A Narrative of Mountains

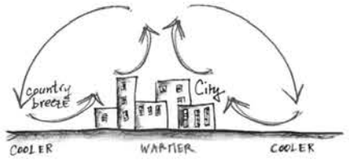
云 山 册 页

LOCATION: Suzhou China
TYPE: Conceptual Architecture Design

Our processes of urbanisation have often been based on the encroachment of agrarian land resources, the erosion of cultural symbols, and environmental problems typified by the heat island effect. The vicious circle of urban encroachment on agricultural land also lead to the continued sucking of rural labour, especially in metropolitan areas, has contributed to a number of socio-environmental problems such as the hollowing out of the surrounding countryside and a lack of food supply in the cities.

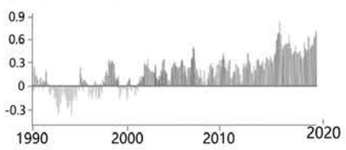
This conceptual architecture design is aimed at the activation of the ancient city of Pingjiang, Suzhou, by analysing its urban texture, calculating the vitality value of the city through the metaball algorithm, and bridging the areas with high and low vitality values to activate the ancient city. We put forward a new design philosophy of "Urbanscape", which is morphologically based on Chinese Shan Shui painting and architecturally based on the visualisation of the vitality value, the methodology is trying to explore a "feasible, desirable, swimmable and livable" Shan Shui city, constructing predefined spatial modules (including agricultural production and community activities),to response the relationship between nature, humanities and the city, and exploring a dualistic integration of urban and rural functions.

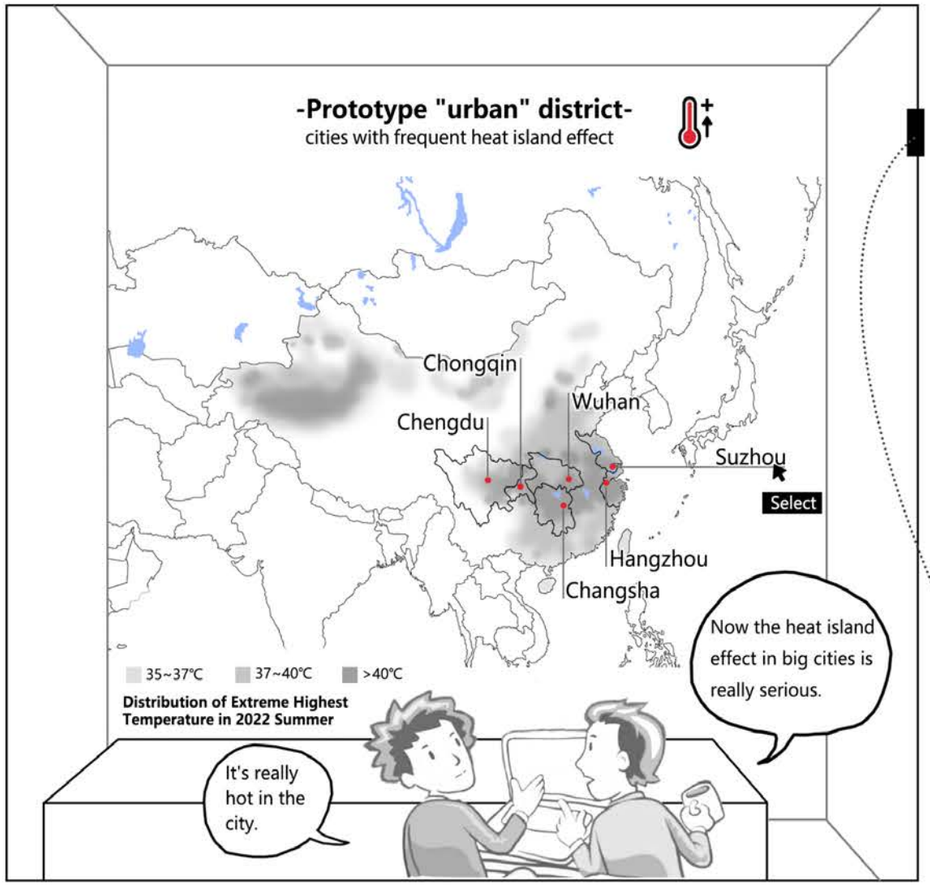
URBAN HEAT ISLAND EFFECT



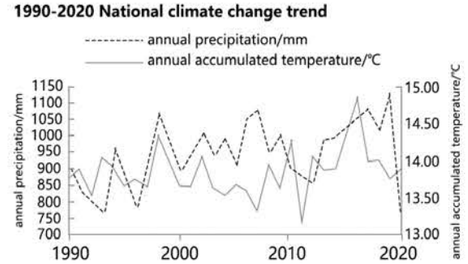
At present, more than half of the earth's population lives in cities. Urbanization has led to changes in the nature of urban underlying surface, resulting in a seriesof problems such as reduced surface water transpiration and accelerated runoff, which have affected the **urban heat balance**. The production and living of human beings in cities will generate heat and greenhouse gases, which will keep the urban temperature at a higher level. Then it causes the **heat island effect**. The heat island effect is gradually becoming a global problem.
Heat island effects can be harmful. It will endanger human health, increase urban energy consumption, affect biological growth and development, affect local microclimate, and so on. It is a problem that we cannot ignore.

1980-2020 Monthly global surface air temperature anomalies

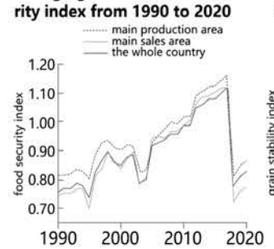




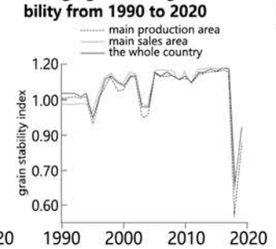
1990-2020 National climate change trend

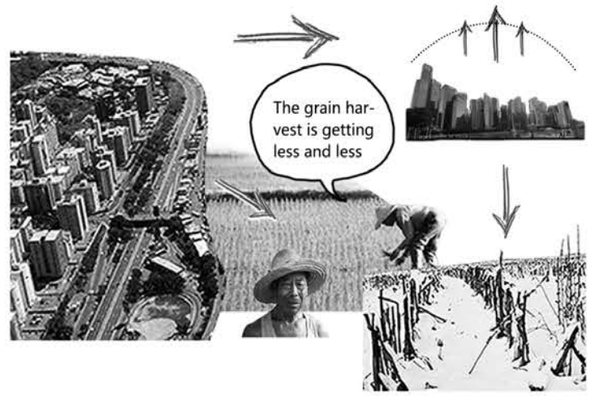


Changing trend of food security index from 1990 to 2020



Changing trend of grain stability from 1990 to 2020

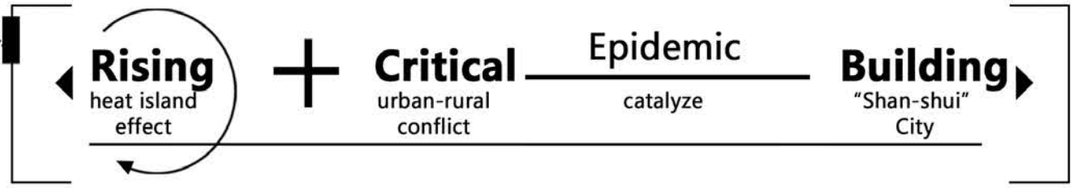




Urbanization encroaches on cultivated land and causes heat island effect. The heat island effect then intensifies global warming, leading to an increase in the **frequency of extreme climate events** and increasing the **threat of natural disasters to food**.

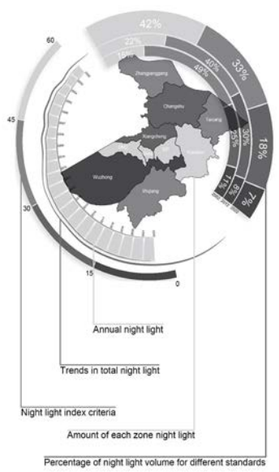
FOOD FAMINE ISSUES

IDEA DERIVATION



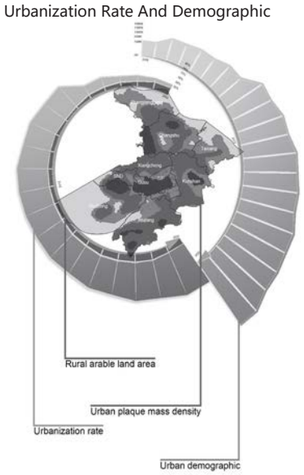
DATA OF SUZHOU URBANIZATION PROCESS

Night Light



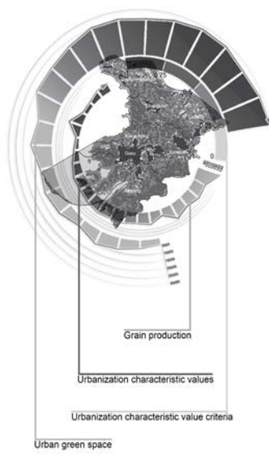
Spatialisation of urbanisation using the Suzhou Night Light Index The urbanisation value (y^2) statistics for Suzhou from 2002-2022 are used as the dependent variable and the county night lighting index (x) as the independent variable, with the relationship **$y^2 = 9 \times 10^{(-8)}x^2 + 0.0433x$**.

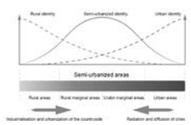
Urbanization Rate And Demographic



Suzhou's urbanisation has increased by leaps and bounds since around '09, both in terms of urban population and urbanisation rate.The density metric is used to measure the density of each patch mass in each unit of analysis; **the higher the density, the more concentrated the city.**

Urban Greenery And Agriculture





Suzhou's **urban green spaces** keep **increasing**, but **food production decreases** every year.

CONCEPT

The isolation of the modern urban area from narural rural area is not only a geographical but also a psychological distance.

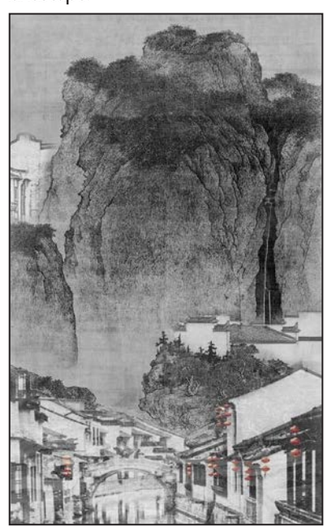
Both the urban and the rural area have their virtues and drawbacks which can complement each other.

The symbolic elements of the rural landscape are invited into the urban area to fill the gaps and solve the problems of the urban area.

Achieving a harmonious dichotomy of urban and rural symbiosis,which help neutralise the disadvantages and improve the urban climate.

IMAGERY

Like a landscape painting interspersed with the city, through the combination of distant, medium and near views of the building ,to provide the people in the city with **a garden-like life** in the landscape.



LOGIC GENERATIONGENERATION

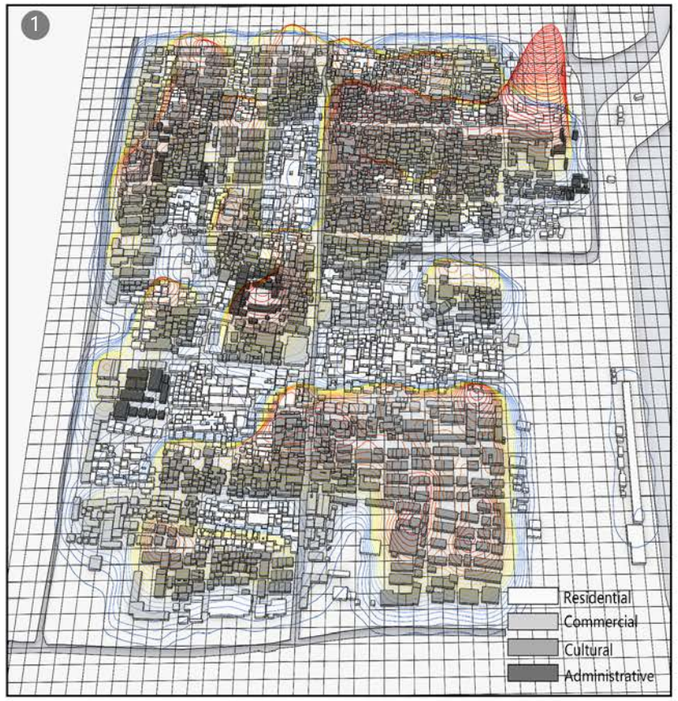
Calculation formula

Reflecting the thermal values around the building site by the average number of people inside the building. By interchanging the three equations as follows:

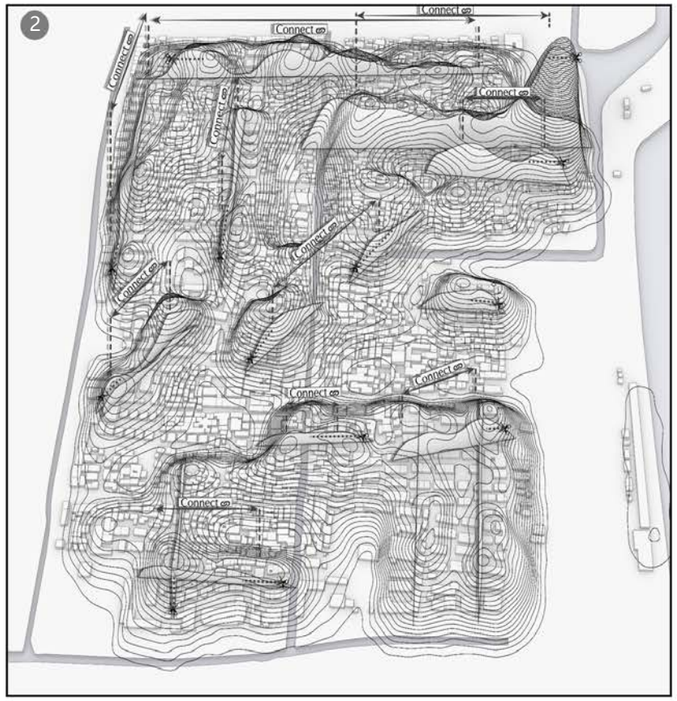
1、Average number of persons = floor area per floor * number of floors * square metres per person.
2、Volume = floor area per floor * total building height.
3、Total building height = height of single story building * number of storeys.

This gives :
The average number of people inside the building = volume / (square metres per person* height of single story building).

According to the above formula, the weighted vitality values for different time periods under different functions are obtained by three sets of time functions **Y=1/500 x^3-1/25 x^2+15/36 x+0.9**, **Y=-1/667 x^3+1/30 x^2+0.9** and **Y=-1/600 x^2+1/25 x+0.2**, and the overall average is calculated.



Generate a grid covering the whole site, forming the thermal values for the different heights of the site according to the **different building functions**, using the formulaes on the left,to reflect the local **population density**.

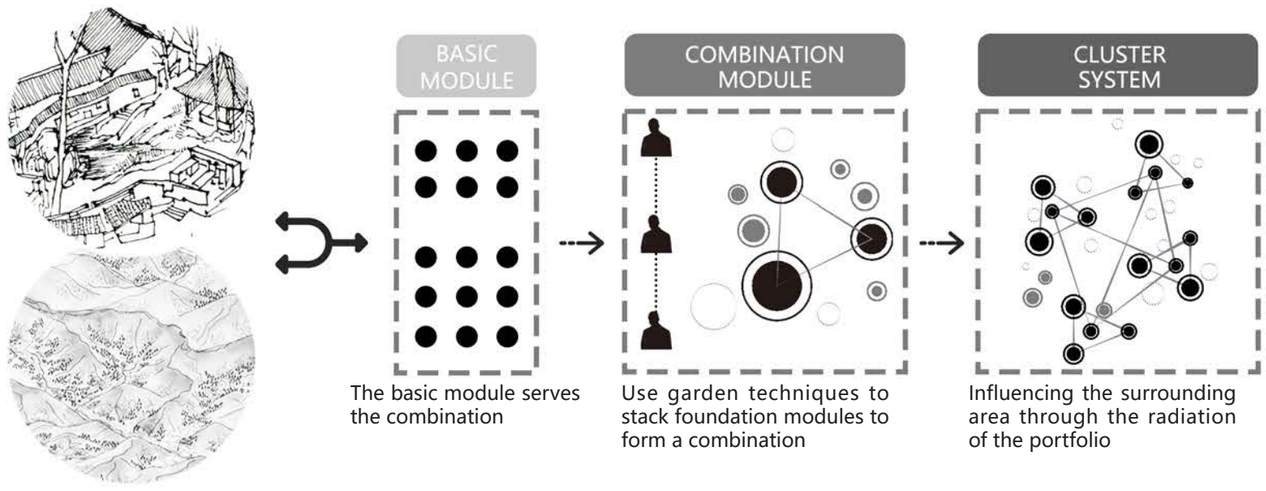


Connection of peak locations on the thermal map and slice analysis according to the direction of the connection to form a building foundation profile，in order to **break up the isolation** relationship between peaks and **place with the high value**.

The base shape of the slices is extended by **12m** in width and a grid of **8m*8m** is formed inside to accommodate the **different functional modules** that will be formed by subsequent stacking.

SYSTEM WORKING

We first set up the basic module, then form the **combination module** with the basic module, and finally form the cluster system, which is put into the **shan-shui city** we created. In the process, the combination of modules uses the gardening techniques of traditional Chinese gardens to give users a **"garden tour"** experience.

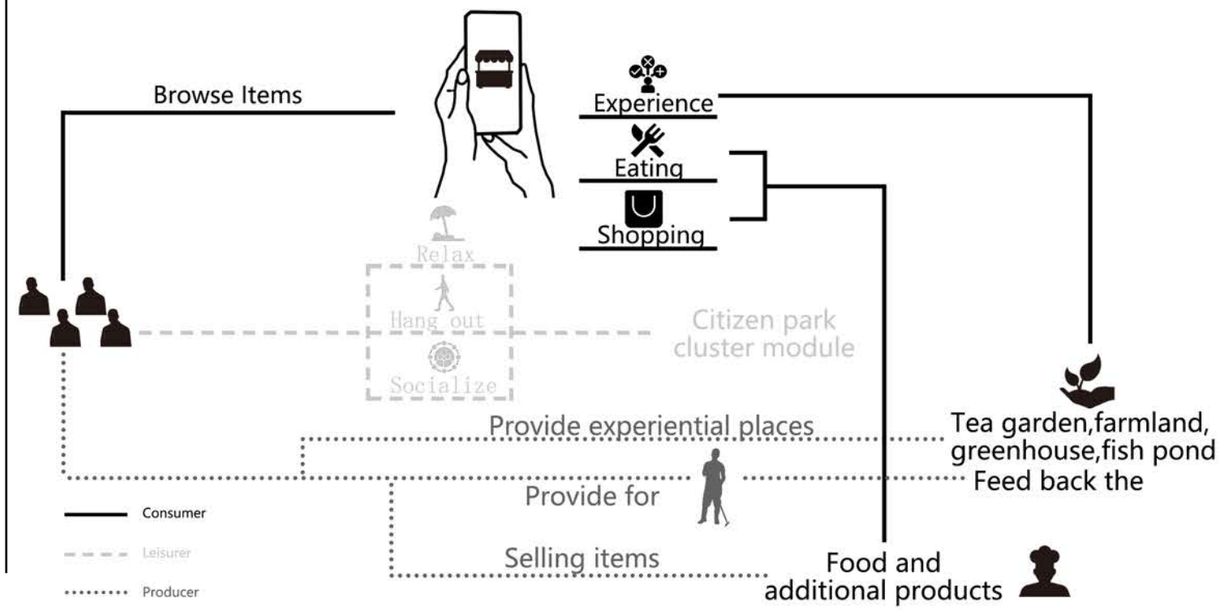


The basic module serves the combination

Use garden techniques to stack foundation modules to form a combination

Influencing the surrounding area through the radiation of the portfolio

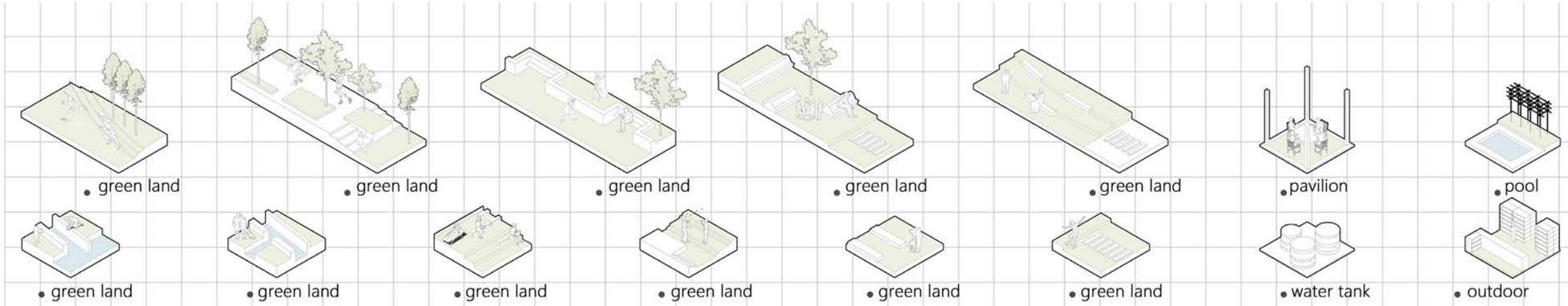
We hope that the Shanshui City can serve different people, create more interesting and comfortable life experiences for them, and form a **harmonious system** that can operate itself and feed back the city.A system that allows not only city dwellers but also farmers from the countryside to **find their niche** in the system.



BASIC FUNCTIONAL MODULES

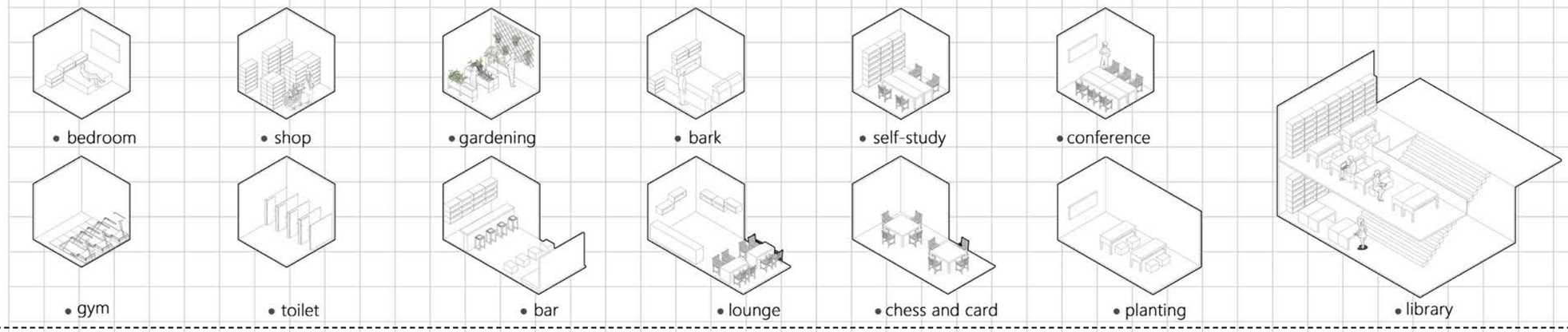
Green Spaces

A module to help people enjoy nature inside the building, providing basic parkland, water.



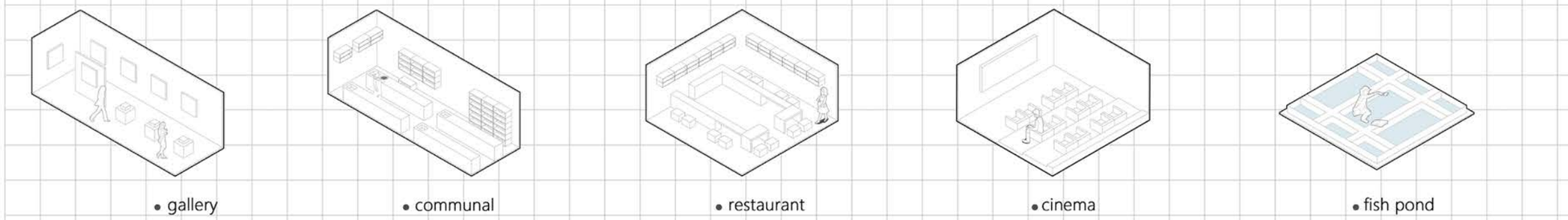
Basic Living Spaces

The modules provide the most basic living functions, such as bedrooms, living rooms, and ease of living.



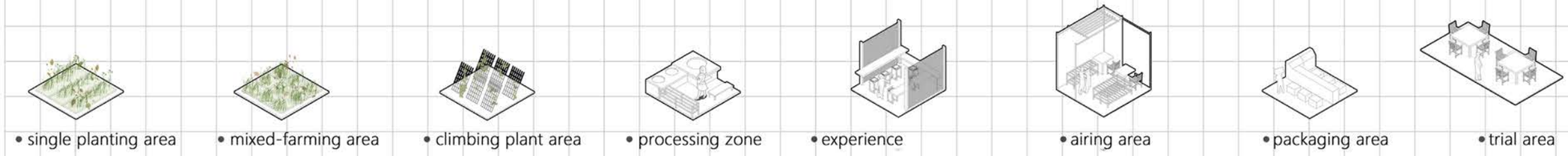
Shared Spaces

Shared modules provide spaces that can be used by more than one person, such as shared kitchens, reading rooms, etc.



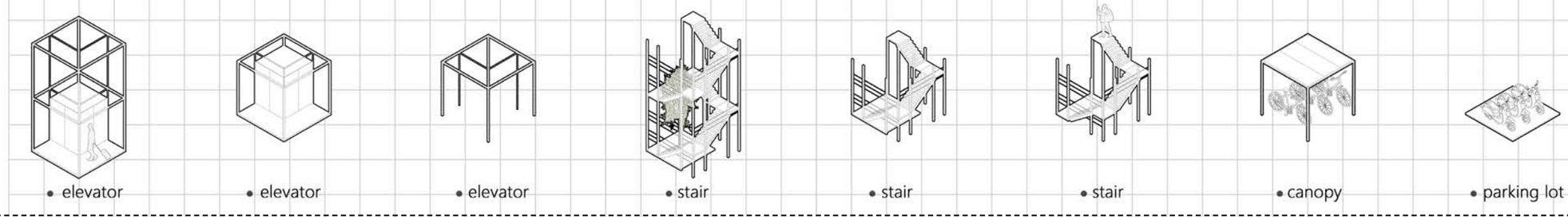
Crop Planting Spaces

Mimicking some of the features of the countryside, giving city dwellers a taste of country life.



Traffic Auviliary Spaces

Some traffic space to facilitate transport links between floors.



COMBINATION OF BASIC MODULES

Through the arrangement of different functional basic modules, the medium-sized modules are formed into **functional collections** to **serve people in their daily lives**.

- Living module

Living modules make up the main part of the module, supported by exhibition and merchandise functions.

1

- Function

Living · Sleeping · Exhibition · Shopping · Greening

- Aquaculture module

The aquaculture module gives people space to fish and for post-fishing work, and provides a litter of land for planting.

2

- Function

Fishing · Swimming · Drying · Machining · Greening

- Office module

The office module contains basic office, meeting, study and break functions, giving people a space where they can handle their daily studies.

3

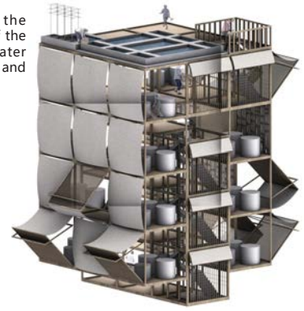
- Function

Office · Chatting · Meeting · Learning · Relaxing · Greening

- Watering module

As a module to ensure the most basic water needs of the occupants, it contains water storage, water purification and water extraction functions.

4



- Function

Storage · Purification · Extraction · Greening

- Flower planting module

An agricultural production module that provides space for people to grow flowers, make tea and other functions.

5

- Function

Flower-growing · Planting · Tea-making · Greening

- Fruit and vegetable planting module

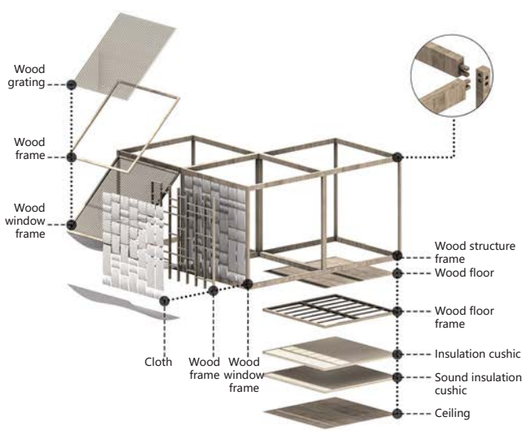
The module where people can experience the joy of growing and harvesting within the city, processing it on site and eating it.

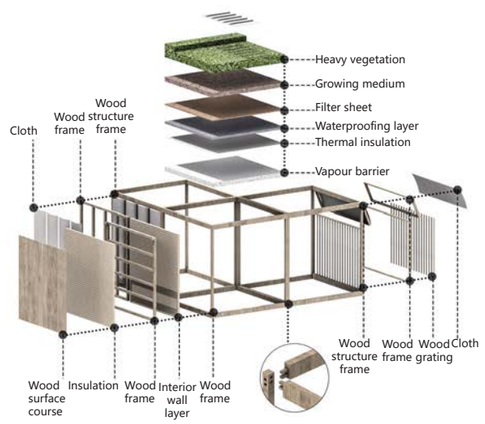
6

- Function

Growing · Cooking · Eating · Greening

STRUCTURAL AXONOMETRIC DIAGRAM

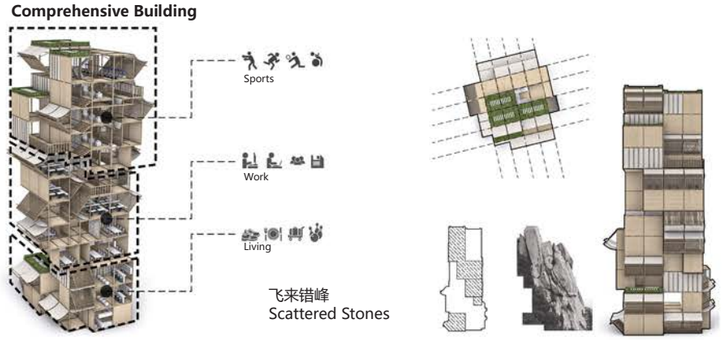




LARGE MODULES

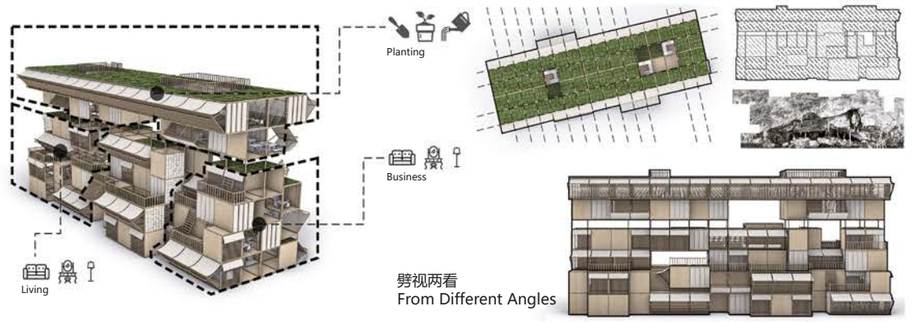
Further combinations of integrated function modules to **mimic** some specific shapes of mountains and rocks to form **analogue shape modules**.

Comprehensive Building



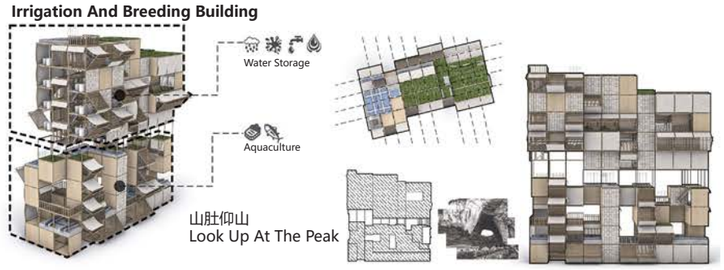
Control the horizontal and vertical proportions of the building, so that the building form is slim and striped, like a scattered stones, and the internal function is mainly sports life work.

Agricultural Planting Building



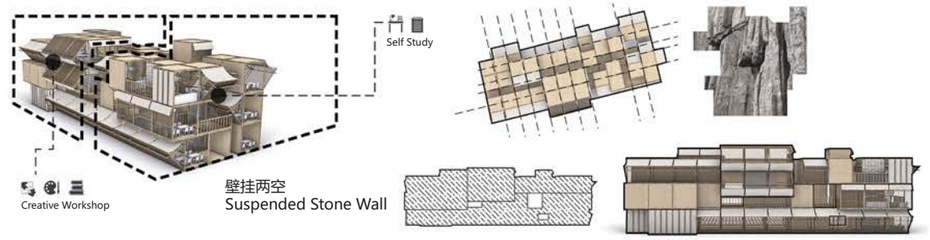
As the name implies, the two eyes are separated by visual contact and the view is different. Through the stacking of reality and fiction between the modules, it gives a different feeling of being in the building and a different view. The interior of the building is dominated by agricultural production.

Irrigation And Breeding Building



The hollowing out of the middle part of the façade creates a cavity, giving the observer space to look up and feel the loftiness of the building above and below. The interior of the building is dominated by aquaculture.

Art Experience Building

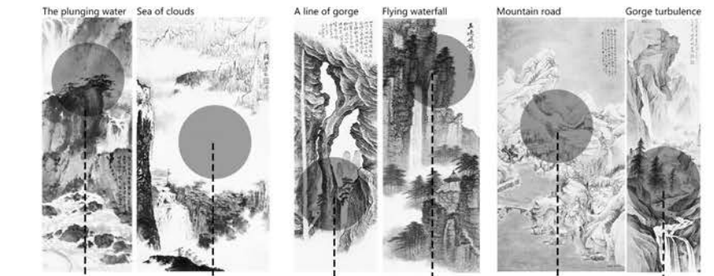


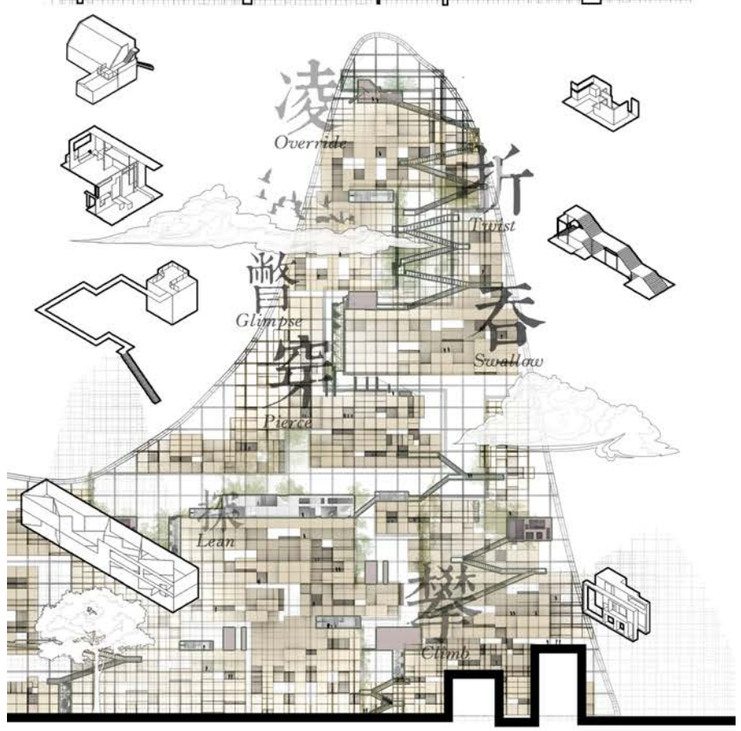
The facade is solid, with few gaps, and the building as a whole is small in size, like a connecting stone spanning between hills. The building is dominated by recreation and entertainment.

PARTIAL PERSPECTIVE

MODULE STACKING IDEAS

The relationship between reality and fiction in the large modules is derived from the extraction of traditional Chinese landscape painting imagery, creating a sense of urban landscape atmosphere.





一径抱幽山

居然城市间

A EXTENDED PATH AROUND THE DISTANT HILL

A RELAXED RESIDENCE IN THE GRACEFUL CITY