CHINESE GEOGRAPHICAL SCIENCE
Volume 4, Number 3, pp.219–231, 1994
Science Press, Beijing, China

URBAN RENEWAL AND DEVELOPMENT OF SHANGHAI CITY

Liu Ta (刘 塔)

(Nanjing Institute of Geography and Limnology, the Chinese Academy of Sciences, Nanjing 210008, PRC)

ABSTRACT: A new strategic thinking is put forward to resolve the urban problems in Shanghai based on the tendencies of recent shift of economic structure and development. It is argued that the traditional institution of urban economy and management is responsible for the degeneration of urban environment. Thus, a change of mechanism of urban functioning is essential to the sustainable growth of Shanghai City. The key part of the new strategic thinking of Shanghai urban renewal is the adjustment of urban land use structure and industrial structure, using land use right leasing of the emergent land market as the start force of the structure adjustment by accumulating capital. And the development of Pudong new area provides right time and space for Shanghai urban renewal.

KEY WORDS: urban renewal, urban problems, mechanism of urban functioning, land market

The urban development in China has a process and characteristics very different from other countries, and thus results in particular urban problems[1]. Due to neglect of infrastructure development and overdevelopment of manufacturing industry, urban degradation is quite severe and urban functions are seriously hampered. Shanghai is very typical of Chinese cities in this respect. Urban renewal has become an urgent demand. Because of the shift of national economic strategy and urban policies since the reform, the underlying mechanism of urban development is gradually changing, which makes urban renewal possible. In addition, the development of Pudong provides a good opportunity for Shanghai urban renewal.

I. THE MEANING OF URBAN RENEWAL

Urban renewal is, in its narrow sense, an attempt to regenerate the old and declined area through urban reconstruction. While in broader sense, it is to change the urban environment through a planned, large scale adjustments of existing city area to present and future requirements for urban living and working.

After a city is formed, because of scale economies, agglomeration economies and multiplier effect, it gradually absorbs population and industries to start its accelerating process of growth. During this process, the population size, land use size and infrastructure size of the city will grow, the economic structure will change and urban function will be improved and strengthened. But urban growth will meet its limit, for the size of the city is determined not only by the level of economic development, but also by many other factors such as geographical location, hinterland and population density (Fig.1).

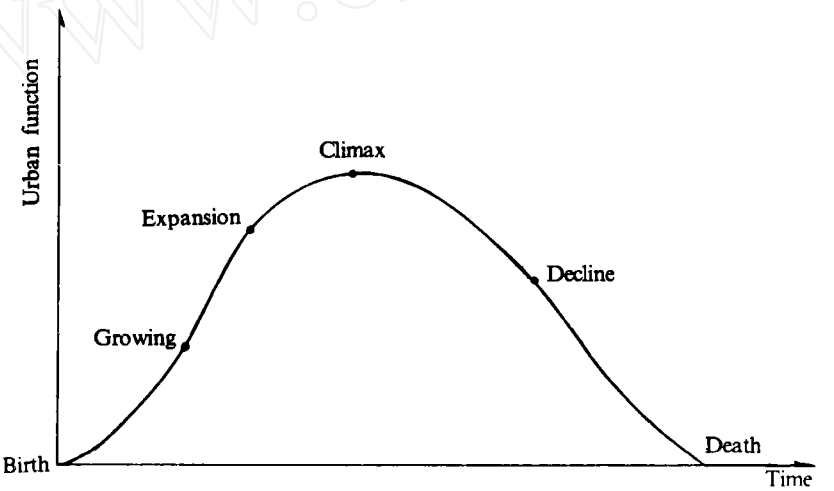

Fig.1 Dynamic process of urban growth

After a relatively long time, because of

1) high population density

2) ageing of buildings

3) lack of infrastructure and public facilities

4) degeneration and pollution resulted from mix of different land use

5) traffic congestion, environment pollution, crime and other social problems

the early developed urban area will gradually decline. If it is not improved, the city will finally decline and die. thus, urban renewal is a kind of urban development strategy to avoid the decline of the whole city by regenerating the declined urban area.

Because the aim of urban renewal is at the maintenance and development of integrated urban functions, it should not be limited only in urban improvement of the declined area, but has a wider view of entire city to coordinate the development of all sectors in urban system. When urban renewal is taken in an urban area, it is very difficult to achieve the expected result without considering the development of entire city.

Urban renewal was first put forward in the United States. After the Second World War, the popularization of cars and raising of living standards moved many middle and upper-class white families to live in suburbs, and left the city centre with poor black, which finally resulted in decline of central business district and forming of slums. On this background, the government of the United States advanced urban renewal policies to reconstruct the city centre through cooperation of government and civil agencies. At the meantime, various urban construction planning were conducted to meet the demands of future development of cities. During the 13 years from 1948 to 1961, American government and enterprises invested US $ 13 billion to conduct urban renewal for 587 cities under the control of the Urban Renewal Administration Bureau[2]. It goes without saying that the influence of urban renewal reached every parts of the United States.

Although urban renewal is a relatively new idea, it is accepted by most developed and many developing countries as the central part of their urban policies. The urban development in China is in its early stage, but the urban problems and degeneration caused by traditional institution of economy and urban administration are quite serious. Being the large city in China, Shanghai is a typical case of being hampered by urban problems and degeneration. The 90's will be the accelerating phase for urban development in China, while Shanghai can expect a greater progress because of Pudong development. We should repair the house before it rains and undertake urban renewal before the city reaches the peak of its development.

II. THE URBAN PROBLEMS AND DEGENERATION IN SHANGHAI

No matter comparing with cities in China, or with international super cities, the urban degeneration in Shanghai is very serious, shown and analyzed as follows:

1. Extra High Population Density in Old Urban Area

Shanghai central city is composed of 10 districts with a land area of 280.45 km^2 and a population of 7.04 million, and its population density is 25104 persons / km^2 (Fig.2). While in old urban area, the population density is as high as 42,900 persons / km^2, which is

the highest in China and rarely seen in international super cities (e.g. Paris with 19,450 persons / km^2, New York 9,109 persons / km^2, see Table 1).

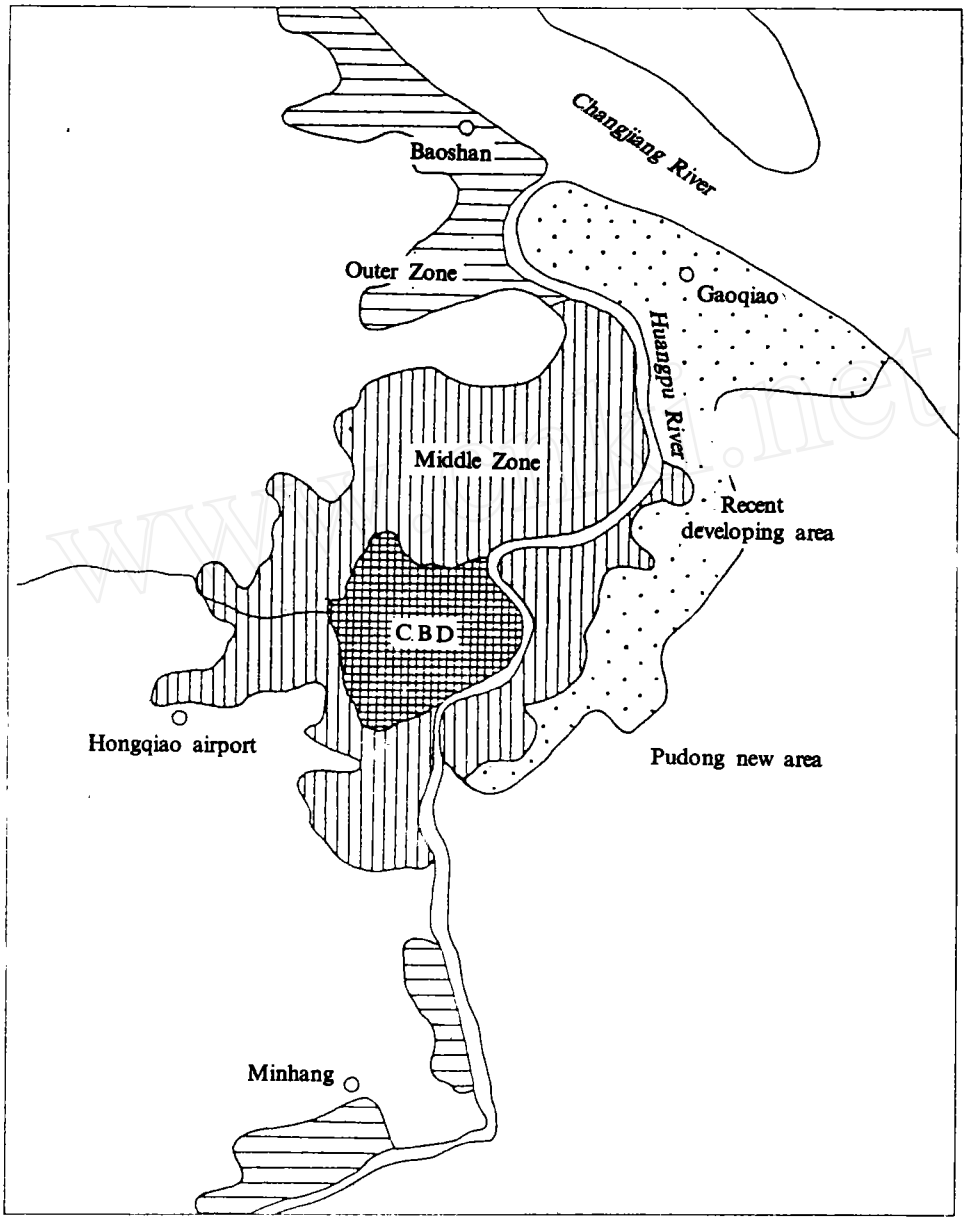

Fig.2 The zone of Shanghai City and Pudong New Area

In addition to the urban population, Shanghai has the largest "floating population" in Chinese cities, 1.34 million in 1986, 2 million at present [3] . It is estimated that the "floating population" in Shanghai will reach 3–4 million. Large amount of the "floating population" stay and live in urban area to become the defect urban population. It is estimated that the

"floating population" in central city is more than 1 million, roughly 4,000 persons per square kilometer. Large amount of floating population put high pressure on the originally weak infrastructure and aggravate the urban environment.

2. Shortage of housing and Ageing of Buildings

Since 1978, the Shanghai government has spent 13.24 billion yuan in housing construction and completed housing with 43.68 million square metres, which is 71% of the total housing after 1949. 2.7 million people moved into new house. Even that, the shortage of housing in Shanghai is still very serious. The living space per capita is only 6.4 square metres, much less than international standard and even less than most Chinese cities. Especially the household with living space per capita less than 4 square metres accounts for 14.4% of total household.

In addition to shortage of housing, ageing of buildings is another big problem. Many old buildings are severely out of maintenance. The old fashioned lanes and alleys, with an age over 60 years, have a space of 20 million square metres, 20% of the total housing space, among which 4.6 million square metres houses are severely damaged and 1.24 million are slums. There are several thousand factories in the old urban area, many of which were rebuilt using every bit of space. The space of factories is little, and the quality is poor, Because of being intensively used, the ageing of factory building is serious.

3. Lack of Infrastructure and Public Facilities

Shanghai is very short of infrastructure and public facilities. There are many problems in transportation, electricity and water supplies, sewer system and sewage treatment[4]. Land area per capita in central city is only 24 m^2 (see Table 1).

Table 1 International Comparison of Ifrastructure and Population Density

	Road Area Per Capita (m^2)	Garden Area Per Capita (m^2)	Population Density (Persons / km^2)
Shanghai	1.6	0.6	
Beijing	3.4	2.1	
Tianjing	1.7	0.7	
Tokyo	10	2.6	25104
New York	28	21	6667
Paris	11	14	
Moscow	7.6	19	

Contrary to the shortage of public land use is the extra high proportion of industrial land use, which is estimated to be 20% of total land area, much higher than international standard. At the same time, commercial land use makes up only 1.3% of total. Although Shanghai is well known for its commerce, the number of commercial institutions every 10 thousand people is far less than the special economic zones, also below national average (see Table 2).

Table 2 National Comparison of number of Commercial Institutions

National Average	Shanghai	Beijing	Tianjing	Guangzhou	Xi'an	4 SEZs
137	98	105	69	202	162	309

4. Serious Environmental Pollution and Inadequate Sewage Treatment Capacity

The discharge amount of industrial waste water per day is 3.62 million tons in 1989, and that of waste gas per day is 991 million m^3. The three wastes increasing year by year severely damage the environmental quality of Shanghai City. For example, the longest annual stinking period from 1963 to 1997 in Huangpu River was 58 days, while that in 80's increased sharply to 229 days. The pollution in some parts of the Suzhou River is much more severe, being stank all days in a year. And waste gas and smoke dust caused the frequency of acid rain in large Shanghai area to be 50%. To deal with the situation, environmental pollution treatment capacity at present is far more inadequate. The sewage treatment capacity of Shanghai City in 1990 is 40 toms, only about 10% of total amount of waste water.

5. Over Concentration of industries in City Center

In the central city are located 8 industrial zones, 70 industrial streets and over one thousand industrial points, forming several rings of encirclement of the city center[5].

Table 3 Terrestrial Structure of Industrial Location in Shanghai

Zone	Location	Area (km^2)	Factory		Production Value	
			Number	%	Billion ¥	%
Inner Zone	City Center	16.5	1059	18.9	4.68	7.68
Middle Zone	Central City	132.5	3850	68.7	48.44	79.4
Outer Zone	Out of Middle Zone	112.1	694	12.4	7.91	13.0
Total		261.1	5603	1008	61	100

It is shown from Table 3 that there is nearly 19% factories in the inner zone with an area of only 65 of total land area. The over concentration of industries in city centre causes serious pollution and degeneration of environment, hampering the functioning of CBD of Shanghai City. Besides, most (about 90%) of industrial production value was fulfilled in the old urban area. Because the de fact population density in old urban area is nearly 50,000 persons / km^2, the over concentration of industries not only causes serious pollution, but also aggravate the situation of shortage of infrastructure.

III. The Underlying Mechanism Causing Urban Degeneration

To understand and solve the urban problems of Shanghai City, it is necessary to find its causes and underlying mechanism, some of which is particular due to natural conditions and historical process of the city, and others are due to institutional factors nationwide.

1. Historical Process

In the middle 19th century, Shanghai was opened up as a trade port and thereafter it gradually became the largest port and economic centre in China. At the same time, world powers set up concession land one after another. The Huangpu district and areas along the Pujiang River developed rapidly, while other areas became dilapidated because of the large population coming from countryside. It is estimated that the slums accounted for 60% of the total houses. Even in the concession land, lack of integrated urban planning resulted in the mixing up of industrial and residential land uses and confused transportation distribution[6]. All these contributed more or less to the future urban problems.

2. Urban Policy to change" Consumer City" to " Production City".

After the founding of new China in 1949, government did some work to tackle the urban problems in Shanghai. But in order to industrialize rapidly, government invested money accumulated from agriculture mainly into industries, especially heavy industries, while urban construction was neglected[7]. In 1985, the gross industry value in Shanghai made up 11% of the national total, fiscal revenue making up 14%, and the profit of industrial enterprises turning over to the state making up 25%. But during more than 30 years from 1949 to 1985, the investment of state on urban infrastructure accounted for only 1% of the fiscal revenue Shanghai turning over to the state. And large part of the investment was on the construction of a few satellite towns. The urban environment of central city was not improved much. Using every bit of space, Shanghai established more than 2000 street facto-

ries in city centre after 1949, many of which were rebuilt from old bank, office and residential buildings. Thus the cost of factory establishment was dramatically reduced. But the urban environment, especially that of the golden zone, was severely aggravated. Shanghai was a money machine for the state in the past. Its economic development was at the cost of urban environment, which in feeding back hampered the future development of Shanghai economy.

3. Irrational Urban Industrial Structure

The proportion of population in secondary sector in Shanghai is 64.5%, much larger than that (20%—30%) of international supercities, and that of Beijing and Tianjing(see Table 4)[8].

Table 4 International Comparison of Industrial Population Structure

City	Primary sector	Secondary Sector	Tertiary Sector	Secondary Sector / Tertiary Sector
Shanghai	0.9	64.5	34.6	1:0.54
Beijing	8.6	50.6	40.8	1:0.81
Tianjing	13.5	50.4	36.1	1:0.72
Guangzhou	16.9	46.2	36.	1:0.80
New York	0.1	17.0	82.9	1:4.88
Tokyo	0.1	29.2	70.7	1:2.42
Melburne	0.1	32.3	67.6	1:2.09
New Dehli	1.2	32.8	66.0	1:2.01

On the one hand, because the secondary sector is more capital intensive and consumes much more resources than tertiary sector, the extra high proportion of secondary sector will certainly put much pressure on urban infrastructure, such as, electricity and water supplies, urban land use and transportation, and it will also cause serious pollution of urban environment[9]. On the other hand, very low proportion of tertiary sector will result in the decline of urban function of services, reduce the living quality of urban citizens and cause much inconvenience and many urban problems. The most important factor for Shanghai urban decline is the irrational urban industrial structure. Taking electricity and water supplies as examples, the ratio of living to industrial water supplies in Shanghai is 1:2, 1:0.57 in Beijing, while only 1:0.04 in Paris, the ratio of living to industrial electricity supplies in Shanghai is 1:16.21, 1:4.20 in Beijing, while only 1:0.75in Paris. It is obvious that the proportion of industrial water and electricity is many times of international average. Different from international supercities, it is the industry, not the living that uses most part of water and electricity in Shanghai. Thus, over concentration of the secondary sector in the urban area causes and aggravates directly the process of urban decline. (see Table 5).

Table 5 International Comparison of Water and Electricity Supplies to Industry and Living

City	Ratio of Living to Industrial Water Supplies	Ratio of Living to Industrial Electricity Supplies
Beijing	1:0.57	1:4.20
Paris	1:0.04	1:0.75
Rome	–	1:1.09
Madrid	1:0.36	1:0.68
New Dehli	1:0.59	1:1.68
Cairo	1:0.09	1:0.91
Shanghai	1:2.0	1:16.21

4. Urban Land Use without Self-adjustmant Mechanism

Urban land rent is an important mechanism for self adjustment of urban land use. It determines to some extent the marginal revenues of urban land of all sectors and their spatial distribution in the city. High profit sectors, such as finance and wholesale, will naturally occupy the golden zone, while low profit sectors, such as industry and horsing will be located in outer part of the city[10]. But it is different in a central planning economy. Because urban land use has long been part of central planning in China and urban land is "free", industrial enterprises will concentrate inevitably in city centre, in order to be near market and central planning departments and to utilize fully the urban infrastructure. As the result, the industrial enterprises are over concentrated in old urban area, which brings about many urban problems. If urban land had its rent and became part of production cost, this situation would be changed. For example, it is estimated that the commercial profit per square meter in Nanjing Road is more than 10 thousand yuan, while industrial profit is inly 400 yuan, and housing demands 3 yuan government subsidy.

IV. Strategic Thinking of Shanghai Urban Renewal

We have discussed above the urban decline and its underlying mechanism in Shanghai City. No matter comparing with international or national supercities, the urban degeneration in Shanghai is very serious, which hinders the sustainable growth of the city. In the 1990's Shanghai rejuvenation and development of Pudong new area will be a key part of Chinese economic development strategy. The rapid growth of economy and population, on the one hand, will inevitably put pressure on the backward infrastructure and urban environment, on the other hand, it will provide a best opportunity for adjustment of terrestrial structure and industrial structure which is the central part of Shanghai urban renewal.

1. Urban Renewal Is the Best Approach to Shanghai Urban Problems

Urban Problems in Shanghai City, such as environmental pollution and high population density, have existed for a long time and been paid attention to. Some measures were taken to solve the urban problems. But due to not fully understanding the underlying causes of urban problems, the results were not as good as expected. The traditional thinking is that the urban degeneration in Shanghai is caused by excess of population and industrial pollution, so the countermeasure is to disperse population and industry. Since 1949, the government invested a large amount of money to establish seven satellite towns, which population is 300,000, only 4.5% of the population in centrical city, so this result was not very ideal. Since 70's, shanghai has dispersed some factories with serious pollution to the neighboring counties, but the environmental pollution in central city was not changed much, and the dispersion of factories caused the spread of pollution to neighboring counties[11].

The real causes of Shanghai urban degeneration, in fact, are not only high population or industrial pollution, but the serious imbalance of industrial structure and urban land use structure and inefficient institution of industry can not resolve the Shanghai urban problems fundamentally. It is recently put forward that Pudong be a major place for dispersion of population and polluted industries. This kind of resolution is also based on the traditional thinking[12]. The urban function is determined by urban structure. The decline of urban function shows the imbalance of urban structure. In order to resolve the urban problems fundamentally, it is necessary to make great adjustment of urban industrial structure and land use structure.

Readjustment of industrial structure is to channel the population and capital in secondary sector into tertiary sector, especially to shut down the low technology street factories in city centre and the factories with serious pollution, the population and capital of these factories being shifted to services without dispersion to other place. In this way, the industrial structure can be gradually improved to make the population in tertiary sector to surpass that of industry to form a rational ratio (see Table 4).

Adjustment of urban land use structure is to form land market gradually by introducing the mechanism of using land upon payment and absorbing the capital from home I—elopment, and to improve the land use structure by the rule of differential rent of urban land, and to accumulate finance to accelerate the change of urban function mechanism. The two adjustments are complemented. Adjustment of industrial structure reduces the industrial land use and improves the land use structure, while adjustment of land use structure will strongly push the shift of industrial structure by urban land mechanism.

2. Urban Renewal Asks for the Institutional Change of Urban Economy and Management

In traditional institutions, the speed and size of economic growth, especially that of industrial growth, are the major quotas of local government achievement and the profit and taxes of industrial enterprises turning over to the state are also the most important sources of fiscal revenue of local government. Industrial growth become inevitably the target of government effort, while service industry and urban infrastructure are neglecter. So it could be said that the deep root of urban problems lies in the institutions.

To solve the urban problems and to have a great urban development, the traditional institutions of urban functioning management must have a change. A new mechanism of urban functioning must be established. That consists of four related parts: 1) the forming of land market; 2) the development of service industry; 3) the change of government function form direct economic management to macro control; 4) the change of urban planning from guidance planning to zoning. Firstly, the forming land market not only improves the land use structure by differential rent, but also provides huge money for urban construction and government finance. Secondly, great development of tertiary sector not only strengthens the service function of the city and is a major source of employment; but also lessens the pressure of industry on resources and urban infrastructure, and it is also the important part of future model of Shanghai as an international financial centre. Thirdly, with the shift of enterprise functioning and the form of land market, it is possible for a change of government function from direct economic management to macro control and services. Some government functions can be enterprise. Because the national land leasing can provide large part of the government finance, the government can be out of the trap of the sole industrial development. Finally, in the process of change from planning economy to market economy, law must replace the planning quota as the major means of regulation. In order to make urban planning effective and to prevent land speculation, the original urban planning which provides reference for government decision making should be replaced by zoning which has the effect of law.

At present, the new mechanism of urban functioning is gradually into shape, such as the forming of real estate market, land tract development by foreign companies, the shift of enterprise functioning, rapid development of service industry, and the change of government functions. All these changes, coming together, are reshaping the urban environment of Shanghai City.

3. Land Leasing Is the Start Force for Shanghai Urban Renewal

Collecting money is the most difficult part of urban renewal according to experiences home and abroad, because urban renewal needs huge sum of money. The money for Shanghai urban renewal will be several 10 billion yuan, which is out of the ability of government finance. But at the mean time, it is estimated that the turn over of land market underground is almost 10 billion yuan a year at the loss of government. Thus, it is a suitable approach for Shanghai urban renewal to absorb capital from home and abroad into urban construction and development by overrating land market underground and leasing land use right. At present, the real estate market in Shanghai is much favoured by Hong Kong, Taiwan and foreign inverters. By the end of July in 1992, 71 plots of lands has been leased, drawing approximately 1 billion US dollars. Land use right leasing not only fosters the process of urban renewal; but also provides a large sum of money for urban infrastructure construction and industrial structure adjustment.

4. Development of Pudong Provides a Good Opportunity for Shanghai Urban Renewal

The economic development in China, especially in the coastal area is very rapid since the reform in 1978. But in the eighties. the speed of economic development in Shanghai is much slower than other coastal cities and provinces, which is called "Shanghai Phenomenon". There are many causes for it, among which no big actions of reform is the important one. After the development of Pudong new area is carried out, the economic situation of Shanghai gets much better. Shanghai become the focus of attention from home and abroad. Development of Pudong is closely connected with the reconstruction of old urban area. So the development of Pudong provides a best stage of time and space for Shanghai urban renewal. The development of Pudong attracted personals and capital from home and abroad, which is beneficial to the reconstruction of old city, At the same time, the development of Pudong provides space for adjustment of land use structure and industrial structure.

Shanghai has come to a turning point in its development process. This good opportunity make it possible for Shanghai to resolve its many urban problems and to have a great progress at the same time. Shanghai should take this opportunity of development of Pudong new area, and use land right leasing as the start force to make adjustment of urban land use structure and industrial structure for urban renewal. so as to lay a good foundation for future Shanghai as an international financial centre and a world city.

REFERENCES

[1] Lo, C.P. Socialist Ideology and Urban Strategies in China, Urban Geography, 8(1), 1987.

[2] 张晓春. 都市更新与都市发展.都市社会发展之研究.台湾巨流图书公司，1978.

[3] 鲍世行. 大城市流动人口研究. 中国社会出版社，1992.

[4] Yeung, Yueman, Human Settlement and Sustainable Development in Urban Area, With Special Reference to China and Hong Kong, Occasional Paper No. 106, the Chinese University of Hong Kong, 1991.

[5] 何兴刚. 浦东开发与上海城市地域结构优化. 地理学报，47(2), 1992.

[6] 严重敏. 上海市经济发展的空间分析. 地理研究，4(3), 1985.

[7] Chan Kam Wing. Characteristics of Urbanization in Socialist Countries, Paper Presented at the Conference of Geographical Research and Development in Hong Kong University, 1990.

[8] 崔林. 中国第三产业发展与城市人口问题. 人口与经济研究，4(1), 1989.

[9] Kornai, Janos, Economics of Shortage, North—Holland Publishing Company, 1980.

[10] Balchin, Pauln and Kieve, Jeffreyl, Urban Land Economics, the MacMillan Press Ltd, 1977.

[11] 于宏俊，宁越敏. 城市地理学引论. 安徽科学出版社，1983.

[12] 郭柏林. 上海市中心区工业疏解探讨经济地理. 经济地理，12 (2)，1992.