Study on Function Transformation and Spatial Reconstructuring of Small Towns in China's South of the Yangtze River From 1840 to 1949: Case on Changzhou

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Abstract. Taking Changzhou as a case, this paper studies on the functional transformation and spatial reconstructuring of small towns in the south of the Yangtze River in China from 1840 to 1949. Then, the article analyzes its adaptability and mechanism. During this period, there were three significant transformations of urban functions in Changzhou. The political status of Changzhou declined from the Changzhou Prefecture of the Qing Dynasty to the county of the Republic of China; the transportation function reduced from the regional transportation hub city to the local transportation hub city; and the economic function was transformed from the traditional agricultural city to the light industrial city. Functional transformations have driven the spatial reconstructuring. Urban construction has transformed from urban internal transformation to a composite expansion mode, a ring-layer and axial-type composite model. Finally, a lute-shaped urban form was formed, and the internal facilities of the city were more modern. Although there are some regrets, Changzhou's urban spatial reconstructuring has changed the original material framework of the city. This adapted and promoted the transformation of urban functions during this period. In terms of mechanism, first, this is a passive transformation model. Changzhou mainly promotes urban functions through local private forces and relies on the role of the market. Second, industrialization is the fundamental driving force. In the political and economic context of this period, these changes in function and space manifested self-organizing and progressive characteristics.

1. Introduction - Urban function and spatial structure in Qing Dynasty

Changzhou is located in the south of the Yangtze River, in the heart of the Yangtze River Delta. Changzhou has a long history. It was named Yanling in the Zhou Dynasty. In 222 BC, Yanling County was established by Qin Dynasty, and Piling County was reorganized in Han Dynasty. In the Qing Dynasty, in terms of urban functions, Changzhou was the seat of the Changzhou government, a transportation hub city in the Beijing-Hangzhou Grand Canal area, and a traditional agricultural city. In terms of urban space, Changzhou has the traditional urban space model of small towns in the south of the Yangtze River. Since the end of Tang Dynasty, Changzhou has formed a complex encircling form of four cities, namely Neizicheng, Waizicheng, Luocheng, and Xincheng[1][2]. The city wall
defines the urban space. The main water system in the city and the four sets of city pools are in the same direction, and together with the main roads constitute the city skeleton. The Qing Dynasty government office is still located in the Neizi city built in the Tang Dynasty (Figure 1).

![Legend: Road, River, City wall]

**Figure 1.** The spatial structure of Changzhou in the late Qing Dynasty, Source: The base map is from reference [3].

### 2. Modern urban function transformation

Influenced by the regional political and economic background, Changzhou in modern times has made great efforts to seize the opportunities and meet the challenges, thus realizing the transformation of the city's functions.

#### 2.1. Macro-political, economic and social background

The changes of human society are divided into micro-changes and mega-changes. Since 1840, China has undergone huge changes based on social revolution [4]. For about 100 years in modern times, Jiangnan has experienced major political events such as the Taiping Heavenly Kingdom Movement at the end of the Qing Dynasty, the New Deal at the end of the Qing Dynasty, the establishment of the Republic of China with the fall of the Qing Dynasty, the War of Resistance Against Japan, the Civil War, and the liberation. The political situation directly affects the demographic changes in Jiangsu Province (Table 1.). In 1927, the Republic of China established Nanjing as the capital. In addition to the national economic center, Shanghai, the Jiangnan region added Nanjing, the national political center. The location conditions have changed dramatically, and Changzhou is located between the two centers.
Table 1. Changes in the population of Jiangsu Province

| Population (people) | Average annual growth rate (%) |
|---------------------|--------------------------------|
| 1911                | 1936                           |
| 26221089            | 41215226                       |
| 1946                | 40568268                       |
| 1949                | 40149200                       |
| 1911-1936           | 1936-1946                      |
| 18.09               | -1.58                          |
| 1911-1949           |                                |
| 10.92               |                                |

Source: Reference [5]

After the Opium War, Shanghai soon became the country's largest import and export trading port [6]. According to customs statistics from 1870 to 1936 [7], the volume of import and export trade through Shanghai has always ranked first among all ports in the country. Shanghai's textile industry using modern technology has also developed and grown. By 1936, the total number of spinning spindles in machine cotton textile factories in the country was 56,35066, and the Jiangnan area had 3,546,222 spindles, accounting for 62.93% of the country's total [8]. Compared with 1913 in 1936, cotton spindles increased by 4.7 times, and cloth machines increased by 11.7 times. The cotton spinning factories in the Yangtze River Delta in modern times, except for Shanghai overseas, are all national industries [9] During this period, the transportation facilities in the area were also greatly improved. The Songhu Railway was opened to traffic in 1897, the Shanghai-Nanjing Railway was opened to traffic in 1908, the Shanghai-Hangzhou Railway was opened to traffic in 1909, and a large number of highways were constructed. The combination of railway, water and highway transportation formed a regional transportation network in the Yangtze River Delta region, greatly improving the traffic location conditions [10][11], laid the foundation for the transformation of urban functions.

2.2. Changzhou City Function Transformation

In modern times, Changzhou itself experienced a decline in its political status and loss of its transportation hub function. At the same time, it experienced rapid economic modernization and was blocked by war. In the end, Changzhou was governed by the Changzhou government, a regional transportation hub city, and a traditional agricultural city. Transform into a county under the jurisdiction of Jiangsu Province, a regional transportation hub city, and a textile industry city.

2.2.1. Political function. Changzhou Mansion was established in the Qing Dynasty. After the establishment of the Republic of China, Changzhou Prefecture was abolished and renamed Wujin County. The urban area was once called Wujin City and later Changzhou, which was under the jurisdiction of Jiangsu Province. Although Nanjing was established as the capital of the Republic of China in 1927, Changzhou's macro-political location conditions have been greatly improved, but Changzhou's own political status has been significantly lower than that of the Qing Dynasty. Thereafter, Changzhou fell during the War of Resistance from 1937 to 1945, and was liberated in April 1949 after experiencing an unstable political situation after the end of the War of Resistance in 1945. The political situation has affected the development of the population. Changzhou experienced a sharp decline in the population of the Taiping Heavenly Kingdom Movement. After that, relying on the advancement of modern medical technology, disaster relief system, and transportation technology [5], although wars and famines continued to accompany, the population of Changzhou still had a considerable development in modern times [12].

2.2.2. Traffic function. The Beijing-Hangzhou Grand Canal was a national water transport trunk line for the transfer of materials during the Ming and Qing Dynasties. Changzhou relied on water
transportation to become a regional transportation hub. After the Shanghai-Nanjing Railway was opened to traffic in 1908, the water transportation of the Beijing-Hangzhou Grand Canal lost its advantage and Changzhou lost its water transportation. On the other hand, the status of the regional transportation hub [10] has been reduced to a regional transportation hub city that mainly serves the city (county) domain. During the period of the Republic of China, in addition to the Shanghai-Nanjing Railway, Changzhou's highways were also vigorously constructed. Changzhou's external transportation was modernized, and automobile transportation was greatly developed. The city had relatively diversified and convenient external transportation conditions, which provided transportation for the transformation of urban industries. Guarantee (Table 2).

**Table 2. List of Changzhou Regional Transportation Facilities from 1840 to 1949**

| Period                          | Water Transport          | Railway               | Road                                      |
|---------------------------------|--------------------------|-----------------------|-------------------------------------------|
| **Late Qing Dynasty**           | Beijing-Hangzhou Grand Canal | Shanghai-Nanjing Railway (1908) | -                                         |
| **(1840-1911)**                 |                          |                       |                                           |
| **Early and middle period**     | Beijing-Hangzhou Grand Canal | Shanghai-Nanjing Railway (1908) | Huyi Highway (1930), Zhencheng Highway, Wuyi Highway (1933), Changli Highway (1934) |
| **of the Republic of China**    |                          |                       |                                           |
| **(1911-1937)**                 |                          |                       |                                           |
| **Late Republic of China**      | Beijing-Hangzhou Grand Canal | Shanghai-Nanjing Railway (1908) | Huyi Highway, Zhencheng Highway, Wuyi Highway, Changli Highway |
| **(1937-1949)**                 |                          |                       |                                           |

Source: According to the reference [1], the items marked with "-" are not found according to the reference.

2.2.3. Economic function. During the Ming and Qing Dynasties, the traditional economy of Jiangnan rural area was mainly agriculture, and the combination of agriculture, industry, deputy and business [11]. After the Shanghai-Nanjing Railway was opened to traffic in 1908, Changzhou's industry declined[10][13][14], and the competitiveness of the traditional home cloth industry declined. Various industries in Changzhou were forced to look for new opportunities and began modern industrialization. The development advantages of Shanghai's textile industry have radiated influence on Changzhou. With the efforts of national capitalists [15], the local traditional textile industry has actively transformed into an advanced textile industry. The traditional local cloth industry has been transformed and upgraded to the modern textile dyeing industry. The family workshop-style production method was transformed into a factory system. According to the "Wujin Industrial Investigation Record" published in 1929[16], textile dyeing industry occupied the dominant position in 68 industries at that time. The development of modern industry broke the traditional operation mode of combining agriculture and handicraft industry in the south of the Yangtze River[17]. In the industrial structure of Changzhou, the proportion of agriculture declined, the proportion of industry rose, and the tourism industry emerged[18]. Generally speaking, cities that traditionally depend on the rural economy have begun to transform in modern times, and Changzhou has transformed from a traditional agricultural city to a textile industrial city.

On the whole, modern Changzhou has undergone a drastic transformation of urban functions, in which the transformation of transportation and economic functions is essentially a process of industrialization. This transformation promoted Changzhou from a former industrial society into an
industrial society, which also led to the modernization of urban space and the corresponding urban spatial reconstruction (Table 3).

3. Modern urban spatial reconstruction

Based on the sorting out of the urban construction activities in the literature, and the city map of Changzhou during the Xuantong period in the Qing Dynasty in "The Complete Map of Changzhou Fucheng Fangxiang" (1909), and the urban construction land in 1916 and 1954 in "Changzhou Urban Construction History" Based on the analysis of the scope data and the map data of the urban area in 1930, the process of urban spatial reconstruction is studied in three stages according to the historical background and development characteristics (Table 3, Figure 2).

Table 3. Function Transformation and Spatial Reconstructuring of Changzhou From 1840 to 1949

| Period                        | Features of Urban Function Transformation | Features of Urban Space Reconstruction |
|-------------------------------|-------------------------------------------|---------------------------------------|
| Late Qing Dynasty (1840-1911) | 1. Political function: the seat of Changzhou Prefecture in the Qing Dynasty, with 8 towns under its jurisdiction. 2. Transportation function: a regional transportation hub city (the Beijing-Hangzhou Grand Canal water transportation hub). The Shanghai-Nanjing Railway lost its status as a regional transportation hub after the completion of the Shanghai-Nanjing Railway in 1908. 3. Economic function: traditional agricultural city. | After the New Deal in the late Qing Dynasty, the internal transformation of the city began. |
| Early and mid-term of the Republic of China (1911-1937) | 1. Political function: the Republic of China abolished the Changzhou government, adjusted the division, and called Wujin County, which belonged to Jiangsu Province. 2. Transportation function: transforming into a regional transportation hub city 3. Economic function: transforming into a textile industrial city. | A compound expansion model of circle layer + axial type |
| Later period of the Republic of China (1937-1949) | 1. Political function: During the Anti-Japanese War-Japanese occupation; after the war-Government of the Republic of China, it belonged to Jiangsu Province. 2. Transportation function: regional transportation hub city 3. Economic function: Light and textile industrial city. | Stagnation period |

3.1. The late Qing Dynasty (1840-1911): the internal transformation of the city
After the Opium War, Changzhou was not a port city. The city construction activities of Changzhou began with the New Deal in the late Qing Dynasty. There are two characteristics. On the one hand, the city maintained its urban form mainly confined to the city walls. The map in 1909 showed that Changzhou was still a closed traditional city pattern surrounded by city walls (Figure 1.). The spatial requirements of new urban functions are mainly met by urban renewal and transformation of building functions. Changzhou has dredged the river several times and built new schools, post offices, street lights, telephones, garbage dens, water dragon palaces, etc. On the other hand, the construction of a
railway station far away from the old city became a catalyst for the axial expansion of the city during
the subsequent Republic of China.

3.2. The early and mid-term of the Republic of China (1911-1937): the compound expansion model of
circle layer + axial type

The construction activities of Changzhou in modern times mainly focused on the relatively stable
political situation before the outbreak of the Anti-Japanese War in the early and mid-term of the
Republic of China. During this period, urban construction land expanded rapidly. On the one hand,
first an enclave was formed around the railway station, and then along the road leading from the city
to the railway station, it expanded from the old city to the east axis to form the east axis; with the road
construction, the east axis was strengthened and moved to the west of the old city To expand to form
the west axis. On the other hand, the urban form gradually broke through the restrictions of the city
wall, and the single center expanded to the outer circle. Statistics show that the scope of urban
construction in 1916 was mainly concentrated in the old city. By 1954, urban construction land had
increased substantially. The circle-layer + axial compound expansion model finally contributed to the
pipa-shaped urban form. In addition, compared with the Qing Dynasty, the functional space within the
city has been greatly modernized during this period, and Changzhou has modernized production and
living facilities (Figure 3).

3.3. Later period of the Republic of China (1937-1949): stagnation period
During this period, the political situation was turbulent. After the Anti-Japanese War and the Civil
War, Changzhou had thousands of miles of red land. From the perspective of urban form, the urban
spatial form maintained the development results of the early and mid-term of the Republic of China;
from the perspective of internal function, the urban function was paralyzed and it was difficult to
recover.

![Construction land change maps in Changzhou](image)

**Figure 2.** Construction land change maps in Changzhou, Source: adapted from reference [1]
4. Adaptability and mechanism of urban function transformation and spatial reconstruction

4.1. Adaptability of urban function transformation and spatial reconstruction
Under the historical background of the time, the urban spatial reconstruction of Changzhou changed the original material framework of the city, adapted to the transformation of urban functions at that time, and promoted the effectiveness of urban functions.

(1) The overall situation of spatial reconstruction: the rapid development of urban construction and the increasing demand for automobile traffic, the city will eventually break the city wall and expand along the axis of railway stations and highways.

(2) Land use function: represented by the construction of independent modern factories and railway stations, a new land use function area has been formed.

(3) Road traffic facilities: The construction of road traffic facilities runs through the entire process of modern Changzhou urban space reconstruction. The reconstruction projects of railways, highways and urban internal roads adapted to the construction of trains and automobiles facilitate the transportation of industrial raw materials and products.

(4) Municipal facilities: The construction of modern communication facilities, such as telephones and telegraphs, has shortened the information acquisition cycle. The construction of fire-fighting facilities has improved city safety, increased factory production safety, and improved the quality of life of residents.

Based on the historical background at that time, the transformation of urban space was adapted to the transformation of urban functions. In addition, it is a pity that the drastic transformation of the traditional urban space has changed the historical and cultural heritage accumulated over thousands of years of urban development, which has left a huge regret for the people of today.

4.2. The mechanism of urban function transformation and spatial reconstruction
4.2.1. Passive urban function transformation model. Urban functional transformation has active transformation and passive transformation. Active transformation is to actively promote the
transformation of urban functions through urban management, while passive transformation mainly promotes urban functions through the market and relying on private forces. From the process of Changzhou's modern urban function transformation and spatial reconstruction, it can be found that the process of Changzhou's urban function transformation mainly relied on the development of national capitalists to promote the development of industries, and made full use of the foundation of the development of the light textile industry in the Yangtze River Delta to solve the loss of Changzhou's transportation location advantage. The urban development dilemma caused by the loss of the advantages of the traditional home cloth industry is mainly passive transformation as a whole.

(1) Driven by political reforms in the late Qing Dynasty. At the regional level, the completion of the Shanghai-Nanjing Railway in 1908 was a landmark event in the Yangtze River Delta. The modernization of transportation started the process of industrialization in the region. This provided Changzhou with the transportation infrastructure needed for industrialization, but also brought heavy losses to the traditional functions of the city. At the city level, governance models, educational facilities, and municipal facilities took the lead in modernization. This top-down administrative promotion model makes the transformation of urban internal functions happen before the development of industrialization. However, in the face of weak industrial development, the transformation of urban functions and spatial reconstruction are slow, and it is mainly reflected in the internal transformation of the city.

(2) Industrial development in the early and mid-term of the Republic of China. The city of Changzhou has obtained sufficient construction funds, and the demand for construction of production space and living space has increased accordingly, and urban space has gradually matched economic development. The urban function transformation and spatial reconstruction promoted by this kind of folk force are gradual.

(3) The development brake brought about by the war in the late period of the Republic of China. During the Anti-Japanese War and the Civil War, the transformation of Changzhou's urban functions stagnated or even degraded, and it was difficult to restore urban functions. It can be seen that the turbulent macro-political environment is the biggest dilemma for urban development, and social stability is the basic guarantee for urban development.

4.2.2. Industrialization is the fundamental driving force. 1908 was the beginning of Changzhou’s industrialization. Taking this as a node, in the former pre-industrial society, Changzhou’s urban function was mainly the political function of the seat of the government and the water transportation hub of the Beijing-Hangzhou Grand Canal. Although it was the center of industry and commerce in the south of the Yangtze River, its economic function was always the dominant function of the city, it is in a secondary position. With the advancement of industrialization, the rise of economic function status during the Republic of China became the dominant function of the city. In the pre-industrial society, the urban space adapted to the urban functions of the agricultural society and formed the traditional urban space model of small towns in the south of the Yangtze River. Urban construction focused on defense facilities and water transportation facilities. The urban development was slow. Administration is the main body and entered the industrial society. The city wall was partially demolished to expand the land, and independent factories appeared, adapting to the urban road reconstruction, highway construction, and railway transportation for car traffic. It can be seen that the transformation of urban functions and the reconstruction of space in Changzhou in modern times were driven by industrialization.
5. Conclusion
The difference between Chinese cities and European cities is that they have undergone huge social changes in the world. In the context of domestic political turbulence, it is moving towards modernization. In modern times, Changzhou's political status has declined, and its transportation location advantages have been lost. At the same time, the modernization of transportation has also opened the door to the modernization of Changzhou's city. Driven by local national capital, Changzhou has transformed from a traditional agricultural city to a textile industrial city. In terms of spatial reconstruction, under the stimulus of railway traffic and highway traffic, Changzhou has transformed from the interior of the city to a compound expansion model of circle and axial, forming a pipa-shaped urban form. Although in the later period of the Republic of China, due to the political reasons of the Anti-Japanese War and the Civil War, this urban development pattern has continued to this day and has a profound impact on the development direction of urban land in Changzhou after the liberation. After liberation, the urban space continued to expand in circles, and at the same time the axial spatial structure developed into a belt-like way.

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