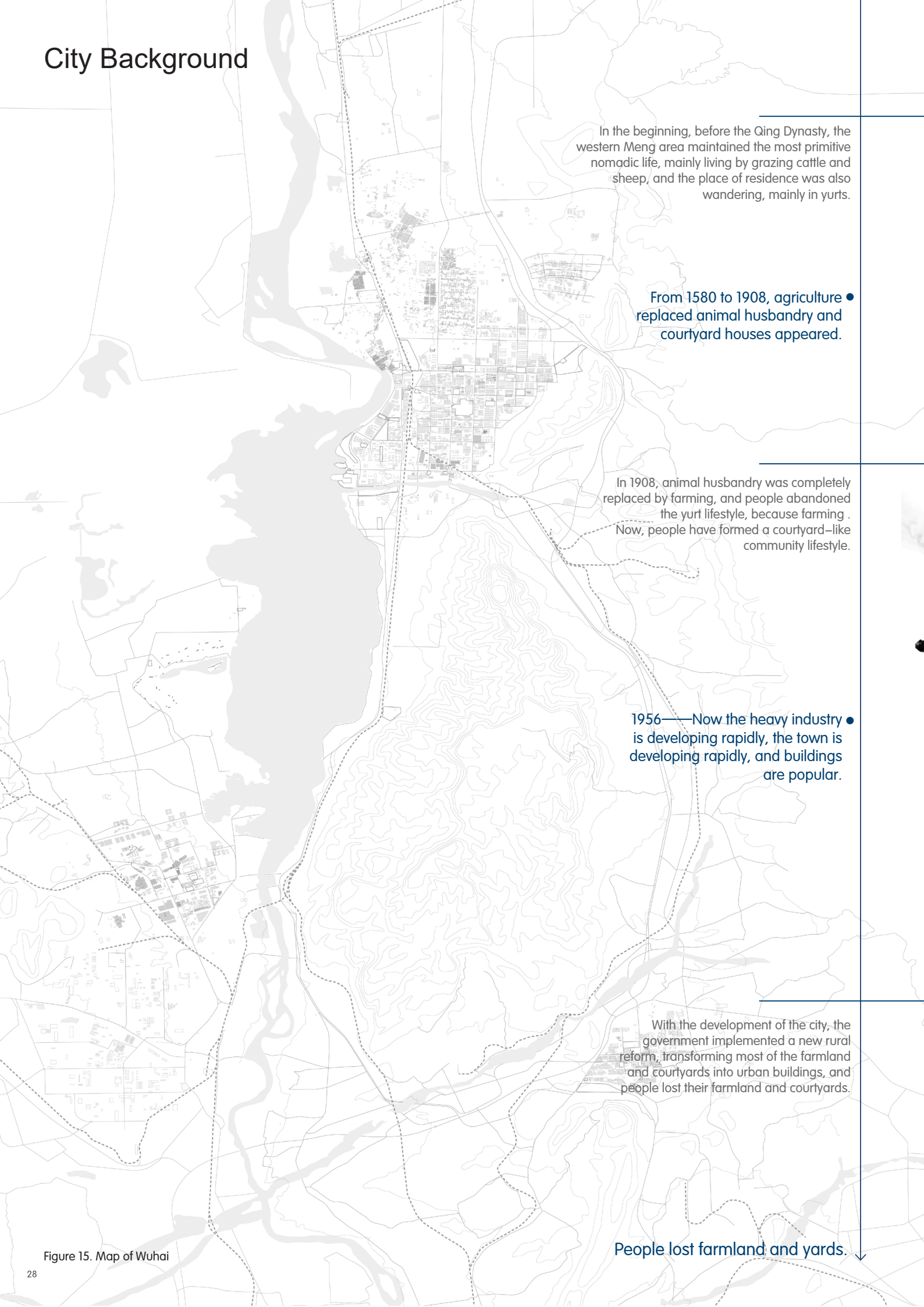
Wuhai is located in the Inner Mongolia Autonomous Region of China, in the north–central part of the country.

It is situated on the north bank of the Yellow River and is bordered by the cities of Ordos to the east, Bayan Nur to the west, and Alxa League to the north. The city has a latitude of 39.66° N and a longitude of 106.81° E.

The city has a population of over 500,000 people and is known for its abundant coal resources, which have fueled its economic development.

Wuhai is also home to many natural and cultural attractions, including the Wuhai Desert, the Haibowan Wetland Reserve, and the Xilamuren Grassland.

City Background



In the beginning, before the Qing Dynasty, the western Meng area maintained the most primitive nomadic life, mainly living by grazing cattle and sheep, and the place of residence was also wandering, mainly in yurts.

From 1580 to 1908, agriculture replaced animal husbandry and courtyard houses appeared.

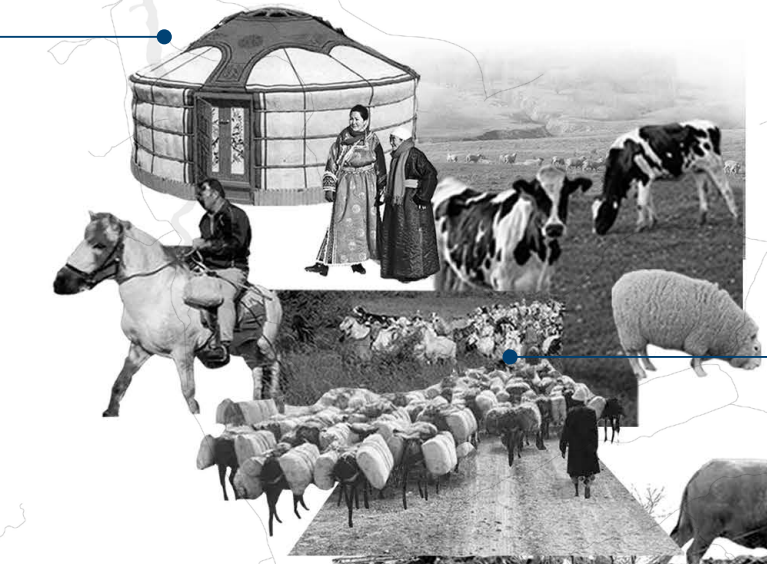
In 1908, animal husbandry was completely replaced by farming, and people abandoned the yurt lifestyle, because farming . Now, people have formed a courtyard–like community lifestyle.

1956——Now the heavy industry is developing rapidly, the town is developing rapidly, and buildings are popular.

With the development of the city, the government implemented a new rural reform, transforming most of the farmland and courtyards into urban buildings, and people lost their farmland and courtyards.

People lost farmland and yards.

Figure 15. Map of Wuhai



- Due to the surge in population in other areas, it has led to the introduction of a large number of foreign populations.

In 1879, because the population of the Central Plains increased rapidly and the land was not enough to use, a large number of people flooded into the western part of Inner Mongolia, mainly from Shaanxi and Hebei. They brought the farming technology and urban model of the Central Plains.

Wuhai City is rich in coal mines, and many coal mines and steel factories have been opened.

- Due to the development of the coal mining industry, it has attracted a large number of labor.

Coal mines and steel mills attract labor from other provinces.

- The decline of the coal mining industry has led to a large loss of labor.

Young people are willing to go to work in other economically developed cities.

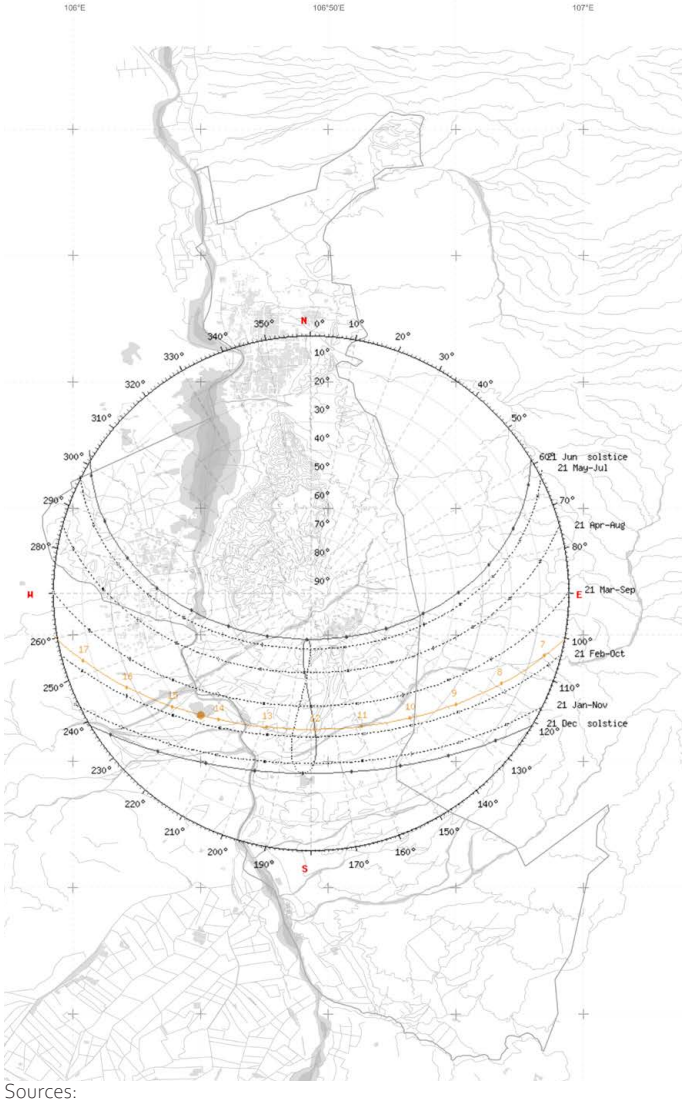
Serious aging of population.

Climate

Wuhai is located deep in the continent and has a typical continental climate, characterized by little snow in winter, drought in spring, hot and high temperatures in summer, and dramatic temperature drops in autumn. Spring and autumn are short, winter and summer are long, with a large temperature difference between day and night, long hours of sunshine, and it is dry year round. Over the course of the year, the temperature typically varies from –16° C to 29℃ and is rarely below –21℃ or above 33℃ .

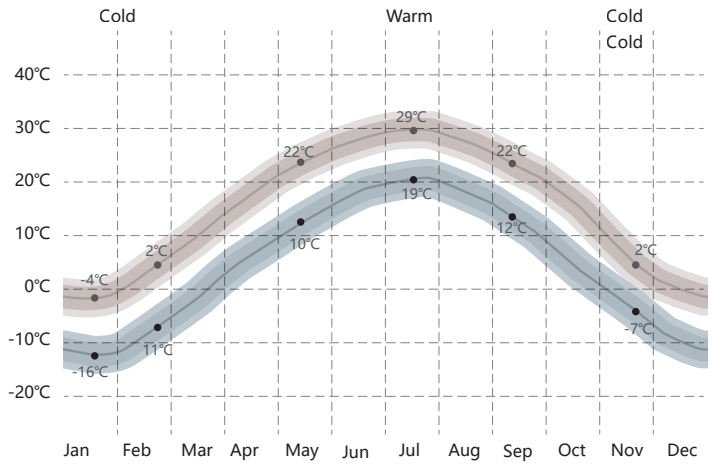
The average number of sunshine hours for many years is 3138.6 hours, the average annual solar radiation energy received is 155.8 kcal/cm2, the average frost–free period is 156–165 days; the average annual precipitation is 159.8 mm, the average relative humidity is 42%, the average evaporation of 3,289 mm.Wuhai is one of the most abundant and ideal areas for the development of breeding and efficient agriculture in terms of light and heat resources, and all northern crops are suitable for cultivation here with high yields and quality.

Weather extremes are likely to occur in Wuhai:
Maximum temperature 40.2°C
Lowest temperature -36.6°C
Instantaneous maximum wind speed of 33 m/s
Sandstorm



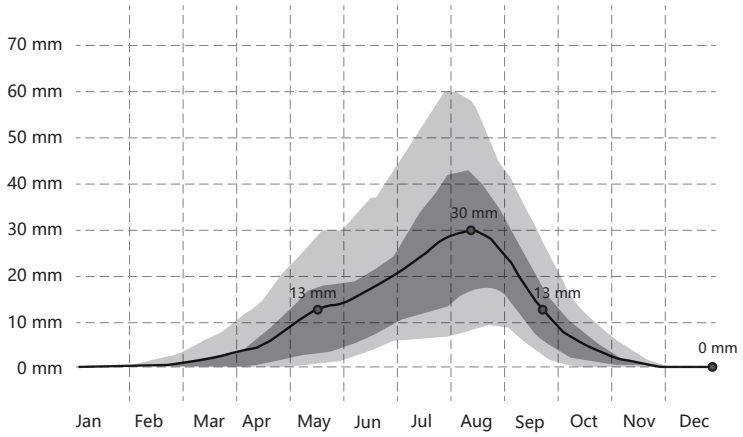
Sources:
https://www.sunearthtools.com/dp/tools/pos_sun.php?lang=cn
https://weatherspark.com/y/117587/Average-Weather-in-Wuhai-China-Year-Round#Sections-Topography

Average High and Low Temperature in Wuhai



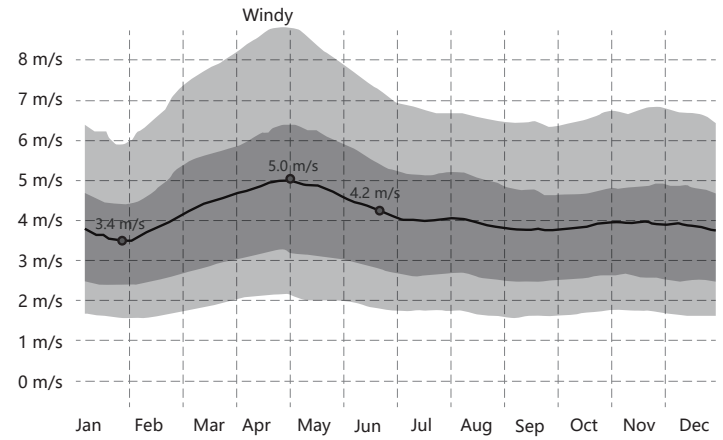
*The warm season lasts for 4.0 months, from May 12 to September 13, with an average daily high temperature **above 22°C**.The cold season lasts for 2.9 months, from November 23 to February 19, with an average daily high temperature **below 2°C**.*

Average Monthly Rainfall in Wuhai



The rainy period of the year lasts for 4.2 months, from May 19 to September 24, with a sliding 31-day rainfall of at least 13 millimeters. The month with the most rain in Wuhai is August, with an average rainfall of 30 millimeters. The rainless period of the year lasts for 7.8 months, from September 24 to May 19. The month with the least rain in Wuhai is December, with an average rainfall of 0 millimeters.

Average Wind Speed in Wuhai



The windier part of the year lasts for 3.6 months, from March 2 to June 19, with average wind speeds of more than 4.2 meters per second. The windiest month of the year in Wuhai is April, with an average hourly wind speed of 4.9 meters per second.

The calmer time of year lasts for 8.5 months, from June 19 to March 2. The calmest month of the year in Wuhai is January, with an average hourly wind speed of 3.5 meters per second.

City and Mountain

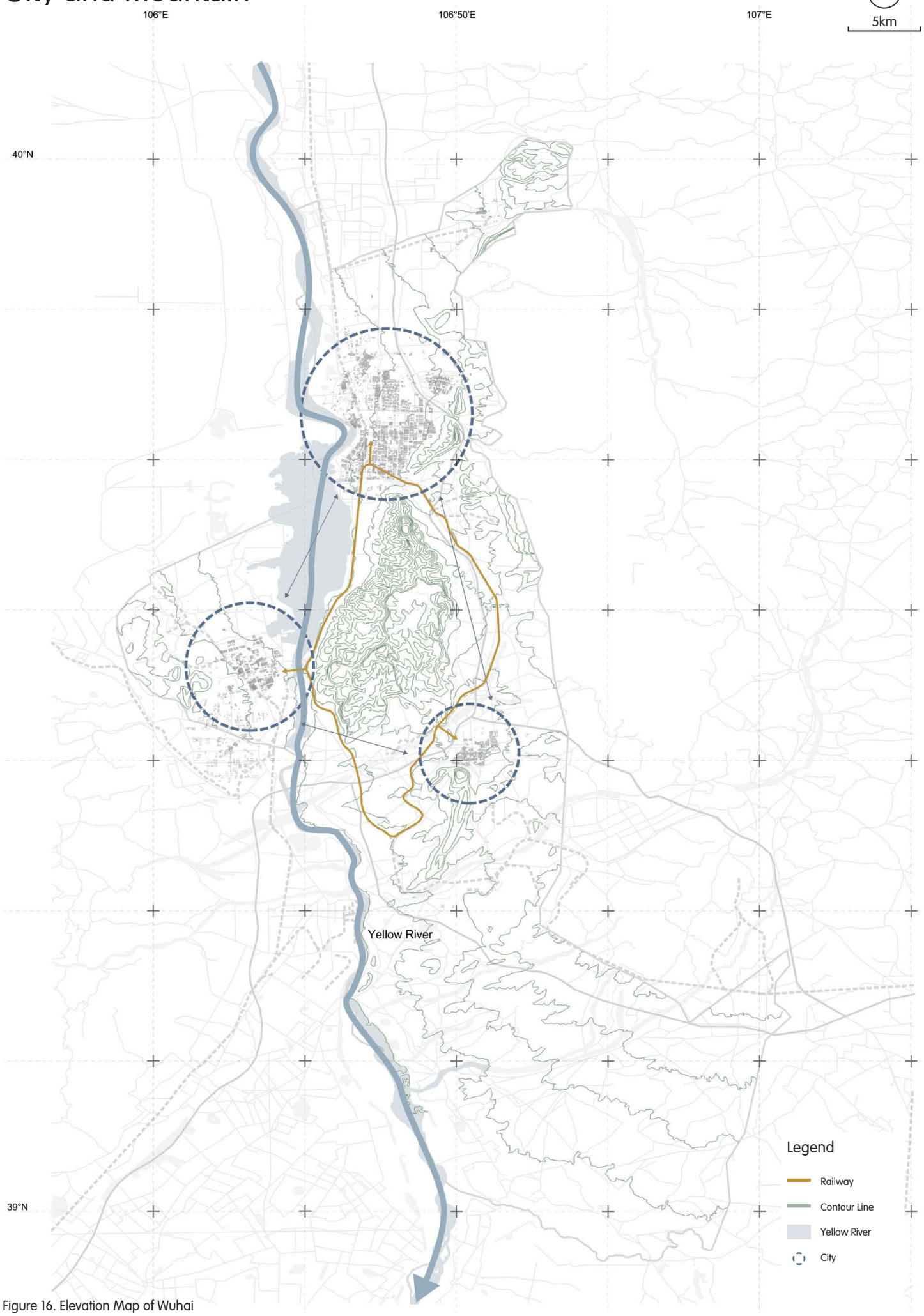


Figure 16. Elevation Map of Wuhai

Water

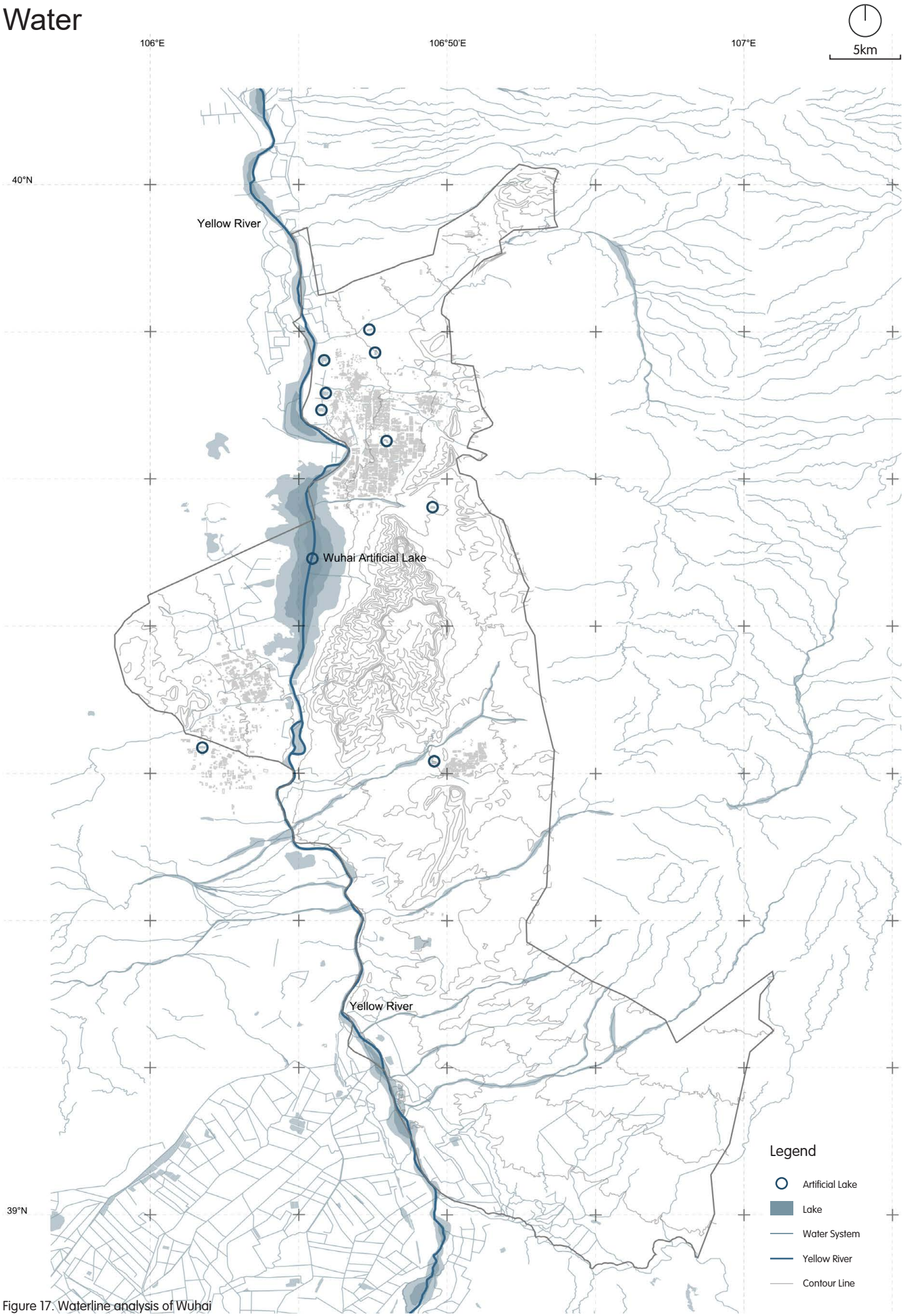


Figure 17. Waterline analysis of Wuhai

Green Space

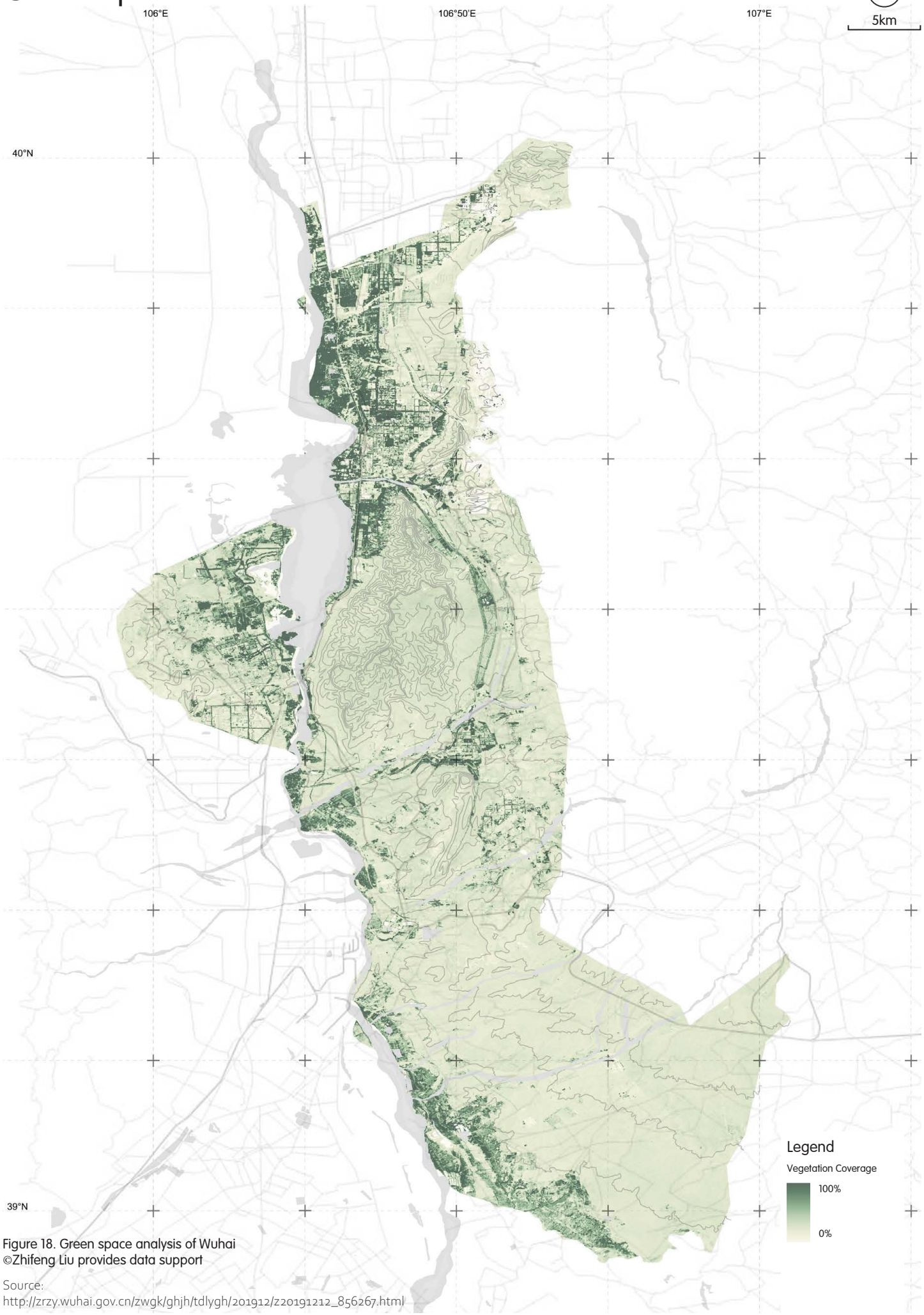


Figure 18. Green space analysis of Wuhai
©Zhifeng Liu provides data support

Source:
http://zrzy.wuhai.gov.cn/zwgk/ghjh/tdlygh/201912/z20191212_856267.html

Soil

Nearly half of the land in Wuhai cannot grow plants, and the land is severely desertified, so sandstorms often occur here.

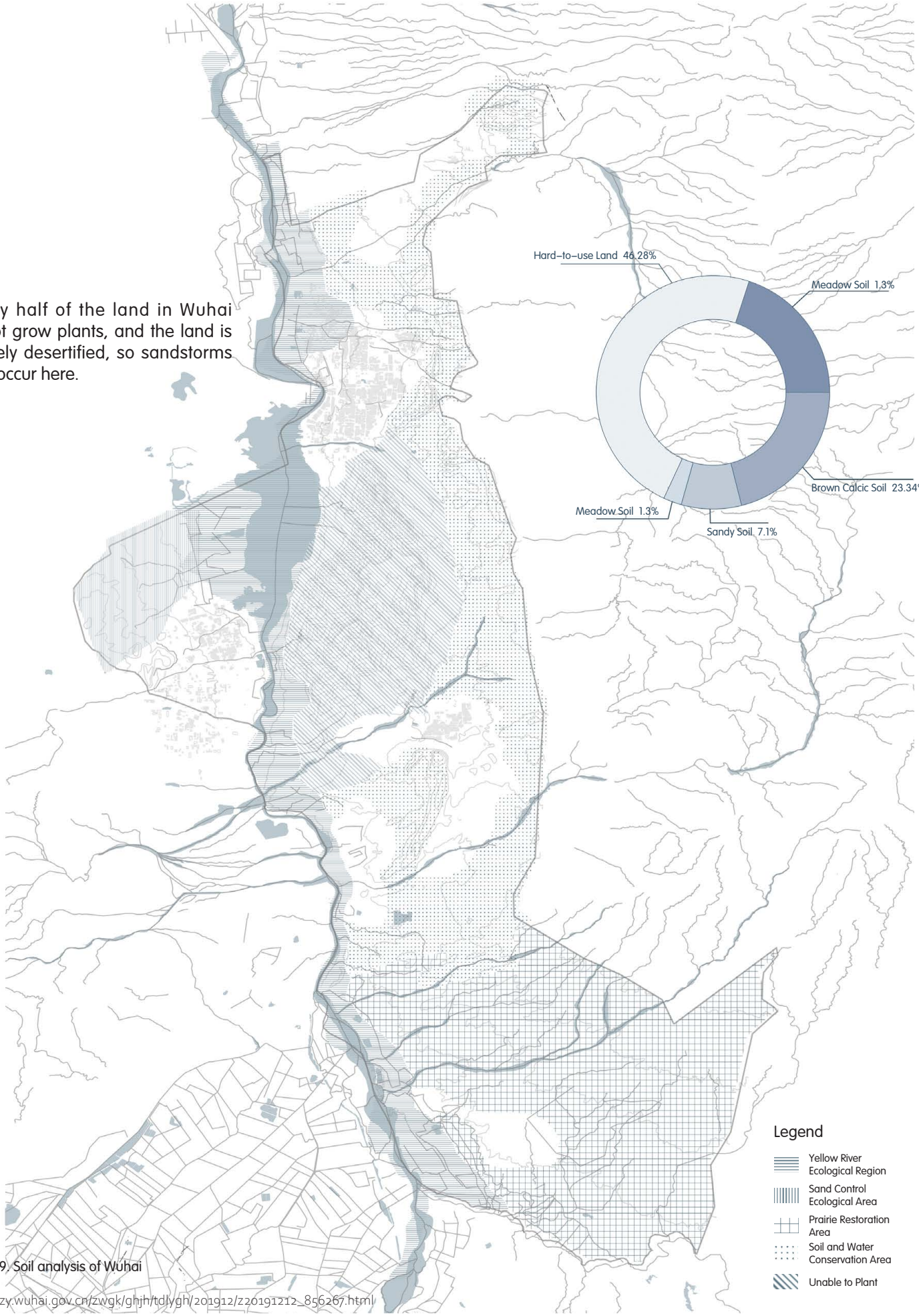


Figure 19. Soil analysis of Wuhai
Source:
http://zrzy.wuhai.gov.cn/zwgk/ghjh/tdlygh/201912/z20191212_856267.html

Road Traffic

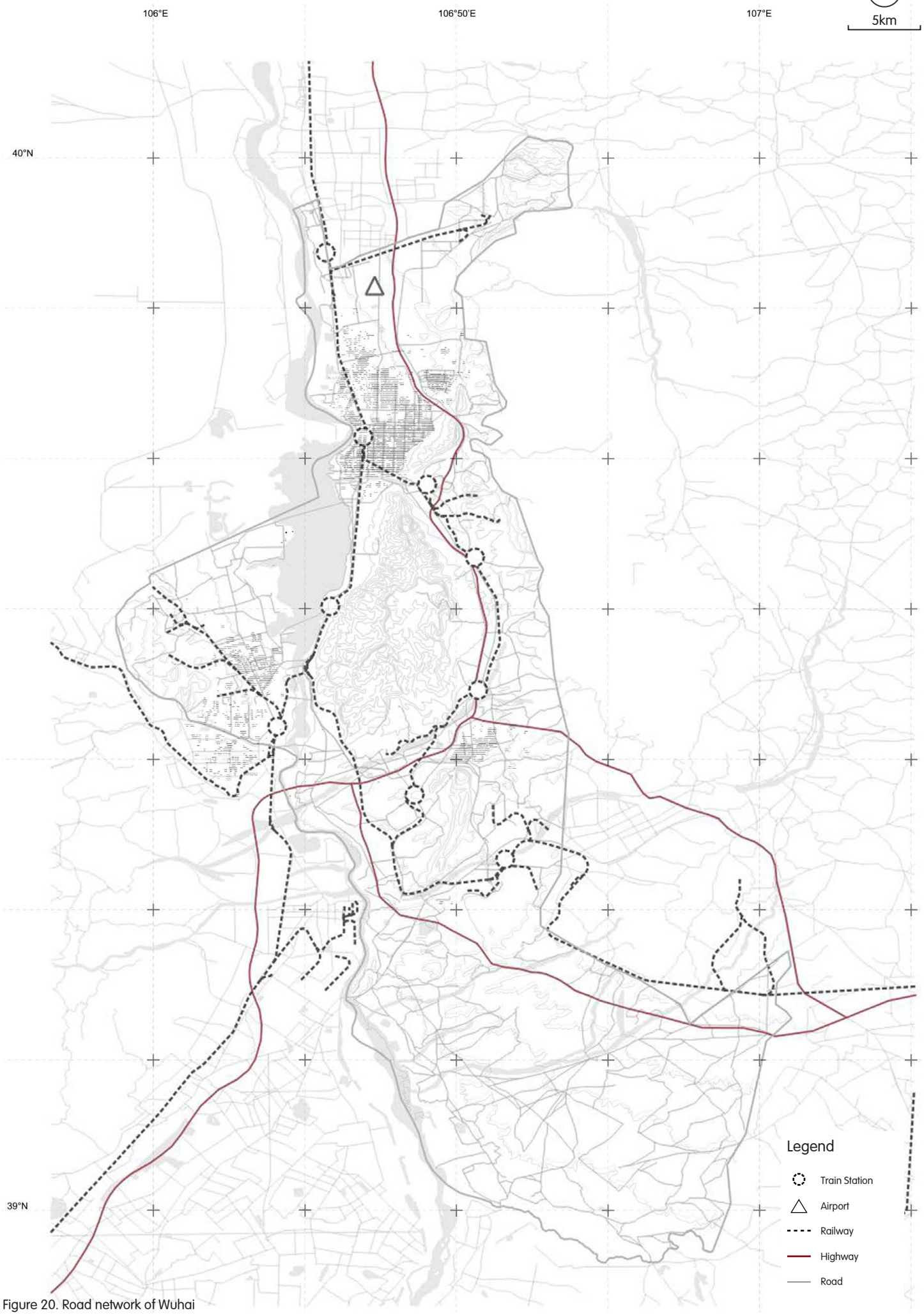


Figure 20. Road network of Wuhai

Industrial Land

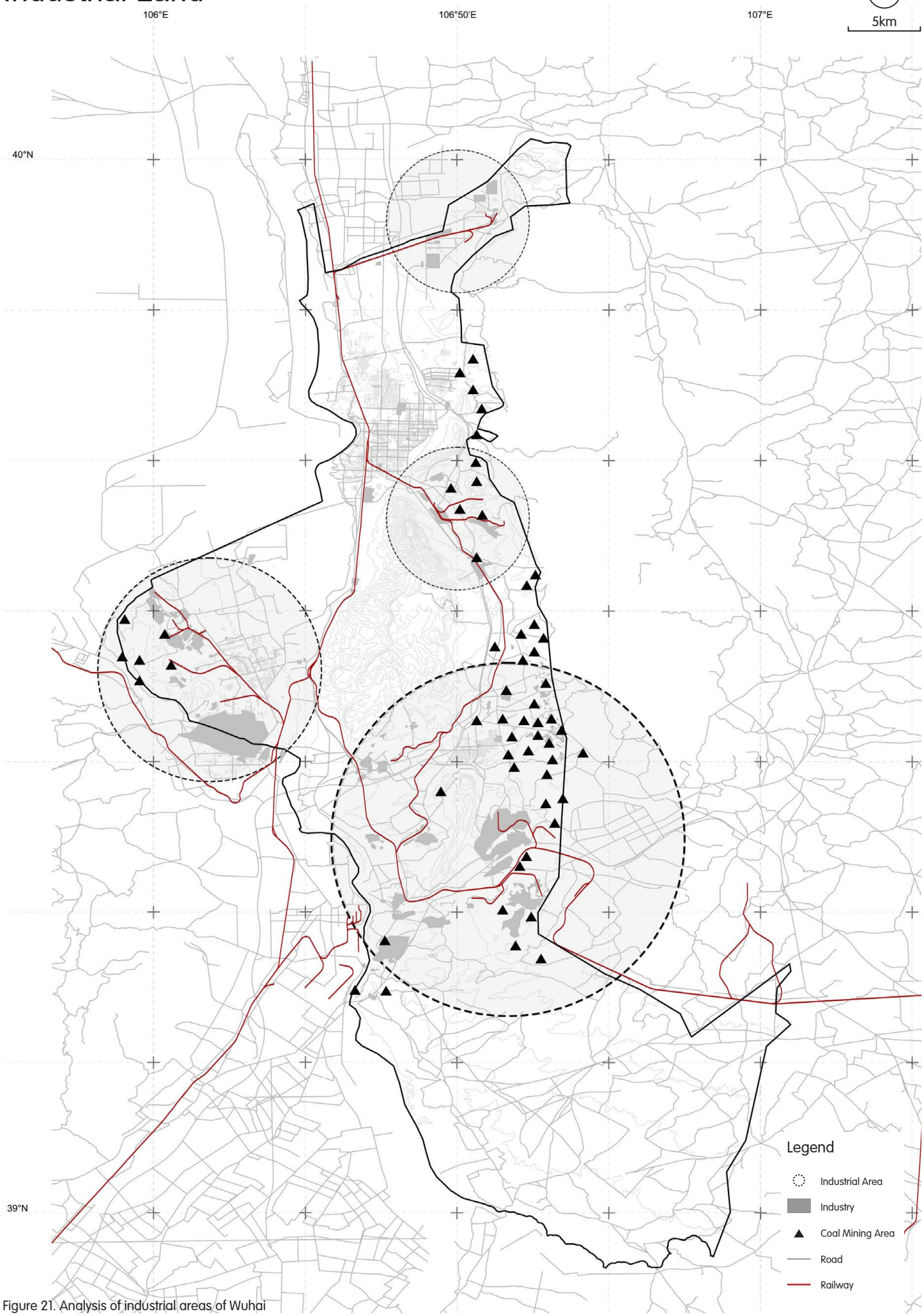


Figure 21. Analysis of industrial areas of Wuhai

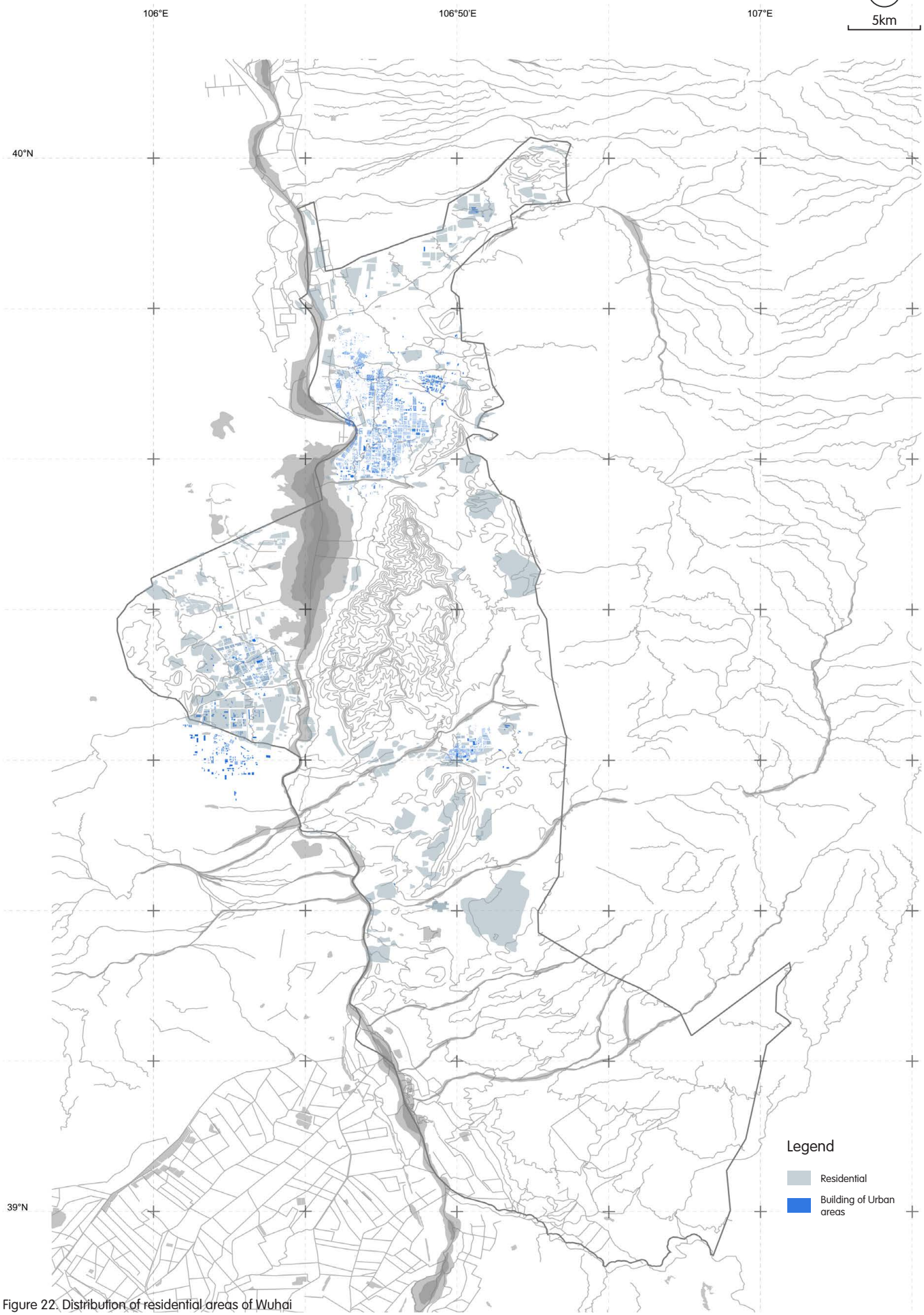


Figure 22. Distribution of residential areas of Wuhai

Crop and Livestock Species

Wuhai is rich in water, soil, light and heat resources, suitable for grape cultivation, won national awards, recommended for the Olympic Games safety and quality grapes.

The grape cultivation area has reached more than 2,000 hectares, with an annual grape production of more than 10,000 tons, an annual wine production capacity of 20,000 tons, and an annual grape production value of more than 200 million yuan. The grape industry has become a pillar industry to promote the development of the agricultural economy and increase the income of residents in the farming areas.

The grapes are available in 22 different varieties and ripen between July and September.
Figure 23. The Graps photo
http://nmj.wuhai.gov.cn/nongmyj/257815/257844/e2d620d8-1.html

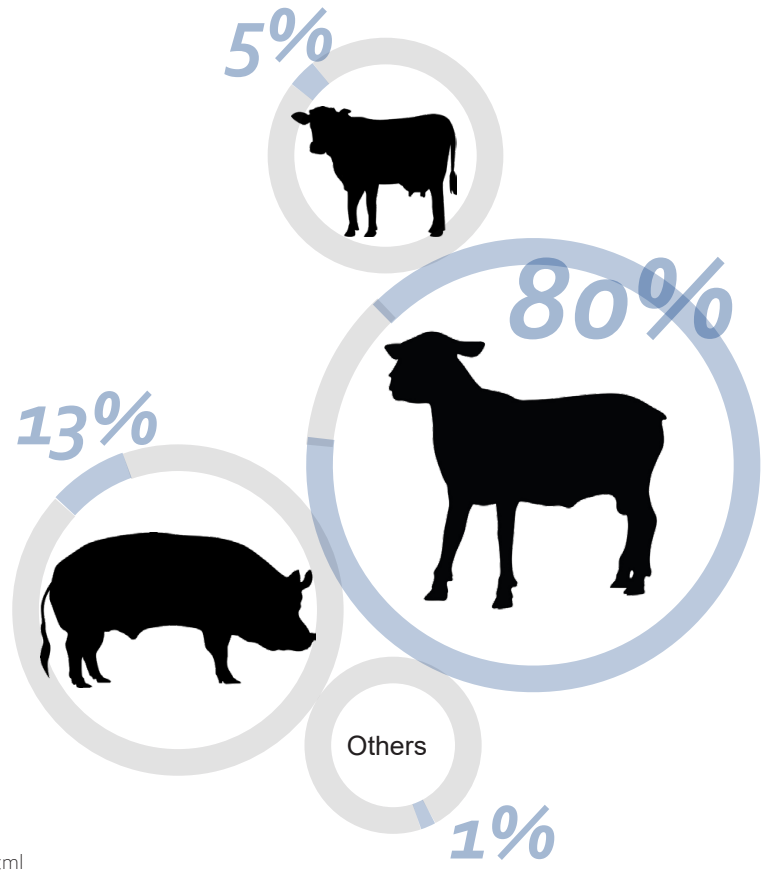
Data@2017		Units: mu	
Main crops	Rice	2,467	1,644,700 m^2
	Wheat	5,990	3,993,500 m^2
	Maize	54,877	36,584,602 m^2
	Oilseeds	5,898	3,932,000 m^2
	Chinese herbs	4,029	2,686,000 m^2
	Melons and fruits (Strawberries, watermelon, orange)	429	286,000 m^2
Other common crops	Green fodder forage		
	Celery		
	Oilseed rape		
	Pineapple		
	Cucumber		
	Peppers		
	Tomatoes		
	String beans		
	Chrysanthemum		

Data@202		Number	Total
Main livestock	Cattle	9,600	174,600
	Sheep	139,000	
	Pigs	23,400	
	Others	2,600	
	Poultry	687,600	687,600
	Total		862,200

Other common livestock: buffalo, horses, donkeys...

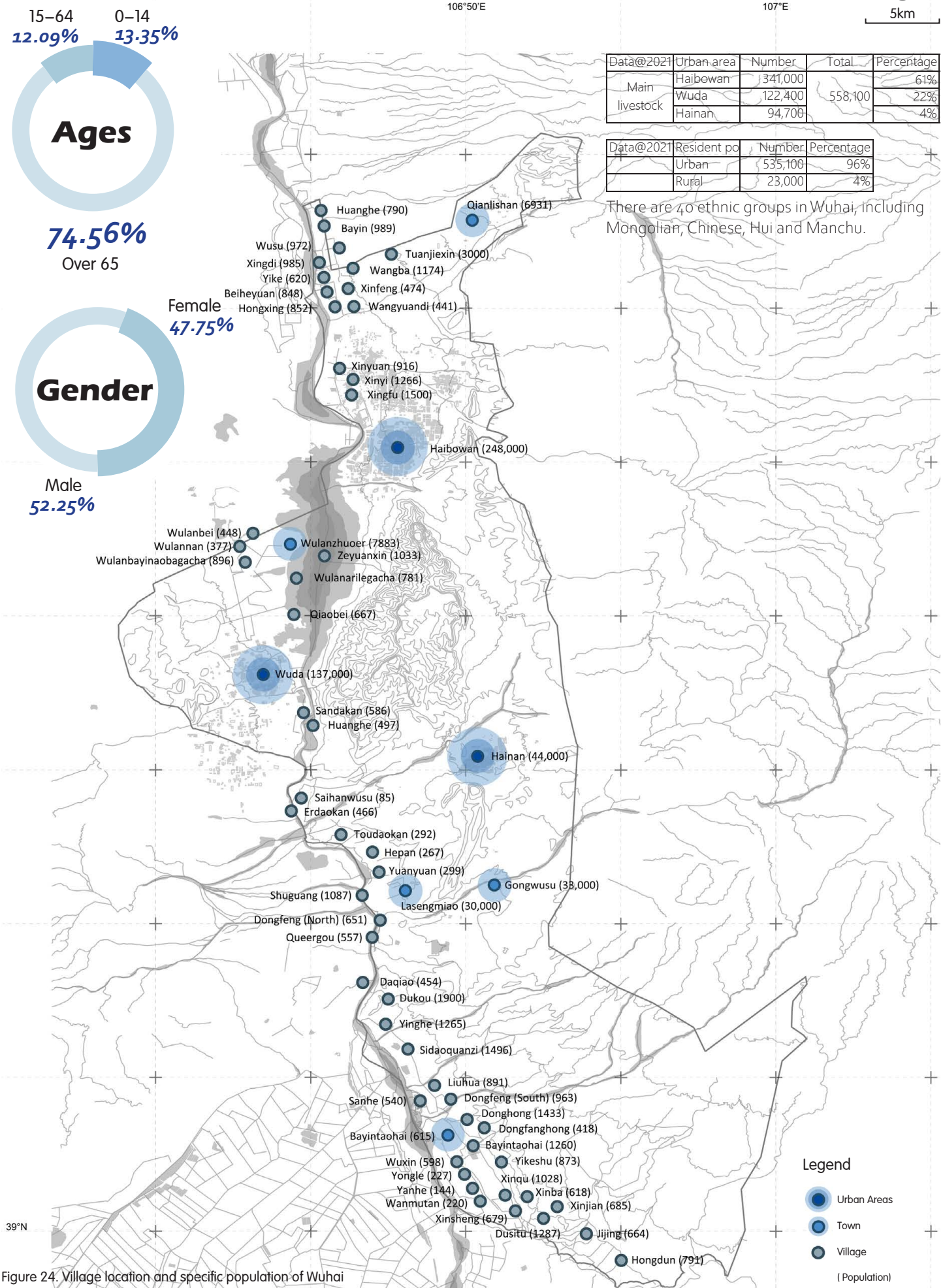
In 2021, the total output value of agriculture, forestry, animal husbandry and fishery in Wuhai was 117,964,000 yuan, from the various industries of agriculture, forestry, animal husbandry and fishery, the output value of agriculture was 485,170,000 yuan, the output value of forestry was 30,001,000 yuan, the output value of animal husbandry was 629,520,000 yuan, the output value of fishery was 7,090,000 yuan, and the output value of agriculture, forestry, animal husbandry and fishery service was 27,850,000 yuan. The upward and downward annual increases did not exceed 8%.

1€ = 7.1yuan



Sources:
http://www.wuhai.gov.cn/wuhai/whyw75/nyjs/1357885/index.html
http://www.wuhai.gov.cn/wuhai/whyw75/rdgz/349965/index.html
http://nmj.wuhai.gov.cn/nongmyj/257815/257844/e2d620d8-1.html
http://www.wuhai.gov.cn/wuhai/xxgk4/zfxxgkzl/805465/805469/1230528/index.html

Population



Data@2021	Urban area	Number	Total	Percentage
Main livestock	Haibowan	341,000	558,100	61%
	Wuda	122,400		22%
	Hainan	94,700		4%

Data@2021	Resident po	Number	Percentage
	Urban	535,100	96%
	Rural	23,000	4%

There are 40 ethnic groups in Wuhai, including Mongolian, Chinese, Hui and Manchu.

Figure 24. Village location and specific population of Wuhai

Sources:

Hu, J., F. (2019). From "Study on the Problem of Geo-Environment and Management Strategy in Wuhai Mining Area of Inner Mongolia, 2019(9)

http://www.wuhai.gov.cn/wuhai/mlwh/whgk/whrk/index.html

Culture

Mongolian Culture

Wuhai, a new industrial city built and prospered because of coal, was once famous for its coal industry. Wuhai City is rich in mineral resources, has a solid industrial foundation, and complete supporting facilities. It is an important coal coking chemical and chlor–alkali chemical production base in China.

Mongolian culture is the foundation and core part of grassland culture, and has distinct characteristics of nomadic culture. It is embodied in a series of rich and colorful cultures such as Mongolian origin culture, Shamanism and Lamaism culture, sacrificial culture, traditional Mongolian medicine therapy, traditional Mongolian etiquette, clothing, yurt culture, food, folk art and entertainment games.

Industrial Culture

Figure 25. Featured culture of Wuhai

Mongolian Calligraphy Culture

Farming culture has had an unshakable position in Chinese civilization since ancient times.
As the mother river, the Yellow River breeds the farming economy. It flows through Wuhai City and affects the eating habits and farming techniques of local residents.

Wuhai is known as the Chinese Calligraphy City, because there are many people in Wuhai who love the art of calligraphy, and the number is huge. Calligraphy culture infects everyone here, and quietly changes the temperament of the city. From children to the elderly, they have different ages and occupations, but they have the same love and dedication to calligraphy.

Farming Culture

Circulation

The average annual precipitation in Wuhai is low, with snow in winter, drought and desertification in summer, making it very easy to form extreme weather such as sandstorms. Therefore, we consider starting with water, increasing agricultural irrigation and providing more watering conditions for urban green areas by diverting water from the Yellow River, improving the utilization rate of water, conserving water and storing water in a reasonable manner, so as to build an "anti–sand fence" and ultimately achieve the beautiful vision of greening the city and improving the weather.

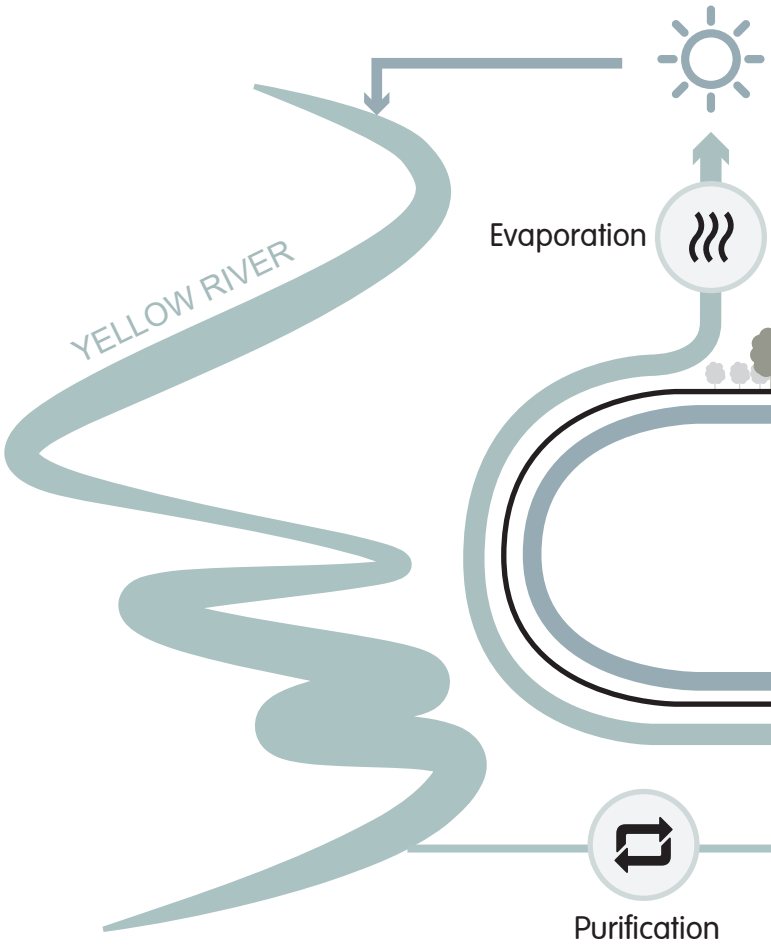
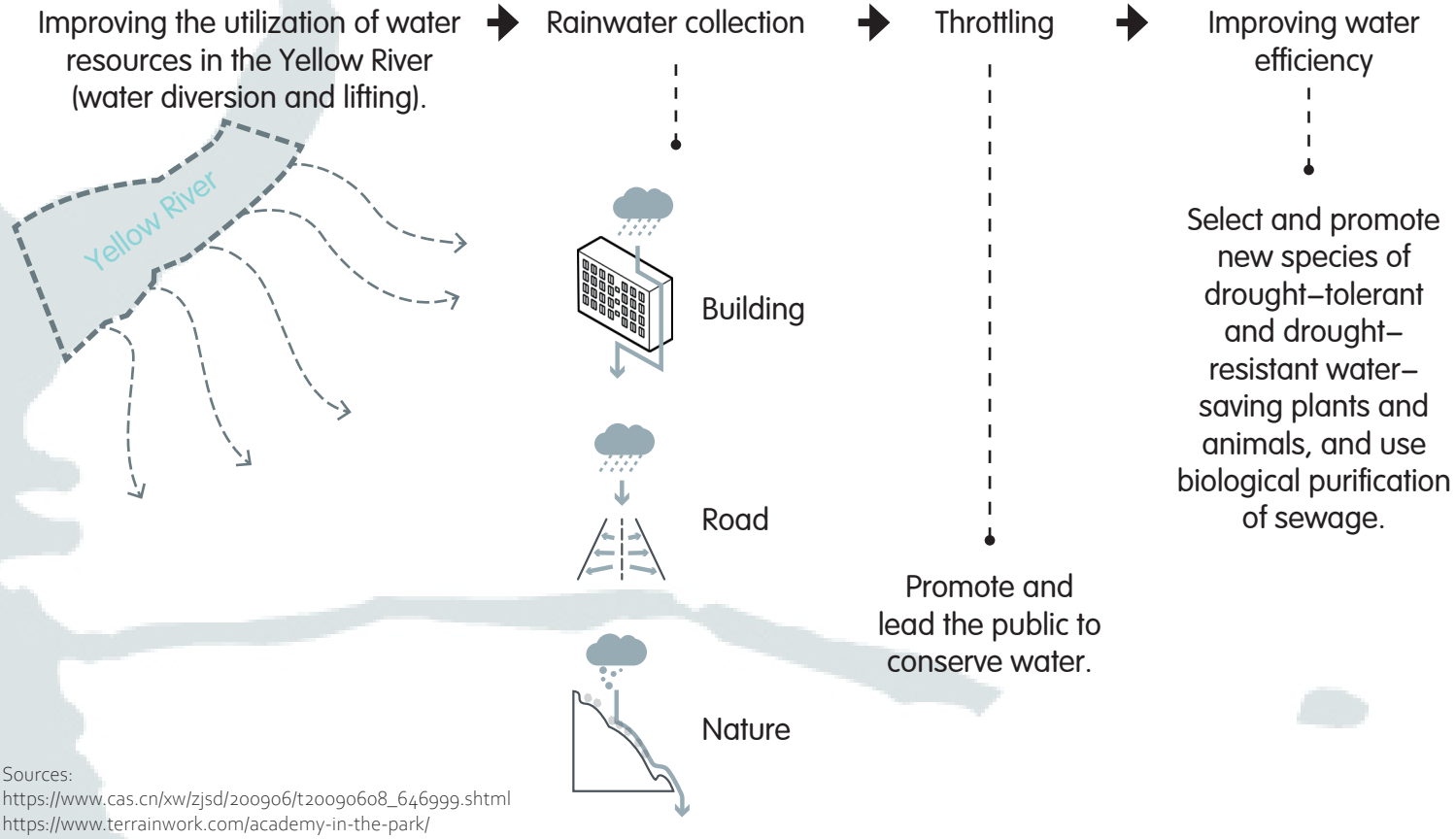
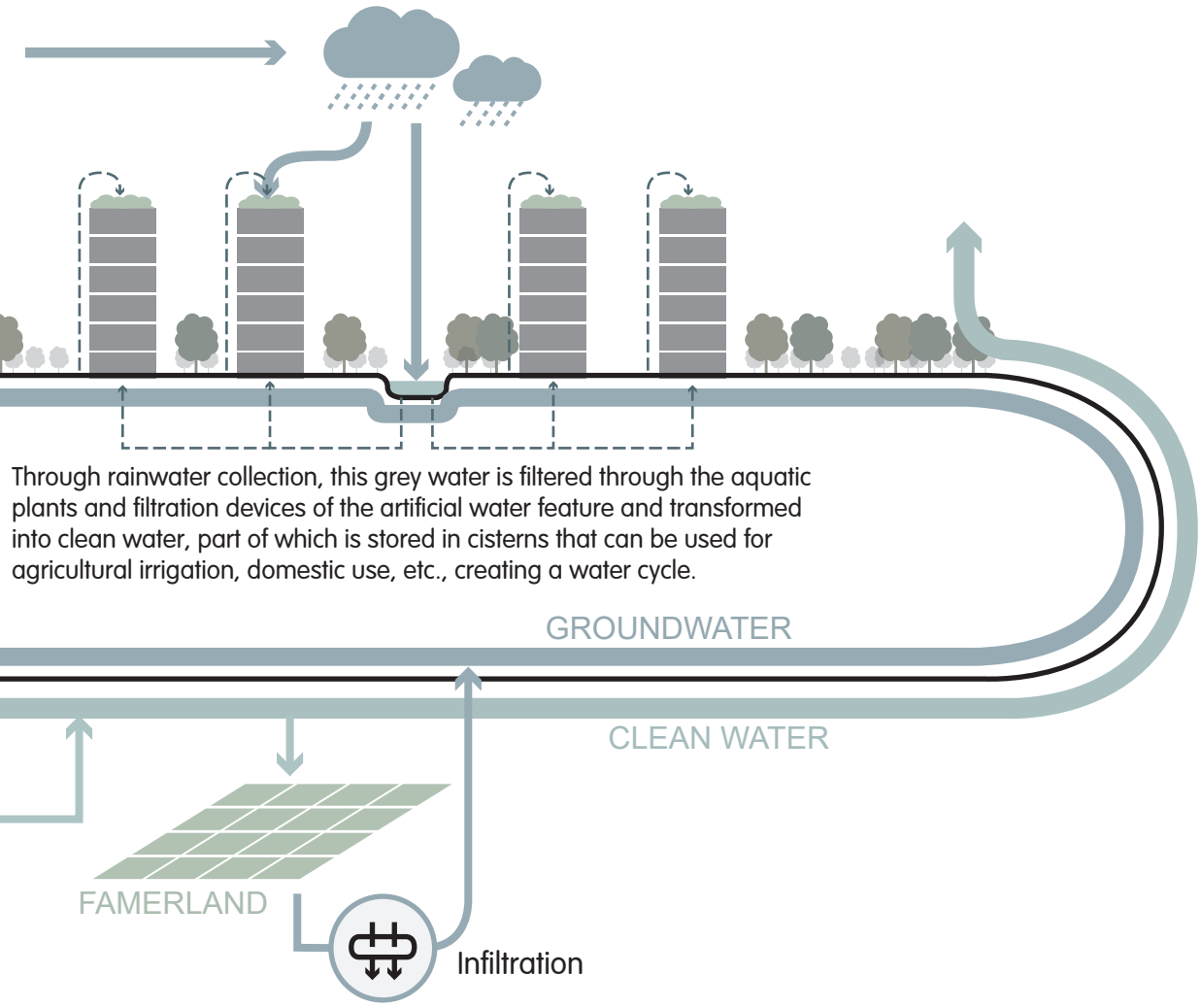


Figure 26. Diagram of the water cycle



Sources:
https://www.cas.cn/xw/zjsd/200906/t20090608_646999.shtml
https://www.terrainwork.com/academy-in-the-park/
https://specifierreview.com/2017/11/01/regeneration-plans-filton-airfield/



Through rainwater collection, this grey water is filtered through the aquatic plants and filtration devices of the artificial water feature and transformed into clean water, part of which is stored in cisterns that can be used for agricultural irrigation, domestic use, etc., creating a water cycle.

→ Improving the economic efficiency of farming → Improving the ecological environment → Less sand and dust (storms) and expansion of desertification

Drip irrigation

Membrane under drip irrigation

Figure.Drip irrigation
©Baidupedia

Rigorous filter treatment to ensure that the tube body is not blocked.

Development of small and medium–sized agricultural mechanization grain and fruit–based dryland moisture efficient use of modern agriculture.

NEXT PAGE

Use gravel, coarse sand or wood chips of different grain sizes to cover the soil surface in order to maintain soil moisture.

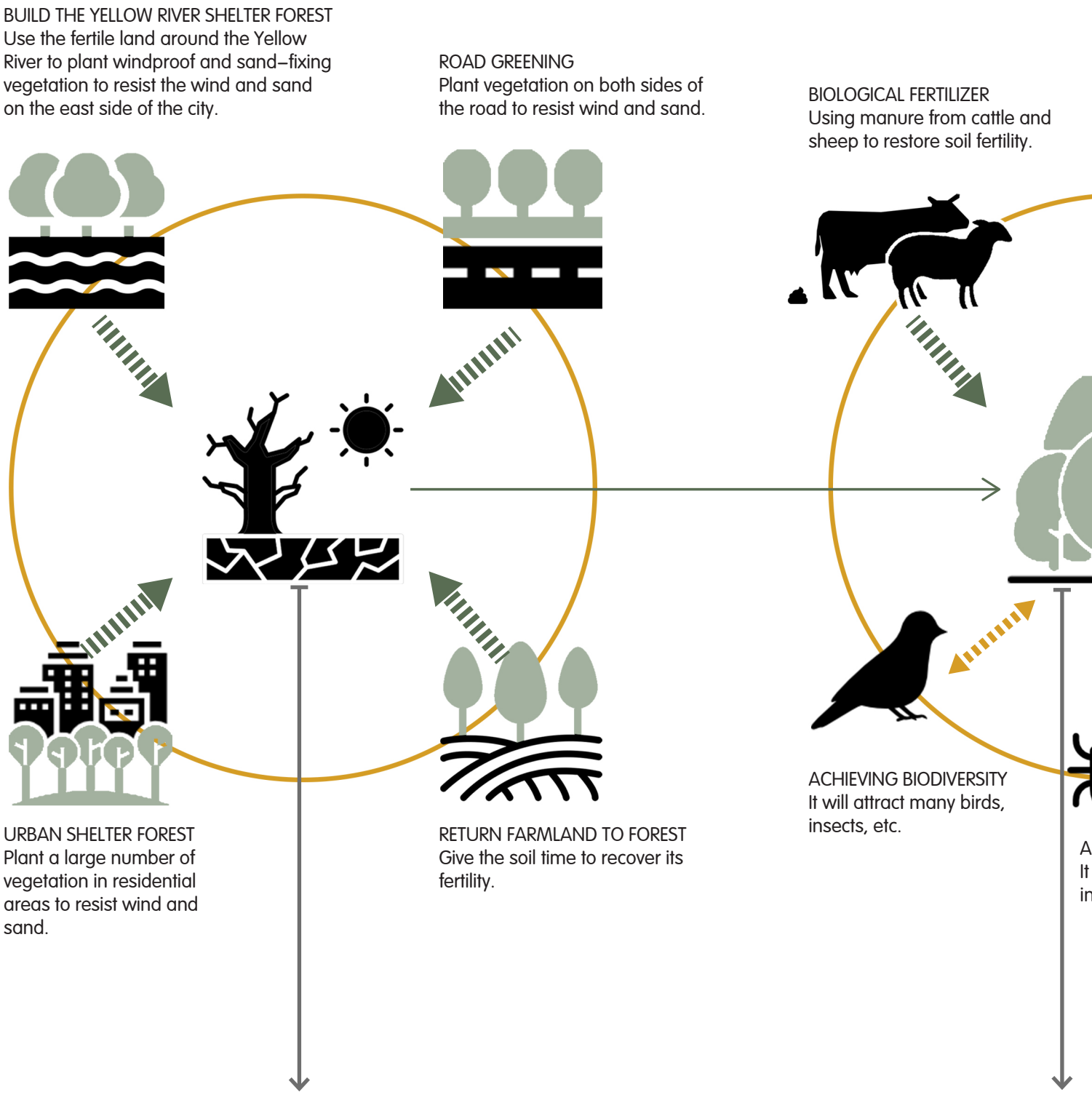
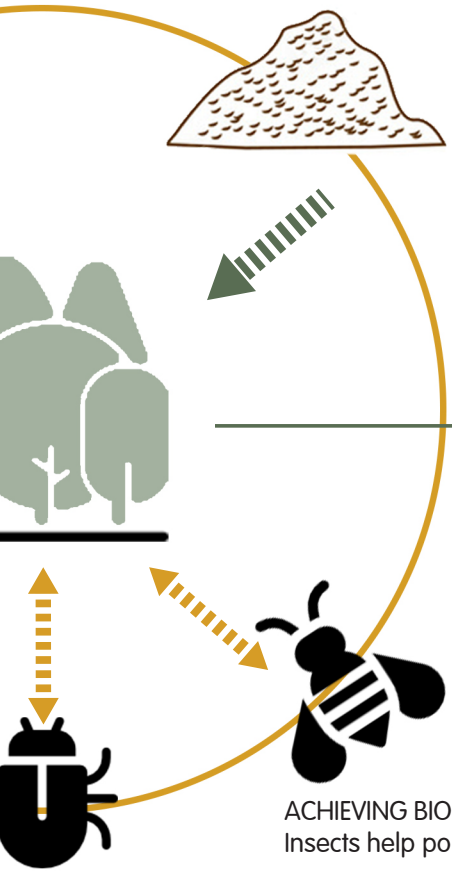


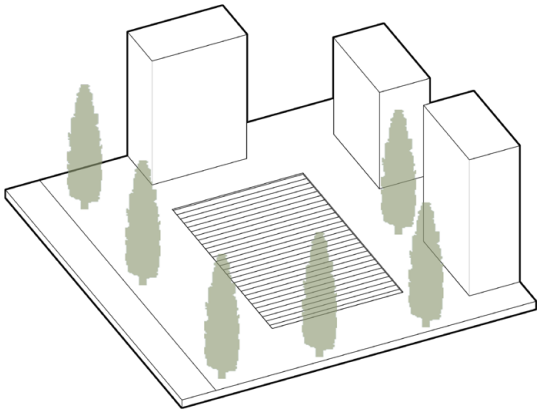
Figure 27. Diagram of the natural cycle
Source:
http://www.wuhai.gov.cn/wuhai/whyw75/rdgz/322888/index.html

SAWDUST

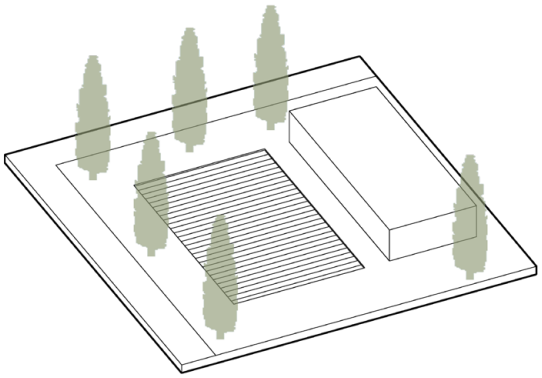


ACHIEVING BIODIVERSITY
Insects help pollinate plants.

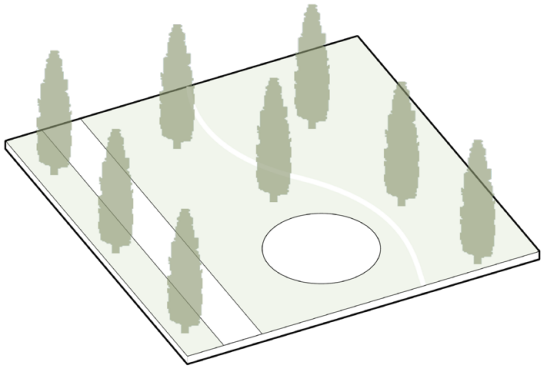
CHIEVING BIODIVERSITY
will attract many birds,
sects, etc.



COMMUNITY FARMLAND



EDUCATIONAL FARMLAND



CITY LANDSCAPE

a certain amount of fertility,
rtilizers, such as livestock
can be added in subsequent
ease its fertility. A variety of
this soil, so it will attract a lot
and help the plants pollinate.

When the soil governance is perfect, various functions can be developed in the city.

Urban Analysis

Road Traffic

The entire urban road network is orderly, and the roads divide the city into many regular grids, with convenient transportation. Train and highway are distributed on both sides of the city. However, due to the unreasonable setting of intersections on many road sections, there is no reasonable management, so many vehicles are too fast, resulting in great traffic safety hazards.

Source:
http://zrzy.wuhai.gov.cn/zwgk/ghjh/tdlygh/201912/t20191212_856169.html

Figure 28. Road traffic analysis in the Haibuwan district

Green Spaces

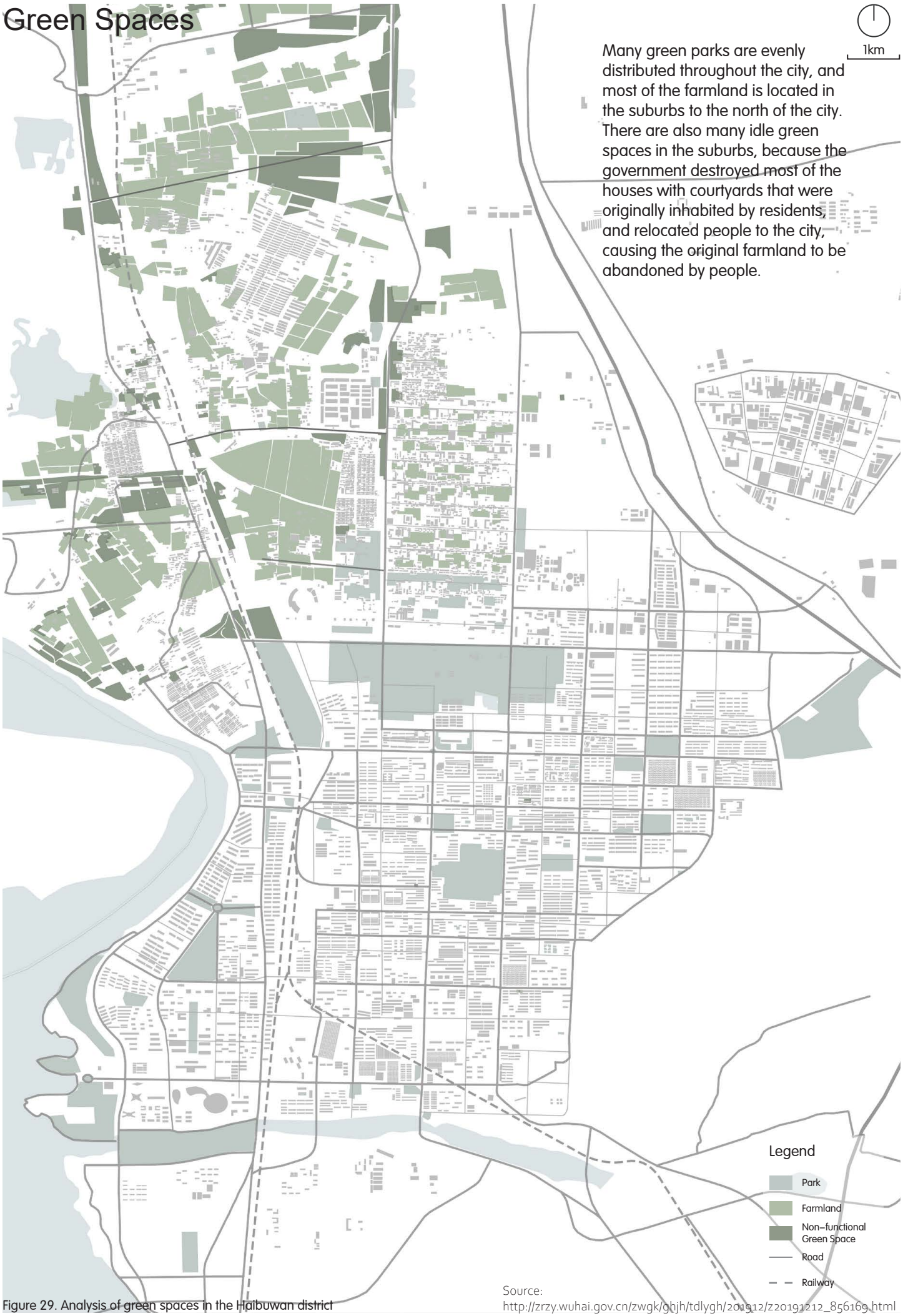


Figure 29. Analysis of green spaces in the Haibuwan district

Source: http://zrzy.wuhai.gov.cn/zwgk/ghjh/tdlygh/201912/t20191212_856169.html

Vacant Spaces

Large areas of vacant land are concentrated on the north side, with mainly fragmented vacant land to the south. Vacant sites are concentrated in the commercial area along the Yellow River, next to processing plants and residential sites to be developed. In the original municipal plan, most of this will be converted into greenfield or industrial areas.

Source:
http://zrzy.wuhai.gov.cn/zwgk/ghjh/tdlygh/201912/t20191212_856169.html

Figure 30. Vacant spaces analysis in the Haibuwan district

Industrial Land

There are still some factories located within the city, which is related to the industrial orientation of the city of Wuhai. Although the factories are not located in the centre of the city, they are surrounded by numerous residential areas and their location is still a source of environmental pollution to the people in the surrounding residential areas.

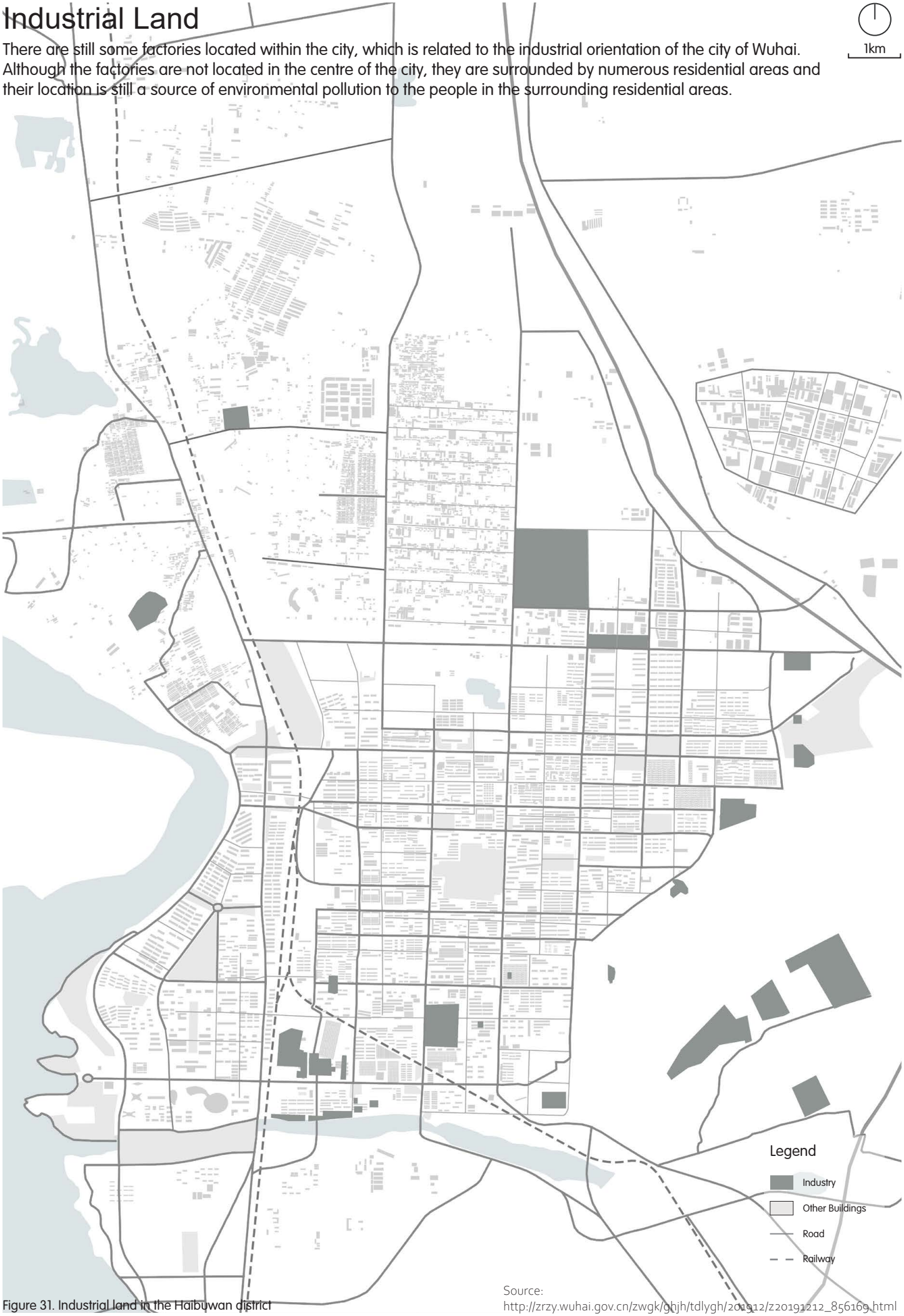
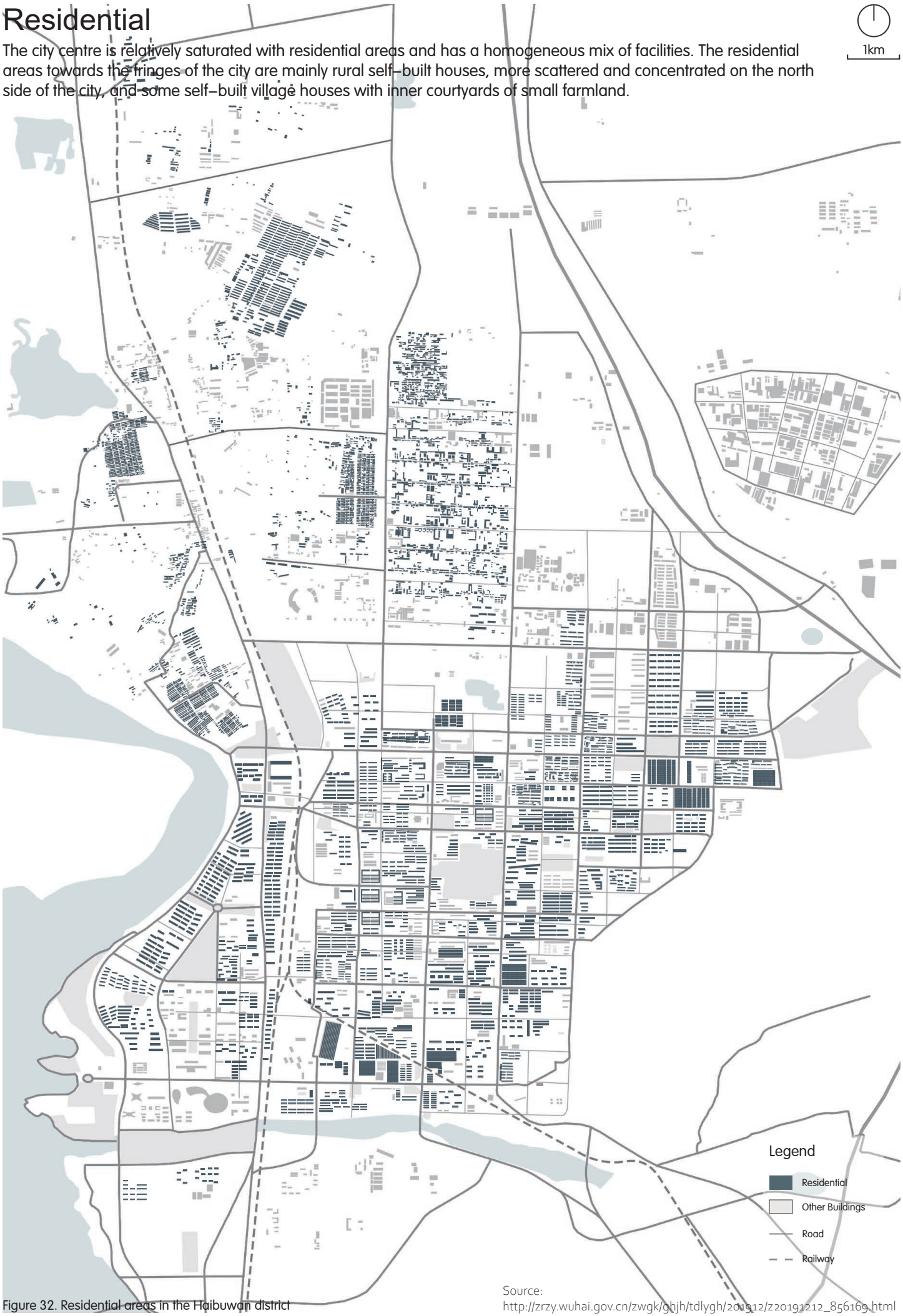


Figure 31. Industrial land in the Haibuwan district

Source:
http://zrzy.wuhai.gov.cn/zwgk/ghjh/tdlygh/201912/t20191212_856169.html

Residential

The city centre is relatively saturated with residential areas and has a homogeneous mix of facilities. The residential areas towards the fringes of the city are mainly rural self–built houses, more scattered and concentrated on the north side of the city, and some self–built village houses with inner courtyards of small farmland.



Source:
http://zrzy.wuhai.gov.cn/zwgk/ghjh/tdlygh/201912/t20191212_856169.html

Figure 32. Residential areas in the Haibuwan district

Education

The distribution of schools in the Haibowan District of Wuhai City is relatively concentrated, mainly in the central area of the city and the southern region. However, there are very few local high schools, and many students drop out of school or go to vocational high schools because they cannot attend high school, which greatly limits the level of education in the area.

Source:
http://zrzy.wuhai.gov.cn/zwgk/ghjh/tdlygh/201912/t20191212_856169.html

Figure 33. Education places in the Haibuwan district

Public Facilities

Most of the public facilities are relatively homogeneous in function and are mainly street offices. There is only one government institution with many different functions in the whole city, which is scattered and has a limited service radius. There are also relatively few supporting cultural and medical facilities, and the north side of the city is poorly developed and lacks corresponding supporting facilities.

Source:
http://zrzy.wuhai.gov.cn/zwgk/ghjh/tdlygh/201912/t20191212_856169.html

Figure 34. Public facilities in Haibuwan District

Commercial

The variety of businesses is relatively complete, but they are densely distributed and concentrated in the city centre, making life more convenient for those living in the city centre, but not for those living in the city boundaries.

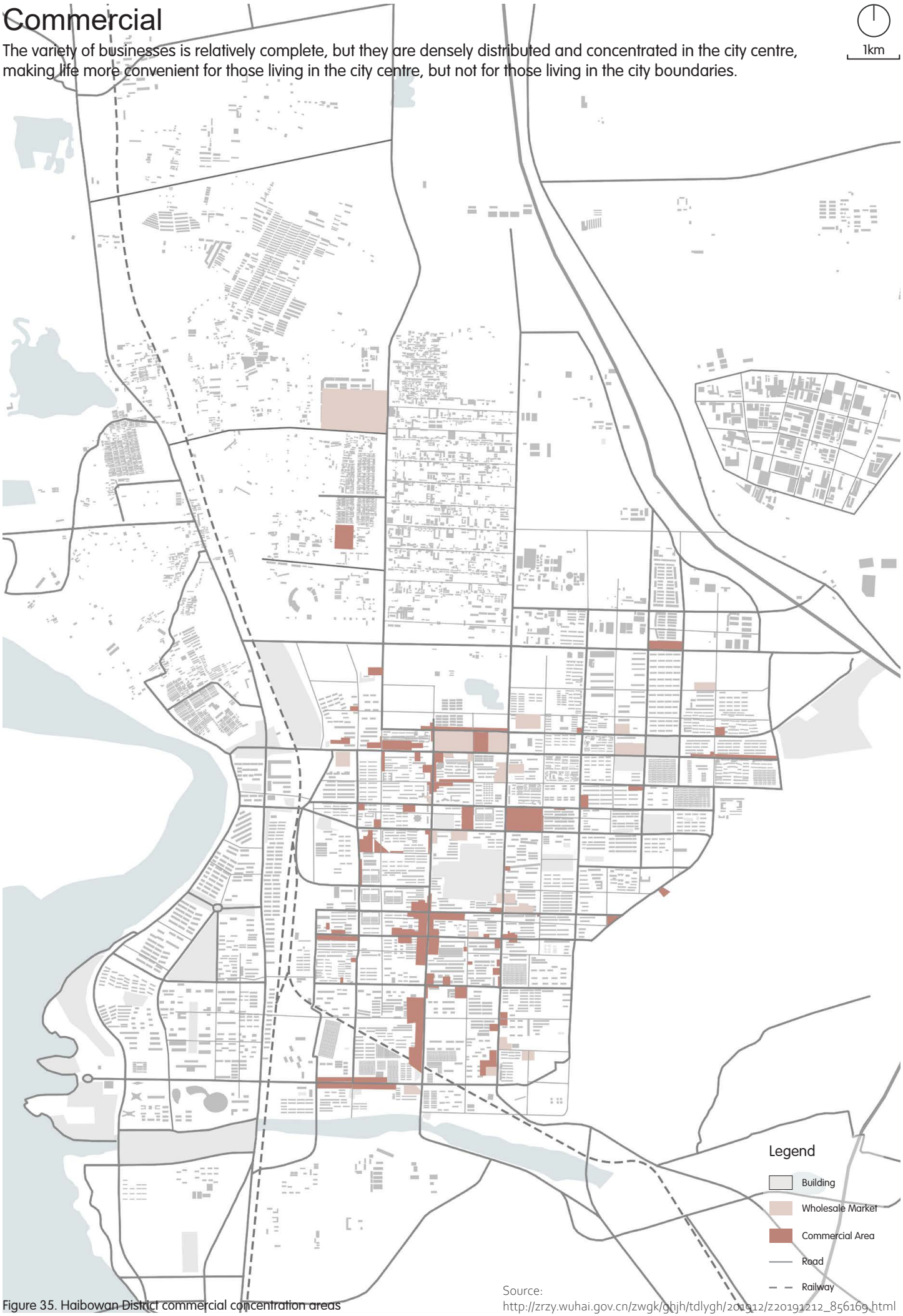


Figure 35. Haibowan District commercial concentration areas

Source:
http://zrzy.wuhai.gov.cn/zwgk/ghjh/tdlygh/201912/t20191212_856169.html

Urban Development Process

2004

There are a lot of farmland beside the Yellow River. People use the water from the Yellow River to irrigate the farmland.

The urban area is mostly courtyard housing, and there are a large number of farmland, high–rise buildings are very few, people use the Yellow River water irrigation farmland.

In the north of the city, every family has its own farm.

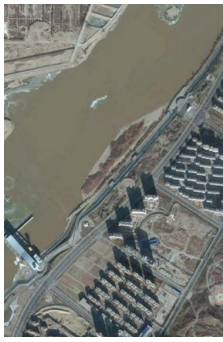
2009

Part of the farmland was demolished and buildings were built, while the rest of the farmland was turned into wasteland. The government set up green parks along the Yellow River to improve people's living quality.

Part of the courtyard house disappeared, replaced by buildings, and farmland gradually disappeared.

Every family had its own farmland and agricultural techniques were developed.

2014



The farmland is gor
is completely occup
In order to improve
government has se
parks.

Part of the courtyar
disappeared and w
buildings. The farml

Most of the suburb
moved to urban are
houses and farmlar
abandoned, some
been turned into fa

Figure 36. City fabric changes
©Google earth satellite map

2019

2022

he and the area
ied by buildings.
air quality, the
t up many green

The higher the density of the building. Greenery is also becoming more abundant.

The higher the density of the building. Greenery is also becoming more abundant.

d house
vas replaced by
land is gone.

The courtyard house disappeared and was replaced by buildings.

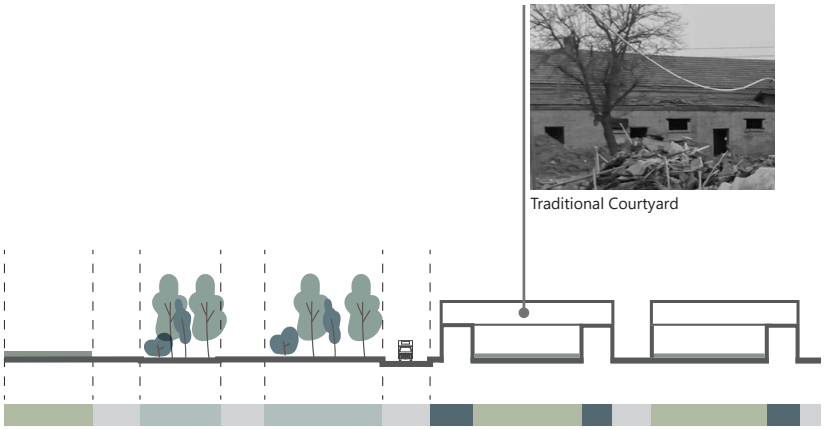
The higher the density of the building.

an population has
eas, where many
nd have been
of which have
ctories.

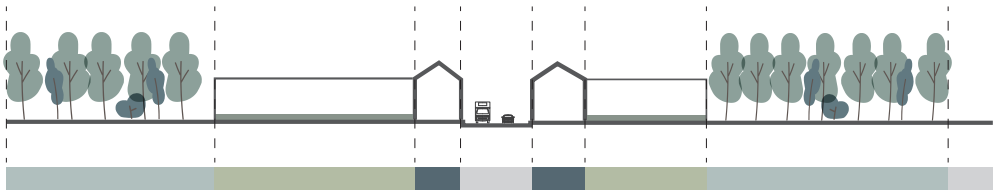
Many houses and farmland have been abandoned, some of which have been turned into factories.

Many houses and farmland have been abandoned, some of which have been turned into factories.

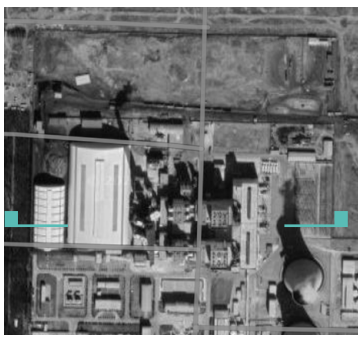
Status quo

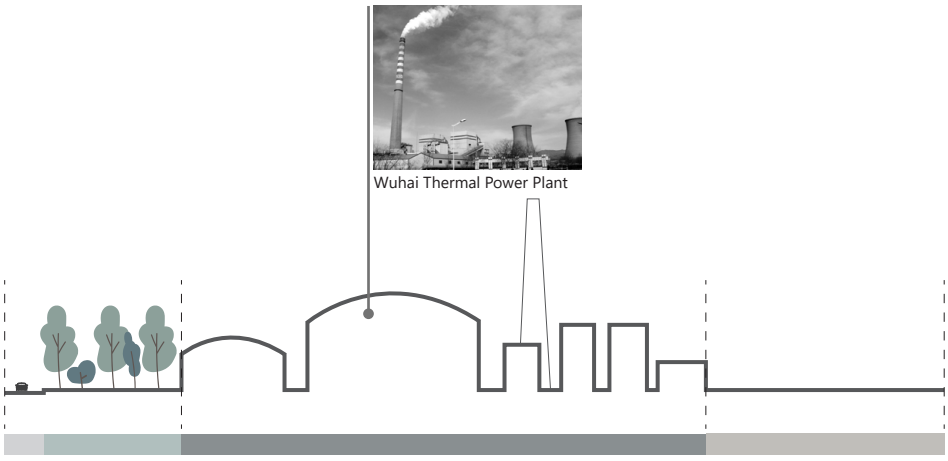


Many dwellings here are mainly courtyard houses, and next to them are farmlands belonging to the residents. Their main income is to grow crops and raise livestock. However, in recent years, due to the government's vigorous development of the countryside, some wrong policies have been put forward, causing most of the residents to lose their farmland and move to the city, and the courtyard houses here have also been demolished.



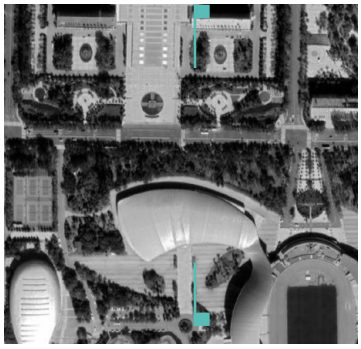
Every household has its own courtyard, where they can grow vegetables and fruits, or raise some livestock for their daily needs. However, in recent years, due to the government's vigorous development of the countryside, some wrong policies have been put forward , causing most of the residents to lose their farmland and move to the city, and the courtyards here were also demolished.

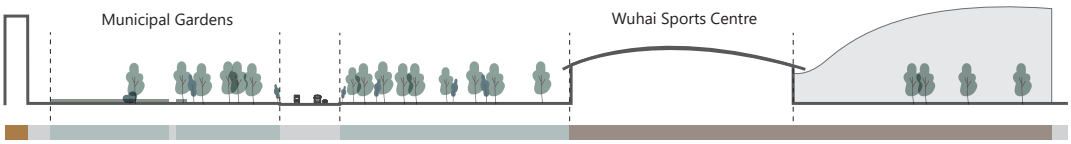




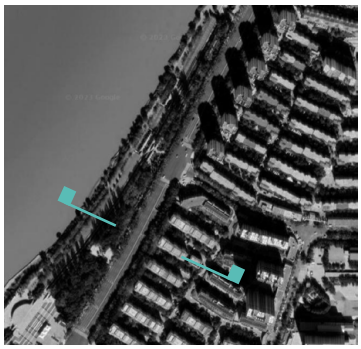
Industrial plants are mainly distributed in the suburbs, which will cause serious air pollution, but there is no greenery around to purify the air, and there are mostly abandoned open spaces around.

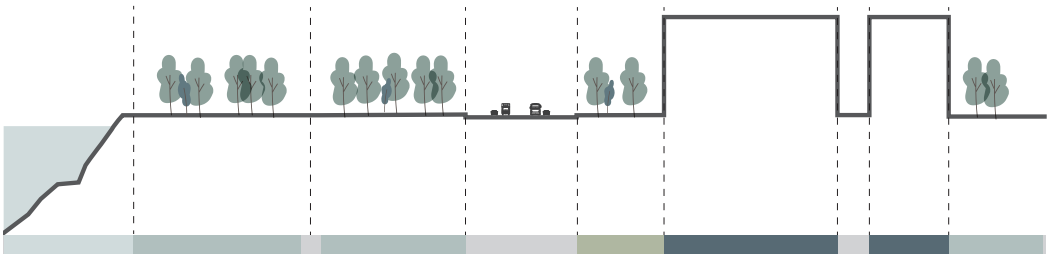
Figure 37. City pictures
©Google satellite map



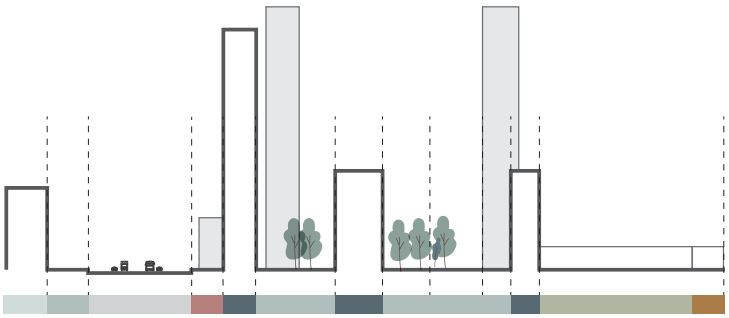


The new town has a well planned municipal area, is adjacent to the stadium and has a relatively rich green landscape.





The waterfront park is a logical over–relationship between the residential area and the Yellow River, but there is currently a lack of appropriate facilities for housing in the area close to the Yellow River.



The above analysis shows that the roads in the new city centre are generally wide. Parts of the greenery in residential areas or parks have also been converted to farmland. This also helps us to make subsequent designs.

Abandoned housing

The northern part of the city is an old town where most of the residential and commercial buildings have been abandoned, the roads are wide, deserted and poorly planned, which contributes to the loss of local people.

Sheep on top of ruins

The surrounding pastures are deserted, there is little vegetation in the city,the agricultural land is scattered, the industrial area is badly abandoned and the cables of the high voltage power lines are scattered all around the area...

Figure 38. City status quo
© Darui Tian

Special local elements

Local building materials: Tile, clay, cement, cinderblock

High voltage power lines

Local religious elements：Aobao

Figure 39. City elements photos

The roads in Wuhai New City are irregular and neat, all facing north and south. The development of the city has forced many residents to abandon courtyard houses and farmland, and the original courtyard–style residences have been replaced by buildings. Wuhai is an aging city. Most of the young people are working in other provinces, and the old people have nothing to do. So they turn the green space on both sides of the neighborhood and the street into their own private fields. Growing vegetables to pass the time has become a way of socializing for them. Way. The roads in Wuhai are wide, but the utilization rate is low. There are only a few elderly people walking on the road, and there are few vehicles. Due to the dry climate, people need to wear masks to protect themselves from roadside dust.

Figure 40. Photograph of new residential area
© Qi Liu

Status of City Garden

Figure 41. Photographs of the current state of the green space adjacent to the new residential area
© Qi Liu

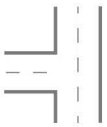
Dust storm in Wuhai on 19 April

Figure 42. Photograph of sandy city storm weather
© Darui Tian

Problems & Proposal

Few schools above high school

Lack of higher education



Vehicle road width is unreasonable

Not pedestrian friendly

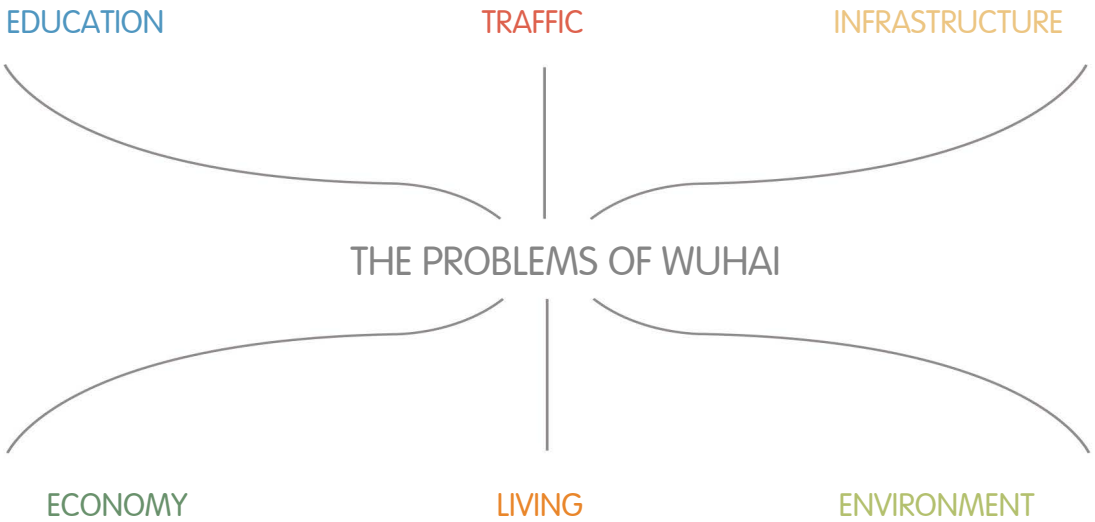
Improper setting of traffic intersections

Concentrated commercial land, short service radius

Limited medical level

Few public service facilities

Few young people

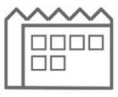


Fragmented abandoned industrial land

High density housing

Residents without space for activities

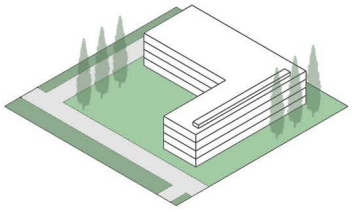
Suburban green space is vacant



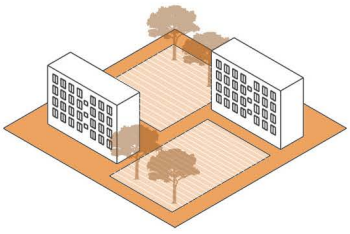
The factories in the city are polluted

The green belt is used by citizens to grow vegetables

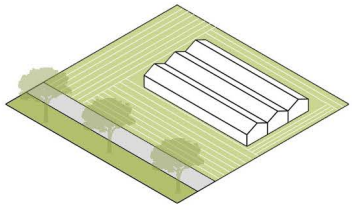
RENOVATION OF ABANDONED FACTORY



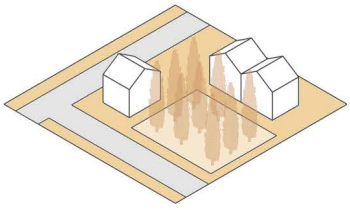
COMMUNITY FARMING



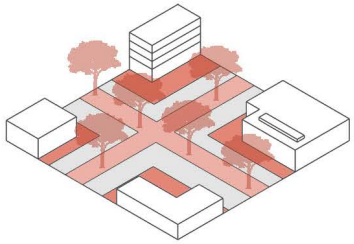
SUBURBAN AND URBAN AGRICULTURAL LANDSCAPES



INFRASTRUCTURE



SHARED STREET



AGRICULTURAL EDUCATION BASE

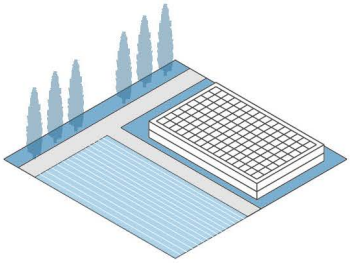
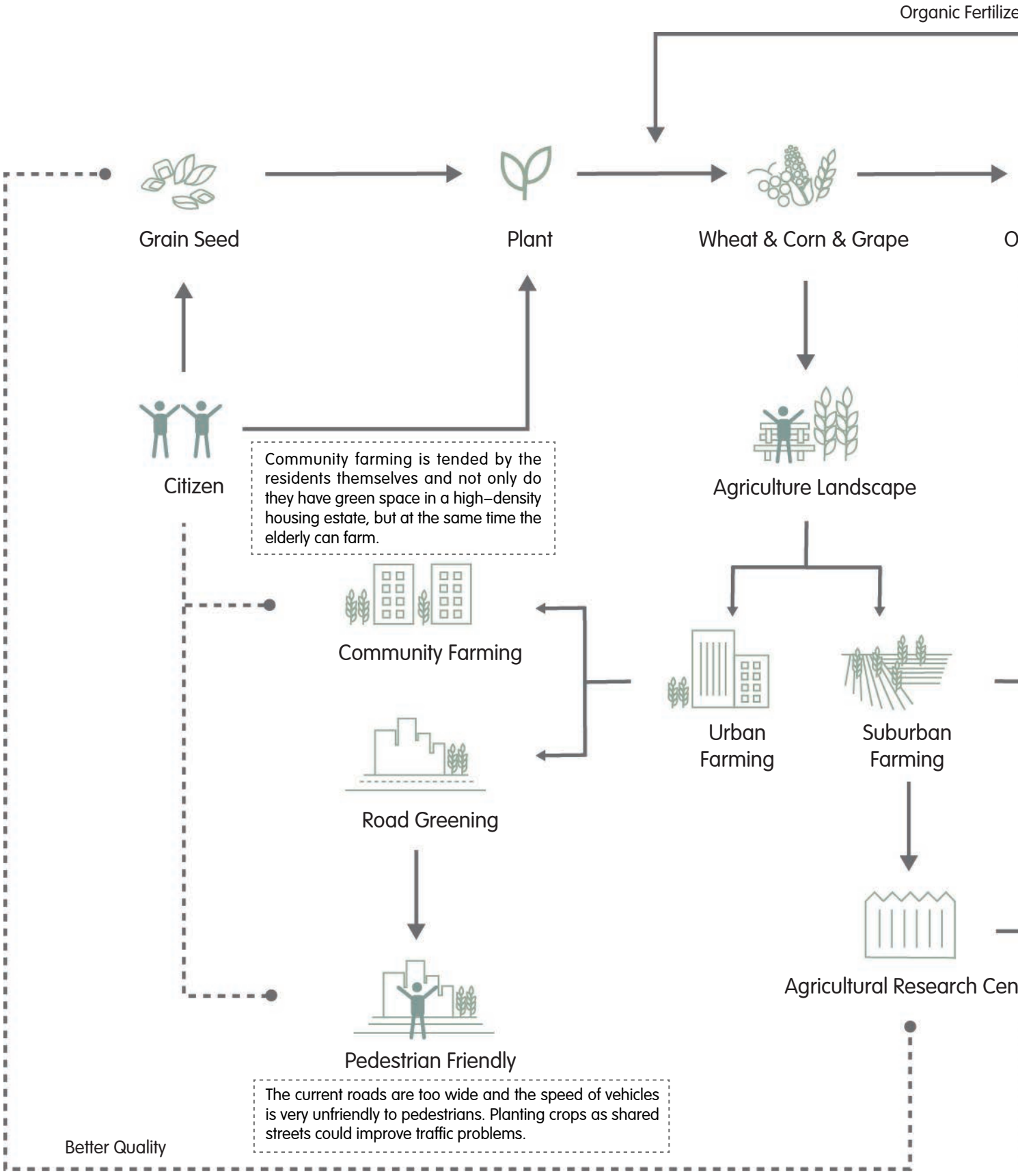


Figure 43. Strategies


Organic Fertilize
Grain Seed
Plant
Wheat & Corn & Grape
Citizen
Community farming is tended by the residents themselves and not only do they have green space in a high–density housing estate, but at the same time the elderly can farm.
Agriculture Landscape
Community Farming
Urban Farming
Suburban Farming
Road Greening
Agricultural Research Cen
Pedestrian Friendly
The current roads are too wide and the speed of vehicles is very unfriendly to pedestrians. Planting crops as shared streets could improve traffic problems.
Better Quality

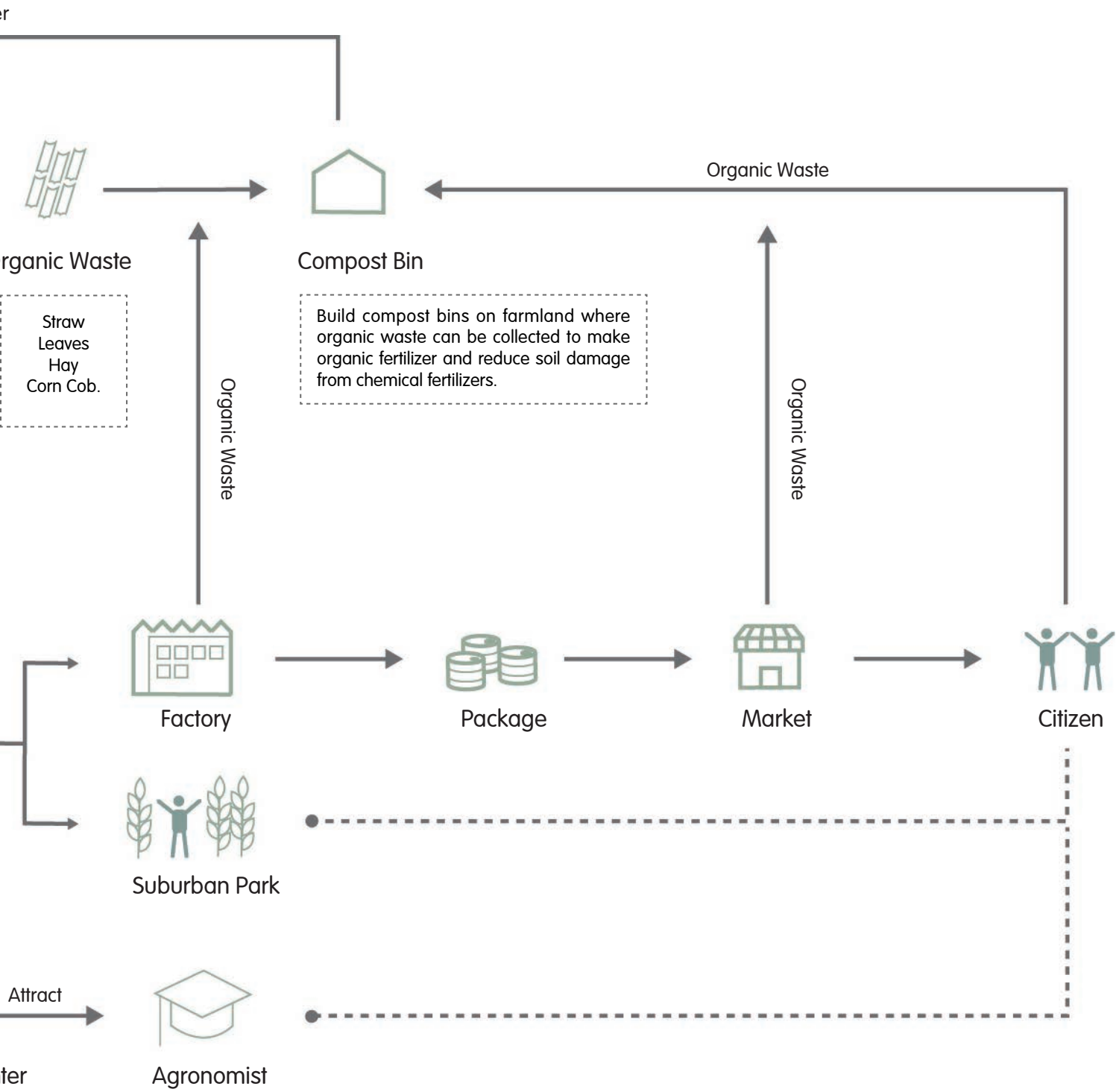


Figure 44. Strategic flowchart

Wild Innovation: Stoss In Detroit

Designer: Jill Desimini

Location: Detroit, America

Design Time: 2013

Project Classify: Urban Design

Detroit is expansive. The culturally significant eight mile road is just that, a survey baseline 8 miles from the river’s edge, marking the boundary line between city and adjacent suburbs and towns. The city itself is 143 square miles in area (approximately 370 square kilometers), large enough to fit all of Manhattan, Boston and San Francisco within its boundaries. Area is a challenge in Detroit, but even more so, vacant area is a challenge. Of the 143 square miles, twenty percent or 28 square miles registers as vacant, and thirty percent or 41.5 square miles is contained within the right–of–way. Detroit is a city whose fabric is dominated by detached houses and free–standing buildings, making demolition possible and prevalent. While the vacancy is concentrated in some areas, the overall pattern is unplanned, perforated and varied.

The voids range in scales, formats, morphologies, locations, past uses, toxicity, perception, land cover, all resulting in differing suitability for new uses. When left relatively untouched, ecological succession occurs on vacant lands, providing measurable and valued ecosystem services. Yet, these abandoned swaths, admirable for their reproductive and sustainable tendencies, [1] underperform culturally and socio–economically. It makes sense to conserve some land for unhindered ecological transformation and research, but given the varied conditions and the active populations, this cannot be the only solution. Detroit will not be left to gradual re–forestation.

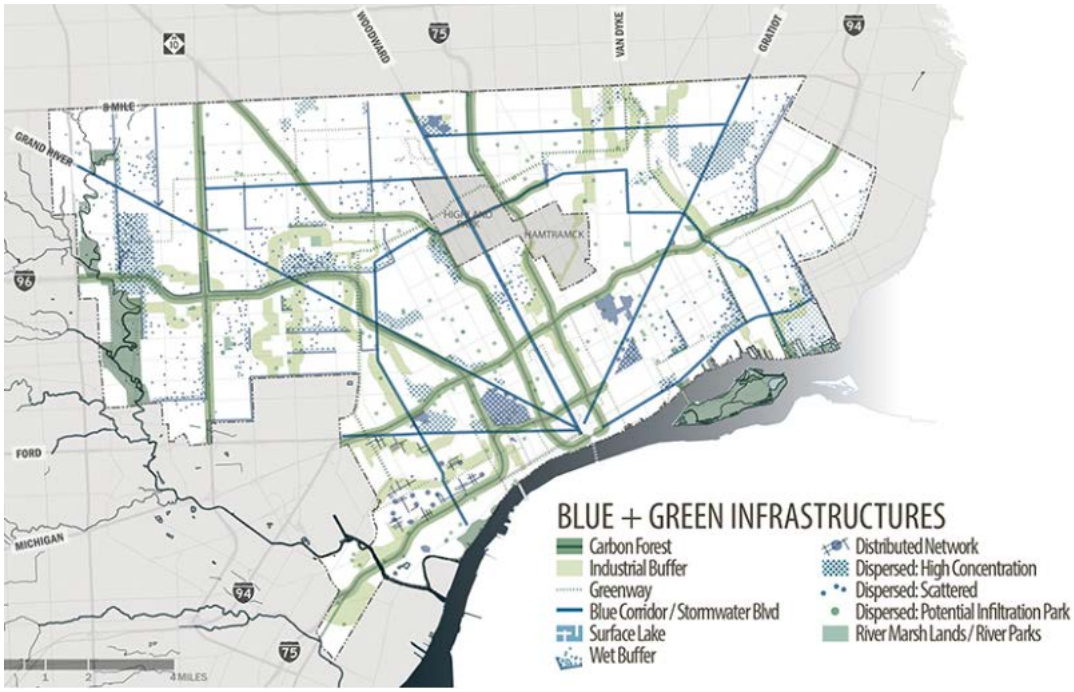


Figure 45. Hybrid network
© Stoss Landscape Urbanism
Sources:https://scenariojournal.com/article/wild–innovation/

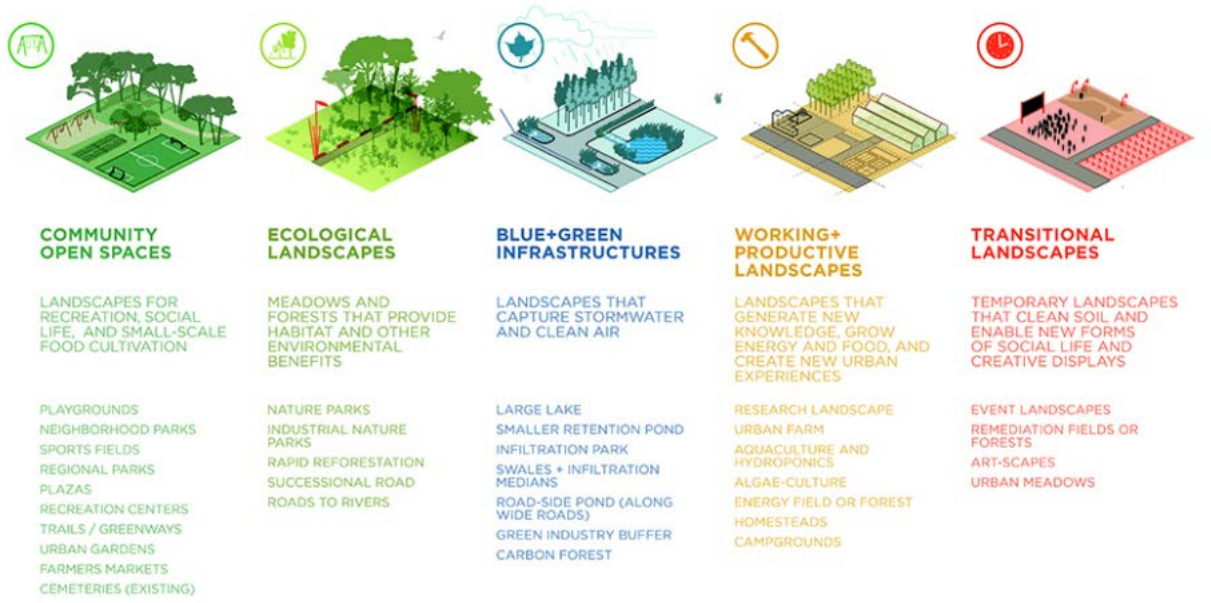


Figure 46. Development categories
© Stoss Landscape Urbanism

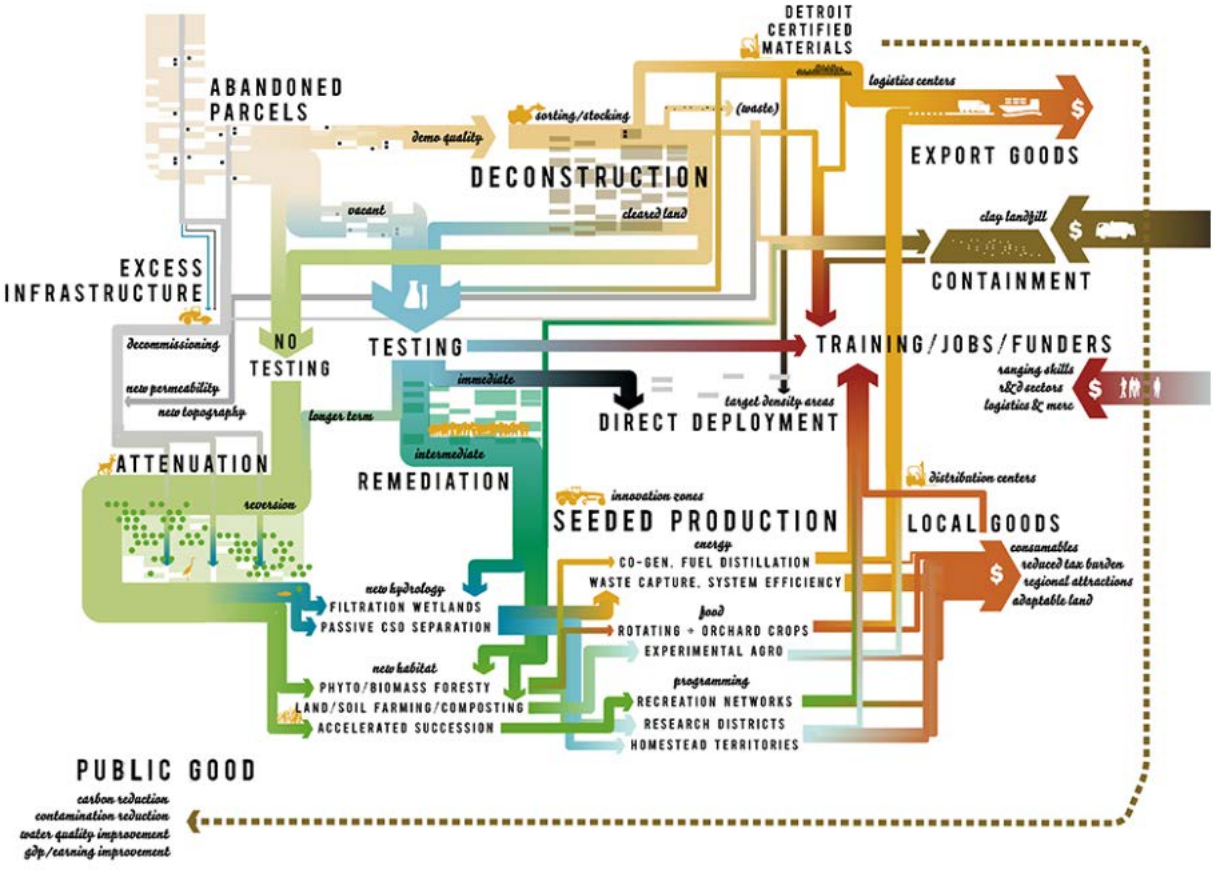


Figure 47. Initial inputs and outputs diagram
© Stoss Landscape Urbanism

Sources:https://scenariojournal.com/article/wild–innovation/

Through a series of land use strategies that can be reproduced, this project focuses on Detroit's vast wasteland, so that the city must face serious environmental problems. Two main strategies are used: blue structure and green structure. The blue structure can store and purify rainwater, and the green structure mainly increases the tree cover area. The urban problems of Detroit and Wuhai are very similar, so we hope to create three structural systems in Wuhai: blue network, green network, and yellow network, respectively referring to water sources, green plants, and public facilities.

Songzhuang Arts and Agriculture City

Designer: Sasaki

Location: Beijing, China

Design Time: Completed July 2012

Project Classify: Landscape Design

Size: 4,000 hectares

As contemporary cities grow, a common issue around the world is how to repurpose agricultural land and resources for urban development. With social, economic, and ecological implications, this topic is an even greater concern in China as cities rapidly expand due to the growth of the country's already enormous population. A significant shift in how we think about the relationship between cities and farms is long overdue. Sasaki's master plan for Songzhuang offers a revolutionary vision for how urbanity and agriculture can be integrated to enhance the relationship between people and the land, creating new economic opportunities.

Conventional development patterns dictate that agriculture is located at the periphery of the city. Located on the outskirts of Beijing, Songzhuang's distance from Beijing's urban core allows for the formation of a new paradigm of development where traditional relationships of city, open space, and farmland are reconfigured. The master plan for Songzhuang envisions a series of self–sustaining communities that are designed to encourage creative pursuits, offer a high quality of living, and integrate with larger regional open space and hydrological systems. Sasaki's plan inverts the traditional pattern. Development forms the periphery of the city and the farmlands within allow for a diversity of edge conditions that foster interaction with the urban fabric. This strategy creates a balance of development and open space that ultimately facilitates a higher quality of life through self–sustenance and new economic opportunities based on research and the scientific advancement of agricultural products and processes.

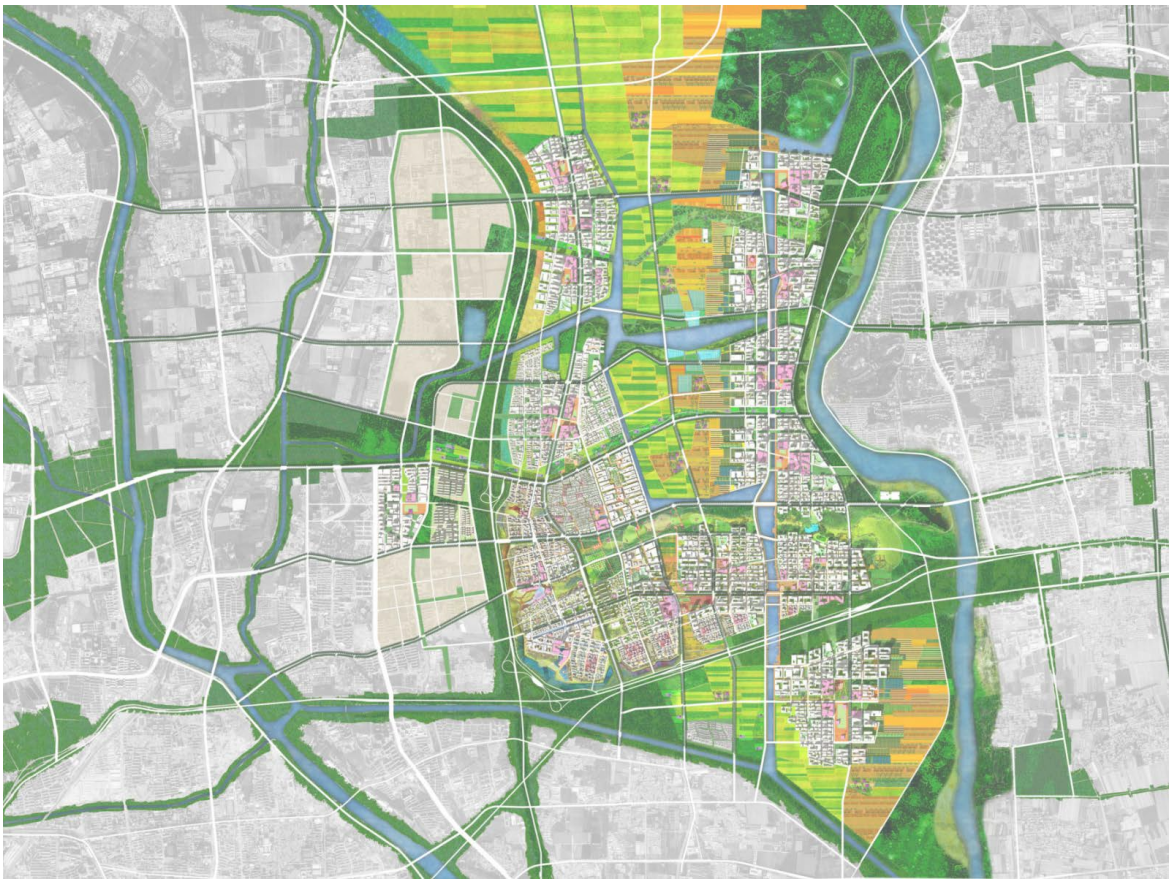


Figure 48. Songzhuang master plan
Sources:https://www.sasaki.com/projects/songzhuang-arts-and-agriculture-city/

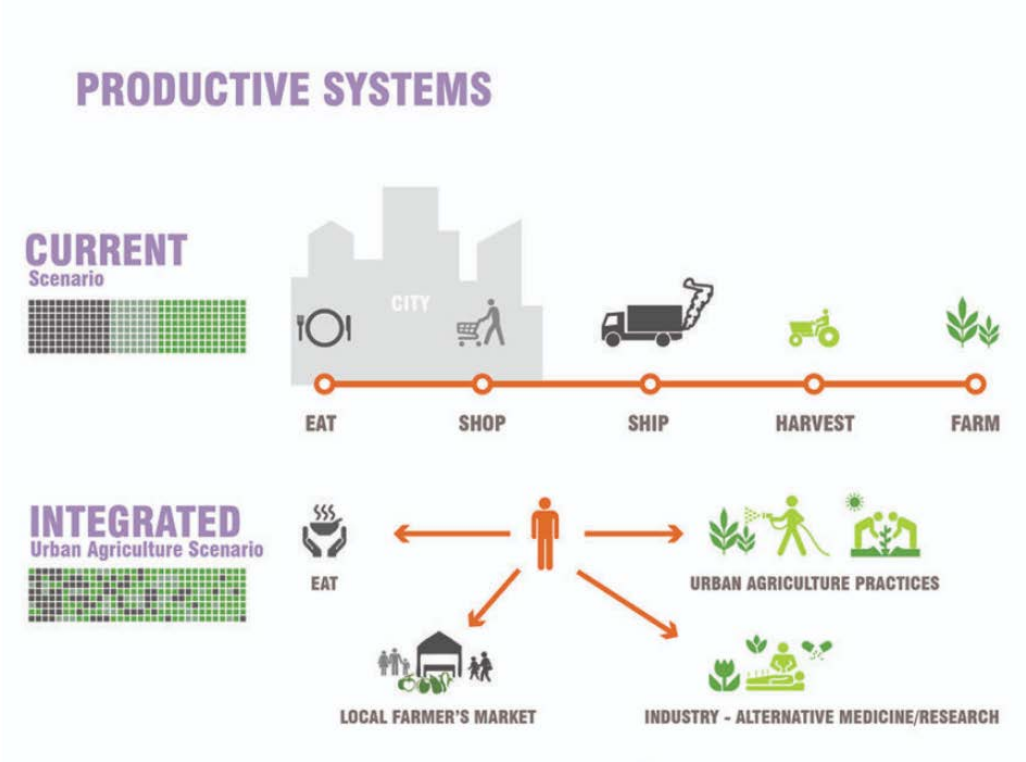


Figure 49. Intention of classification of farmland
Sources:https://www.sasaki.com/projects/songzhuang–arts–and–agriculture–city/

Figure 50. Classification of farmland
Sources:https://www.sasaki.com/projects/songzhuang–arts–and–agriculture–city/

Strategic maps

WATER CYCLE

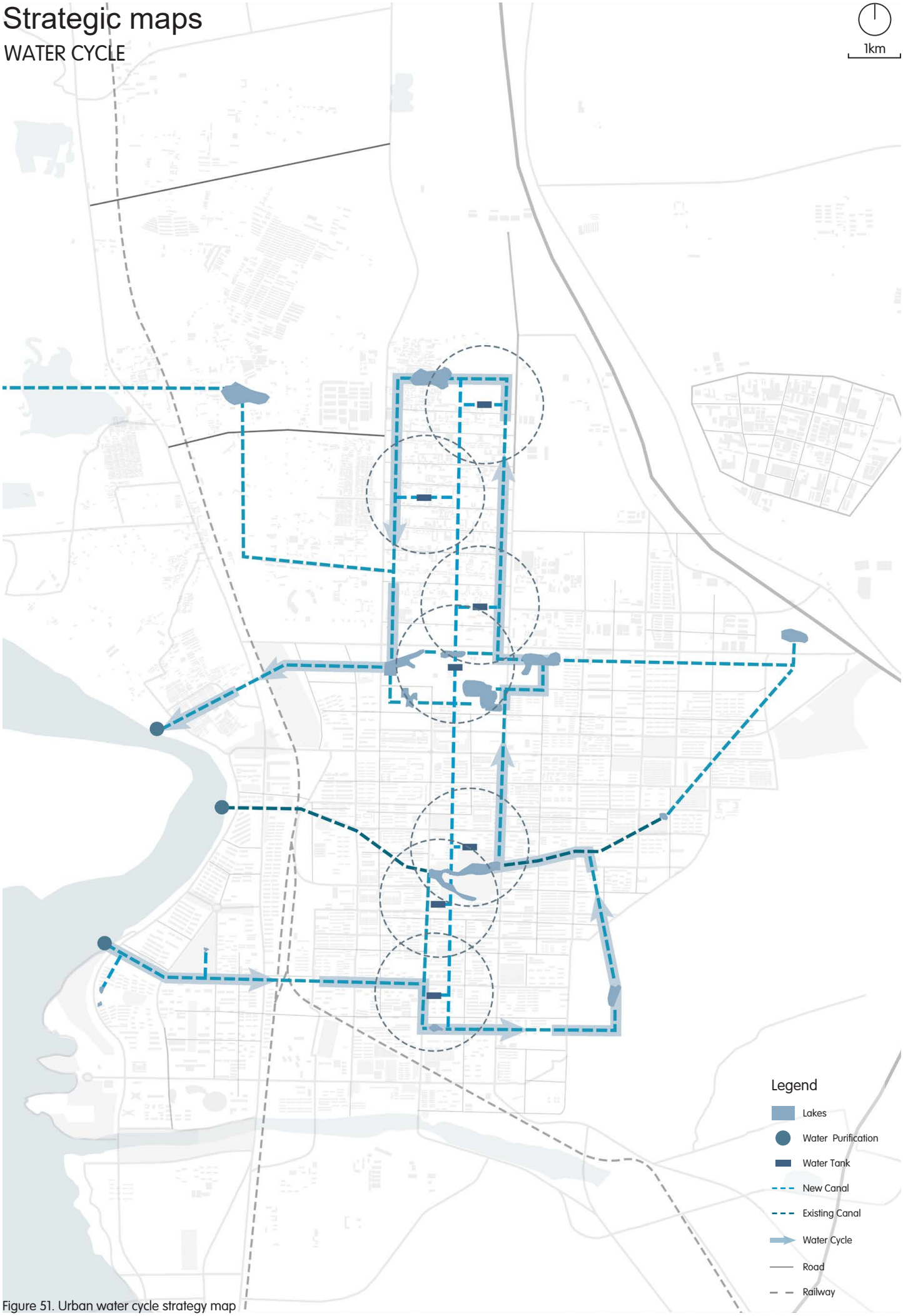


Figure 51. Urban water cycle strategy map

Figure 52. Greenfield strategy map

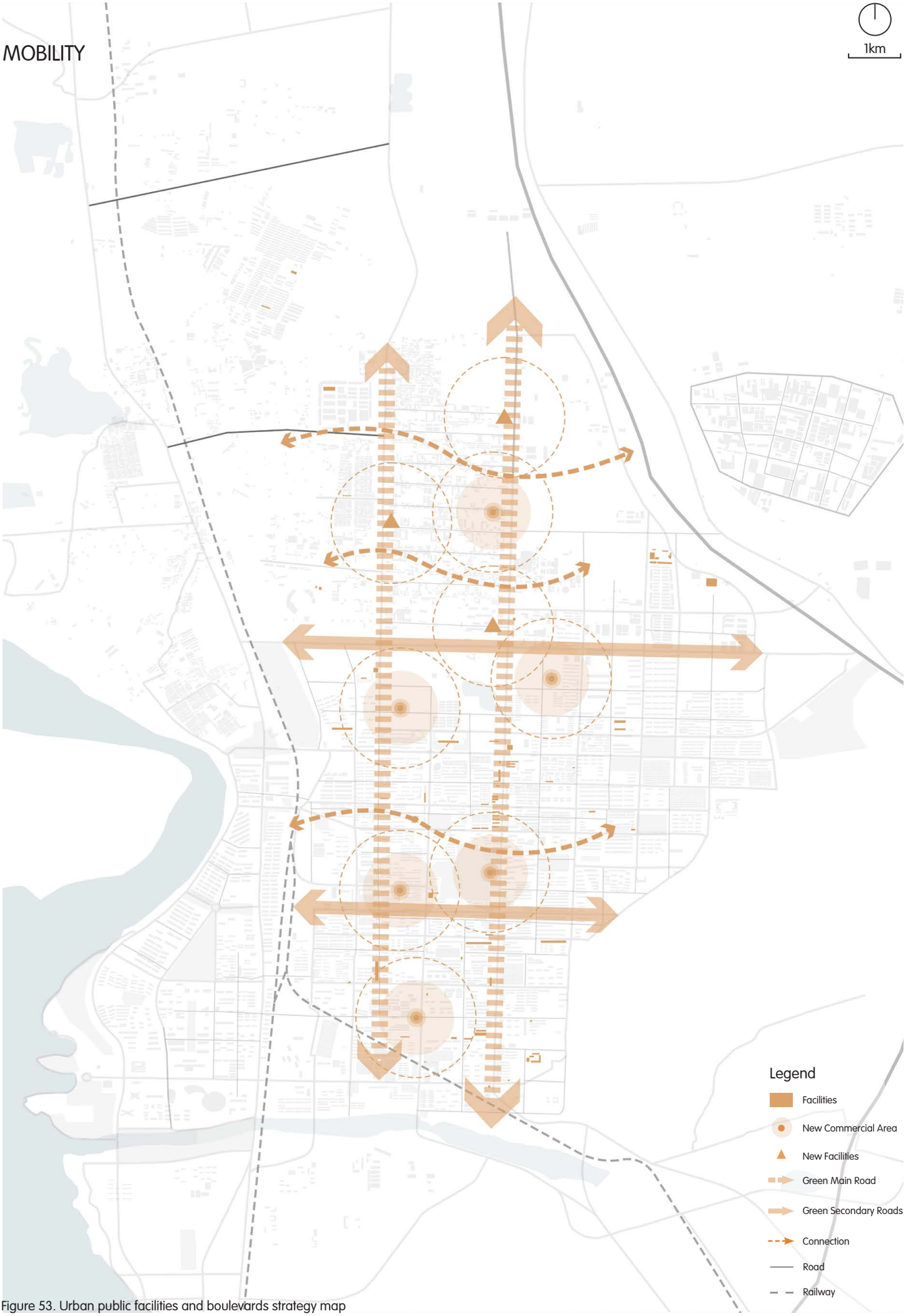


Figure 53. Urban public facilities and boulevards strategy map

Strategic maps overlap

FRAMEWORK

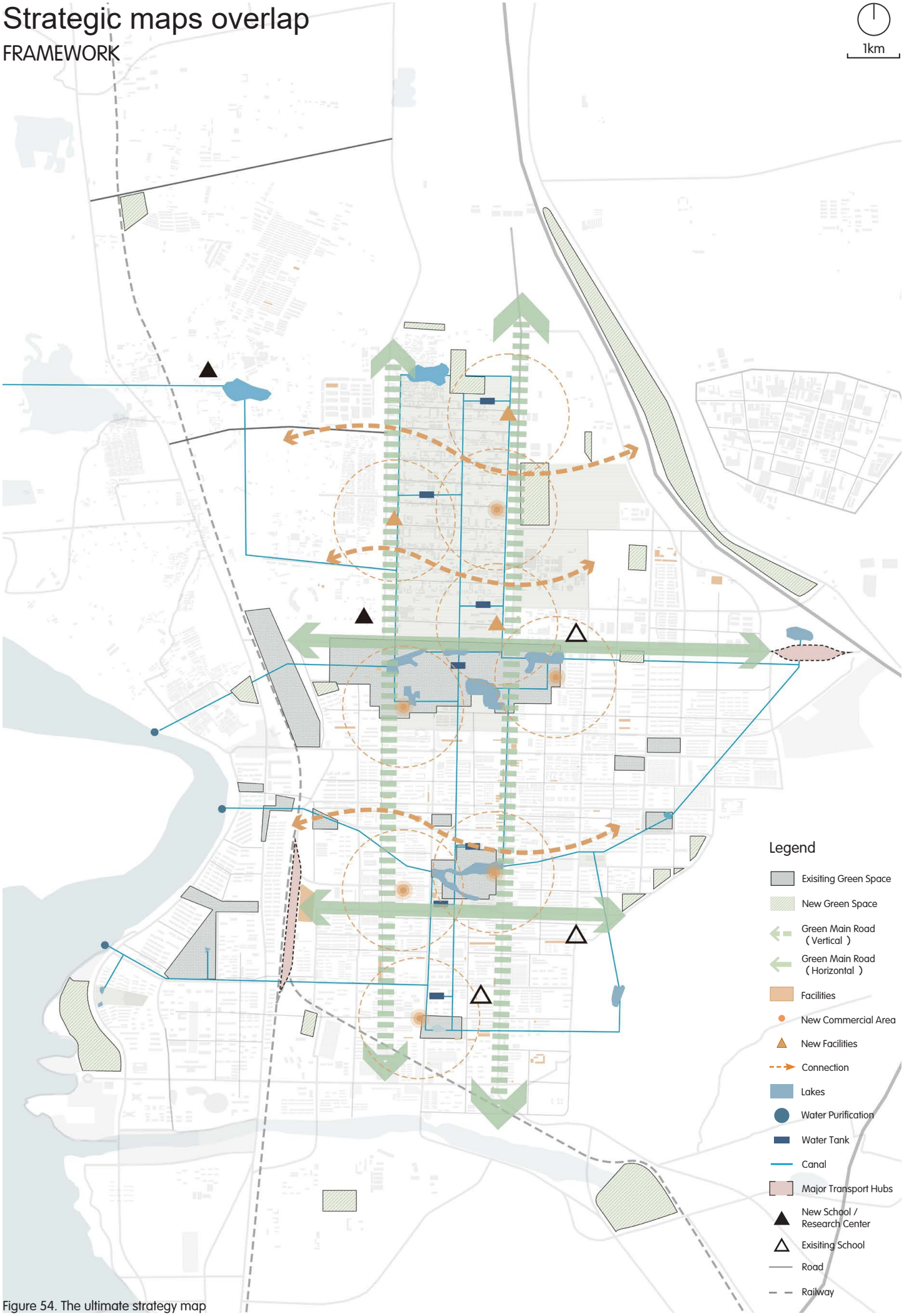


Figure 54. The ultimate strategy map

Design Proposal

Concept

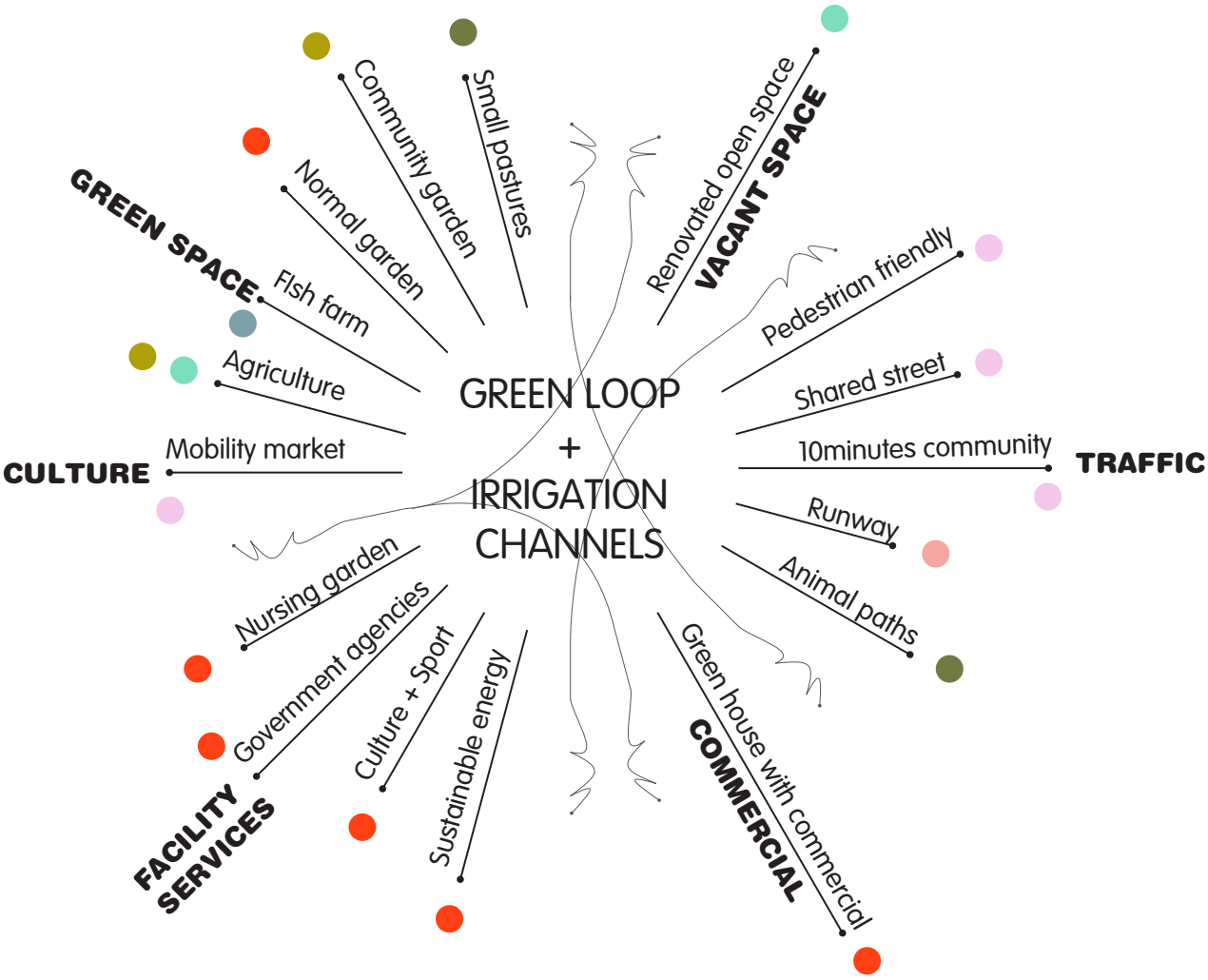


Figure 55. Concept mind map

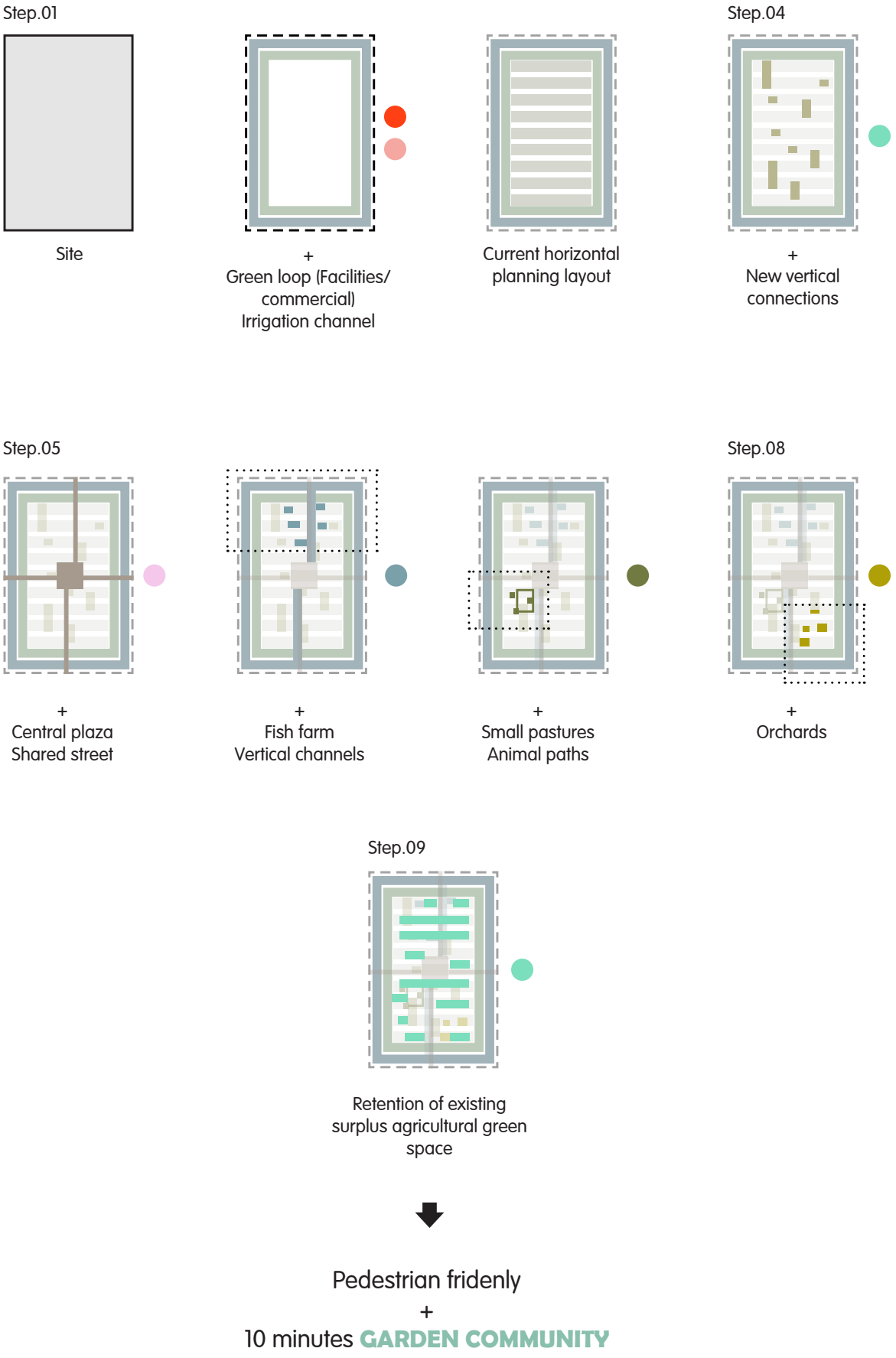


Figure 56. Concept generation diagram

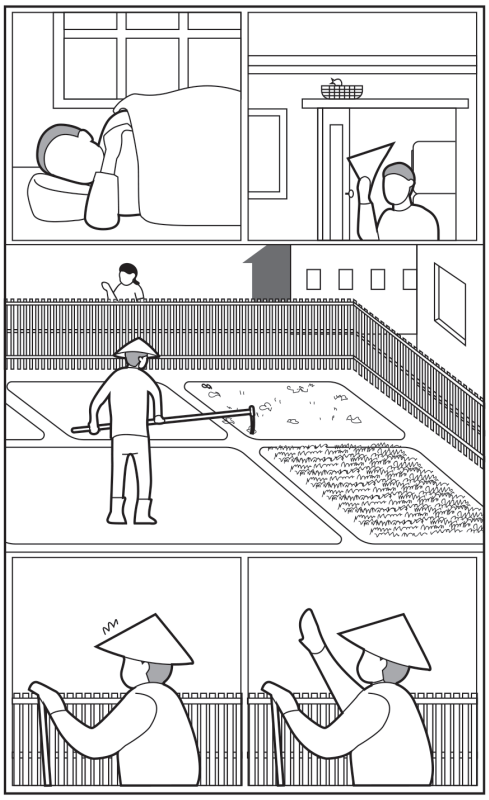
Lifestyle

Current

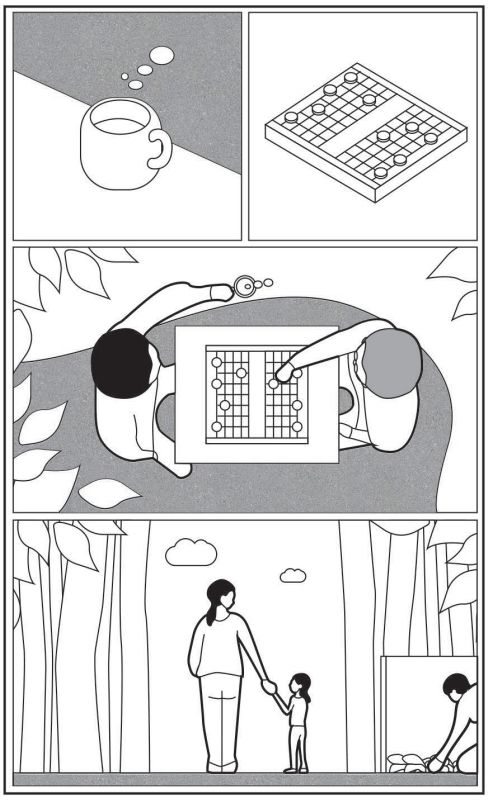
Hui moved to the city a few years ago, but there was no land to grow on, so she had to use the public green space underneath the residential area to grow some vegetables.

Qiaozhen is 80 years old and especially likes to bring her own bench to chat with neighbours in the open space downstairs by the road.

Future

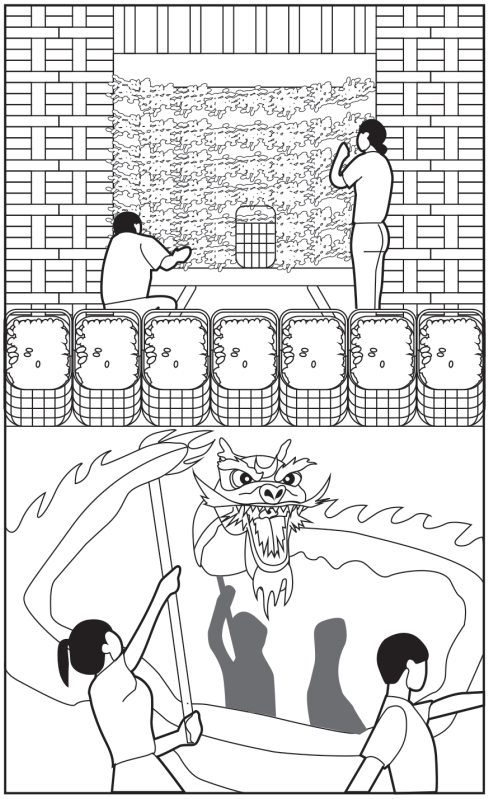


The first thing Tie Zhu does every morning when he wakes up is to go to the community garden to look after the vegetables he has grown. Everyone grows their vegetables here and is self–sufficient and has space to mingle with their neighbours.

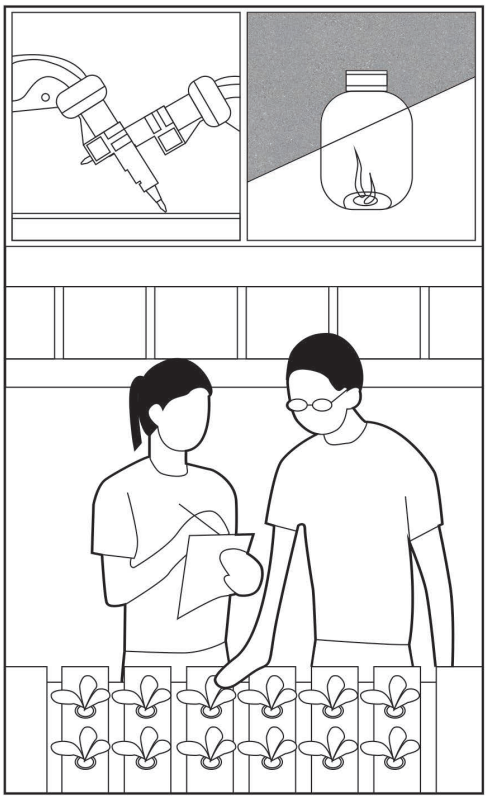


In his retirement, Jianguo enjoys playing chess in the park with friends from the community and often meets his daughter–in–law for a walk with his granddaughter after school.

Qiaozhen lives alone and understands very well that her children are very busy working in the big city, so she only calls them occasionally and does not expect them to come home.



Wuhai produces grapes in abundance and what everyone looks forward to most during the week, apart from work, is the temple fairs that are held every so often.



The strong development of the garden city of Wuhai has attracted more young people to stay and come, with new research, services and businesses providing them with new jobs.

The community manages part of the fish ponds and sheep, which are invested by the government and the residents, and the profits are used for the further development of the community. The community also works on agricultural education and science activities, organises gatherings for the residents, etc

Masterplan

How to intervene?

Figure 58. Site status

Figure 59. Specific design types

Masterplan

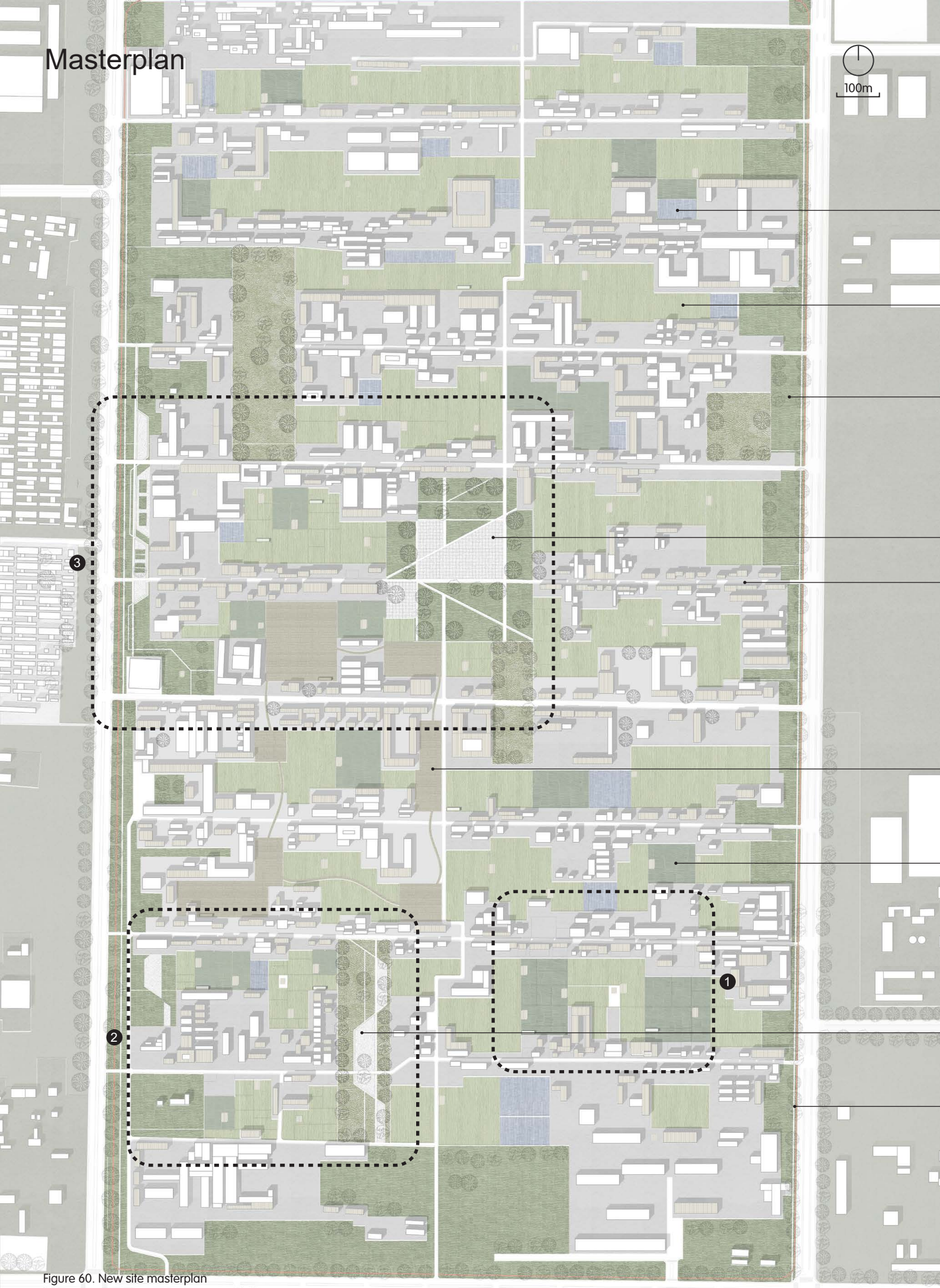


Figure 60. New site masterplan

Fish Farm

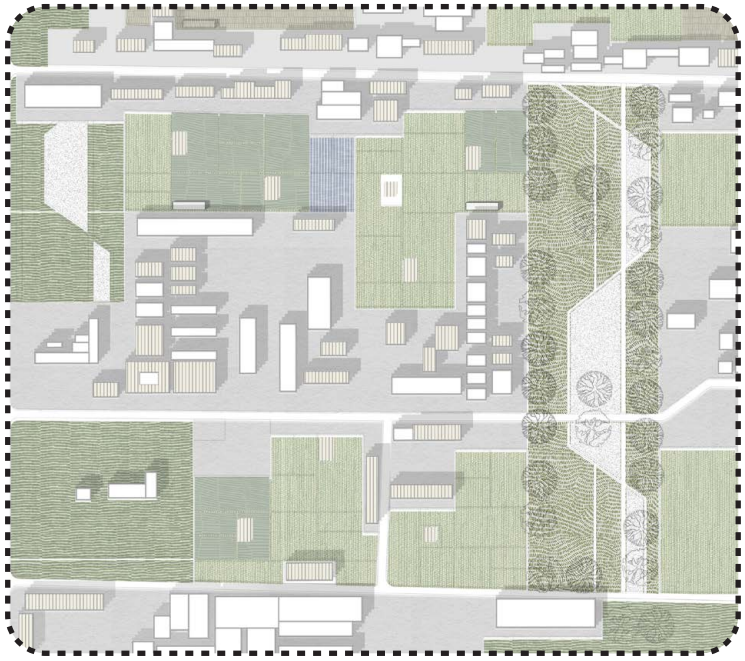
Farmland

Community Green Belt

1

Central Square

Share Street



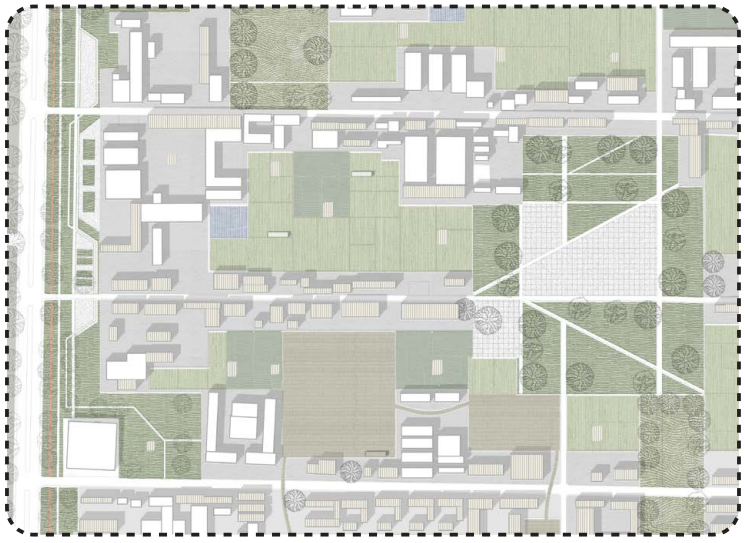
2

Small Pasture

Orchard

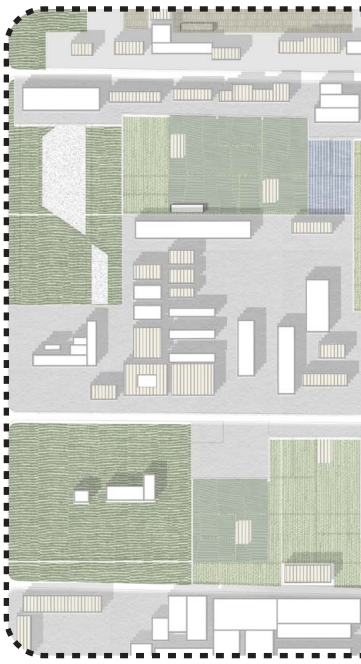
Park

Irrigation Channels



3

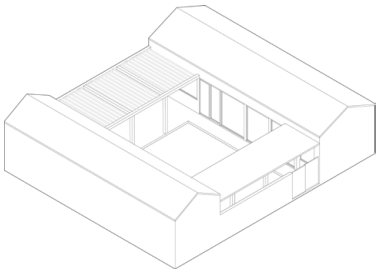
Figure 61. Enlarged view of three programs



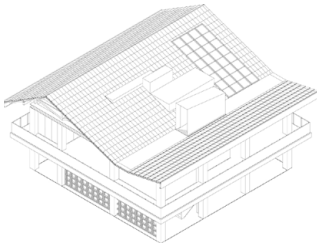
HOUSING

PUBLIC BUILDINGS

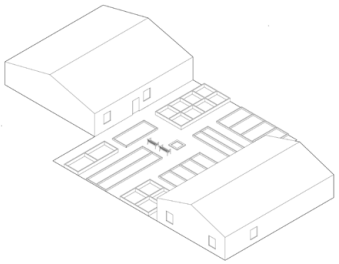
AGRICULTURA



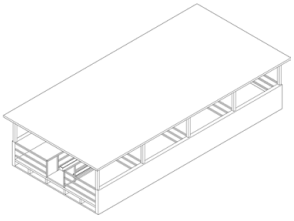
Enclosed



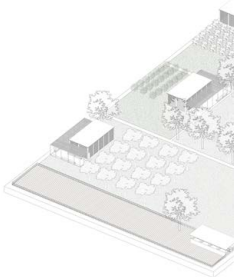
Community Centre



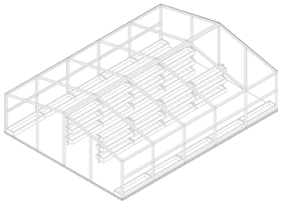
Semi-enclosed



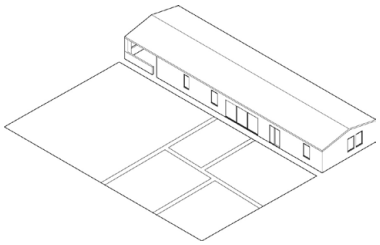
Sheep Pen



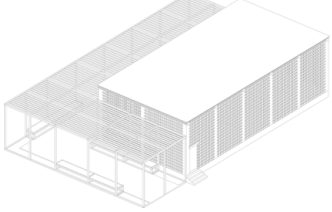
Farmla
Agricultura



Green House

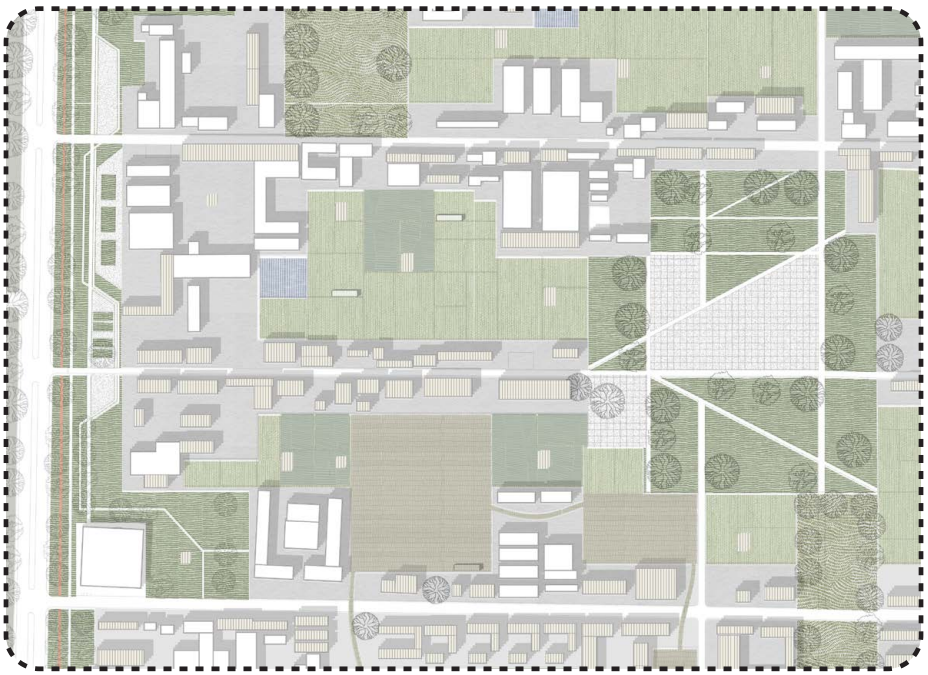


Open



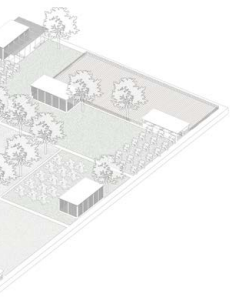
Raisin Drying and Fruit Storage

Figure 62. Specific design type axonometry

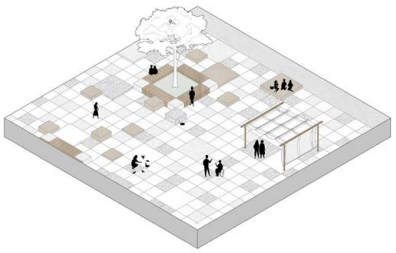


AL PRODUCTS

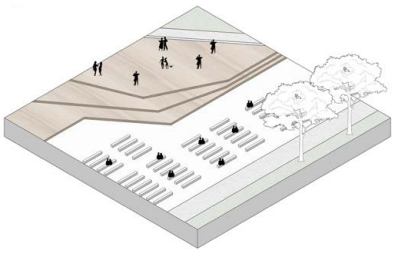
LANDSCAPE



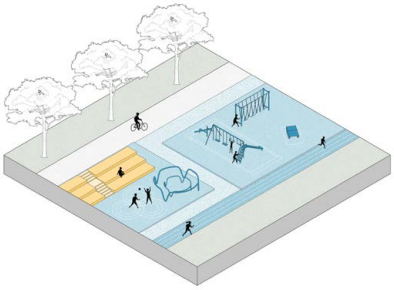
nd and
al Premises



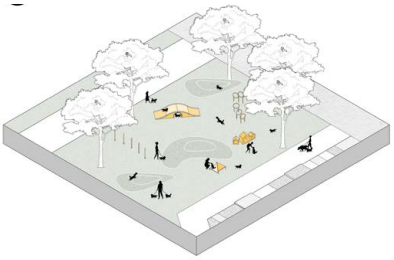
Tree Array Plaza



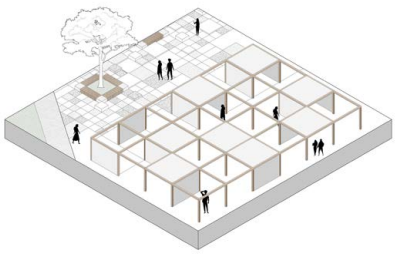
Outdoor Stage



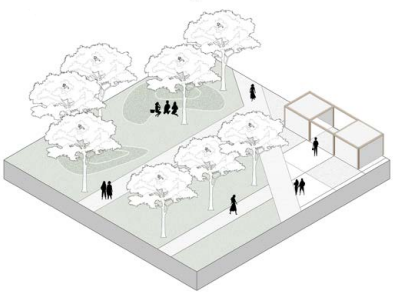
Fitness Equipment



Dog Park



Calligraphy Exhibition



Mound

Traffic Models

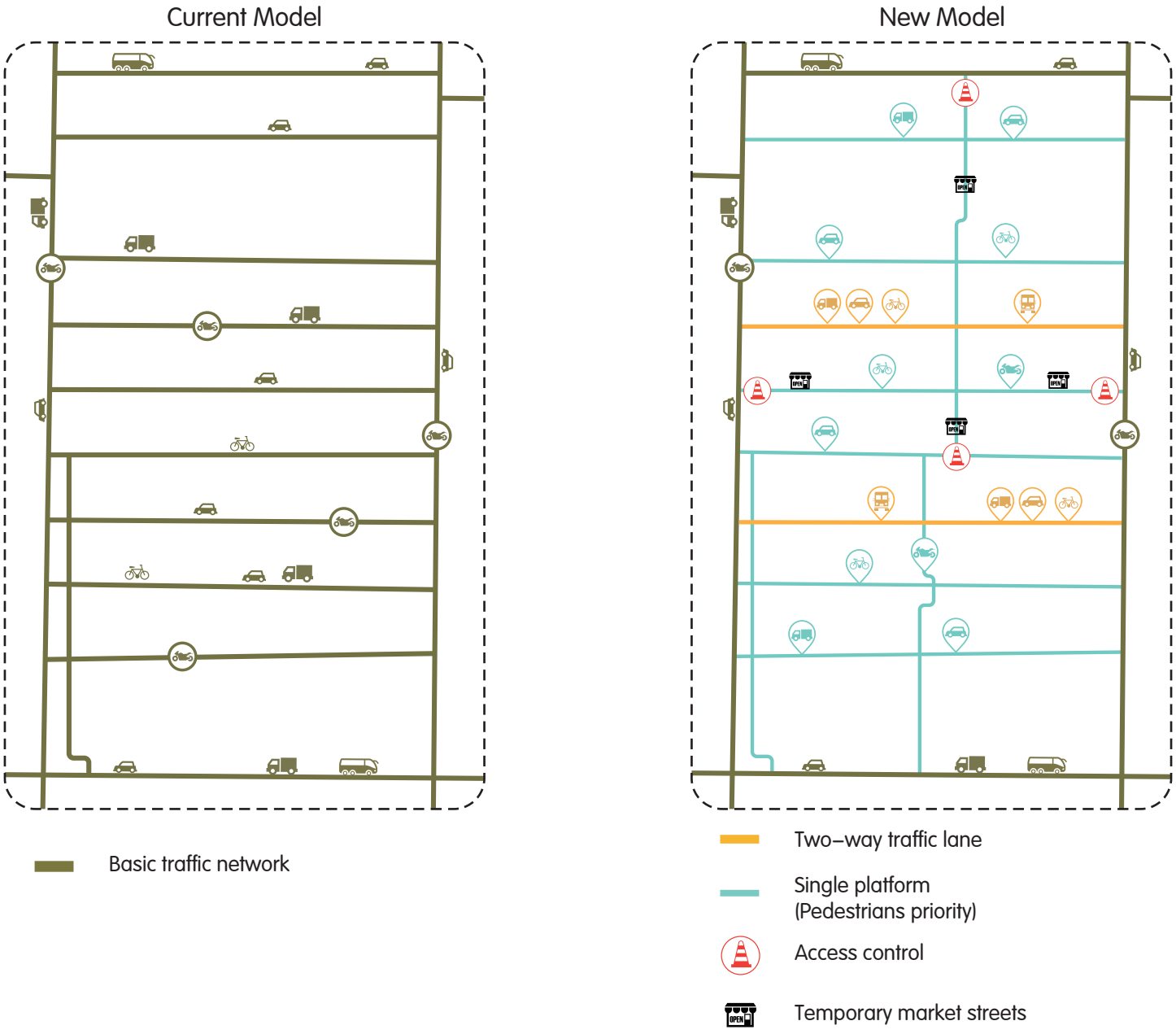


Figure 63. Resetting the transportation system

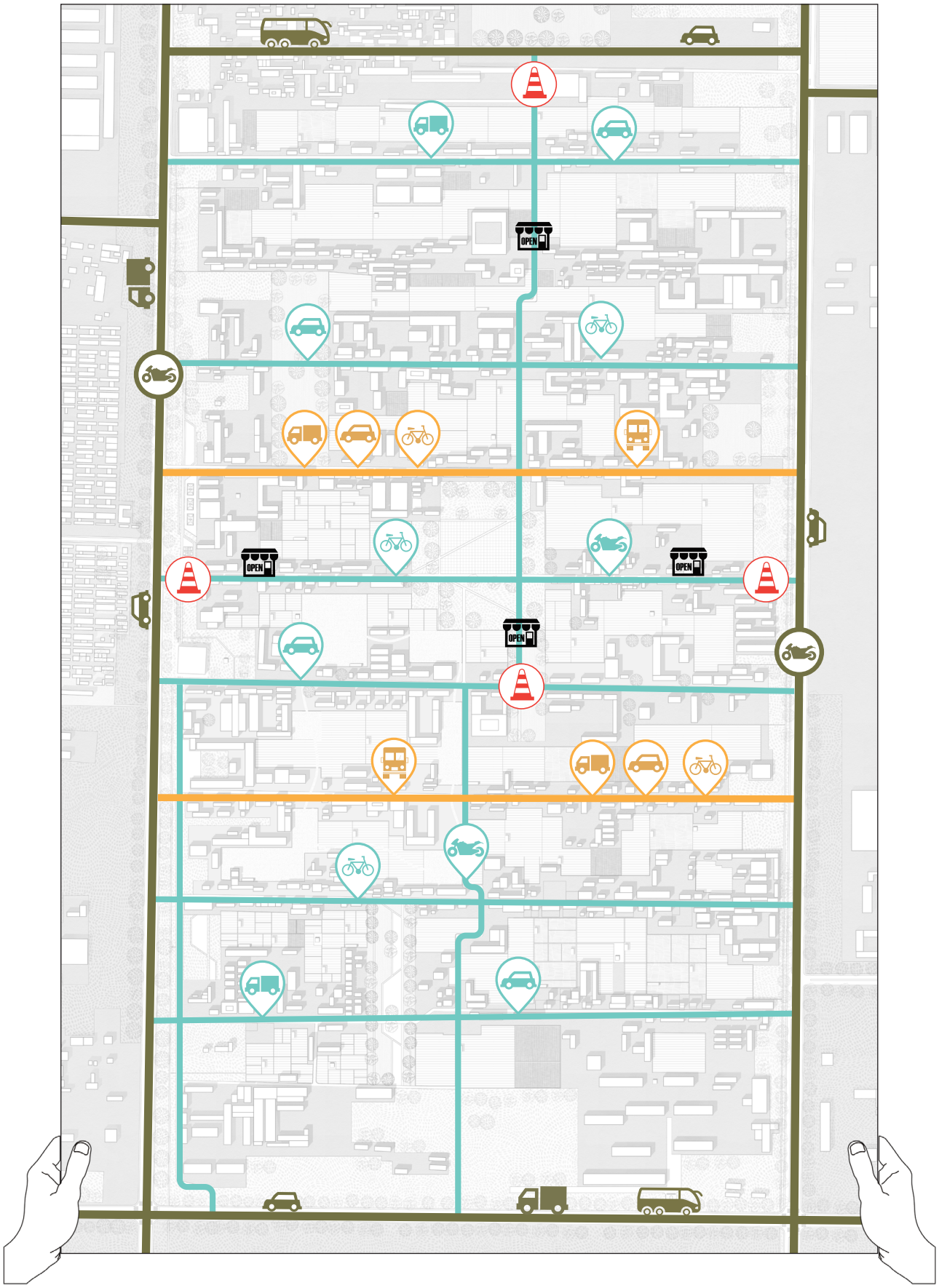
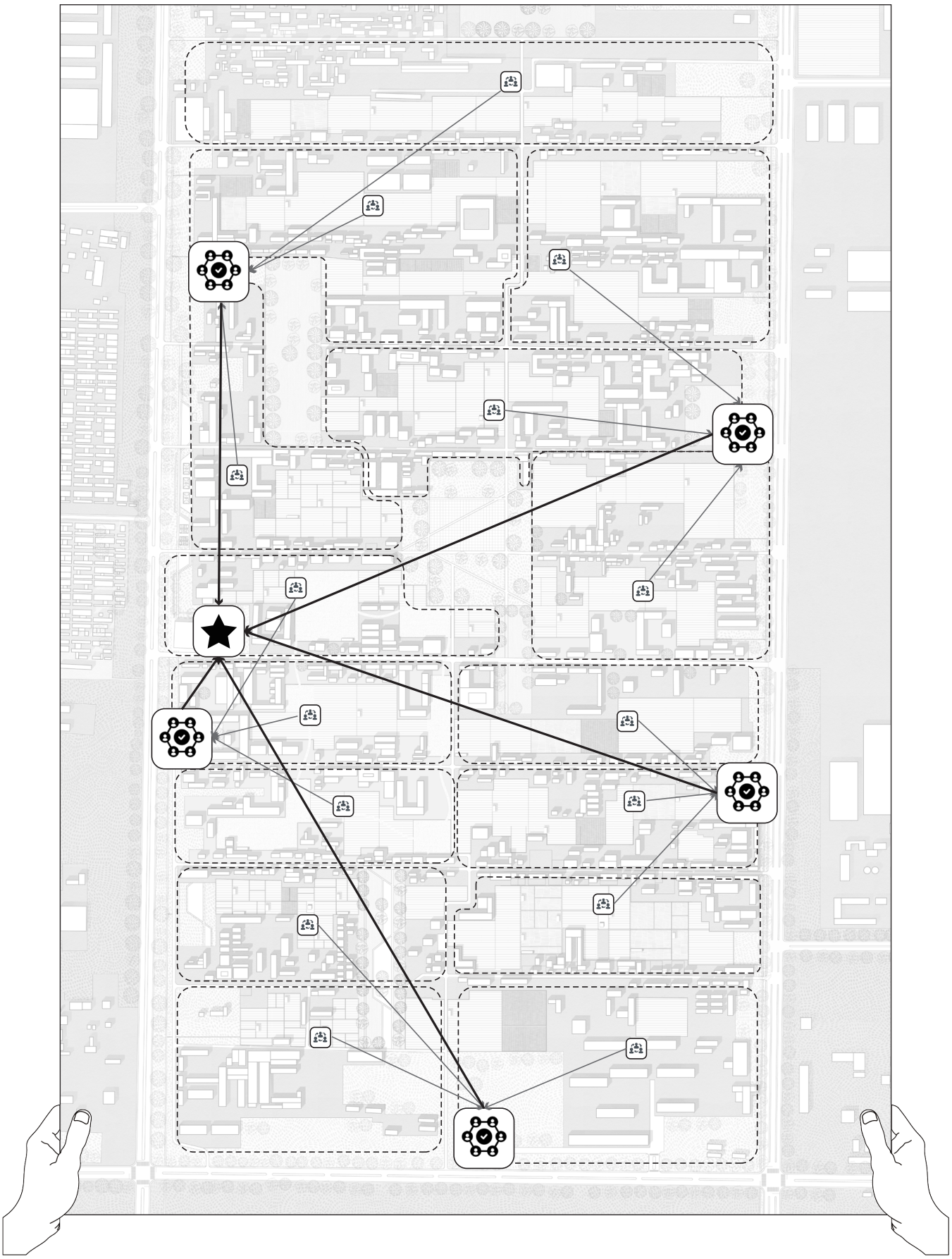


Figure 64. Final transportation system

Community Management



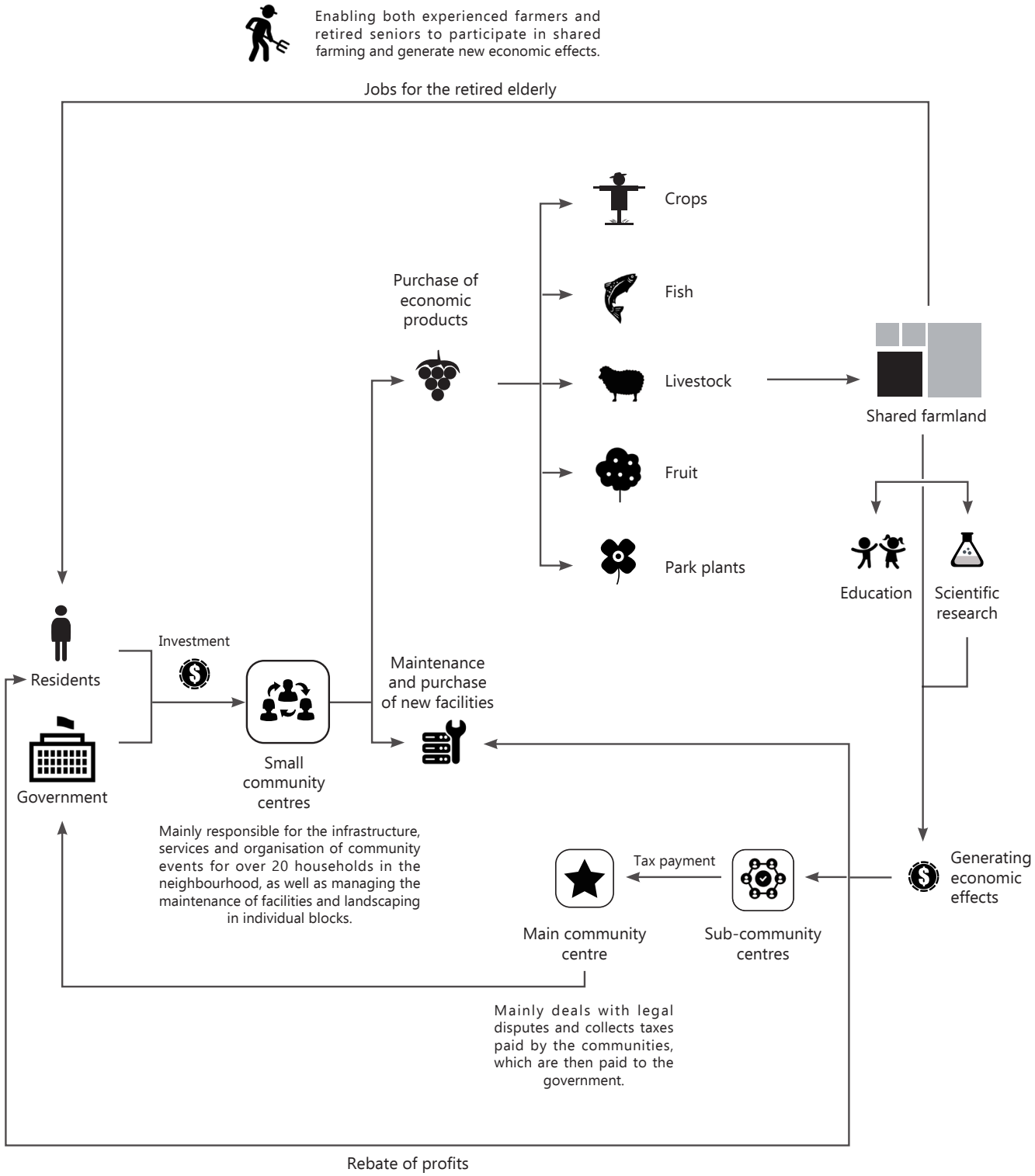
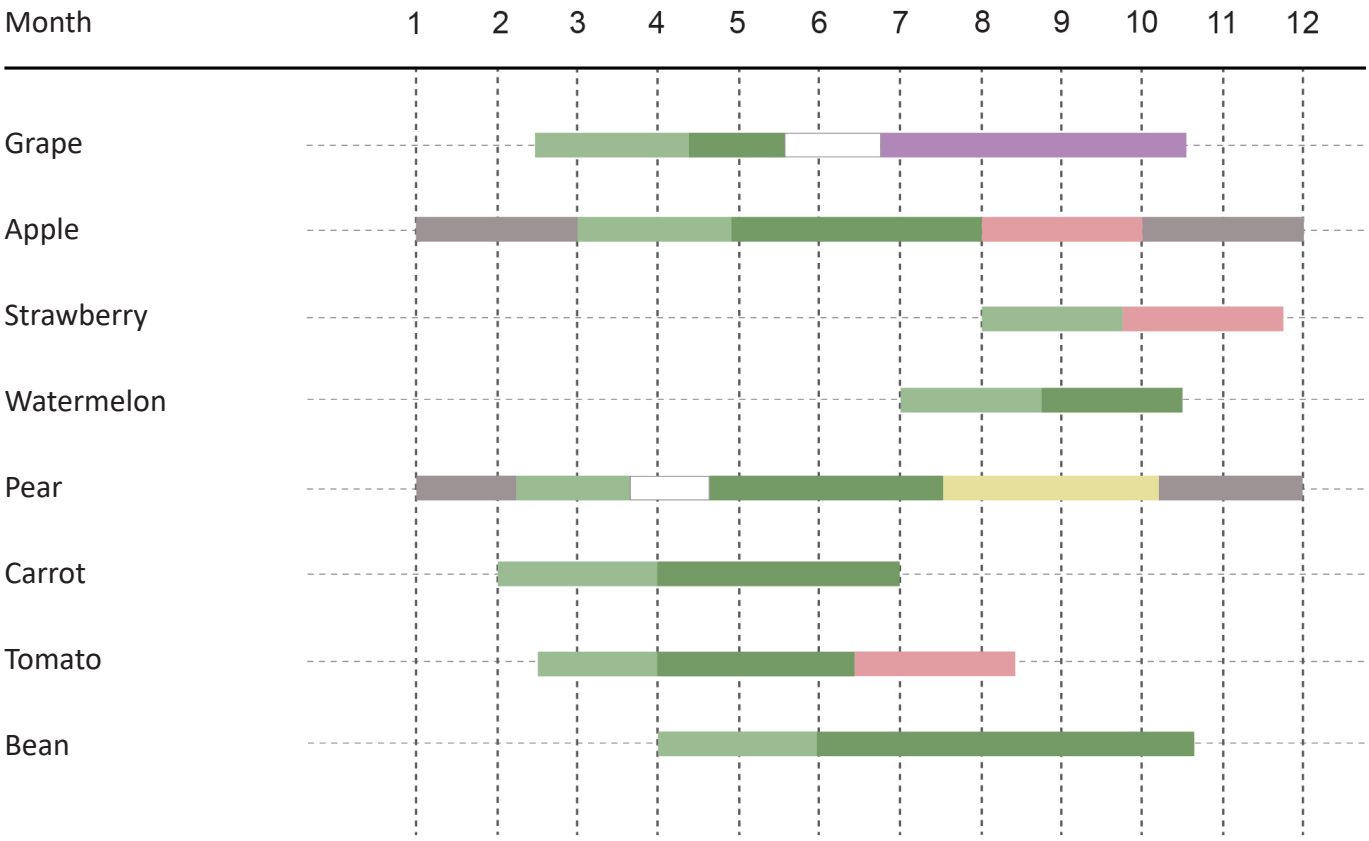


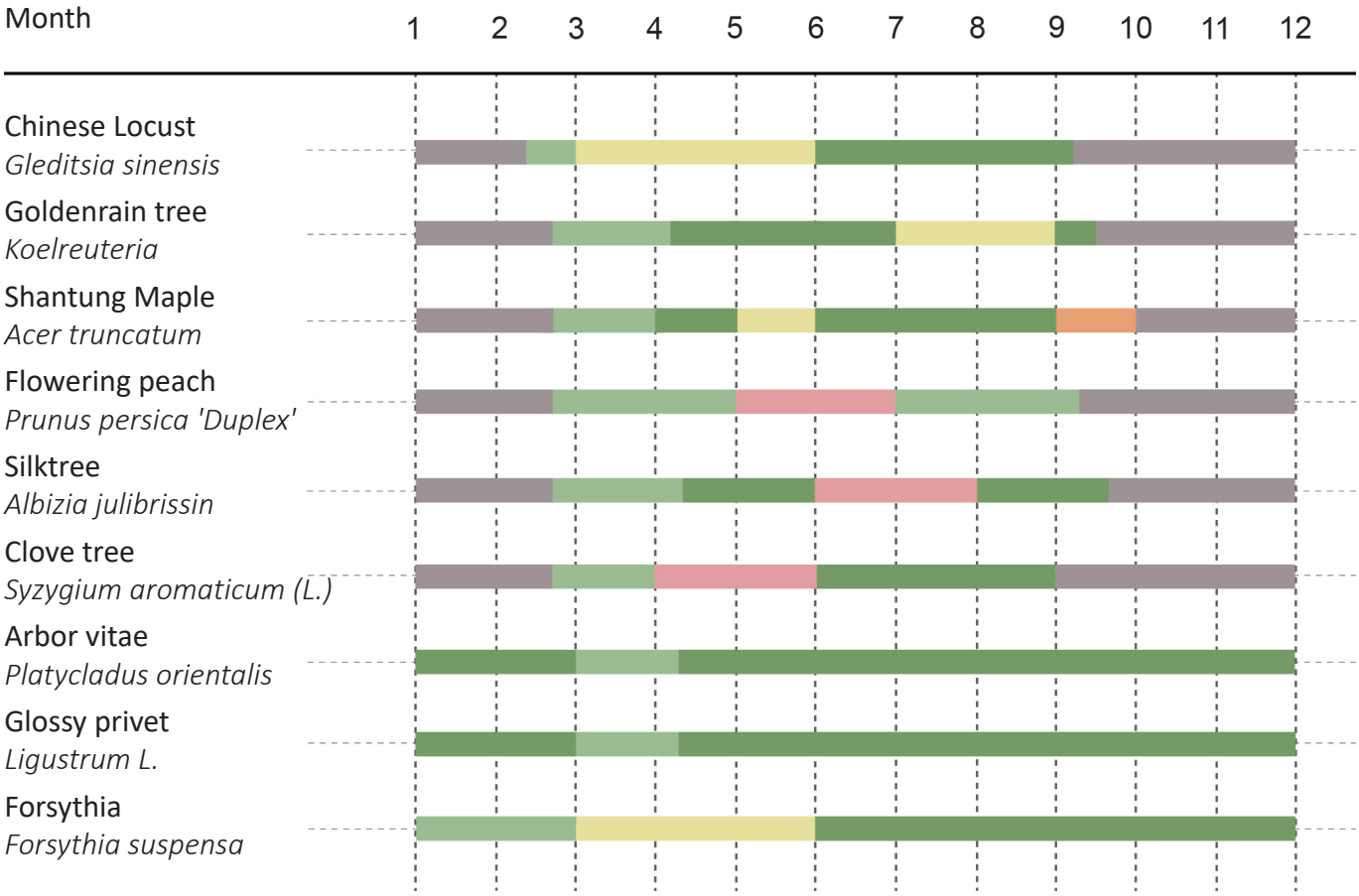
Figure 65. Community organisation flow chart

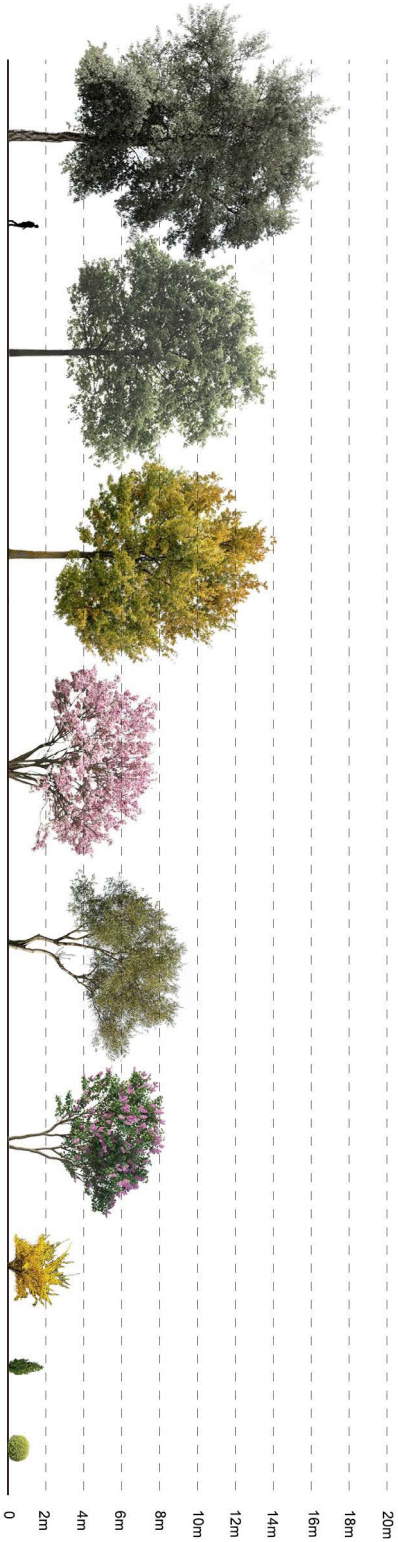
THE FLOW NETWORK BETWEEN CULTVATIONS, PRODUCTS AND USERS

Figure 66. The flow network between cultvations, products and users

Plant Analysis







Chinese Locust
Gleditsia sinensis

Goldenrain tree
Koelreuteria

Shantung Maple
Acer truncatum

Flowering peach
Prunus persica 'Duplex'

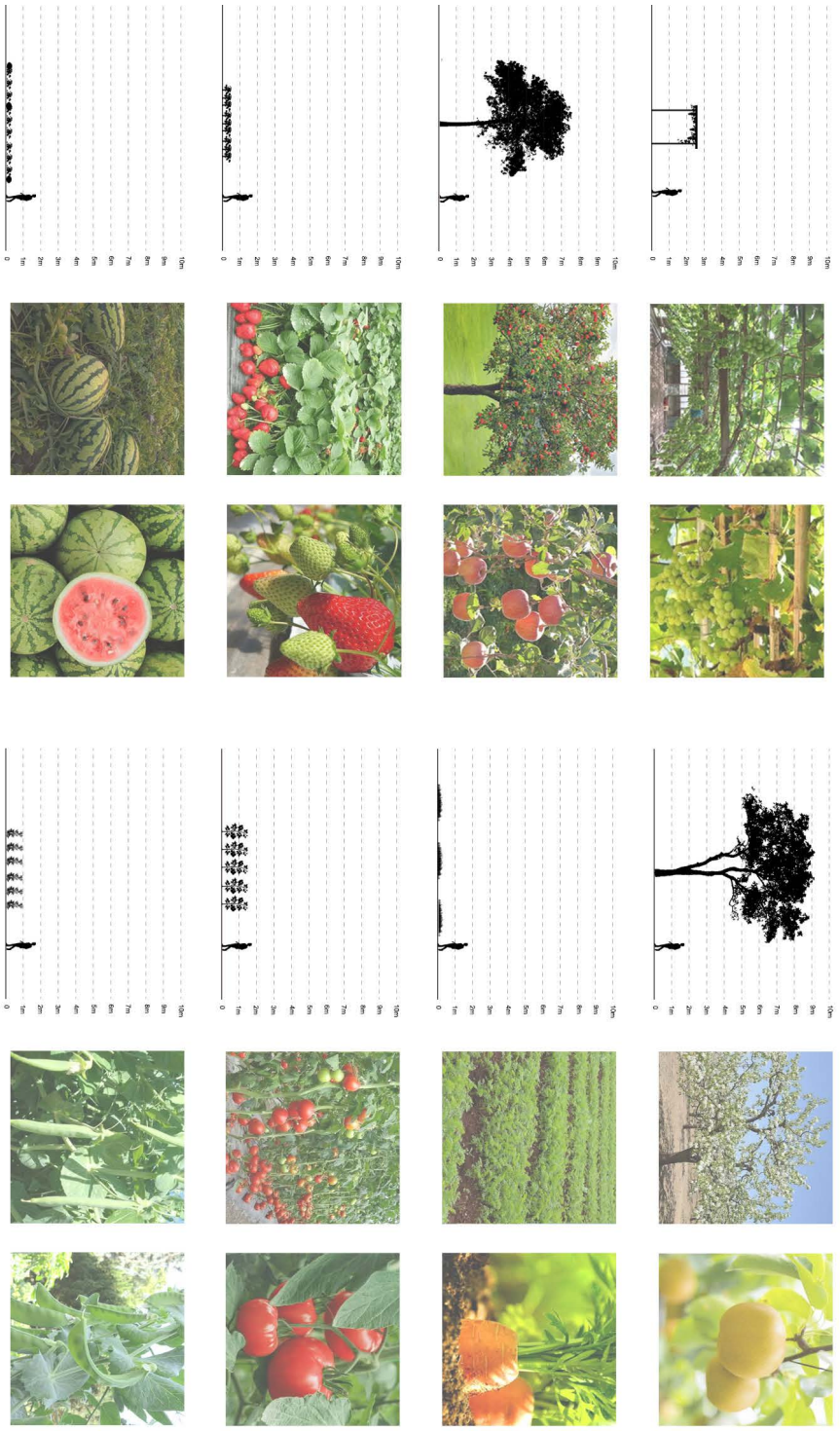
Silktree
Albizia julibrissin

Clove tree
Syzygium aromaticum (L.)

Forsythia
Forsythia suspensa

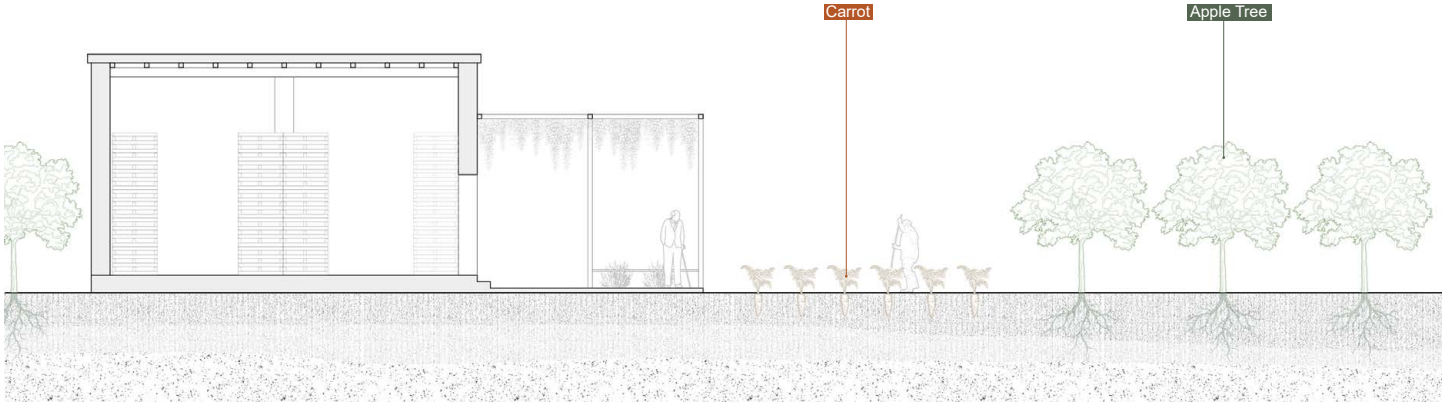
Arbor vitae
Platycladus orientalis

Glossy privet
Ligustrum L.

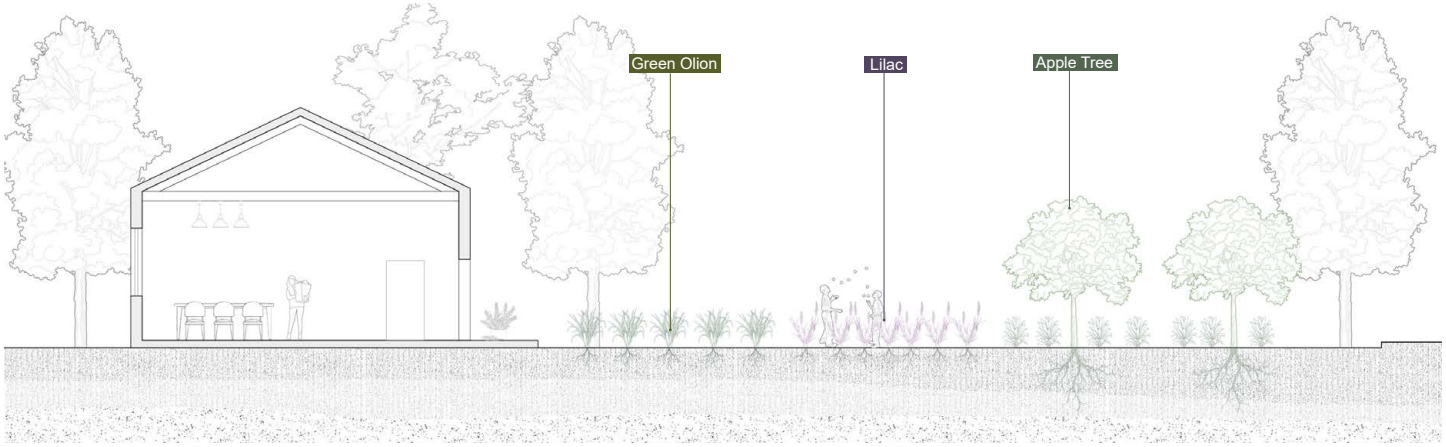


USE OF PLANTS IN DIFFERENT PLACES

Community Farmland 1:200

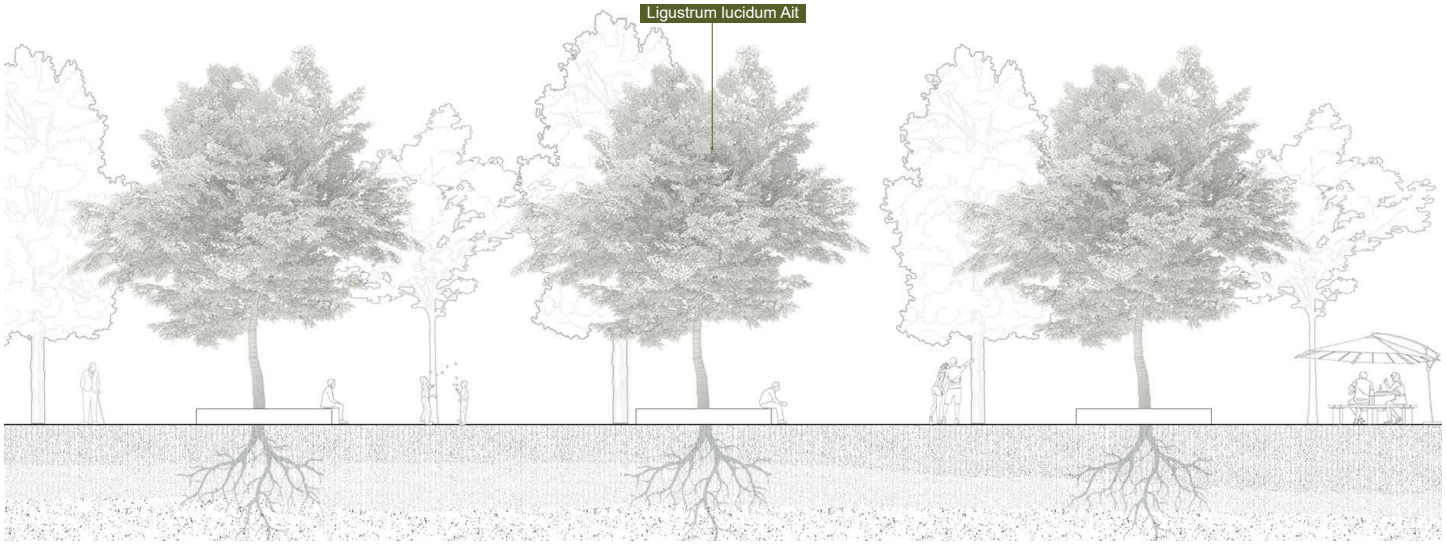


Community Garden 1:200



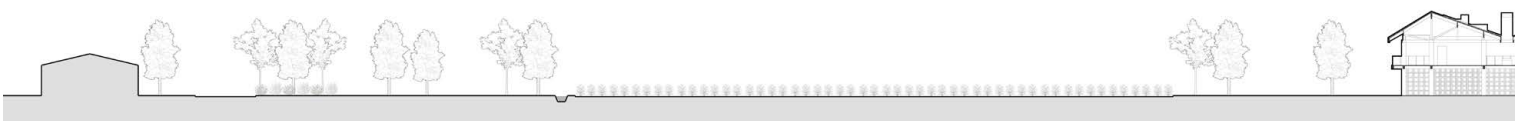
Park 1:200

Activity Square 1:200



PROGRAM PLAN.01

1:2500



Housing | Open space | Road | Community entrance plaza | Irrigation canal | Farmland | Shade square | Community centre

1:1000

Figure 67. Program plan. 01_Focus on the layout of basic shared farmland

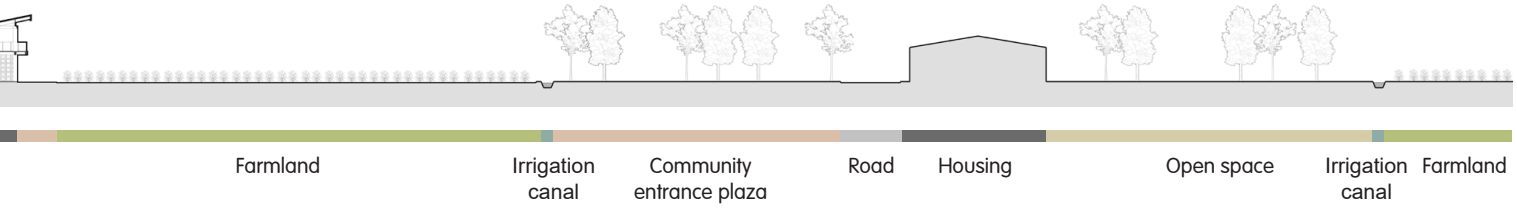
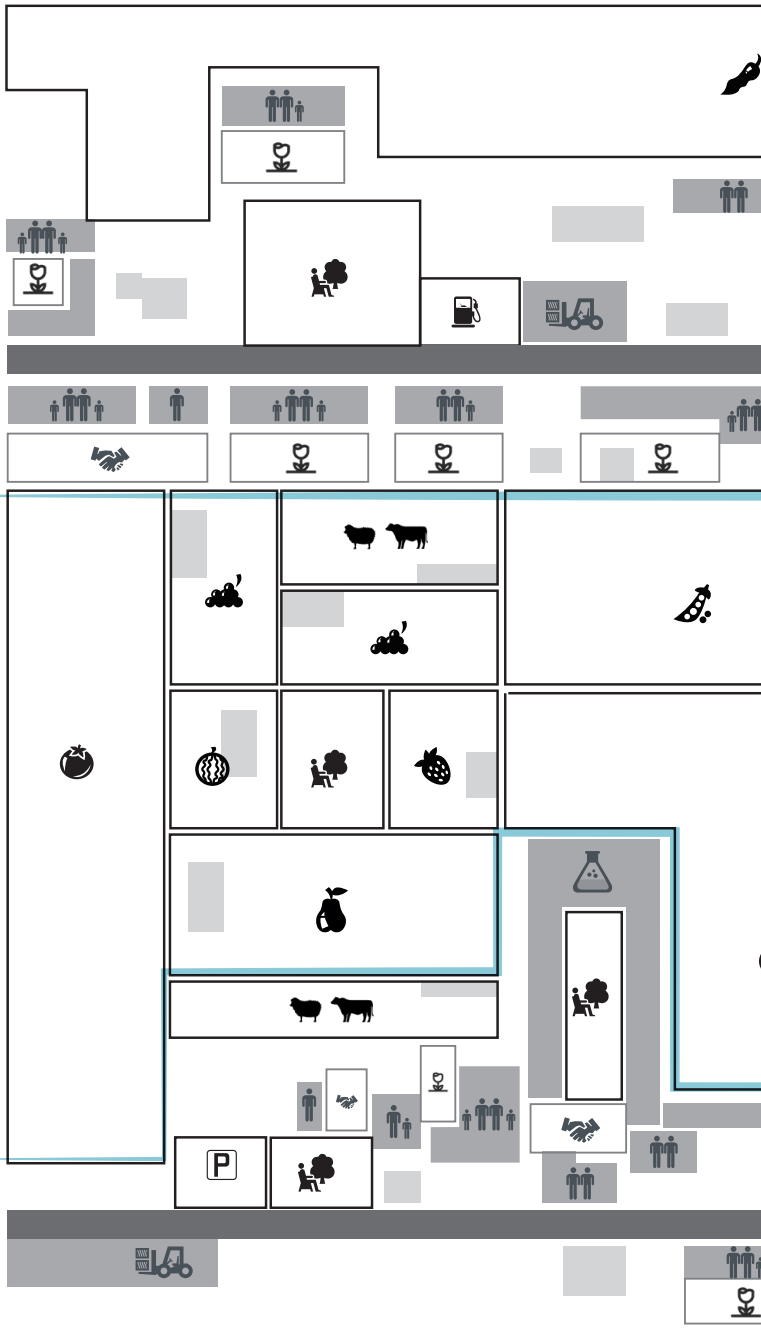


Figure 68. Section of program. 01

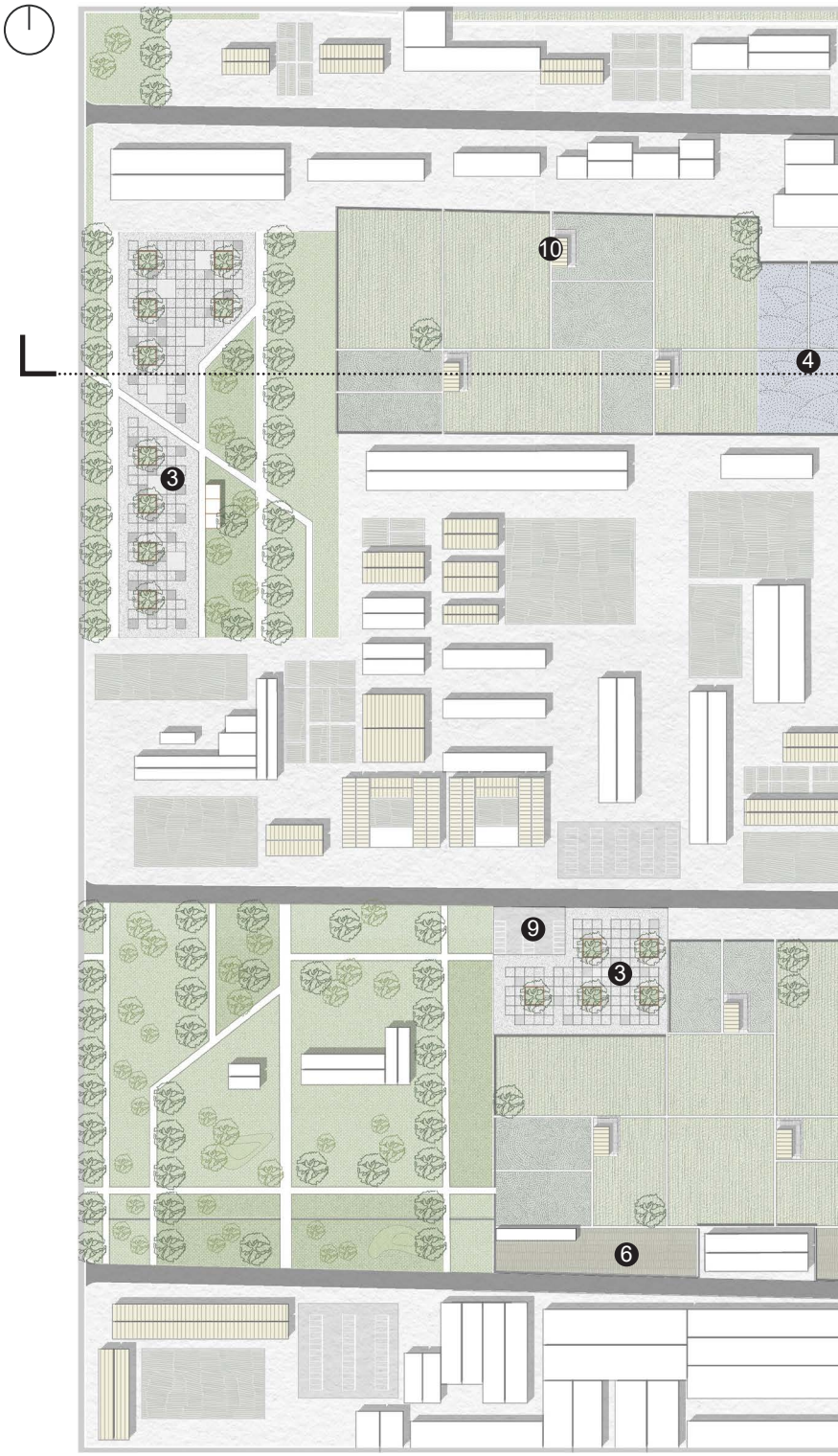
PROGRAM LAYOUT.01



Source of irrigation water
from the Yellow River

Figure 69. Functional division of program. 01

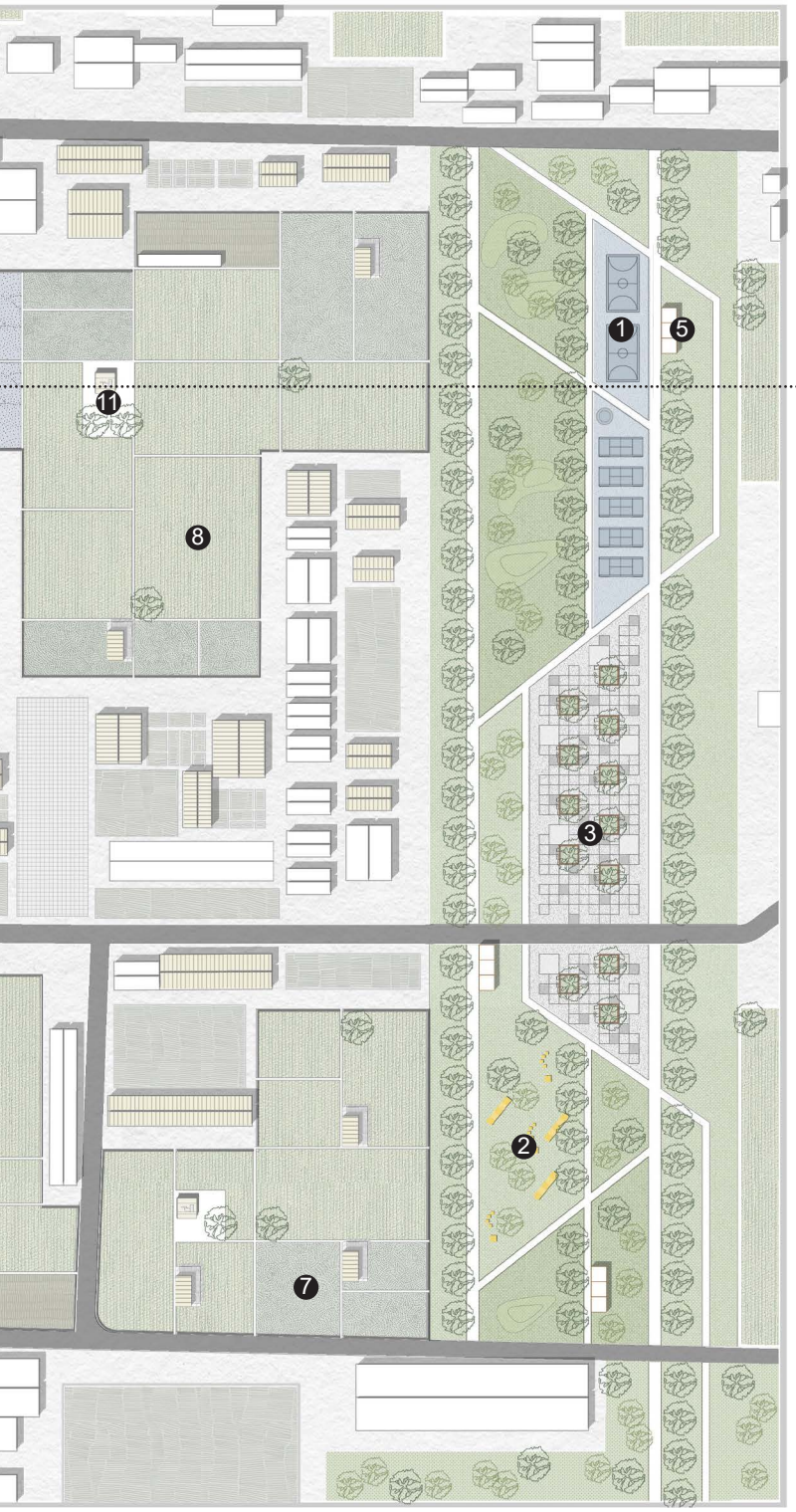
PROGRAM PLAN.02



1:3000

Tree array plaza | Garden | Irrigation canal | Orchard | Agricultural premises | Farmland | Orchard | Agricultural premises | Farmland | Fishing farmland | Fa

1:1500



❶ Playground

❷ Dog Park

❸ Tree Array Plaza

❹ Fishing Farmland

❺ Modular Unit

❻ Small Pasture

❼ Orchard

❽ Farmland

❾ Car Parking

❿ Raisin Making House

⓫ Community

Figure 70. Program plan. 02_Focus on the layout of public park

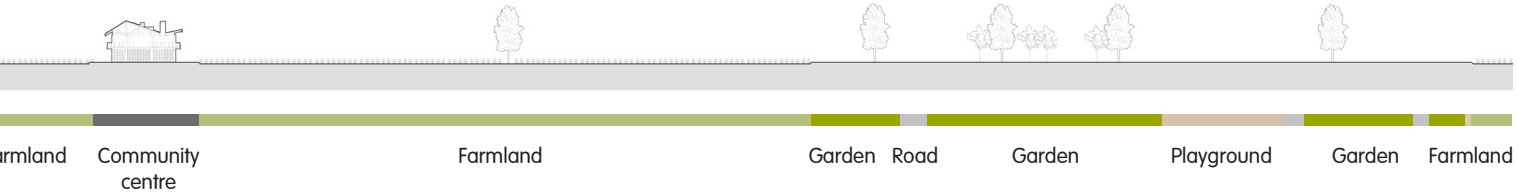
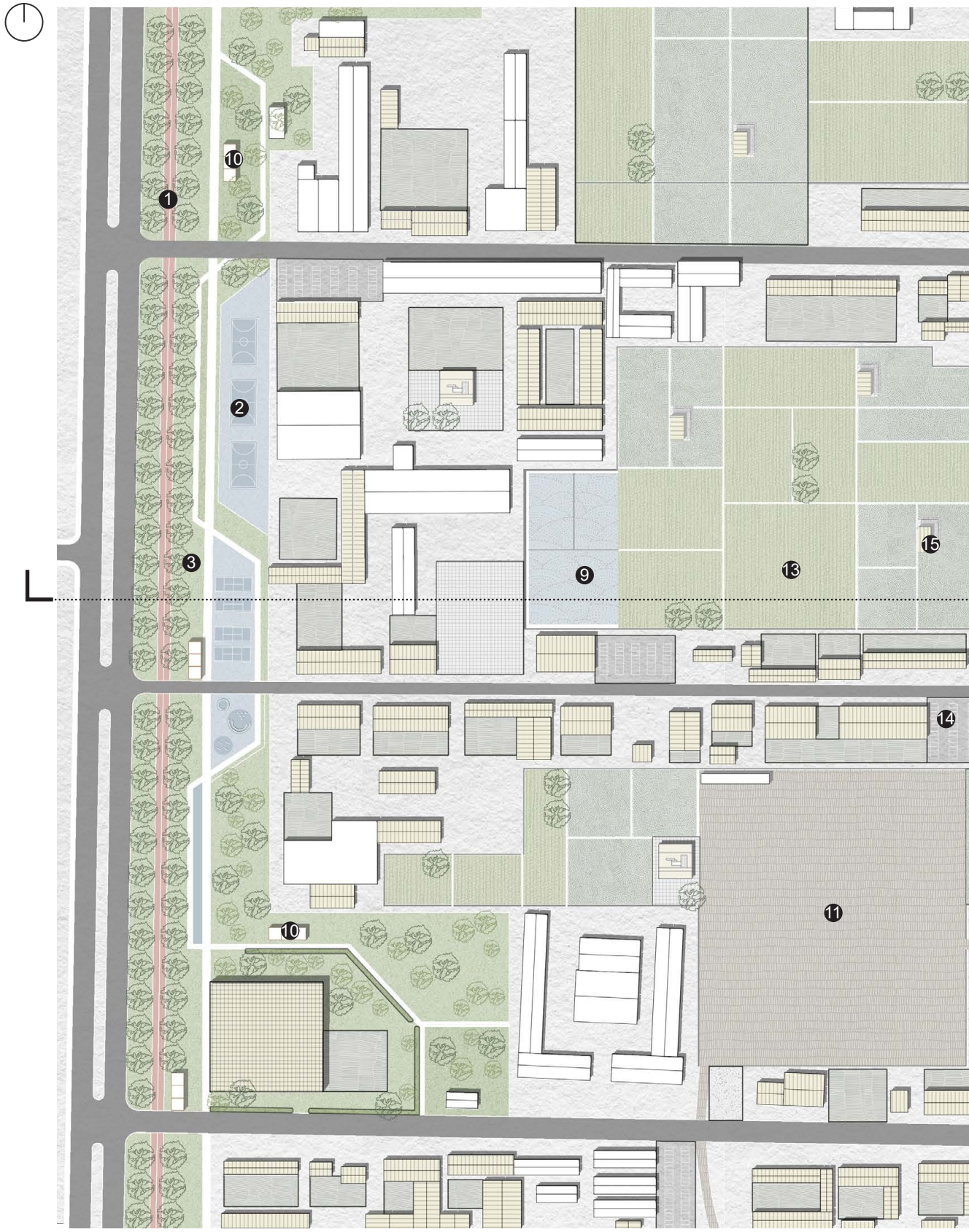


Figure 71. Section of program. 02

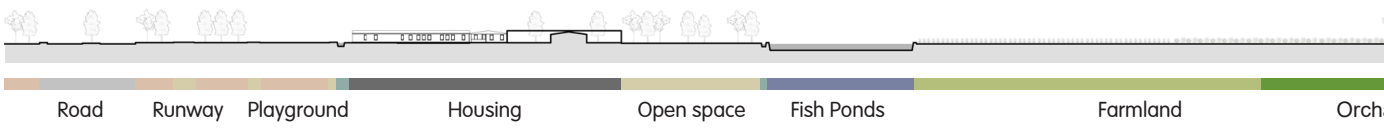
PROGRAM LAYOUT.02

Source of irrigation water
from the Yellow River

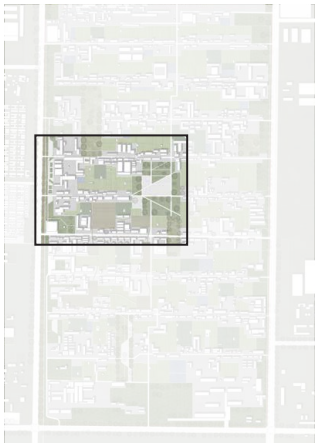
Figure 72. Functional division of program. 02

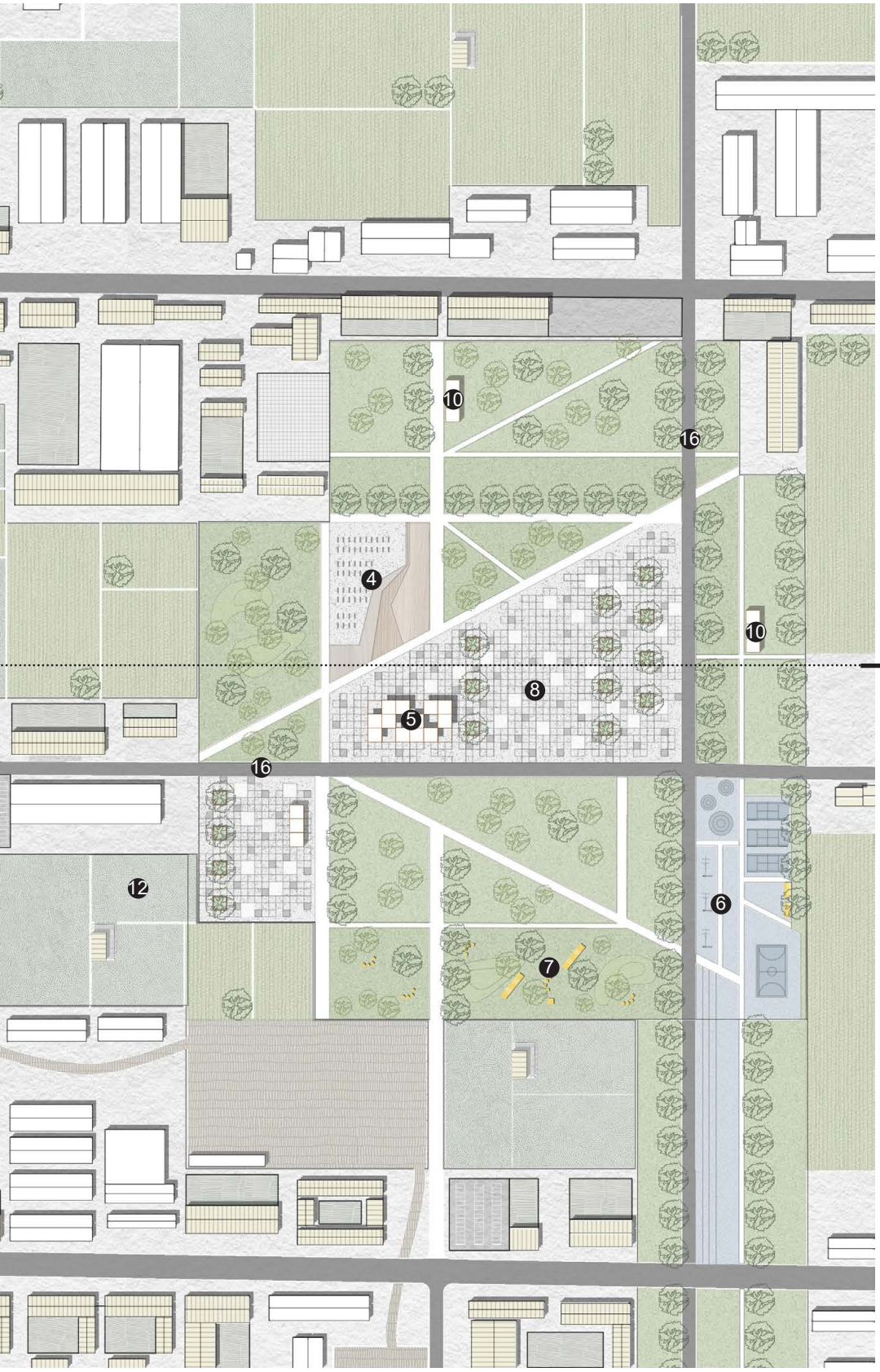

1
2
3
9
10
10
11
13
14
15

1:3500


Road
Runway
Playground
Housing
Open space
Fish Ponds
Farmland

1:3000





❶ Biking and running paths
❷ Playground
❸ Green belt
❹ Outdoor stage
❺ Calligraphy Exhibition
❻ Fitness Equipment
❼ Dog Park
❽ Tree Array Plaza
❾ Fishing farmland
❿ Modular unit
⓫ Small pasture
⓬ Orchard
⓭ Farmland
⓮ Car parking
⓯ Raisin making house
⓰ Shared street

Figure 73. Program plan. 03_Focus on the layout of community centre plaza

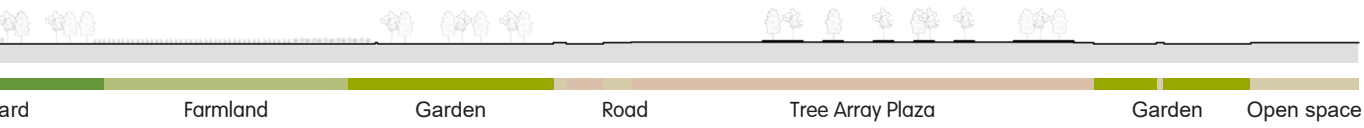
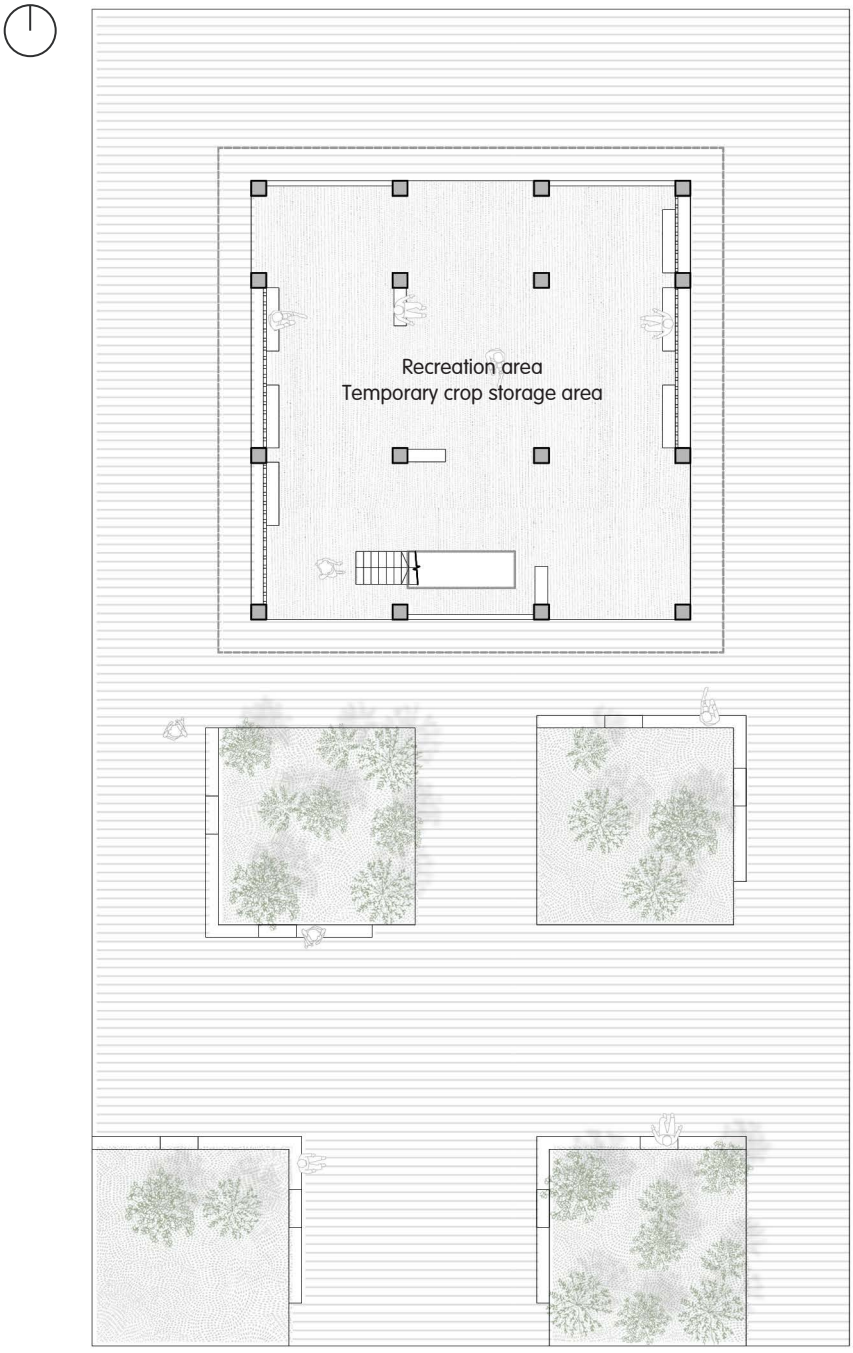


Figure 74. Section of program. 03

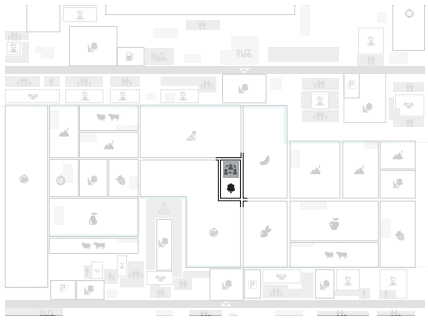
PROGRAM LAYOUT.03

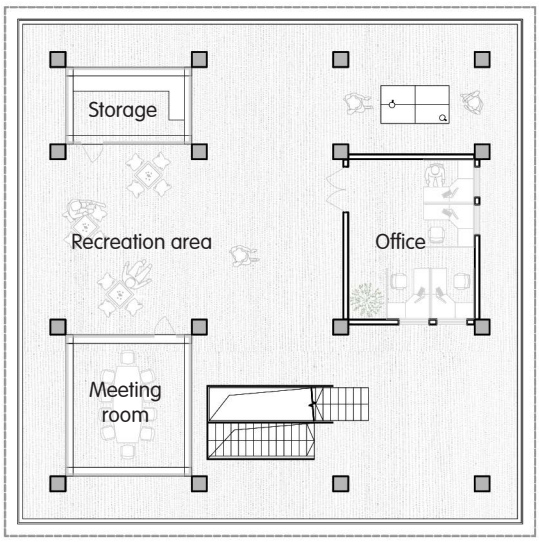
Figure 75. Functional division of program. 03

Community Centre

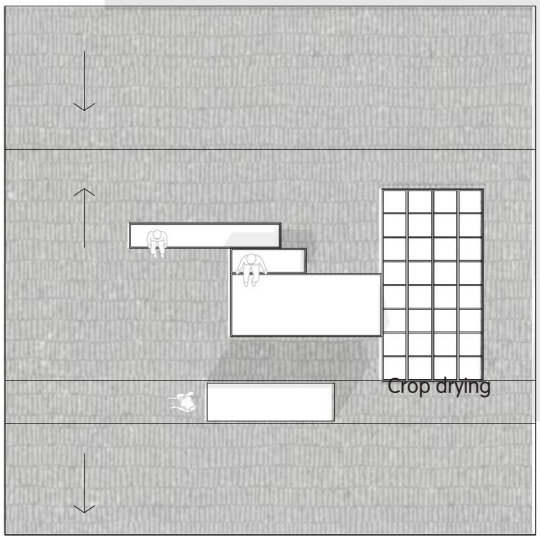


Ground Floor
1:300





Level 01
1:300



Roof
1:300

Figure 76. Small community centre plan

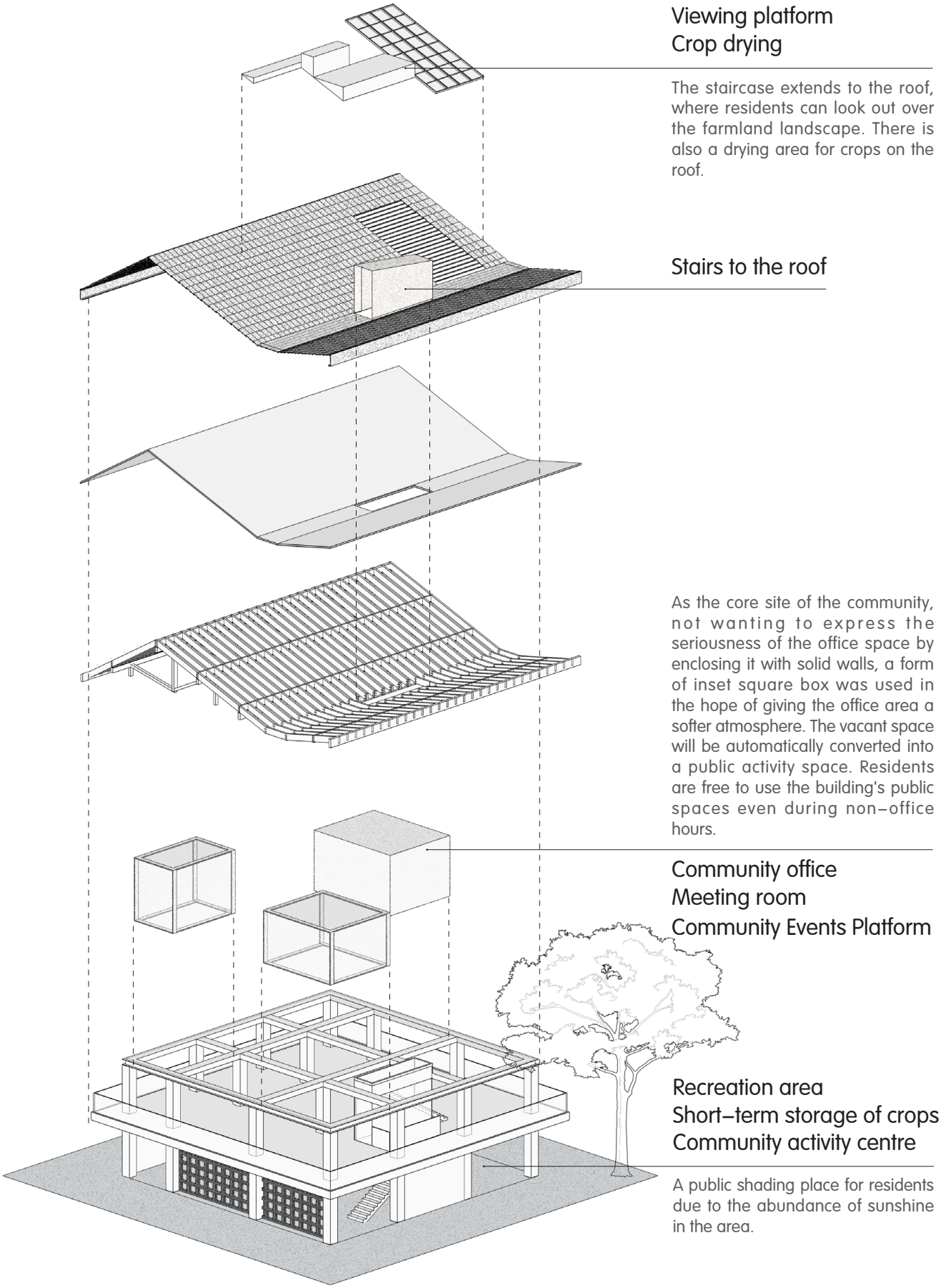
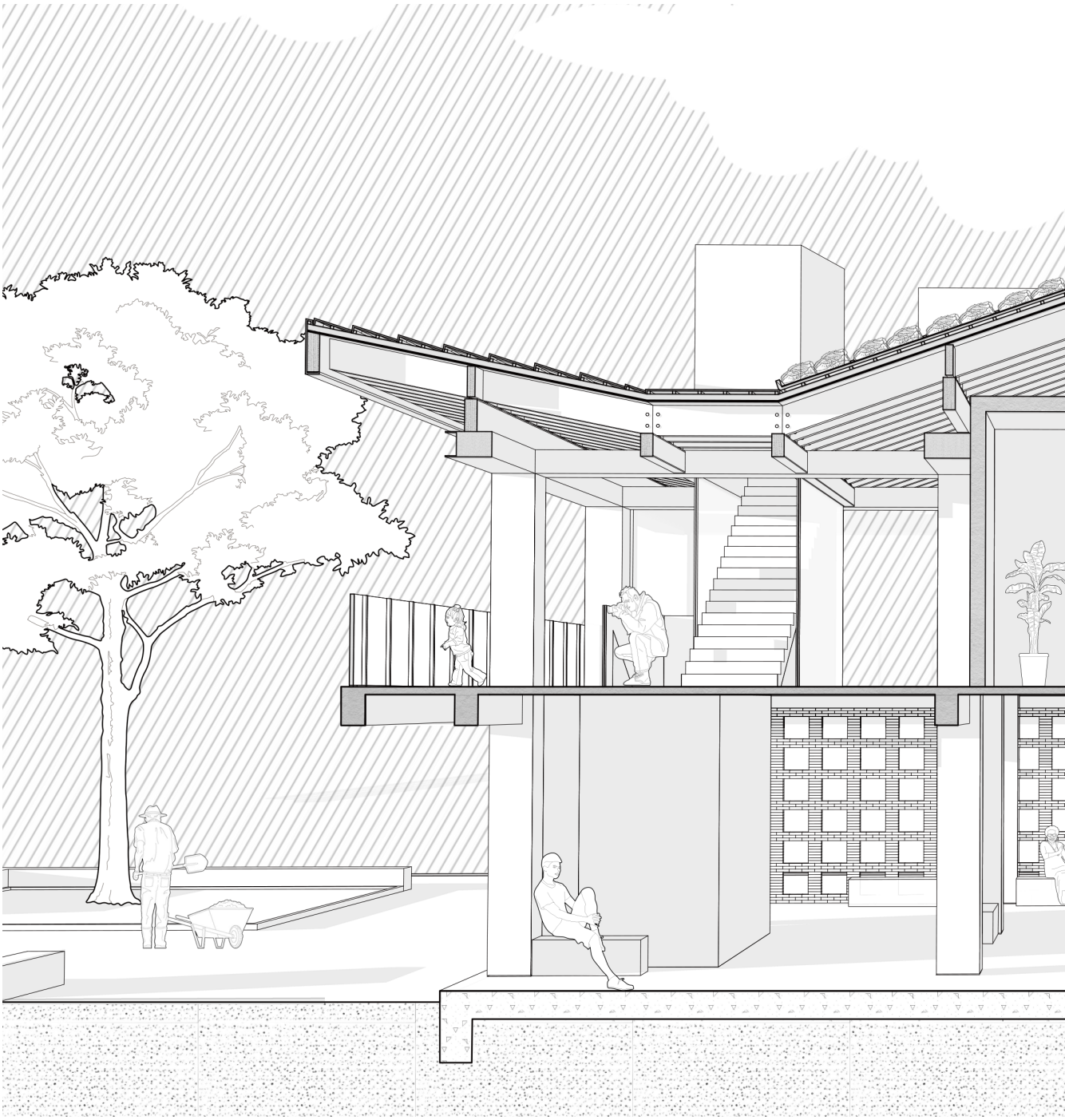


Figure 77. Exploded view of a small community centre

Figure 78. Small community rendering



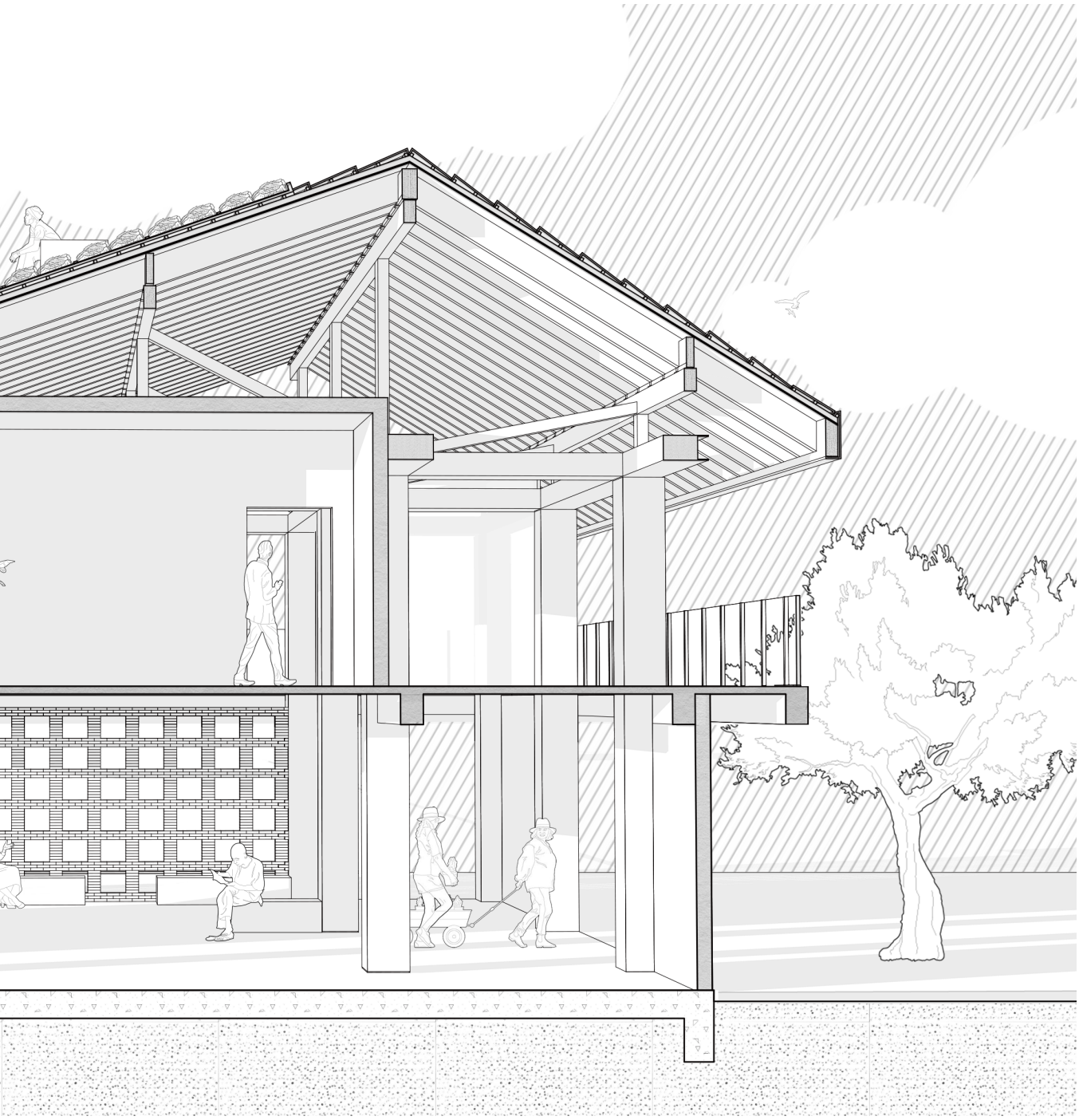
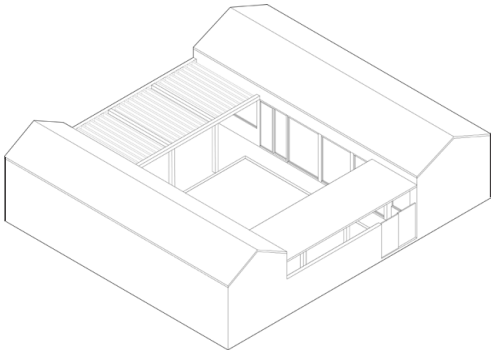
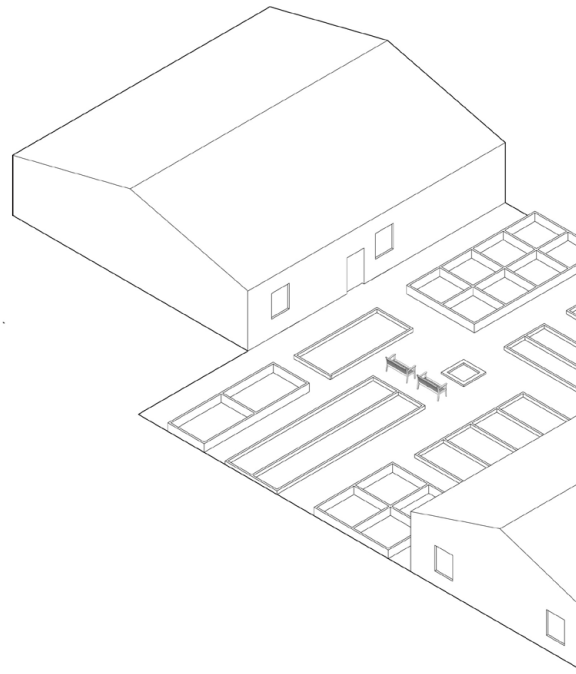


Figure 79. Cutaway view of small community centre

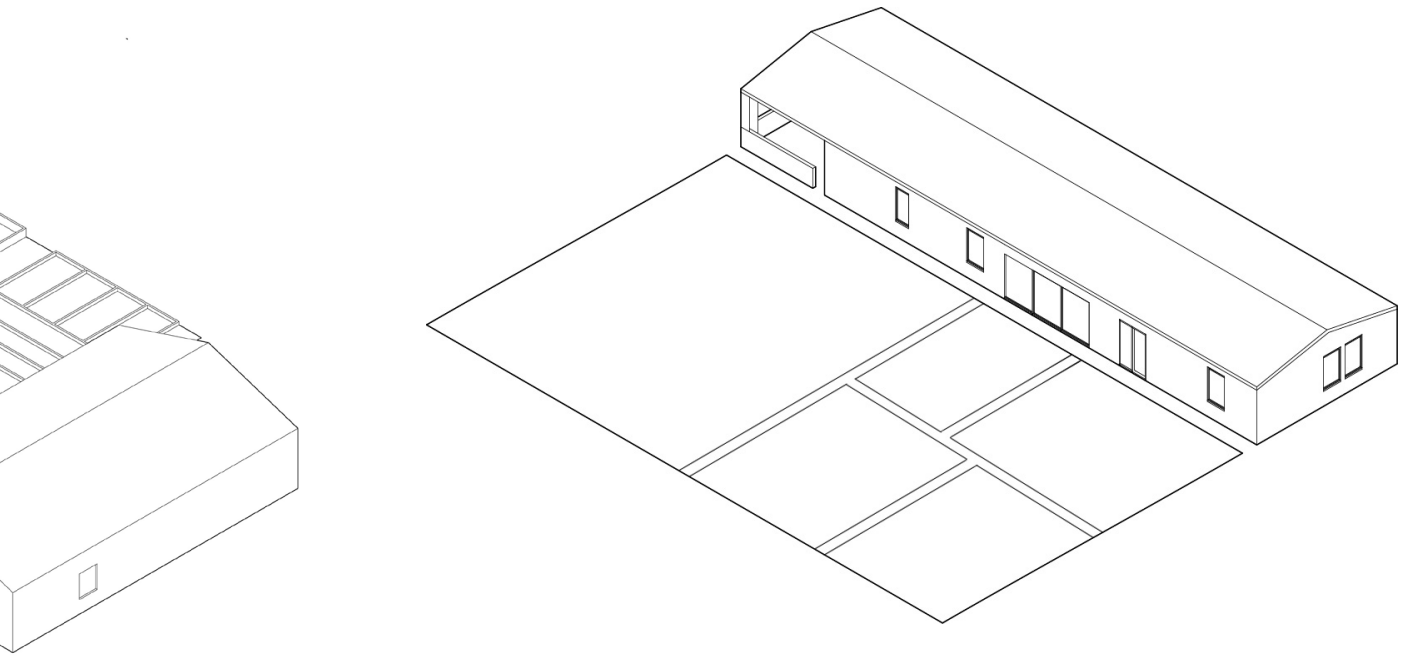
Housing Typology



Enclosed



Semi–enclosed

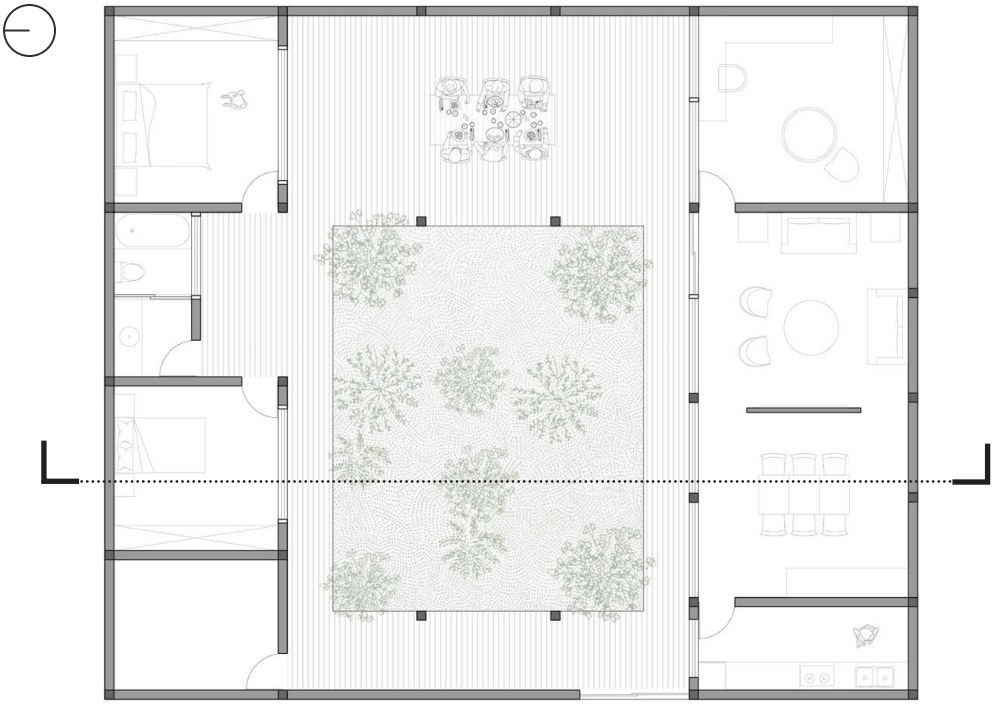


Open

Figure 80. Three typical housing typologies

HOUSING TYPE A

Enclosed

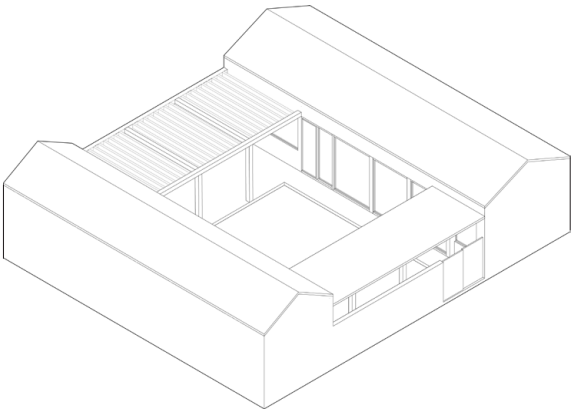


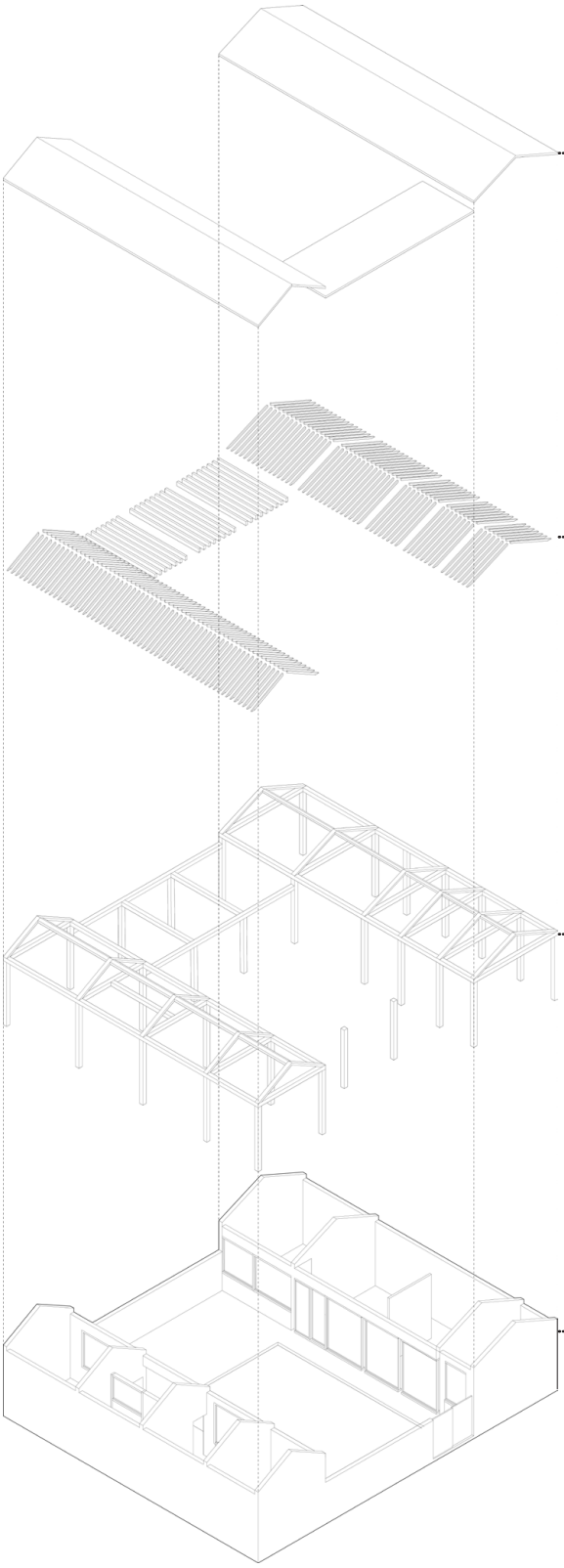
Ground Floor
1:200

Figure 81. Housing type A ground floor

Section
1:200

Figure 82. Housing type A section





Roof

Residential roofs are usually constructed with tiles.

Purlin

Purlins are made of wood. Outdoors, climbing vines can be planted on wooden poles.

Wooden Structure

Structure are made of wood.

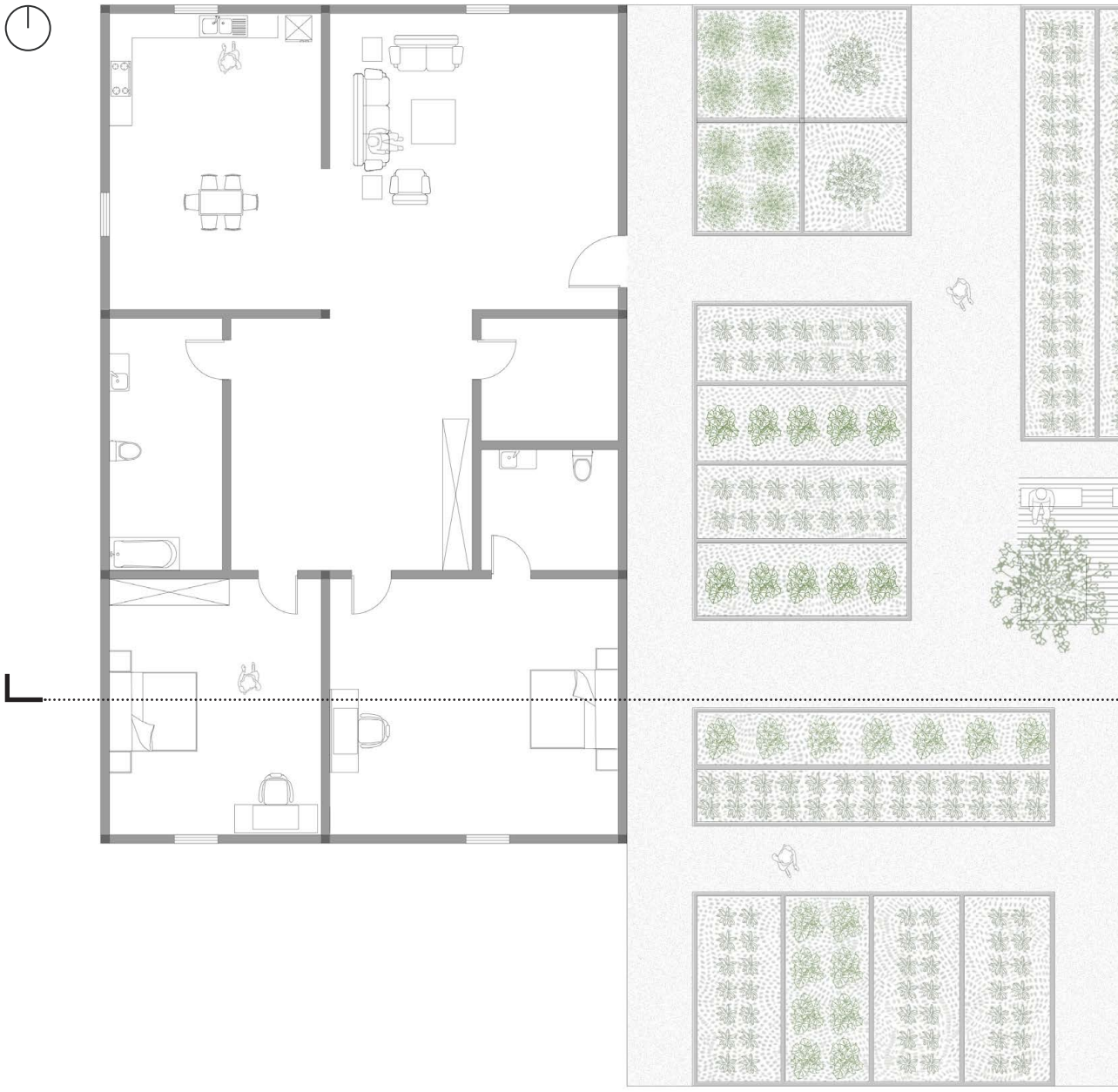
Wall

The walls facing the inner courtyard have large openings, but the walls facing the street are more closed.

Figure 83. Exploded view of housing type A

HOUSING TYPE B

Semi–enclosed



Ground Floor
1:200

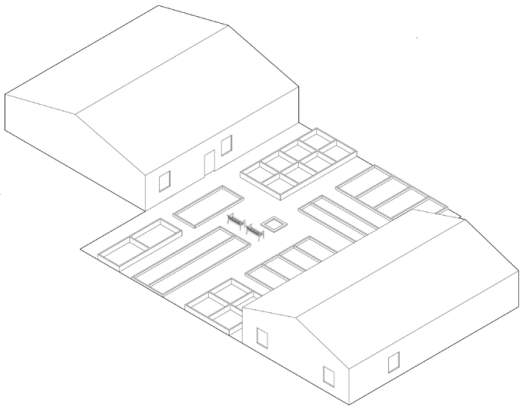
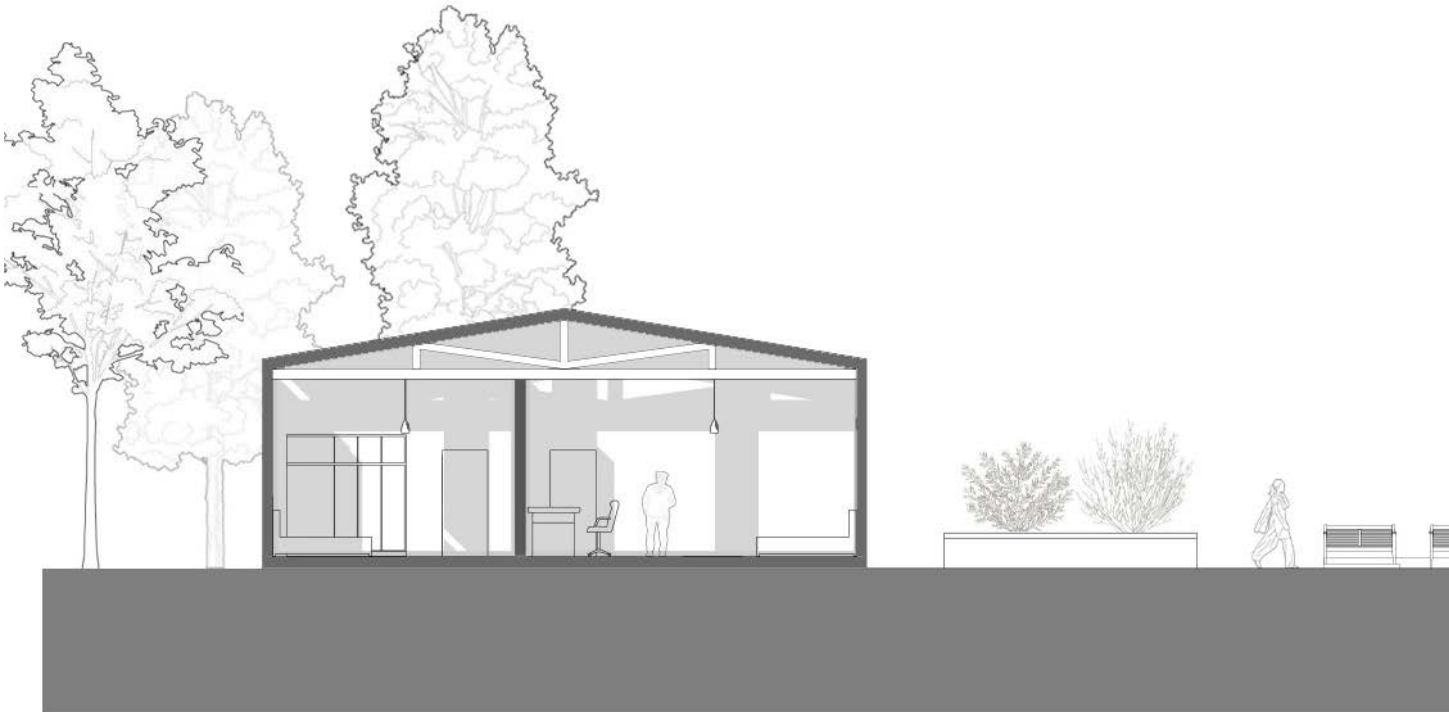


Figure 84. Housing type B ground floor



Section
1:200

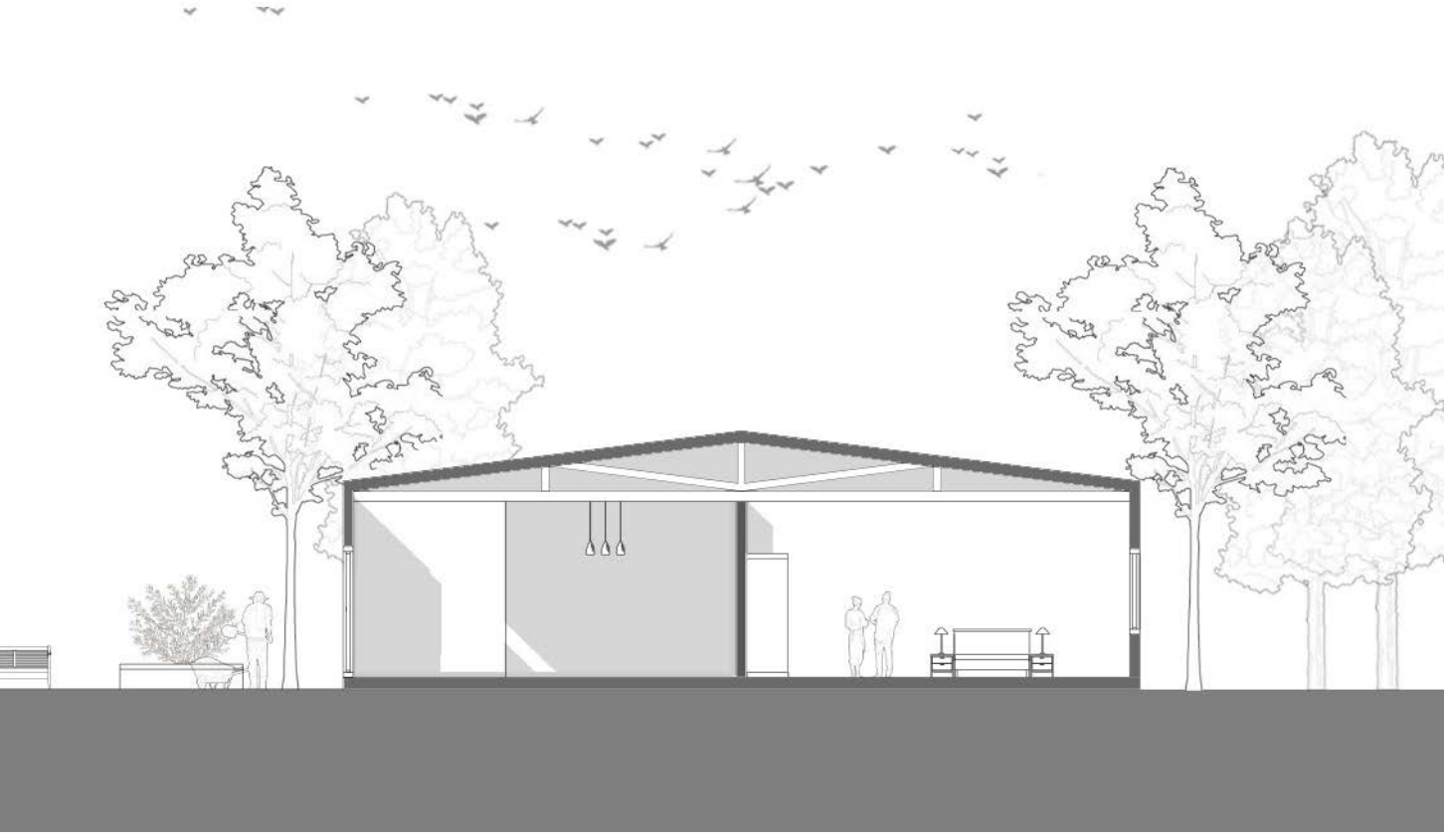
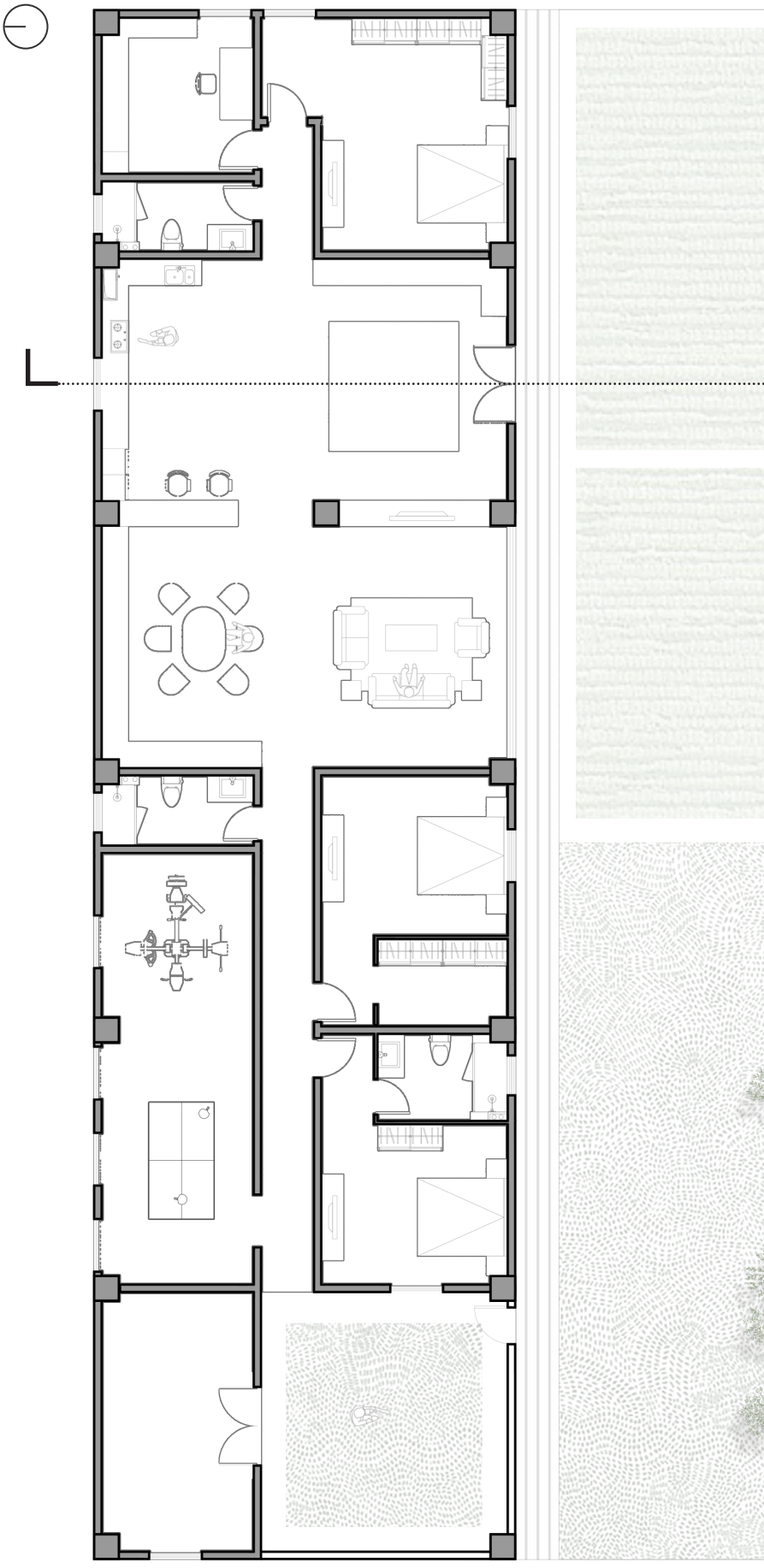


Figure 85. Housing type B section

HOUSING TYPE C

Open



Ground Floor
1:200

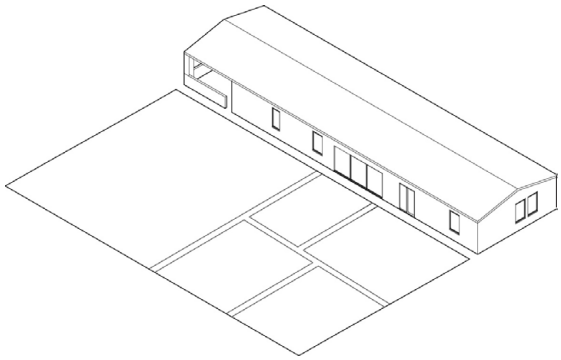
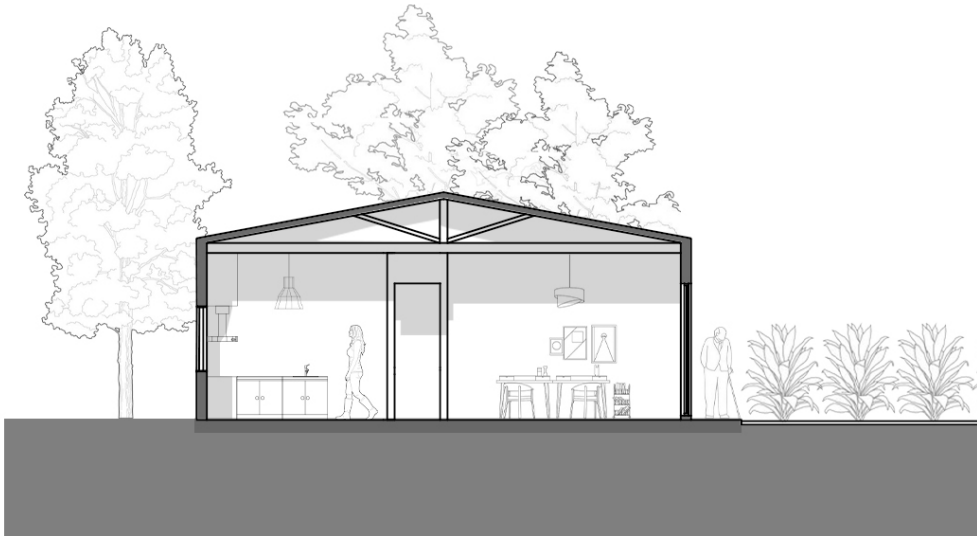


Figure 86. Housing type C ground floor



Section
1:200

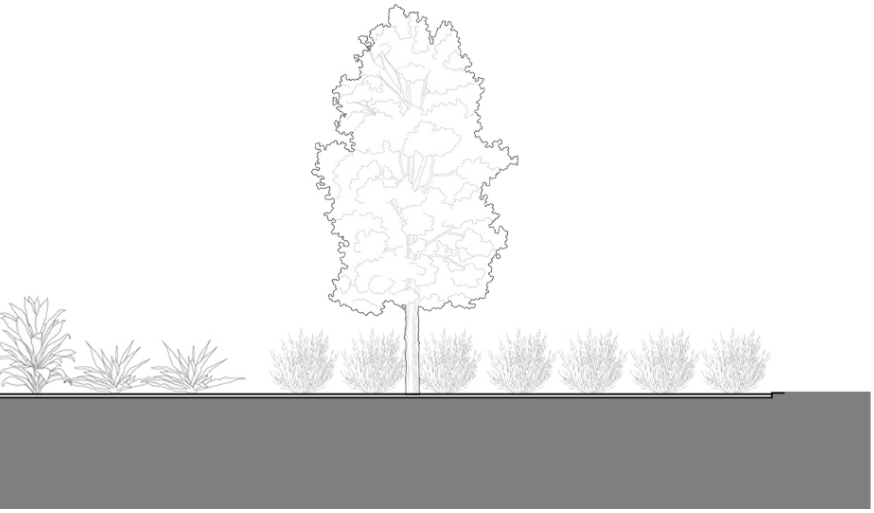
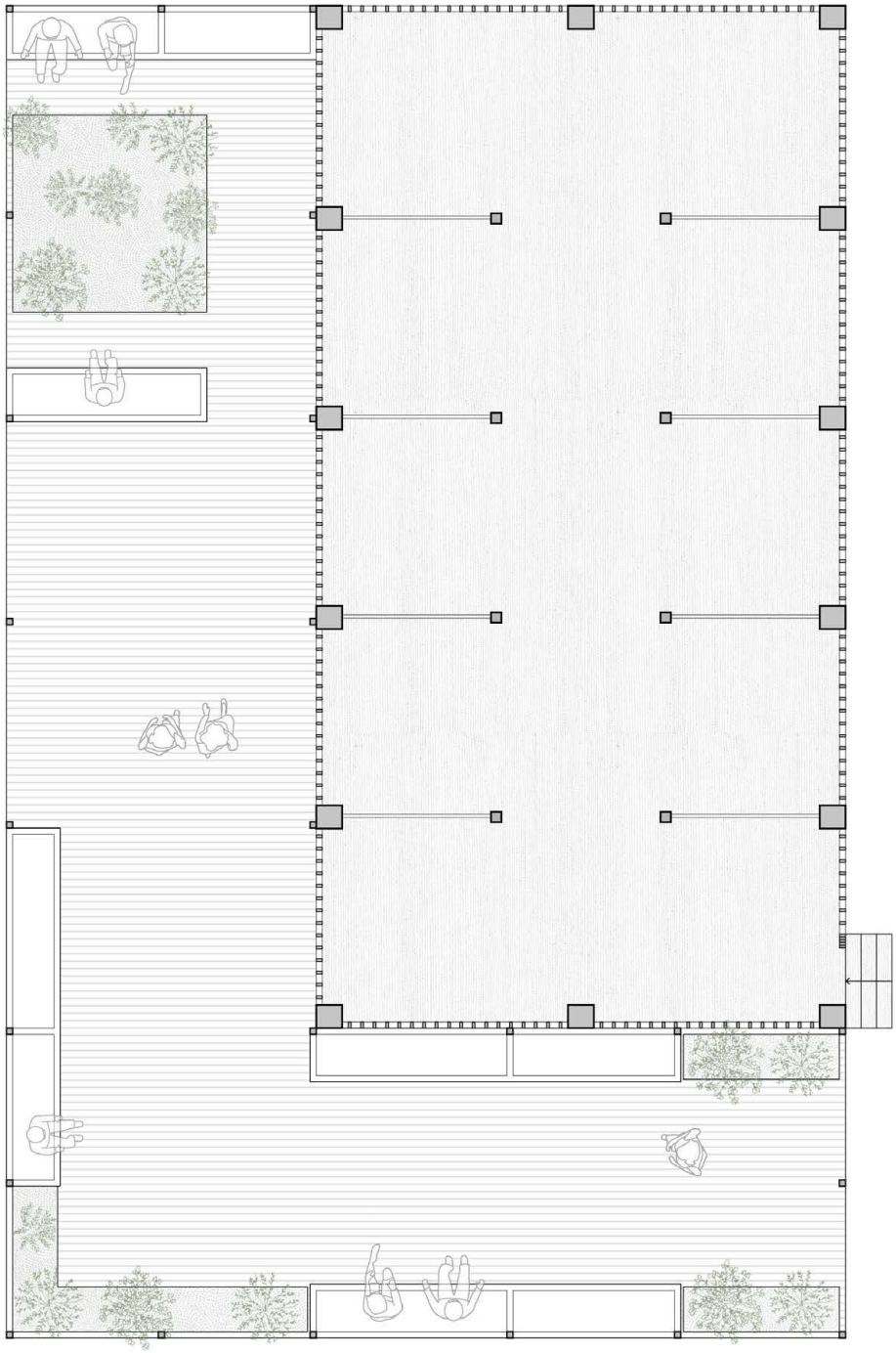


Figure 87. Housing type C section

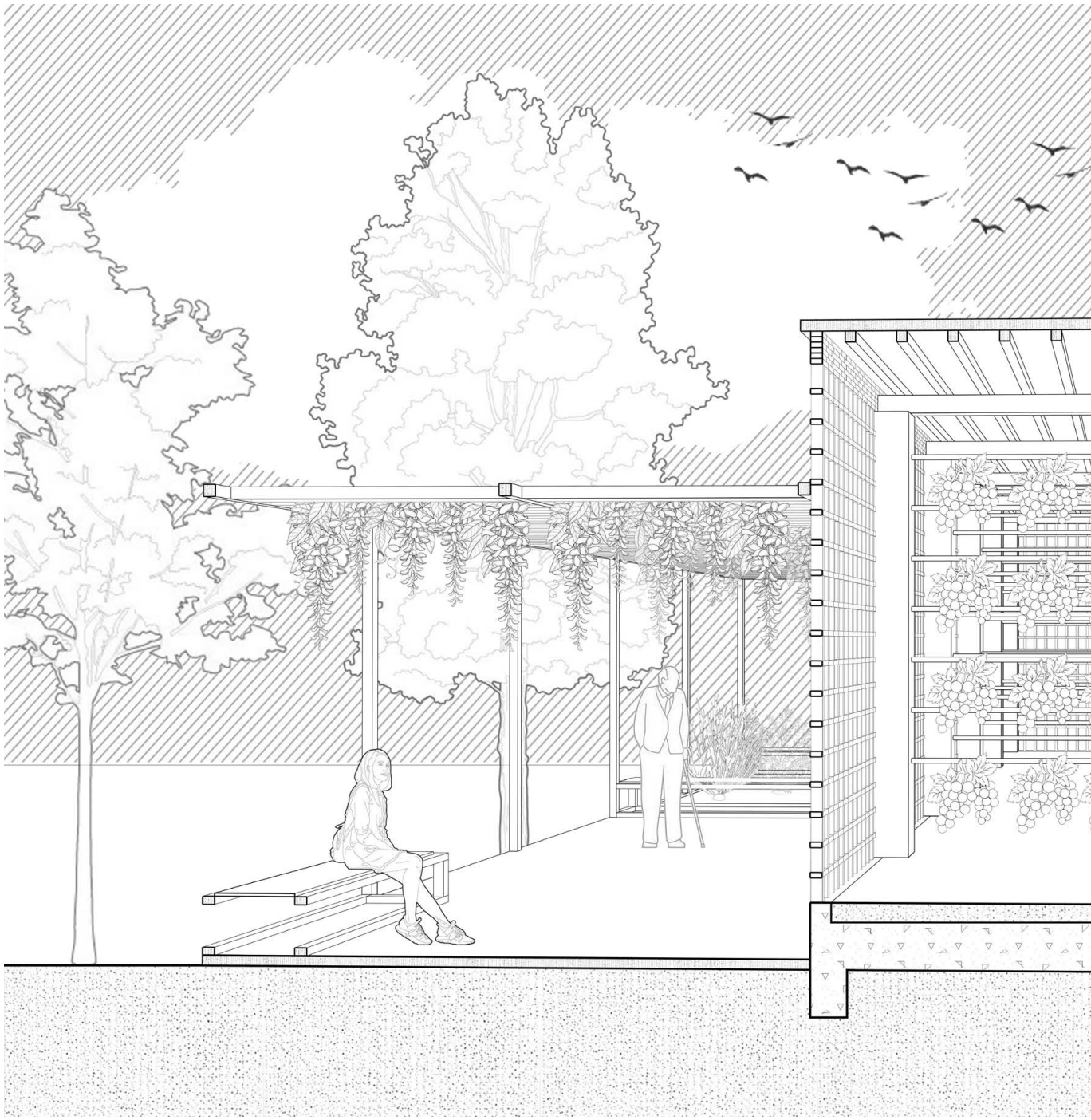
Agricultural Premises Typology



Ground Floor
1:200

Roof
1:200

Figure 88. Raisin making house plan



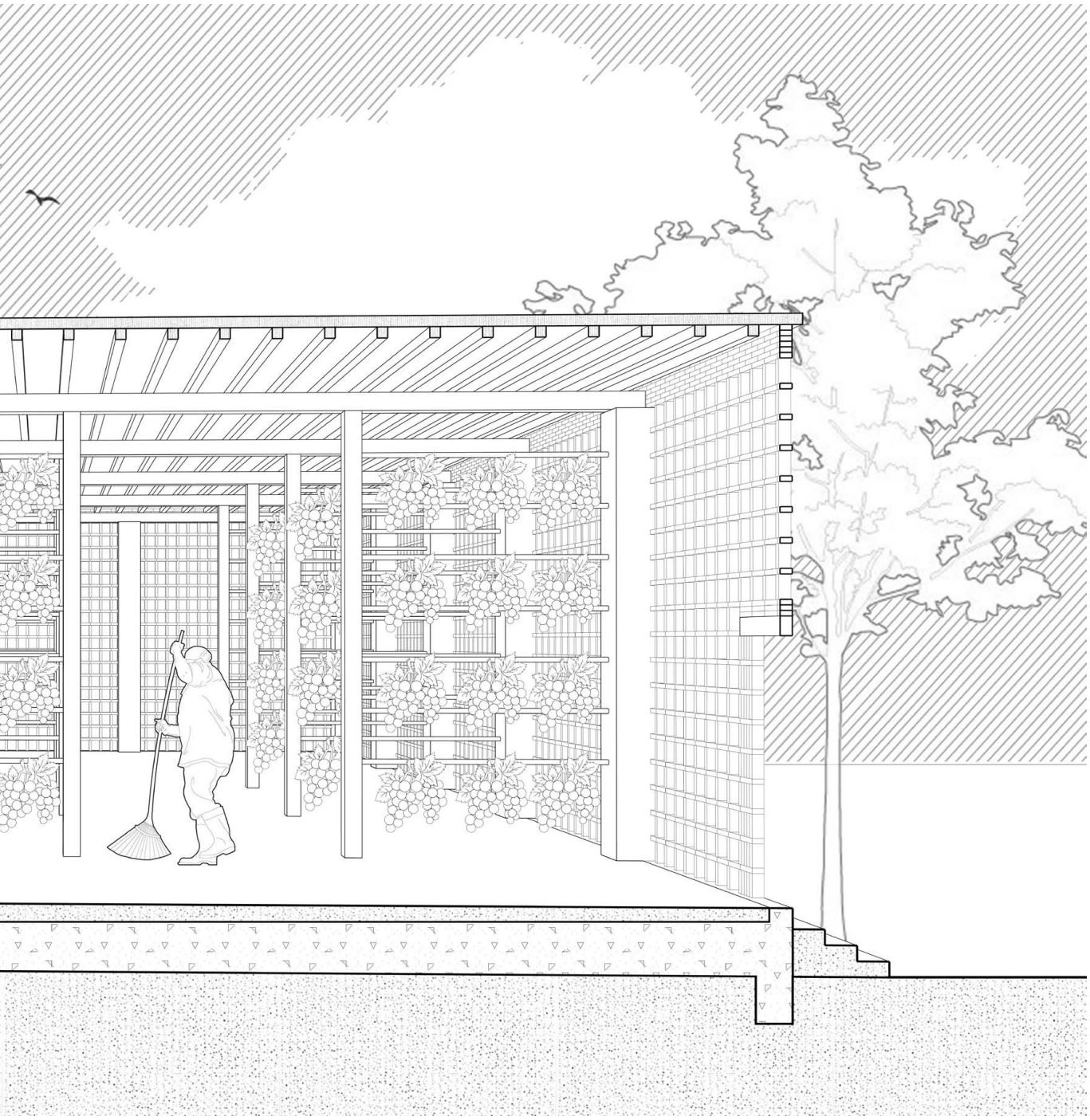
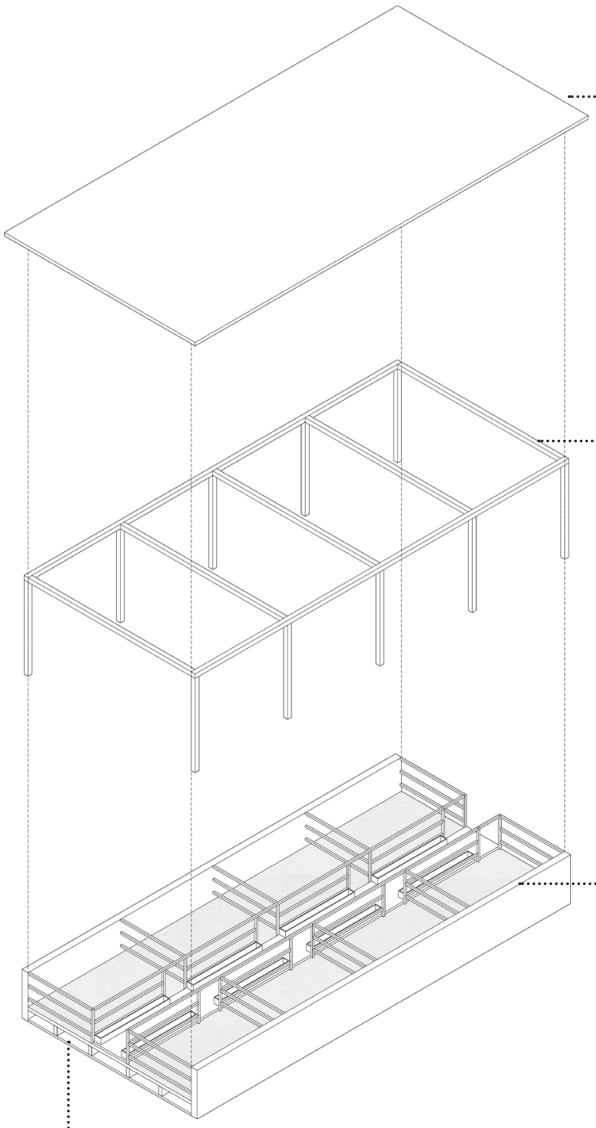


Figure 89. Cutaway view of raisin making house plan



Roof

The roof of the sheep shed is made of hay.

Wooden Structure

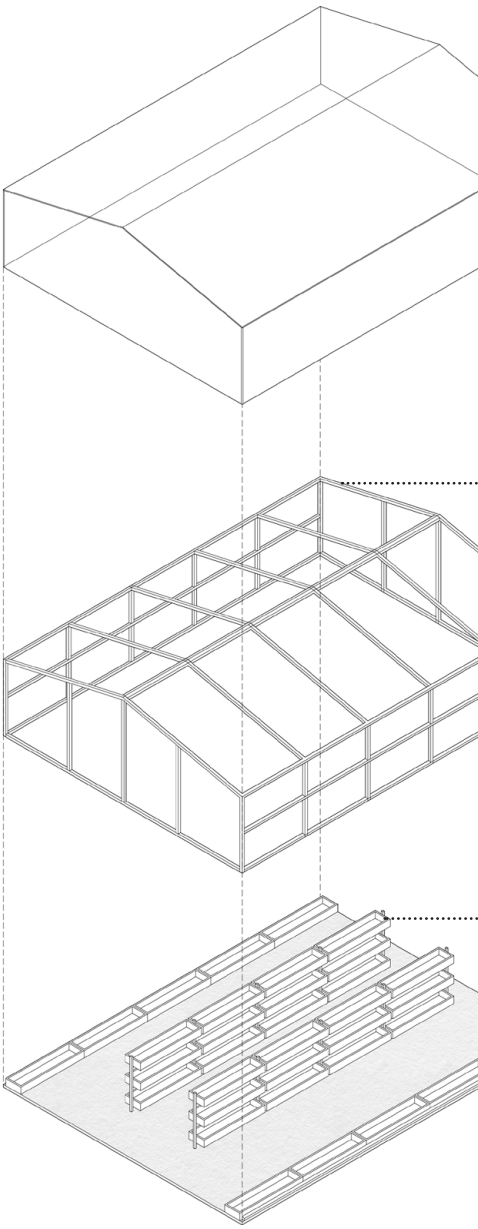
Structure are made of wood. The pillars will be higher than the wall, which can ensure the ventilation of the sheepfold.

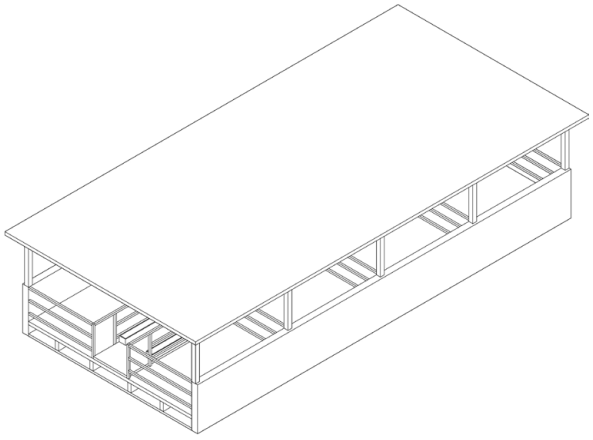
Wall

Walls made of brick or stone.

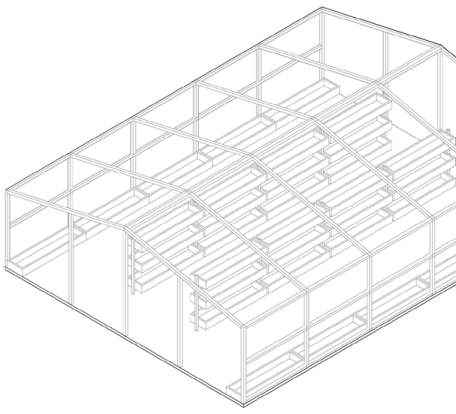
Sheep Feces Collection

the lower part of the building is dedicated to collecting sheep droppings, which can be used as agricultural fertilizer.





SHEEP PEN



GREEN HOUSE

Glass Surface

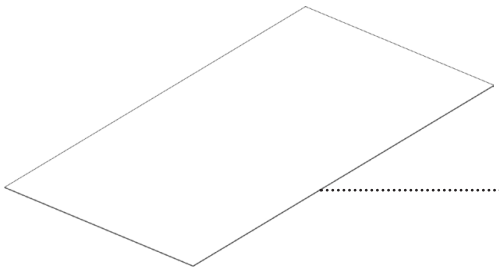
The outer surface is made of glass, in order to collect more sunlight and heat.

Structure

The material of the structure is steel.

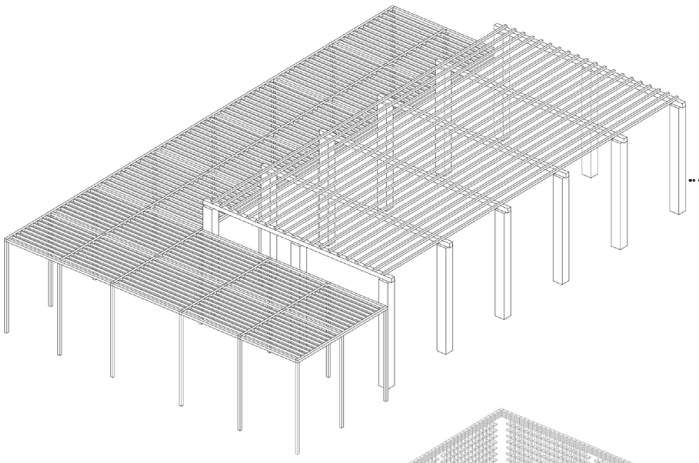
Flower Stand

The material of the flower stand is wood, and some rare species will be cultivated in the greenhouse.



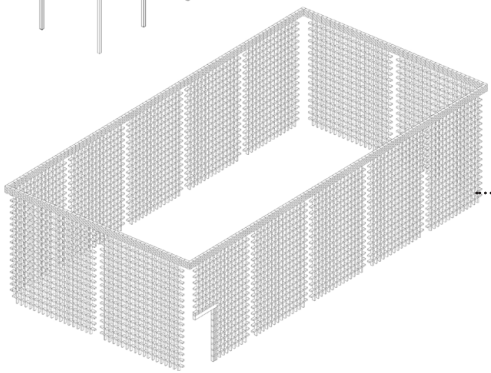
Hay Roof

Inner Mongolia has a dry climate, so local residents use hay to make roofs.



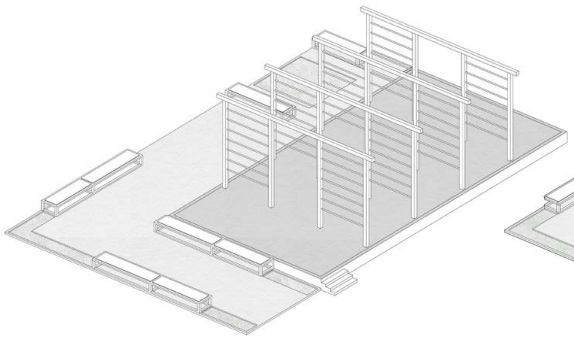
Wooden Structure

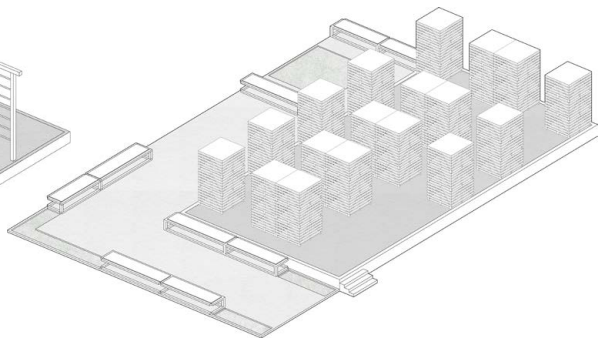
The material of the structure is wood.

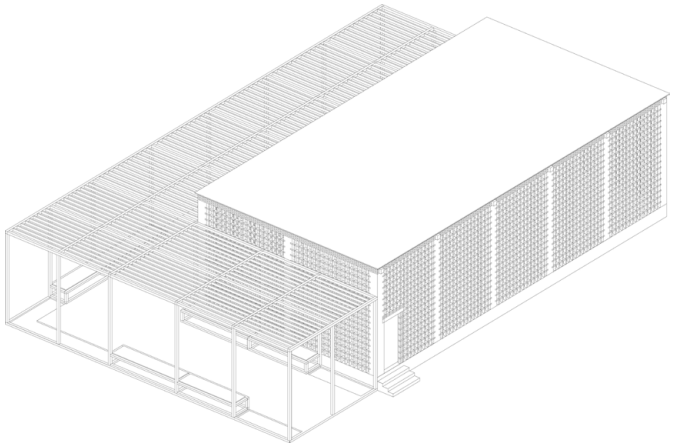


Brick Facade

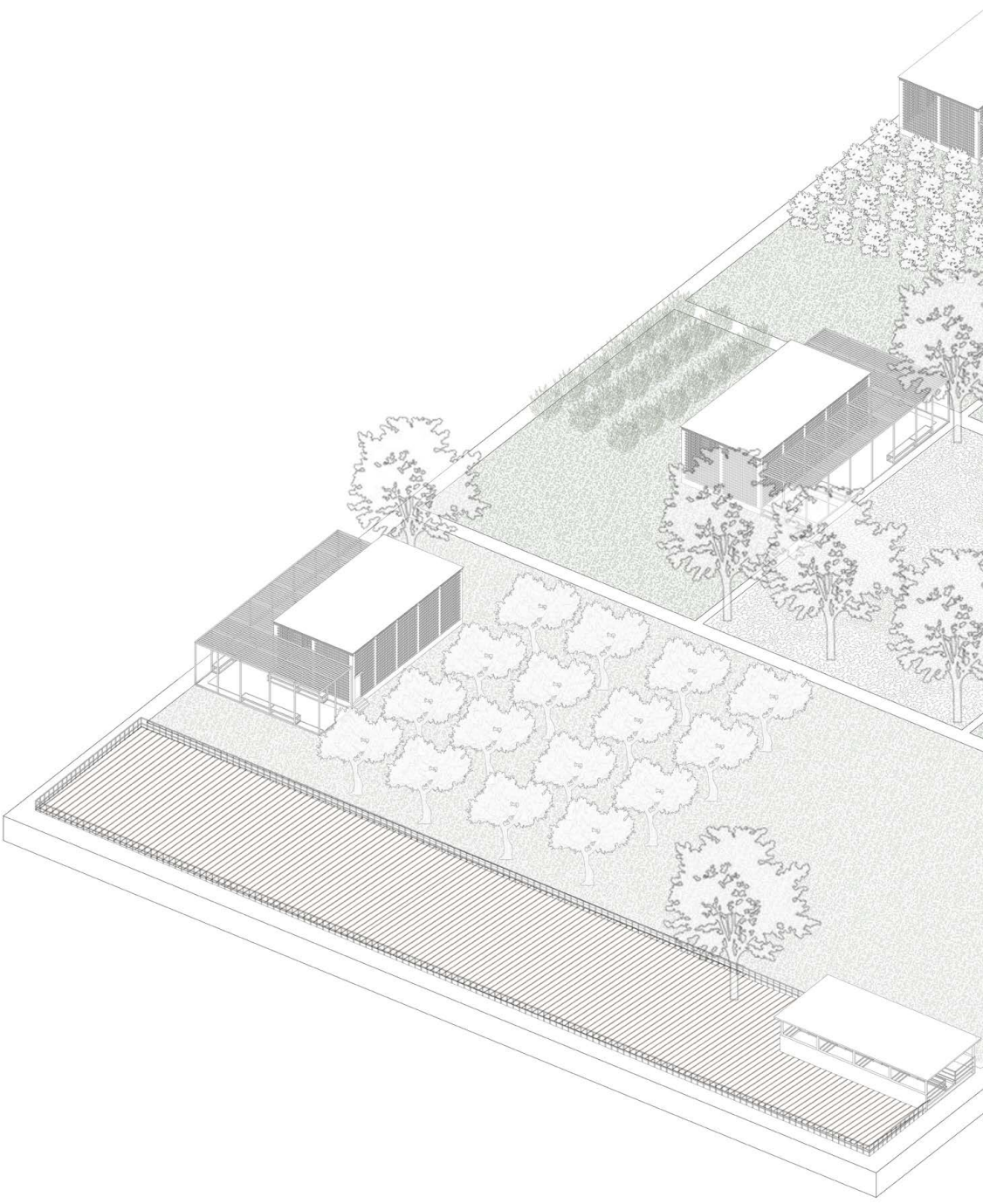
We built the facade with bricks, leaving some gaps between each brick for ventilation.







RAISIN DRYING AND FRUIT STORAGE



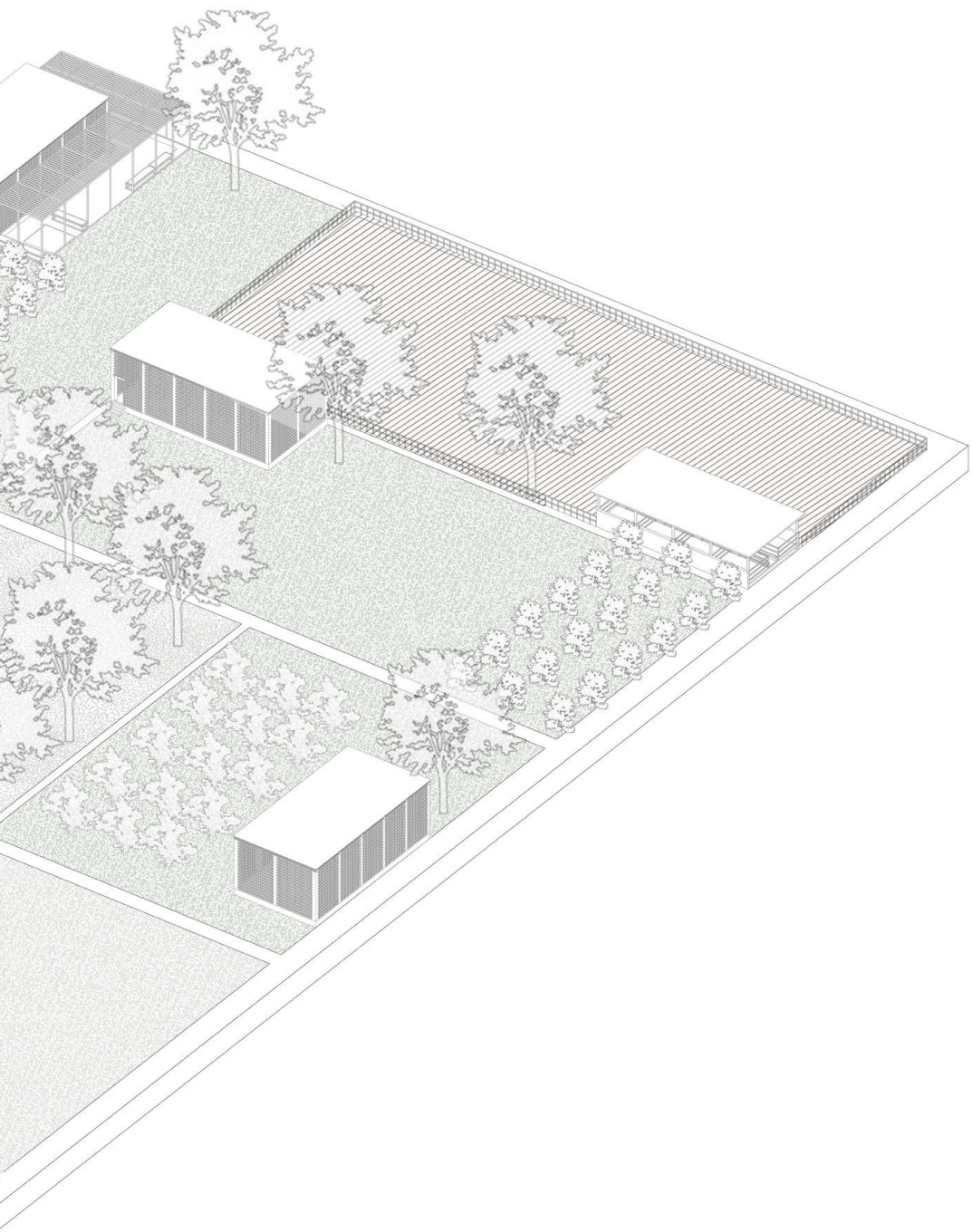
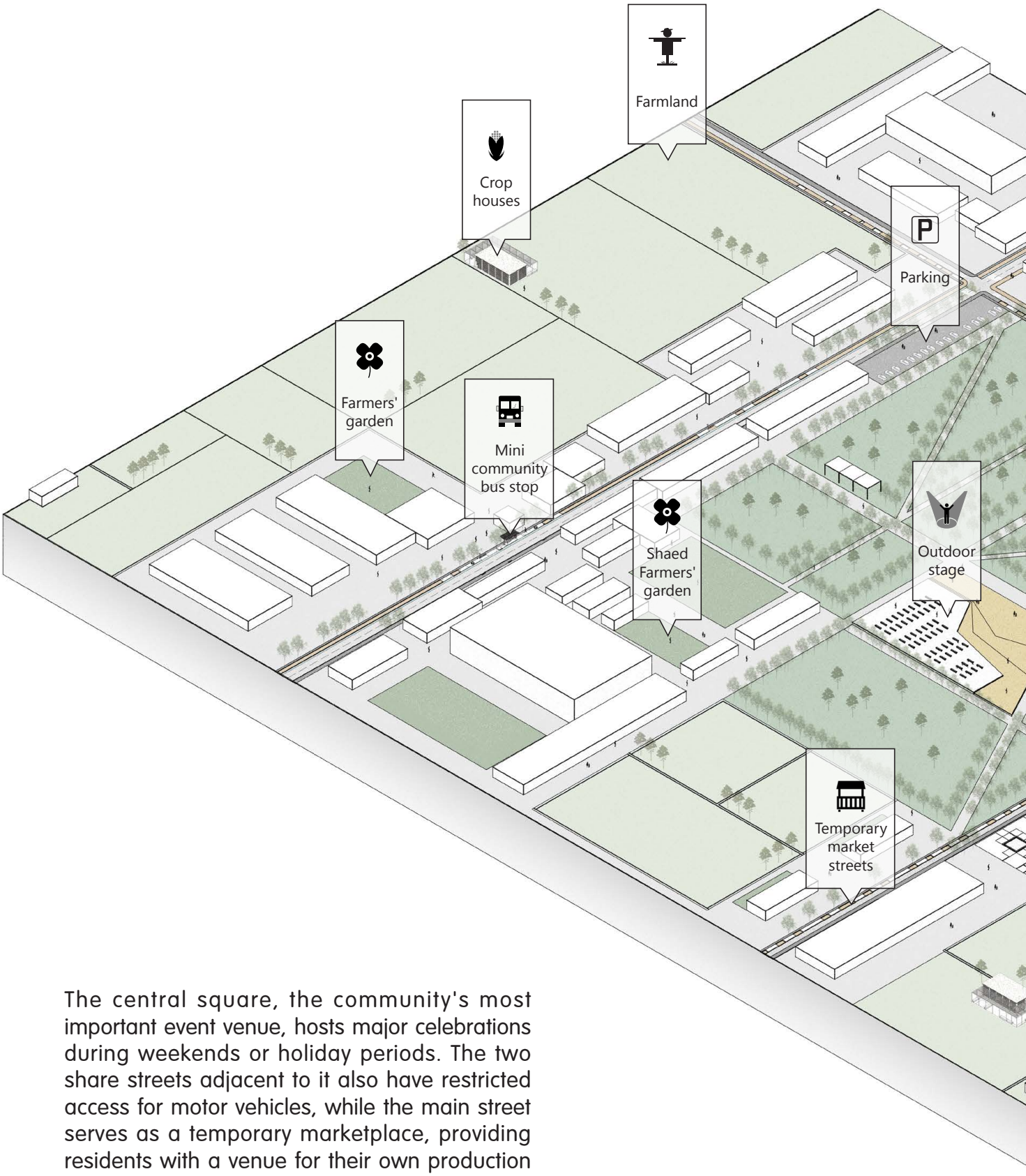


Figure 91. Axonometric layout of the orchard

Central Plaza Area



The central square, the community's most important event venue, hosts major celebrations during weekends or holiday periods. The two share streets adjacent to it also have restricted access for motor vehicles, while the main street serves as a temporary marketplace, providing residents with a venue for their own production and sales, and thus attracting visitors to the area to create economic value.

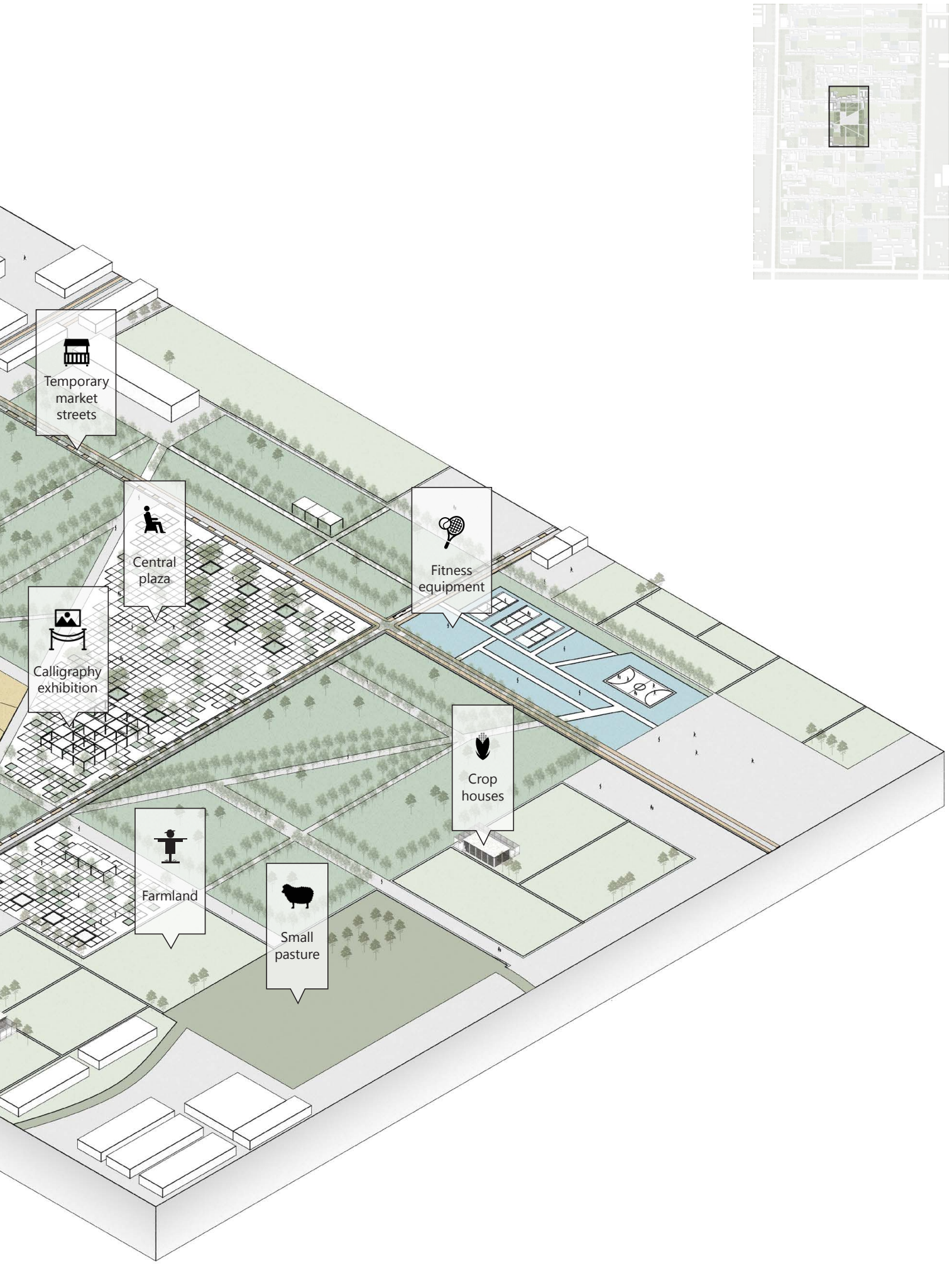


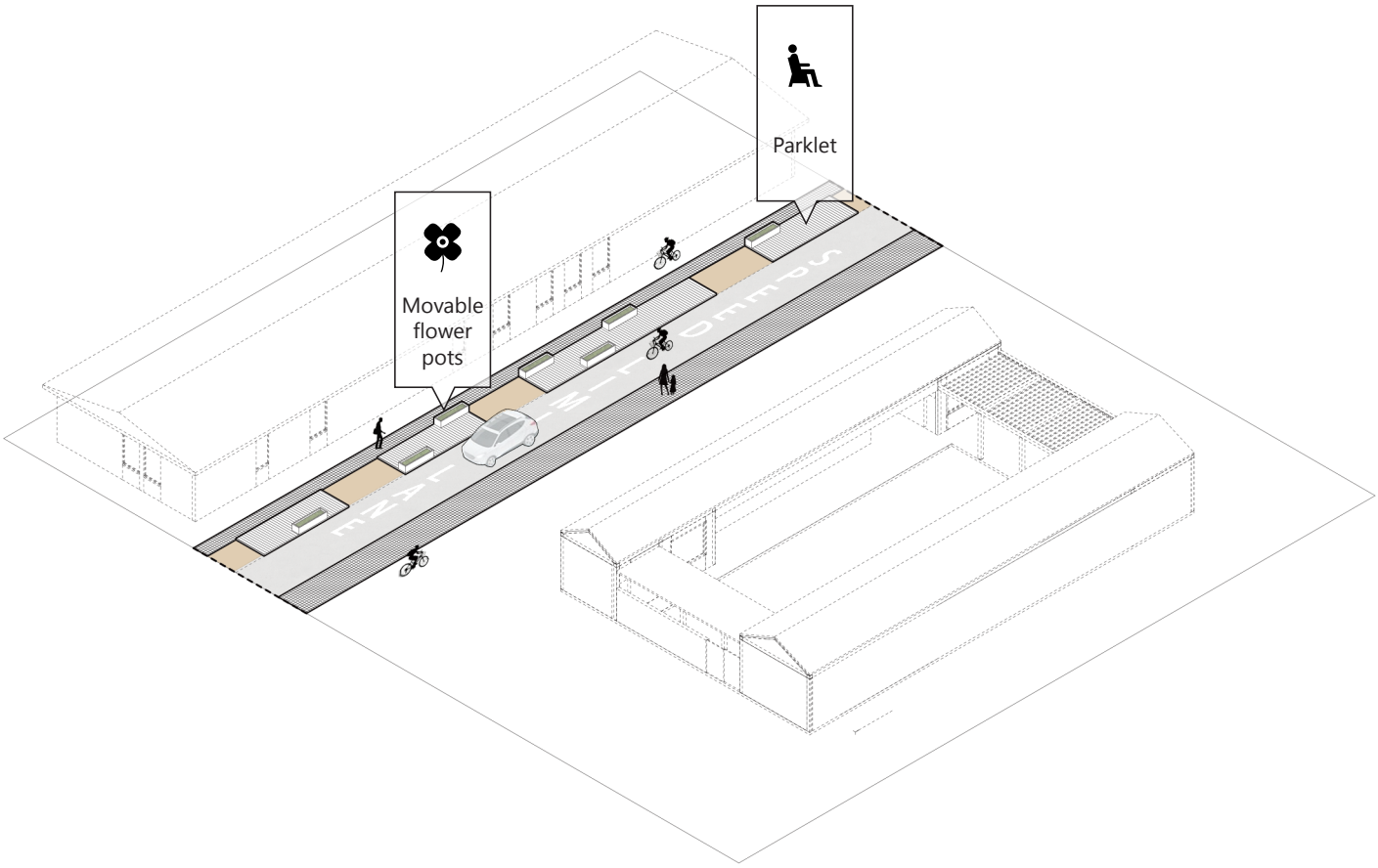
Figure 92. Central plaza axonometric

Figure 93. Rendering of the central plaza

SHARE STREET – ONE–WAY TRAFFIC LANE

USUAL

Pedestrians priority street



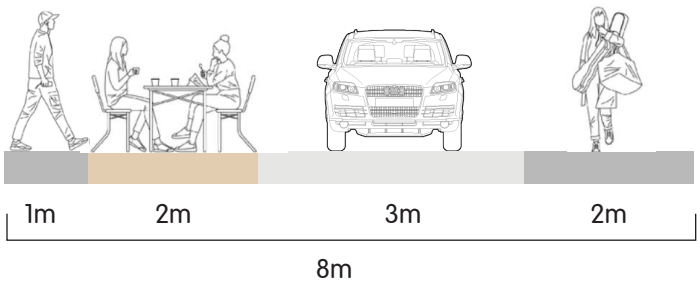
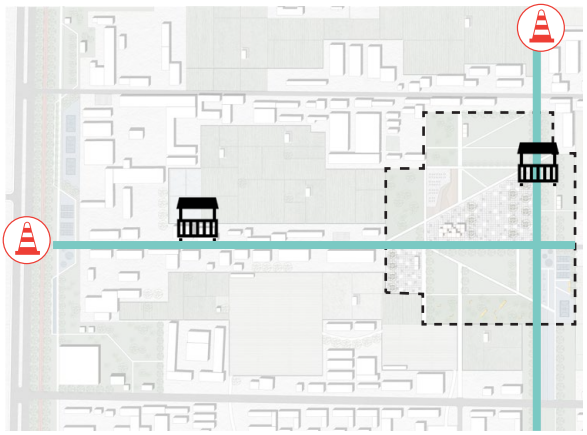
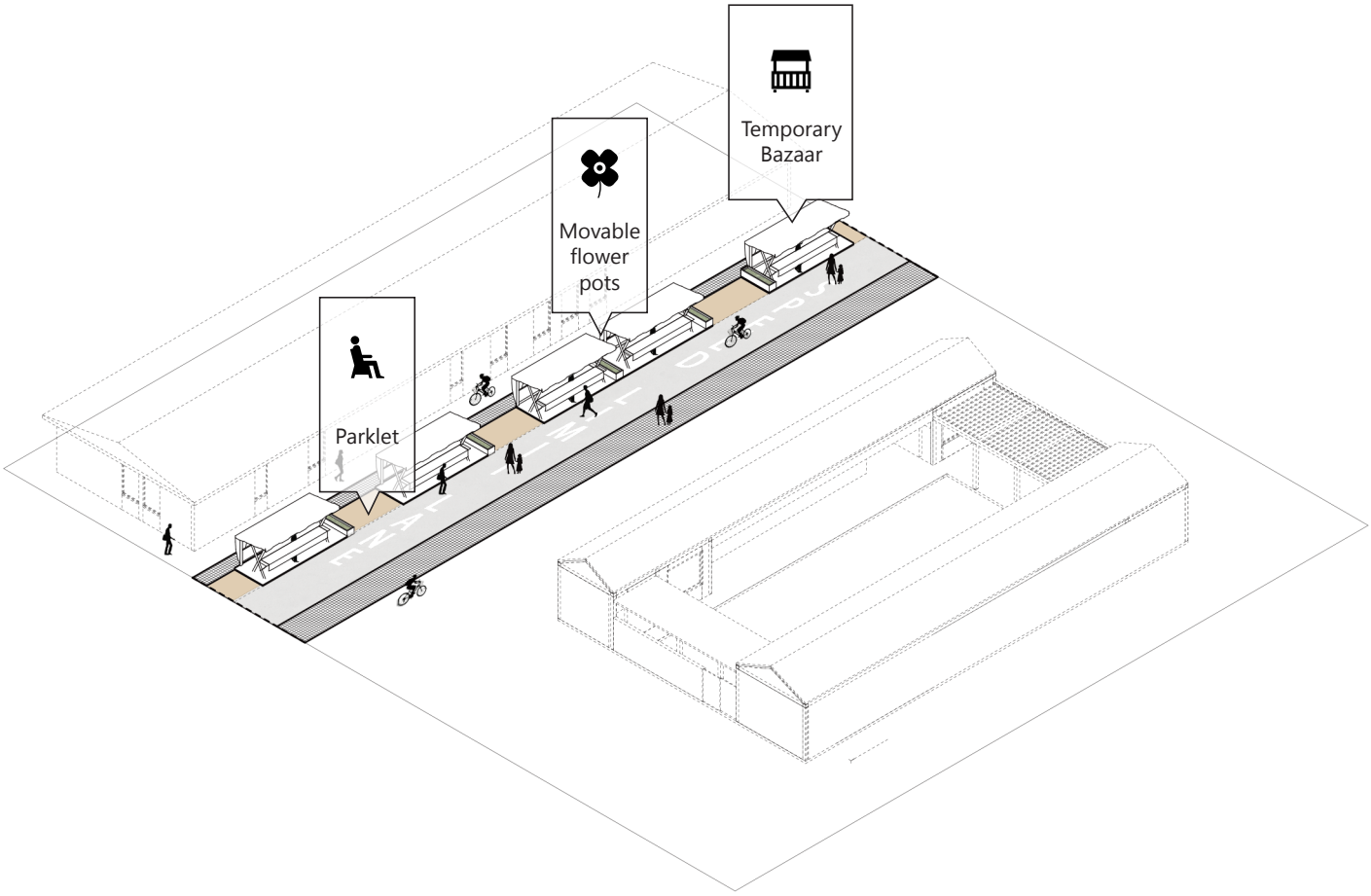


Figure 94. Daily one–way lane axonometric



WEEKEND / FESTIVALS

Temporary market street
Restricted vehicle access



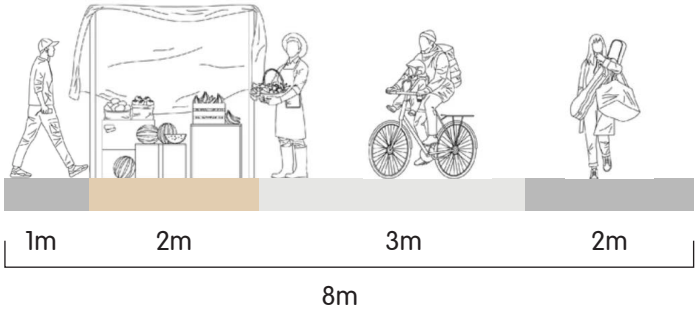
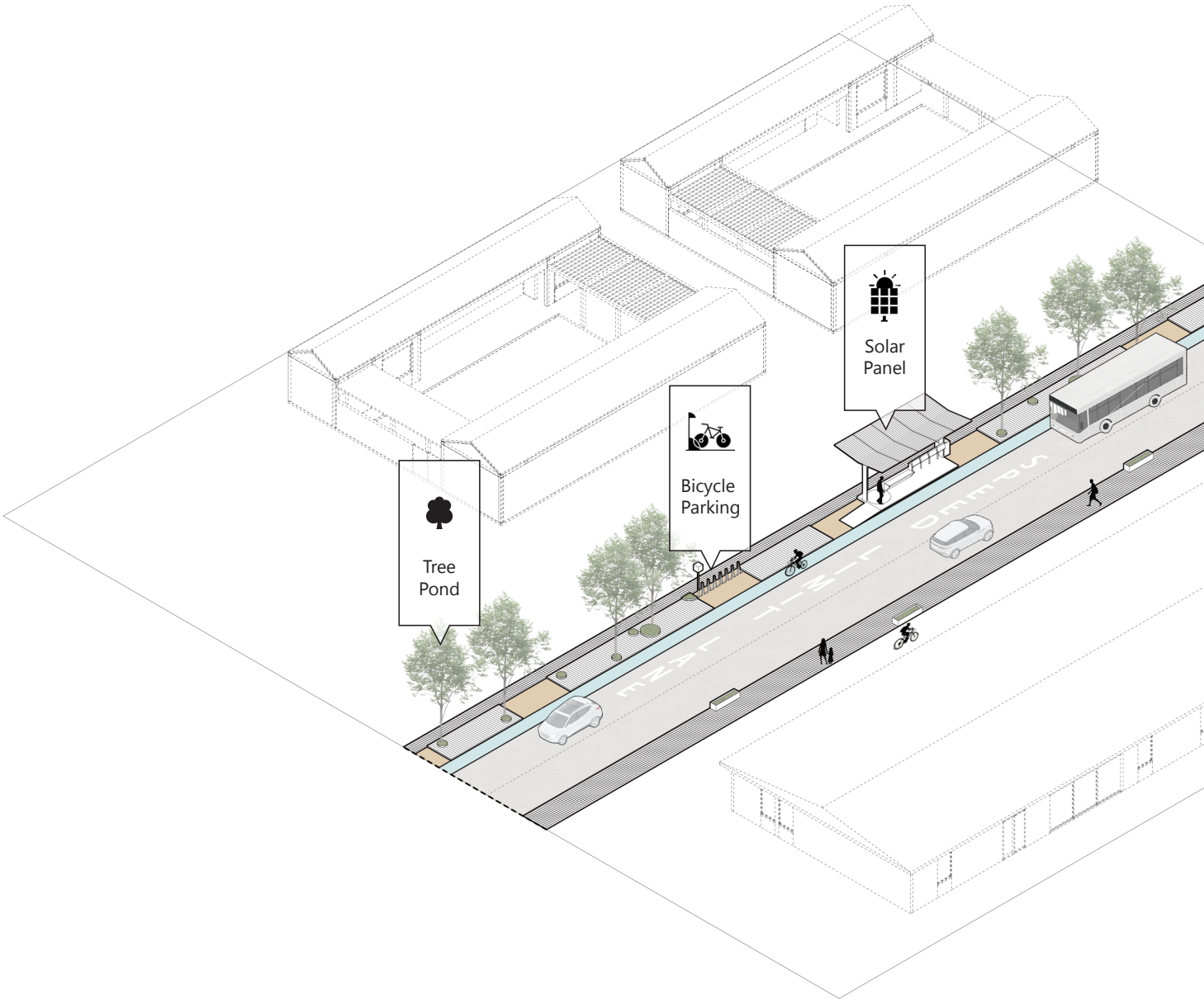
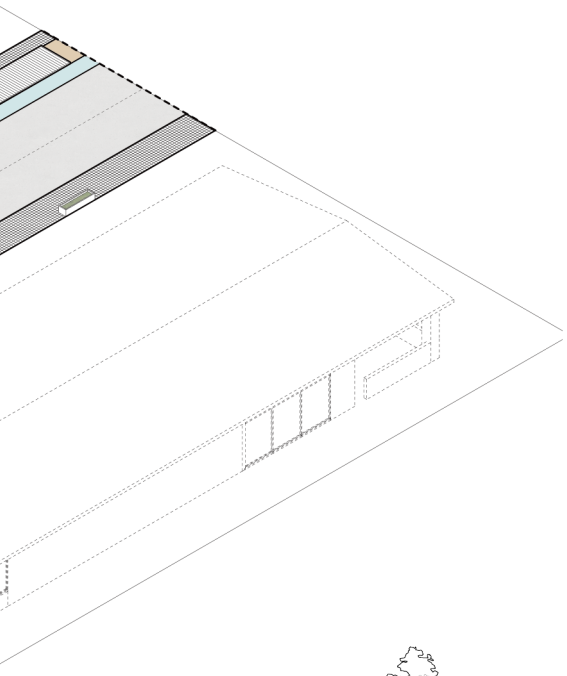


Figure 95. One–way lane axonometry on weekends and holidays

SHARE STREET – TWO–WAY TRAFFIC LANE



Two–way traffic lane



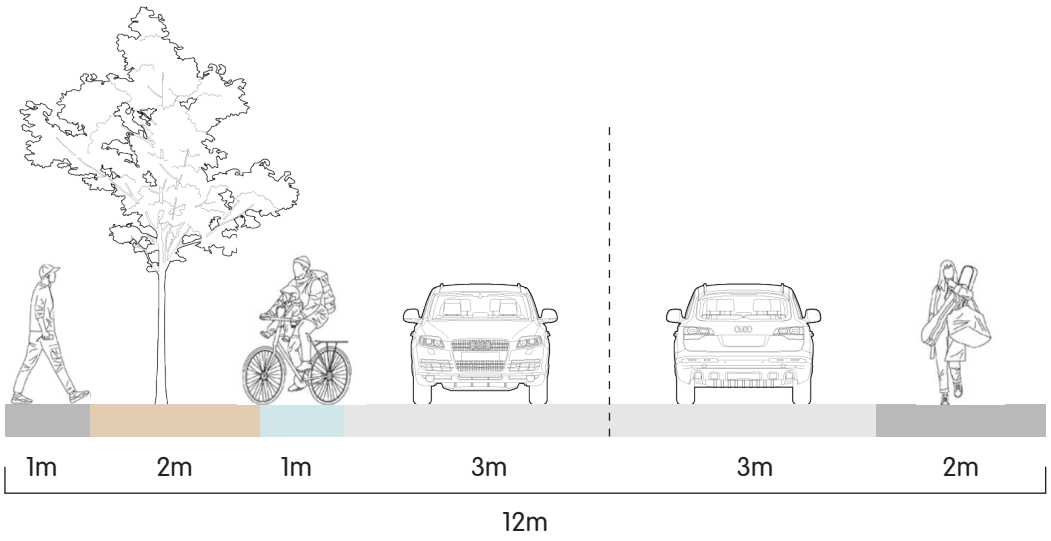


Figure 96. Two–way lane axonometry

Conclusion

The Haibowan district of Wuhai has an innate geographical advantage for agricultural development, and the project experiment is based on Howard's theory of the garden city, with a shared garden community as the experimental objective, and a critical discussion on its practicality.

By analysing the local agricultural production resources, the local cultural and industrial structure of Wuhai, the project proposes a model for a sustainable agricultural community. It seeks to balance residential, commercial, recreational and agricultural uses by integrating different land uses, incorporating the concepts of ecological agriculture and sustainable development into the future development of Wuhai and improving the quality of life of its residents.

Today, Wuhai's Field Sharing Community is only a pilot area, and in the coming decades, it will expand throughout the city. The specific details of Wuhai's Garden City may change slightly over time, but the main concept of the Garden City will continue.

Wuhai's Field Sharing Community is an attempt to address the uneven development of urbanisation. It is hoped that Wuhai's garden sharing community can become a model that can be applied to other small and medium–sized cities in a localised way, revitalising small cities.

Bibliography

Ebenezer Howard, (2013), Garden Cities of To–Morrow, ISBN: 978–0415847896

Natallia Barykina, (2018), 'The dissolution of cities': The Horseshoe settlement in Weimar Berlin, Urban History, 45(3), 471–488,
DOI: 10.1017/S0963926817000360

Marcus, Clare Cooper (EDT), (1997), People Places, Design Guidlines for Urban Open Space, 2nd Edition, ISBN: 978–0471288336

Girot, Christophe, (2016), "Thinking the Contemporary Landscape" Ed. Princeton Architectural Press, ISBN: 978–1616895204

Kate Kennen, Niall Kirkwood, (2015), "Phyto: Principles and Resources for Site Remediation and Landscape Design" Ed. Routledge Taylor & Francis,
ISBN: 978–0415814157

Yu Kongjian, (2016), Sponge City, Theory and Practice, ISBN: 978–7112194896

Yoshiharu Ashihara, (2006), The Aesthetics of the Street, 街並みの美学 ,
ISBN: 978–7530644768

References

Huang Minghua, Hui Qian, (2018), A Pastoral City? A Garden City?: Re–understanding of Howard's Garden City, DOI: 10.11819/cpr20181003a

Xu Yanbing, (2014), The Image of "Social urban"—The Environment Construction on Cocialization of Urban Lifefrom Ebenezer Howard's Planning Theory, Design Culture and Aesthetics, DOI: 10.3969/J, ISSN 1674–4187

Ayyoob Sharifi, (2016), From Garden City to Eco–urbanism: The quest for sustainable neighborhood development, Sustainable Cities and Society, Volume 20, Pages 1–16, ISSN 2210–6707

Antonio Blanco Pastor, Eamonn Canniffe, Carlos Jes ú s Rosa Jim é nez, (2023), Learning from Letchworth and Welwyn Garden City: Garden cities' policies for the development of existing settlements in the contemporary world, Land Use Policy, Volume 132, 106759, ISSN 0264–8377

Yuan Zhiyuan, (2017), Land use optimization in urban agglomerations based on the idyllic city theory
https://kns.cnki.net/KCMS/detail/detail.aspx?dbname=CDFDLAST2017&filename=1017136116.nh

Cheng Gaoming, (2013), From Garden City to Rural City: On the value and significance that the agricultural landscape involved in the urban construction, 2013, 20(03): 25–28

Wang Juan, (2017), Adaptability of introduction and domestication of 14 species of plants in Wuhai desert city
https://kns.cnki.net/KCMS/detail/detail.aspx?dbname=CMFD201802&filename=1018020520.nh

Zhang Yanqiu, (2019), Study on the Problme of Geo–Environment and Management Strategy in Wuhai Mining Area of Inner Mongolia,
DOI: 10.27431/d.cnki.gxnyu.2019.000340
https://kns.cnki.net/KCMS/detail/detail.aspx?dbname=CMFD202202&filename=1022005907.nh

Zhang Liping, Yang Hongzi, (2021), Characteristics of daily variation of sand and dust storms in Wuhai City and analysis of related factors. Inner Mongolia Meteorology, DOI: 10.14174/j.cnki.nmqx.2021.01.008.

Huang Yan, Li Hao, (2022), Wuhai, Inner Mongolia: Special industries accelerate urban agriculture development [N]. Farmers' Daily,
DOI:10.28603/n.cnki.nnmrb.2022.000673.

Luca Bertolini, (2020), From "streets for traffic" to "streets for people":
Can street experiments transform urban mobility?, Transport Reviews, 40:6, 734–753, DOI: 10.1080/01441647.2020.1761907
https://doi.org/10.1080/01441647.2020.1761907

David Banister, (2008), The sustainable mobility paradigm, Transport Policy, Volume 15, Issue 2, Pages 73–80, ISSN 0967–070X,
https://doi.org/10.1016/j.tranpol.2007.10.005.