

Analysis of Sustainable City Design and Planning Strategies in Hangzhou: A Case Study of ‘Liangzhu New Town’

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Abstract: Liangzhu New Town, located in the northern suburbs of Hangzhou City with Liangzhu culture relics, is planned to be an integrated ecological and cultural leisure tourism town with liveable habitat. The essay focuses on the design plan, analyses, the sustainable strategies implemented. The new town is designed with social, ecological, and economic concepts. The planning emphasizes on creative industries, which not only complement the primitive Liangzhu culture and promote each other. The planning adopts innovative modes of development, respect the tradition, and encourage creativity and use local resources, which is a successful practice of garden city. Moreover, further deficiencies are explored. Lastly, critical thinking is proposed based on the analysis. Residential part is overemphasized, but commerce, culture and eco-tourism fail to catch up with real estate. The design ideas of Liangzhu are a case study to provide advanced experience and great context to the preservation and utilization of national relics in China.

1. Introduction

1.1. Liangzhu Culture

The Liangzhu culture, dated to 3310 – 2250 BC, is a late Neolithic (or Chalcolithic) culture located in Southeast China [1], including all material culture and spiritual cultures created in 1000 years. Well known for its high quality and number of delicate jade artifacts and black-burnished pottery, this splendid Primitive culture around Taihu drainage basin is now regarded as ‘the Dawn of Oriental Civilization [2].

Spiritual culture: originality, initiative, and extension.

Hangzhou was a small town during the Chalcolithic Liangzhu culture and was originally named “Liangzhu”. The small town was renamed many times and eventually became a essential city and one of the cradles of the Chinese civilization.

1.2. Background

1.2.1. Location of Liangzhu New Town

Liangzhu New Town, an important part of Liangzhu Group, is situated in the northern suburbs of Hangzhou City, where is border with the famous Liangzhu Relics [3]. According to ' Hangzhou Master plan (2001-2020)'. Liangzhu group, one of the six cluster groups of Hangzhou, is targeted to develop the Cultural reserve. Consequently, the planning and construction of Liangzhu tightly focuses on Liangzhu Culture, heritage and eco-tourism[4]. As shown in Figure 1, the project of Liangzhu New Town, 16 km from downtown Hangzhou, sits within a spectacular setting, with forested mountains to the northwest and the Liangzhu River to the southeast[5]



Figure 1: The location of Liangzhu New Town.

1.2.2. Profile of Liangzhu New Town

The new town consists of 833 ha of existing agricultural and forest land with 398 ha considered for residential and tourism development, which can accommodates 30,000-50,000 inhabitants. And the following table 1 shows the land use information [6]:

Table 1: Land use of Liangzhu New Town (Ha)

Floor space	667	} --Construction land: 50%
Natural landscape	333	
Residential area	227	
Tourism and recreation land	80	
Land for facilities	40	

--Natural scenery: 50%

1.2.3. Business Overview

Liangzhu cultural relics have been the most valuable heritage found in Hangzhou, so far, abundant in social, cultural, environmental and economic value. Besides, it is also rich in artistic value and worthy of scientific research[7].

(1)Unique value of Liangzhu cultural relics

It contains a wealth of historical and cultural information. Jade, pottery and other artifacts include scientific and artistic qualities as well as its special significance and status in archaeology[8].

With the advance of archaeological work in the future[5], provided that more structured village ruins, jade and pottery production processing sites can be found, Liang Zhu are well expected to be the hotspot of sightseeing[9].

(2) Research on Liangzhu Culture and its development can stimulate tourism

Firstly, Liangzhu Relics bridges an advantaged communication between the modern and the ancient times, as well as creates particular opportunities for modern people understanding and exploring the past. Moreover, the discovery and debate of Liangzhu ancient city and the inclusion in China declared World Heritage Tentative List draw, increasing attention not only from the government but also the public. Secondly, Vanke Group invested heavily to create an upper-class new town with the theme of Liangzhu culture, which will enhance the region's popularity undoubtedly.

2. Case Study of Liangzhu New Town

2.1. Master Planning of Liangzhu New Town

2.1.1. Development Goal

The underlying ecotourism model in planning Liangzhu New town is “tourism + community”.

Therefore, rather than just being confined to a theme park or concentrated tourist area[10], the objective of this project is to integrate ecological and cultural leisure attractions perfectly with a livable habitat, eventually forging a multifunctional tourism town.

2.1.2. Planning Concept and Rules

(1) Planning concept--Practice of Garden City

Based on the concepts of garden city planning, organic evacuation, organic growth, urban villages, and etc., Liangzhu New Town aims to be a dream town reviving the idea of low density and slow lifestyle.

(2) Planning rules----Focus on system harmony and organic growth

- Preserve essence of the existing eco system
- Defined villages in a ‘string of Pearls’
- Fit built form with natural setting
- ‘Green Fingers’ reaching down to the river
- Hierarchy of roads and pedestrian linkages
- Linked open spaces and recreation, integrated with villages
- Tourism integrated with towns and villages
- Tourism concentrated on Highway 104
- Culture and arts as defining themes

2.1.3. Planning Features and Structure

(1) Master plan (Design by Civitas Urban Design & Planning Inc.), as shown in Figure 2



Figure 2: Master plan of Liangzhu.

Components show in Figure3:

- Residential area: Heron, shire/Sun ridge, Vista, etc.
- Commercial area: Yu'niaoliusu Street)(including food street & Cultural Art Center (planning))
- Cultural and tourism area:
 (Culture)Liangzhu holy land---Liangzhu cultural museum/ Liangzhu National Relics Park (planning)/ Meilizhou park/ Daxiong Temple
 (Tourism)Aigrette Bay Narada Holiday Hotel/Theme parks

Key words: original ecology, pedestrian scale, diverse architecture

Features:

- Humanized engagement

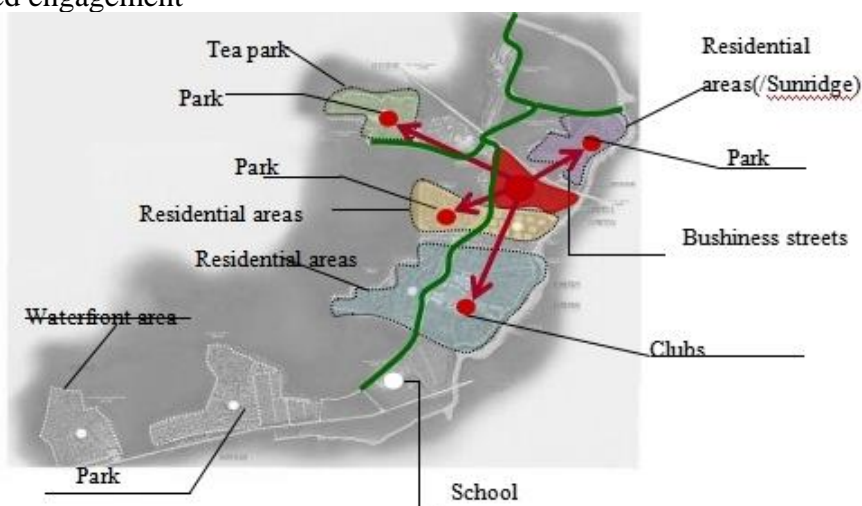


Figure 3: Greenway planning of Liangzhu.

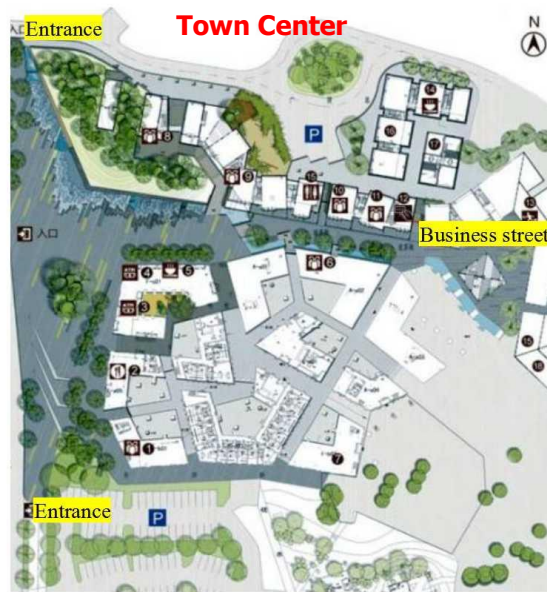


Figure 4: Detailed planning of Liangzhu Town center.

As is shown in Figure 4, with the scale of the five-minute walk, the supporting service systems of each village are established. The villages are strung by the main road and distributed closely around the town centre, where more comprehensive business services and public facilities are built, consequently linking all villages sharing the infrastructure as well.

In the town centre, by pedestrian streets between blocks instead of first floor business, more open spaces are added and more opportunities for mutual communication.

In all, people can feel warm at home; feel passion in the business area, and feel history in the Liangzhu holy land, and touch the nature in the parks. In Liangzhu New Town, any interaction provides a more pleasant experience.

(2) Framework and Layout structure



Figure 5: Framework of Liangzhu.

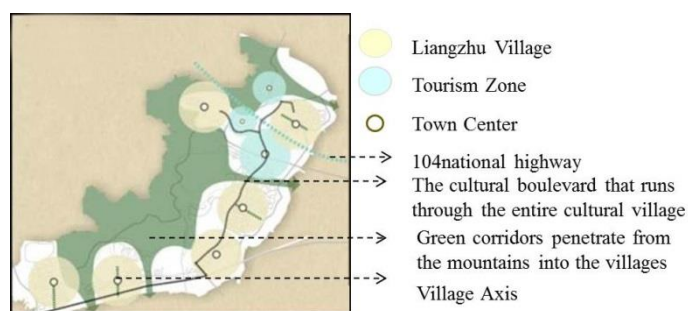


Figure 6: Layout Structure of Liangzhu

According to Figure5 and Figure6, there are two axes, two cores, three zones, seven patches

Two axes: west-east main road& waterfront road. Two cores: eastern tourism area &western public service area. Three zones: Main tourism area& Forestry Leisure area& Town Resort. Seven patches: scattered theme villages

Ecology aspect---

Respect the natural texture:

For protection ecosystems and the original native villages, all villages are located in the south to avoid remodeling the northern landscapes.

Accessibility to facilities and green spaces:

A series of eight villages, commercial zone, and tourism areas are linked by a major parkway boulevard. The villages are to be sized and spaced with a 5 minute walking radius. Open space links are to be preserved between the villages allowing ‘green fingers’ of the mountain forest to link with the riverfront.

Social aspect--

Respect the history and terrain:

Liangzhu culture village itself is not a town without any living foundation. On the contrary, it is time for human settlement, probably longer than most cities in China. Some parts built in the Liangzhu New Town are referred to the layout of the original primitive villages, whose layout and scale have inherent excellence. Planning in Liangzhu fully respects and draws on history.

Conclusion: Without sacrificing the environment, the planning builds organic connections between buildings and environment and reserves the flexibility of the development of towns.

2.2. Sustainable Strategies for Liangzhu New Town Planning

2.2.1. Residential Areas

(1) East Heronshire

As is shown in Figure7, features include inheritance of the traditional architecture

- 3-5 storey apartments of Minimalism style
- Innovatively divided into 14 blocks or small islands, fully based on the original characteristics and local architectural culture.
- On a high granite base, the surrounding houses constitute the enclosure open public space, and form as a Chinese traditional courtyard

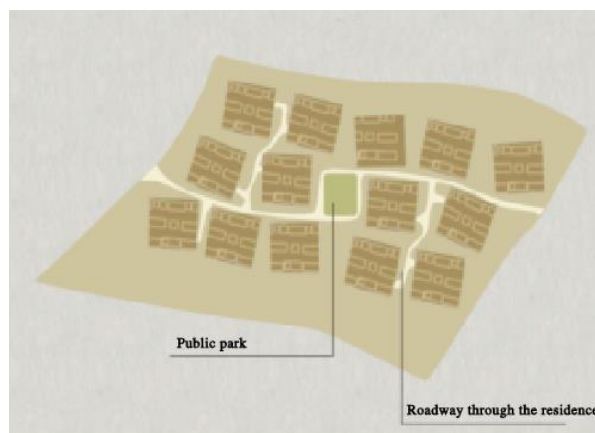


Figure 7: Inner road system of East Heronshire.

(2)Sunridge Vista

Feature: Combination vernacular settlement pattern with modern residential functions

- Low-layer townhouses and villas in sloping fields
- Break the continuous residences into individual units which are strewn at random according to altitude difference
- Underground parking garage is built under the houses, taking advantage of the terrain elevation
- In the plain area, modern recreational and leisure facilities are added
- Local building materials and preservation of the original ecological environment
- (3) Public service
- Pedestrian and Bicycle-oriented community and electric tour bus
- Garbage treatment center and providing relative education

2.2.2. Commercial Areas-- Yu' Niaoliusu Street

(1) Space development mode

Feature: symbiosis of events and architecture

As a cluster of culture, entertainment, and leisure business, rich individuality, various events and activities will be integrated into the architectural space.

Based on its bird-shaped land--

Conclusion: organic organization and growth of terrain, waters, and road system with multiple functions

(2) Architectural I style

Design concept: departure of memory

With local architectural features: white walls and grey tiles/local arcades and yards

Using local building materials: bamboo/stones

Designers created archaeological fields, recalling people's memories of the ancient relics and responding to the local culture. Designers also used a collapsed or damaged stone structures to fabricate the structure of cascade. Useful information was inscribed in the rolling stone, inviting visitors to explore and identify the different roads. And the 'Liangzhu convention' is engraved as well to remind and education residents to make an individual contributions to the community.

(3) Commercial mode (economic and socially sustainable)

Feature: initiative, originality, extension

- Small- scale plaza: Sculptures & fountain

A multipurpose plaza with mist, music, and lighting

- Diverse commercial pedestrian streets:

Rather than large scale shopping malls, there are various Individual small shops around the main street. Narrow alleys, Low-layer shops and human activities offer distinctive street fun and good ventilation.

- Local industry

Food Streets: mainly sell local and traditional food and other foreign snacks

Family hotels and inns: Experience with the local helps tourists better understand the culture

(4) Liangzhu Cultural Art Center(on planning stage)

Design by: TADAO ANDO ARCHITECT & ASSOCIATES

- Open public space under large roof merging with nature

- Water, planting and forests around the center

2.2.3. Cultural and Tourism Areas

(1) Culture resort-- Liangzhu holy land

1) Liangzhu cultural museum

Award: Architectural Record China Award, 2008, Best Public Project

- Design concept: scattered jade awls in nature

Function: a collection of archaeological findings from Liangzhu culture

Without reshaping the original landscape and referring to the jade artefacts of Liangzhu culture, the museum consists of four cuboid exhibition halls stretching out to link with the outdoor space.

- Using solid building materials –wood and stone:

The external walls are made of yellow travertine and look as if a transparent and exquisite jade boxes collecting treasures. Such a simple and plain style embraces the essence of primitive Liangzhu culture.

- Traditional yards connections

As is shown in figure 8 and figure 9, courtyards are inserted into each cuboid. These courtyards are part of the tour route and function as joints, linking different exhibition halls. The landscape interior courtyards, which are used as naturally lit circulation spaces and places to linger, provide a high degree of complexity for possible individual tour routes through the museum, despite the linearity of the museum halls.



Figure 8 & Figure 9: Traditional yards.

- Exhibition design

Design concept: Lead road through Liangzhu culture

The layout and orientation of exhibition halls depend on the historical development.

Besides the display of antiques, with multimedia guidance and simulation, visitors are equipped with rich interaction and fabulous experiences.

Conclusion: Build the museum in a humble way

As David Chipperfield said ‘good museums should leave all the glory for the exhibits rather than itself is a presumptuous or dominant role. By courtyards and ecofriendly materials the house merges with nature and coordinates with the surroundings, which highlights the culture and exhibits.

This building is not intended to let people to wonder or view, on the contrary, it leads people to calm down to meditate and feel the culture.

2) Meilizhou church

Feature: Localization of the church

- Low-carbon materials--Wooden frame and fair-faced concrete

Instead of the traditional dim design of the church, the wooden frame creates an open and bright indoor environment

By using Fair-faced concrete with inscribed wooden textures for the exterior walls, the church is integrated with nature.

- Eastern traditional layout

The footsteps run through axes of the church, so the pilgrimage route is symbolic and sacred.

At the end of the church, a small square as well as functional rooms is constructed, which contributes to spread a uniquely eastern philosophical and aesthetic air.

(2) Tourism areas

1) Aigrette Bay Narada Holiday Hotel

Design style: elegant and spectacular

Design feature:

- Cultural theme hotel with tranquility
- Using the courtyard as the basic unit

Making full use of the original landscape, the hotels are built as low-density continuous courtyards surrounded by forest and wetlands, which provides an easy access to nature.

- Exclusive facilities as a multifunctional resort

The hotel contains different classes of guest rooms, gorgeous restaurants for 1,000 clients, 960 m² meeting hall. Besides, it has distinguished recreational infrastructure, including indoor and outdoor swimming pools, spa, squash center, fishing zone, outward bound, and marriage plaza, which contribute to a high-class and unique leisure and business spot.

2) Other tourism products---parks and trails&farms as shown in Figure10&11

- Parks, tea parks, and trails offer various alternatives for tourists.
- Parent-child farm

Function:

- ◆ Planting garden for both residents and tourists(Economic sustainable)
- ◆ Environmental education(Social and Environmental Sustainable)



Figure 10: Over view of Parent-child farm Figure 11: Rendering of farm

3. Conclusion and Critical Thinking

3.1. Conclusion of Liangzhu New Town

3.1.1. Successful Experience from Liangzhu New Town Planning

(1) Innovative mode of development (Figure 12)

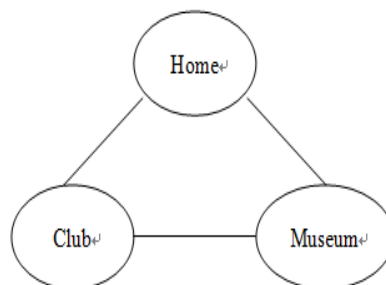


Figure 12: Development mode of Liangzhu.

First, depending on Liangzhu culture and relics, real estate and cultural tourism are mainly centered on and support and stimulate various recreational activities as is shown in Figure12.

Second, the planning emphasizes on creative industries, which not only complement the primitive Liangzhu culture and promote each other.

Lastly, in addition to the diverse tourism leisure products, Liangzhu New Town plans a large amount of urban commercial and public facilities, by which the project is gradually converted from a cultural and leisure resorts into urban recreational areas, which helps the town develop sustainably.

In all, the project successfully expanded the source of income and obtains a variety of finances.

(2) Respect the tradition and encourage creativity

The project keeps the terrain almost intact and the new buildings are harmonious with the surrounding environment. Besides physical relics, it digs up spiritual culture, so the ancient civilization will still make differences in the future.

(3) Use local resources

The local resources including building materials, local architectural elements, and employing local people, is not ecological sustainable but also social and economic sustainable.

3.1.2. Deficiency of the Liangzhu New Town and Improving Strategy

(1) Lack of systematical and practical further planning

(2) Imbalanced development

Residential part is overemphasized, but commerce, culture and eco-tourism fail to catch up with real estate.

Solution: Determine the potential and capacity of the project according to the current situation and formulate and implement future planning.

(3) Little popularity

The project is not well-known even in Hangzhou, so it fails to attract people in China and overseas.

Solution:

- offer coupons and hold tourism festivals
- Cooperate with other famous tourist attractions (eg., West lake) to expand the popularity
- Advertisements via media and online

3.2. Critical Thinking of Eco/Culture Ecotourism

First, although Liangzhu is near the Hangzhou city and enjoys sky-high land price, the developing mode not only embraces and takes the instinct advantages of the culture but also makes full use of it.

Second, the design ideas of museum parks of foreign architects can serve as a case study to provide great context on the preservation and utilization of national relics in China.

Thirdly, many European countries are now facing the challenge of de-urbanization because the downtown lacks something that the suburban exactly has. In fact, during the urbanization, the cities are losing its human resources as well as capital resources on account that the downtown loses its own identity and become much like monotonous metropolises.

So in terms of Liangzhu New Town, the key lies in retaining its characters.

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