

III-1.

Demand for Housing and the Structure

1. Demand for Housing and the Structure

1.1. Status Quo of Housing Market in Three Model Cities

1.1.1. Time-series of Changes in Stock and Flow of Housing

China is now facing the first housing consumption boom. It made its appearance in concomitance with the progress registered in the reform of the housing system, the policy directed to the promotion in housing investment and the various measures taken to stimulate the internal demand since 1998. Before the housing reform, the Chinese housing market was supplied by state-owned and public enterprises that provided and distributed to their personnel the corporate housing classified as “Basic Construction Investments”. The housing market in China has now shifted to the construction and sale of “commercial housing” in the real estate industry. The commercial housing sold in 1991 covered an area of 27.45 million square meters. In 1999 it reached an area of 129.98 million square meters, rising 4.7 times at an annual growth rate of +21.5% (Table 1-1). In the commercial housing sales in particular, the private purchases reached a share of 80% or more in 1999. Individuals are responding to changes in the Chinese housing market. China has been doing steady progress toward the “changeover of the housing market to a market economy.”

Table 1-1 Commercial Housing Sales all over the Chinese Territory

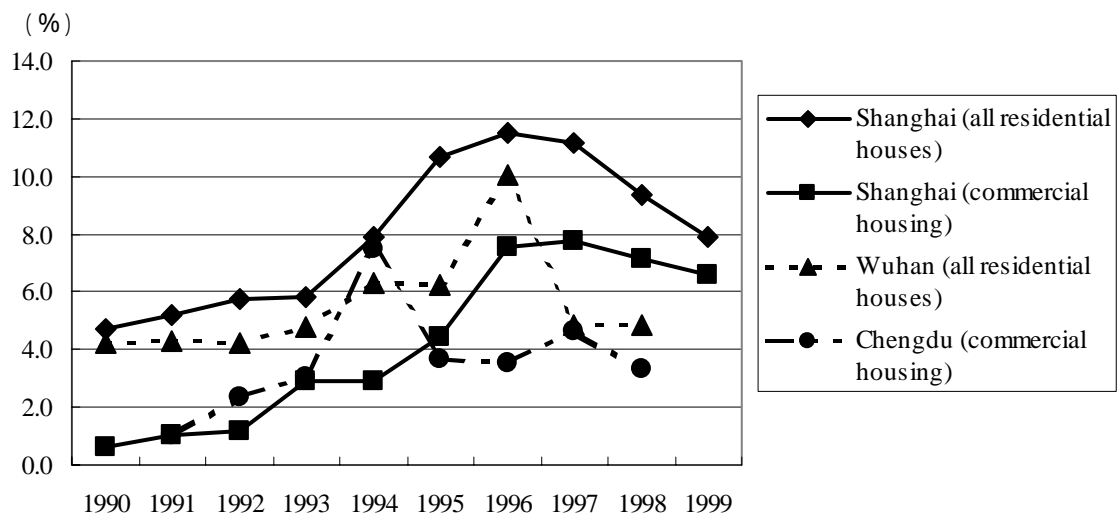
Year	Area sold					Sales (0,000 RMB)	Selling unit price (0,000 m ²)
	(0,000 m ²)	Growth (%)	Private purchase (0,000 m ²)	Growth (%)	Share (%)		
1991	2,745	7.9%	927	126.8%	33.8%	2,075,979	756
1992	3,812	38.9%	1,456	57.1%	38.2%	3,798,493	996
1993	6,035	58.3%	2,943	102.2%	48.8%	7,291,913	1,208
1994	6,118	1.4%	3,345	13.6%	54.7%	7,305,208	1,194
1995	6,787	10.9%	3,345	0.0%	49.3%	10,240,705	1,509
1996	6,899	1.6%	3,667	9.6%	53.2%	11,069,006	1,605
1997	7,864	14.0%	5,234	42.7%	66.6%	14,075,553	1,790
1998	10,827	37.7%	7,793	48.9%	72.0%	20,068,676	1,854
1999	12,998	20.0%	10,409	33.6%	80.1%	24,137,347	1,857
2000	16,570	27.5%	14,464	39.0%	87.3%	32,286,046	1,948

Source: China Statistics Yearbook 2001

The three model cities surveyed were large cities that led the housing reform movement all over China. Shanghai ranked first among them. The movements towards a market economy have been growing consistently. In analyzing the construction trends in each city given the ratio of the stock of housing completed, the following features can be pointed out:

- (1) In Shanghai, a share of the completed housing area rose to more than the 4% at the beginning of the 1990s continuing consistently until 1996, which led to the housing construction boom. The trend declined slightly starting 1997 due perhaps to the natural “adjustment” resulting from the increase in the vacancy ratio as a result of the construction rush. However, it might likely be a result brought about by the market maturation in the long-term perspective and progress registered in the quantitative build-up of the housing stock.
- (2) In Wuhan and Chengdu, the housing construction boom started in 1994 and is still continuing. In terms of completed housing areas however, they have not yet reached the level of Shanghai.
- (3) In 1998, the share of the completed housing areas remained at a level around 4-9% in all the cities. This numerical value is at a higher level compared to other developed countries, showing progress in the housing stock and its commercialization. This trend is expected to continue in the future.

Figure 1-1 Ratio of Completed Housing Area to Housing Stock (effective building area)



Source: Prepared by JICA Study Team, based on municipality statistics yearbooks

The three cities was used as reference in the following sections to analyze the basic indicators of the changes of each city housing stock and an overview of the Chinese housing market was given at the end.

1.1.2. Trends in the Housing Market of Shanghai

Based on available statistical data and findings, the trends of the housing market in Shanghai may be summarized as follows:

- (1) Shanghai experienced a long-term real-estate economy depression that came to an end in 1999. This year represented a turning point because the commercial housing area sold (12.43 million m²) exceeded the completed commercial housing area (12.29 million m²) for the first time in this city. It was the most significant result of the incentives given to promote housing consumption.
- (2) The completed commercial housing area grew steadily from 11.5 millions m² in 1997 to 12.5 millions m² in 1999. This numerical value is equal to 6-8% of the housing stock. The housing stock showed a steady growth too. In Shanghai the current trend of a housing construction is expected to last throughout the five years of the 10th five-year plan.
- (3) Since 1997 the sales of the commercial housing area grew rapidly. In the first half of 2000, it maintained a level of 6.12 millions m² with an increase of 24.9% respect the previous year. In the Shanghai municipality most of the people involved in the housing policy see a bright future in the short/medium-long term perspective based on:
 - 1) As gathered from outstanding cases in various foreign countries, a housing boom arise when the per-capita GDP is higher than US\$3,750. Shanghai has now a per-capita GDP higher than that amount.
 - 2) The distribution of housing has been done through the existing-house market, including the houses disposed by the government. The activation of the housing market is mainly due to “Filtering” (relocation to improve the living condition) that conversely contributed to the development of the market and the creation of the private rental housing market. Economical housing did not register a sale in conspicuous quantities. In Shanghai the good stage of development in the housing system limited the role of the economical housing.
- (4) Commercial housing unit prices remained around 3 thousand RMB/m² from 1996 to 1999. Since the first half of 2000 the real estate market situations have been rising all over China and as a consequence, the Shanghai real estate market is recovering.

Table 1-2 Time-Series of Housing Stock Flow in Shanghai

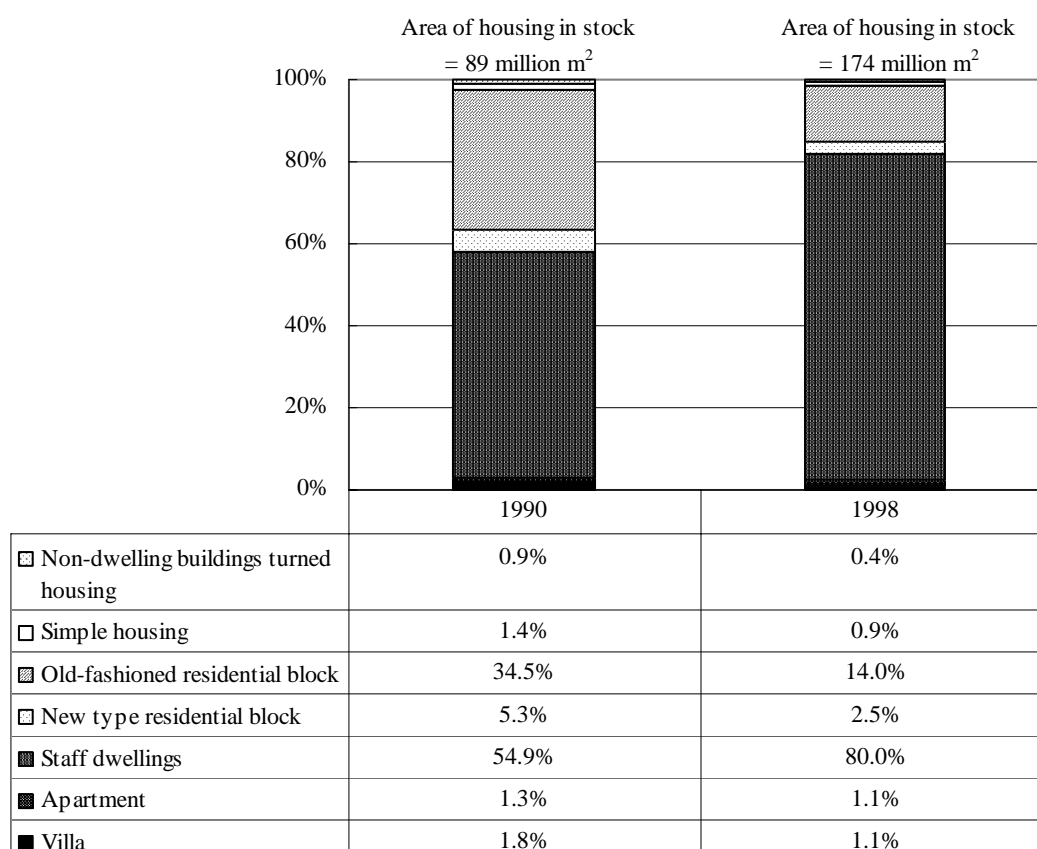
	1996	1997	1998	1999	2000
Stock					
Construction area (0,000 m ²)	13,135	15,116	17,416	18,587	19,644
Increase in stock (difference from a year earlier)	1,229	1,981	2,300	1,171	1,057
Dwelling area (0,000 m ²)	11,319	12,127	12,659	13,580	-
Dwelling area/construction area (%)	86.2%	80.2%	72.7%	73.1%	-
Per-capita dwelling area (m ²)	8.7	9.3	9.7	10.4	-
Resident population (0,000 persons)	1,301	1,304	1,305	1,307	-
Vacancy area (0,000 m ²)	507	729	902	922	-
Ratio to construction area (%)	3.9%	4.8%	5.2%	5.0%	-
Flow					
Completed construction area (0,000 million m ²)	1,509	1,684	1,624	1,469	-
Ratio to a year earlier (%)	18.9%	11.6%	-3.6%	-9.6%	-
Less commercial housing (0,000 million m ²)	992	1,176	1,242	1,229	-
Ratio to a year earlier (%)	87.2%	18.5%	5.6%	-1.0%	-
Commercial housing area sold (0,000 million m ²)	529	617	1,065	1,243	-
Ratio to a year earlier (%)	-1.3%	16.6%	72.6%	16.7%	-
Less economical housing (0,000 million m ²)	-	-	-	101	-
Ratio to a year earlier (%)	-	-	-	-	-
Share (%)	-	-	-	8.1%	-
Commercial housing selling unit price (RMB/m ²)	2,968	2,891	3,095	3,102	-
Less economical housing (0,000 million m ²)	-	-	-	-	-

Note 1: "Dwelling area," for which no statistic data had been available, was obtained under Expression "per-capita dwelling area x resident population."

Source: Prepared by JICA Study Team, based on *China Statistics Yearbook 2000, Shanghai Municipality Yearbook 1999, Shanghai Real Estate Yearbook 2000*, etc.

The construction of new housing expands the housing stock available and contributes to a quality improvement because new houses replace old-fashioned dwellings. This tendency is evident in the statistics of Shanghai where there are a lot of old-fashioned houses and historical buildings. (Refer to Figure 1-2.) In Shanghai the housing stock (effective construction area) passed from 89 million m² in 1990 to 174 million m² in 1998 at an annual growth rate of 8.7%. Under such circumstances, the old-fashioned dwellings, including "residential blocks," have decreased their share in a great measure, obviously being replaced with a new housing stock, including "staff dwellings." This shows that the housing construction boom in Shanghai in the beginning of 1990 has not only expanded the housing stock quantitatively but likewise achieved a qualitative improvement.

Figure 1-2 Internal Changes in the Shanghai Housing Stock



Source: Prepared by JICA Study Team, based on Shanghai Statistics Yearbooks

Activities as the dismantling and replacing of the old-fashioned houses with new ones are critical to project the housing demand. Regrettably enough, it was impossible to determine the quantity of the existing housing stock each year in the three model cities making it difficult to accurately reflect the data on a projection model. Besides, a precise projection of the demand for housing should consider the “loss” factor to elaborate a housing plan, a housing policy and a housing fund plan. In this study the loss has been simply guessed. (Refer to the next chapter.) The housing stock per year and an accurate loss estimation are data that should be available in analyzing the Chinese housing market and provide projection of the demand for housing in the future.

1.1.3. Trends in the Housing Market of Wuhan

Based on the statistical data and available findings, the trends of the housing market in Wuhan may be summarized as follows:

- 1) In Wuhan, the commercial housing showed a series of changes in the completed and sold areas. The sales of the commercial housing area increased greatly in 1998. By the year 2000, Wuhan achieved a sold commercial housing area estimated at 4 million m². This marked a 20% increase in sales compared to the data for 1998 and is considered to be one of the result of the housing system reforms and consumption incentives.
- 2) Unlike Shanghai, the economical housing plays an important role in the Wuhan housing market with a share of 31% in 1998. In the Wuhan municipality, it is believed that the economical housing construction will maintain a share of the 20% for 1999, 16% for 2000 and 15% from 2001 and so on. In Wuhan, the economical housing will likewise remain to be important for the future in attempting to improve the quality and quantity of housing.
- 3) Commercial house unit prices, including economical housing, have been fluctuating irregularly since 1996. The economical housing unit price fluctuations could be due to the immaturity of the conventional housing market, including some operational confusions in terms of the size, income restriction and so on. In general, the current unit price is 1.5 thousand RMB/ m² for commercial housing and 1.3-1.4 thousand RMB/m² for economical housing. Thus, the status difference between them seems to be decreasing. Though slowly, the housing market standardization and the housing market maturation based on the market principles are making gradual progress in Wuhan.
- 4) Many in the field of housing pointed out that lots of properties in larger sizes are available at relatively low prices in the large cities, including Wuhan. The properties with a housing area of approximately 120 m² are demanded and supplied mainly by the city.

Table 1-3 Time-Series of Housing Stock Flow in Wuhan

	1996	1997	1998	1999	2000
Stock (Wuhan)					
Construction area (0,000 m ²)	5,328	5,568	5,830	-	-
Increase in stock (difference from a year earlier)	-6,578	240	262	-	-
Dwelling area (0,000 m ²)	2,620	2,762	2,907	-	-
Dwelling area/construction area (%)	49.2%	49.6%	49.9%	-	-
Per-capita dwelling area (m ²)	7.5	7.8	8.1	8.5	-
Resident population (0,000 persons)	351	356	359	-	-
Vacancy area (0,000 m ²)	88	94	121	-	-
Ratio to construction area (%)	1.7%	1.7%	2.1%	-	-
Flow (Wuhan city as a whole)					
Completed construction area (0,000 million m ²)	680	717	836	-	-
Ratio to a year earlier	12.2%	5.4%	16.6%	-	-
Less commercial housing (0,000 million m ²)	266	278	335	-	-
Ratio to a year earlier	14.7%	4.5%	20.5%	-	-
Commercial housing area sold (0,000 million m ²)	93	125	213	-	-
Ratio to a year earlier	-	34.4%	70.4%	-	-
Less economical housing (0,000 million m ²)	22	20	65	-	-
Ratio to a year earlier	-	-9.1%	225.0%	-	-
Share (%)	23.7%	16.0%	30.5%	-	-
Commercial housing selling unit price (RMB/m ²)	1,406	1,757	1,588	-	-
Less economical housing (0,000 million m ²)	1,402	1,160	1,084	-	-

Source: Prepared by JICA Study Team, based on Wuhan Municipality Statistics Yearbook 1999 and Wuhan Real Estate Yearbook 1999

1.1.4. Trends in the Housing Market of Chengdu

Based on statistic values and hearing findings, the trends of the Chengdu housing market may be summarized as follows:

- (1) Concerning the commercial housing, the areas completed and sold changed over time. In 2000 the commercial housing area sold was of 4 millions m², twice the area in 1996.
- (2) Similarly to Wuhan, Chengdu's economical housing is important in the housing market. It had a share of approximately 30% of the commercial housing area sold in 1999 and 2000. The economical housing will continue to play an important role in Chengdu.
- (3) Commercial housing unit prices increased gradually since 1996 fluctuating on an irregular basis. In the Chengdu municipality, the unit prices in the wards of Chengdu city have remained at approximately 1.8 thousand RMB/m² for commercial housing in general and at 1.6 thousand RMB/m² for economical housing. Similarly to Wuhan, Chengdu's housing market has gradually stabilized and is turning to mature market principles.

Table 1-4 Time-Series of Housing Stock Flow in Chengdu

	1996	1997	1998	1999	2000
Stock (municipal wards)					
Construction area (0,000 m ²)	3,833	4,199	4,549	5,001	-
Increase in stock (difference from a year earlier)	378	366	350	452	-
Dwelling area (0,000 m ²)	1,889	2,051	2,244	2,459	-
Dwelling area/construction area (%)	49.3%	48.8%	49.3%	49.2%	-
Per-capita dwelling area (m ²)	9.2	9.7	10.4	10.9	-
Resident population (0,000 persons)	206	211	216	225	-
Vacancy area (0,000 m ²)	82	122	62	86	-
Ratio to construction area (%)	2.1%	2.9%	1.4%	1.7%	-
Flow (Chengdu municipality as a whole)					
Completed construction area (0,000 million m ²)	1,320	1,408	1,232	1,348	1,546
Ratio to a year earlier	23.5%	6.7%	-12.5%	9.4%	14.7%
Less commercial housing (0,000 million m ²)	314	360	304	375	460
Ratio to a year earlier	33.6%	14.6%	-15.6%	23.4%	22.8%
Commercial housing area sold (0,000 million m ²)	208	263	311	337	400
Ratio to a year earlier	77.8%	26.4%	18.3%	8.4%	18.7%
Less economical housing (0,000 million m ²)	70	76	74	105	112
Ratio to a year earlier	600.0%	8.6%	-2.6%	41.9%	6.5%
Share (%)	33.7%	28.9%	23.8%	31.2%	28.0%
Commercial housing selling unit price (RMB/m ²)	1,308	1,344	1,388	1,614	-
Less economical housing (0,000 million m ²)	1,060	903	790	1,113	-

Source: Prepared by JICA Study Team, based on Chengdu Municipality Statistic Yearbook 1999 and Chengdu Real Estate Yearbook 1999

1.1.5. Background of the Current Housing Boom and where it Emerged

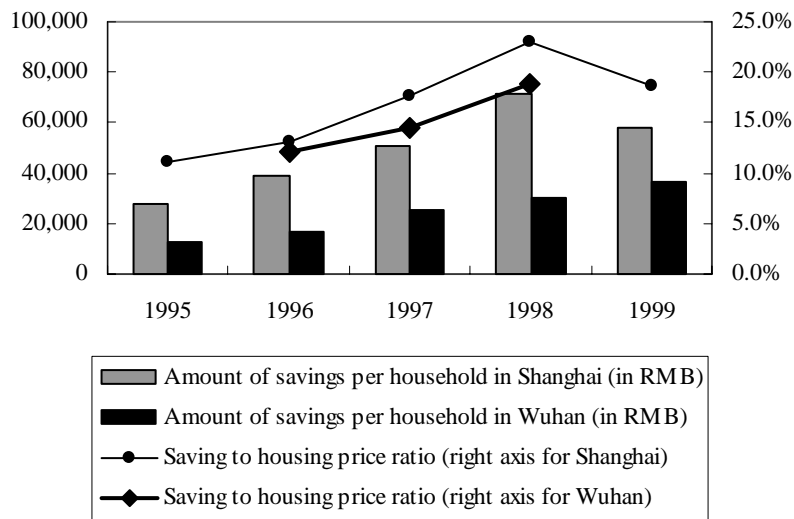
The changeover to a housing market economy resulted to the three model cities to experience the first housing consumption boom. A study of the boom's backgrounds and characteristics is given below.

(1) Factors Increasing Consumers' Earnings and Savings

In China, the growth of the economy has led to an increase in household income. Consequently, savings per household have been increasing too. Based on the urban residents' per-capita savings and number of persons per household, the amount of savings per household was estimated to reach approximately 58 thousand RMB in Shanghai and about 36 thousand RMB in Wuhan for 1999. These values showed a nearly consistent growth over the last five years. A ratio of this per-household saving value to the housing price was calculated by multiplying a statistically obtainable commercial house unit price (RMB/m²) for 100 m². The area of a standard commercial house newly built, was calculated and found to reach 23% in Shanghai and 19% in Wuhan in 1998. (Refer to Figure 1-3.) The statistics however, does not

capture a high percentage of earnings and savings. Moreover, in China, parents provide financial aid to purchase a house, therefore the provision for a down payment can remarkably enhance their ability to acquire a house. To actualize a latent demand for housing, the most important factor in the future is to increase the household income/savings according to the economic growth registered and form an “expectation” of such growth.

Figure 1-3 Time-Series of Changes in Savings and Housing Prices (Shanghai and Wuhan)



Note 1: An amount of savings per household was obtained under Expression (urban per-capita savings x number of persons her household).

Note 2: A housing price was obtained under Expression (commercial housing unit price in RMB/m² x 100 m²)

Source: Prepared by JICA Study Team, based on China Statistics Yearbook 2000, etc.

(2) Publicly Owned Housing Disposal Progress and Materialization/Utilization of Resale Profit (capital gain)

In the three model cities, the publicly owned houses have been disposed progressively. It is estimated that approximately 60 million m² had been disposed: This is equivalent to two-thirds of the 90 millions m² stock available at the Shanghai municipality by the end of 1999. A publicly owned housing stock of approximately 30 million m² is considered to be “houses which should neither be disposed because they are old and/or in need of redevelopment, or of low quality enough to require repairing”. It might well be considered, therefore, that the Shanghai municipal government effectively completed the disposal of publicly owned housing at the end of 2000. It appears, moreover, that Wuhan and Chengdu have almost completed the governmental disposal of publicly owned housing.

The state-owned and public enterprises’ corporate houses have had their disposed area and pricing vary with the number of service years, qualifications and so on. Assuming that a

state-owned house is disposed at a unit price of 2 hundred RMB/m² and resold at 1 thousand RMB/m², a resale profit of 40 thousand RMB will be made from a house with an area of 50 m², or of 80 thousand RMB from 100 m². These resale profits can be used as a down payment to purchase new commercial housing. In reality, the resale profit (capital gain) of 80-100 thousand RMB is common in Shanghai. The Shanghai municipal government organized a system to allow reselling of disposed housing immediately. At the same time, the system has positively operated in striving to “stimulate a step-by-step housing consumption.” In the case of Shanghai, not only the dwelling portion but also the commonly shared portion has been disposed. The disposal can lead to a complete private ownership. Thus, there are few restrictions on the resale of a disposed house that were publicly owned and this should be considered as a first step to further develop the tertiary housing market (to sell and buy existing houses).

The disposal of state-owned/public enterprises’ corporate housing is a transfer of assets (national treasury) from the governmental to the private sector in line with a reform of the housing system. The promotion of the reselling or leasing of these disposed houses is considered very important in activating the housing market. In Section 1-4 the status quo and the challenges to the existing housing market will be presented.

(3) Effectiveness of Housing Consumption-activating Measures (housing tax reduction)

A policy fostering the consumption of housing has been promoted on a nation-wide level since 1998. The municipality of Shanghai is trying to stimulate the housing consumption through two policies: (1) A measure to reduce the income tax of individuals purchasing housing during the period from 1998 to 2003 (the portion equivalent to the total sum of a housing price is withdrawn from an amount of tax); and (2) The reduction of the conventional 6% contractual tax to 0.75% for the second half of 1999. These two policies are used to stimulate the housing consumption and are implemented in other cities, including Wuhan and Chengdu.

Especially the “withdrawal of a total housing price from the income tax” (1) is a significant full-scale tax reduction measure considered very effective. In addition, the purchase of the second house receives a certain tax reduction though different in portion. It appears that a number of the wealthy classes are eventually buying their second houses for investment or rental. A large part of the non-registered population (including a population inflow) are buying their houses in the urban area as an investment.

(4) Increase in Housing Provident Fund Reserves

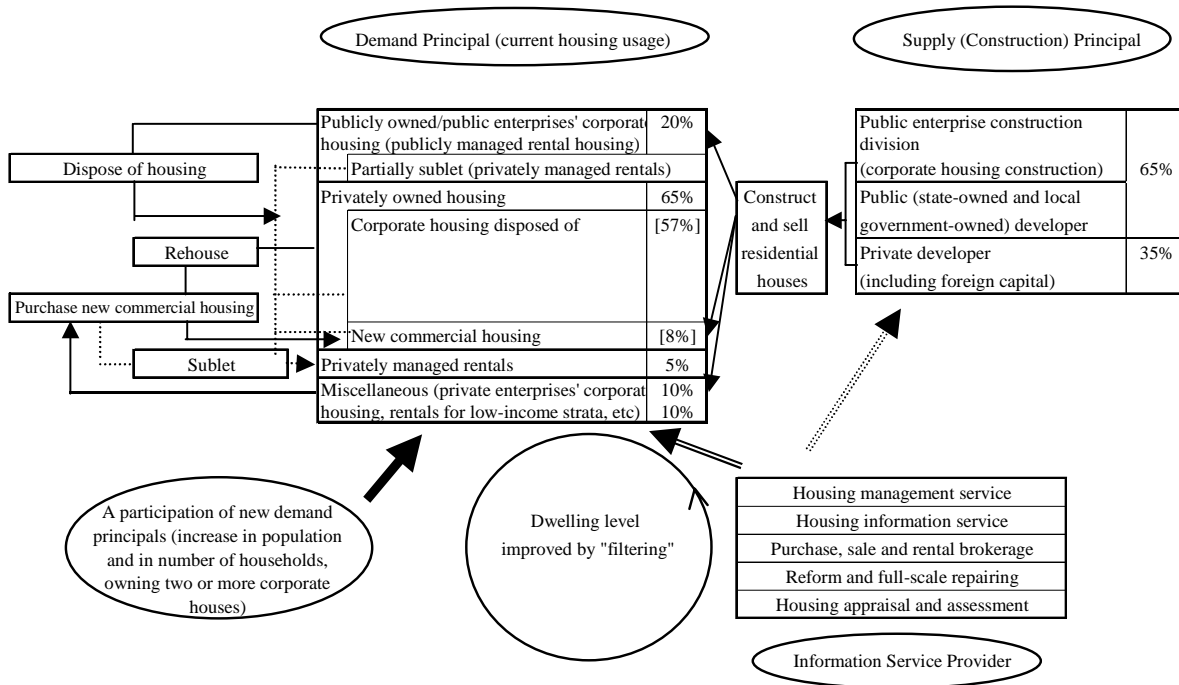
The Shanghai municipality has already started to operate through the Housing Provident Fund system since 1991. A decade has already passed since the system started its

operations. The initial deposit rate of 5% (from both employer and employee) rose to 7%. The reserves of some early subscribers have already reached an amount equivalent to their annual income. In Wuhan and Chengdu, some groups have a consistent amount of Housing Provident Fund in reserve. At present, many seem willing to buy a house because of the housing tax reduction and the low housing prices on a down payment/loan basis.

1.1.6. Framework for Housing Markets, and How To View It

Once the status quo of the housing market in three model cities is determined, it is necessary to form and activate a wholesome housing market aiming at the improvement of the residential level and the housing industry. Therefore the “player (principal)” forming the housing market and “activity” should be defined and then delineate the overall market framework created by their mutual relationships. A geometry of the current housing market in China (refer to figure 2-4) and a framework of the housing market that would upgrade a level of residence through “filtering” oriented for the future are proposed hereunder:

Figure 1-4 Main Players on Housing Market, and Market Activities (status quo and direction in the future)



Note 1: Ratios (%) by form in Demand Principal and in Supply Principal were established by JICA Study Team, based on questionnaire survey, hearing, and so on.
 Source: JICA Study Team

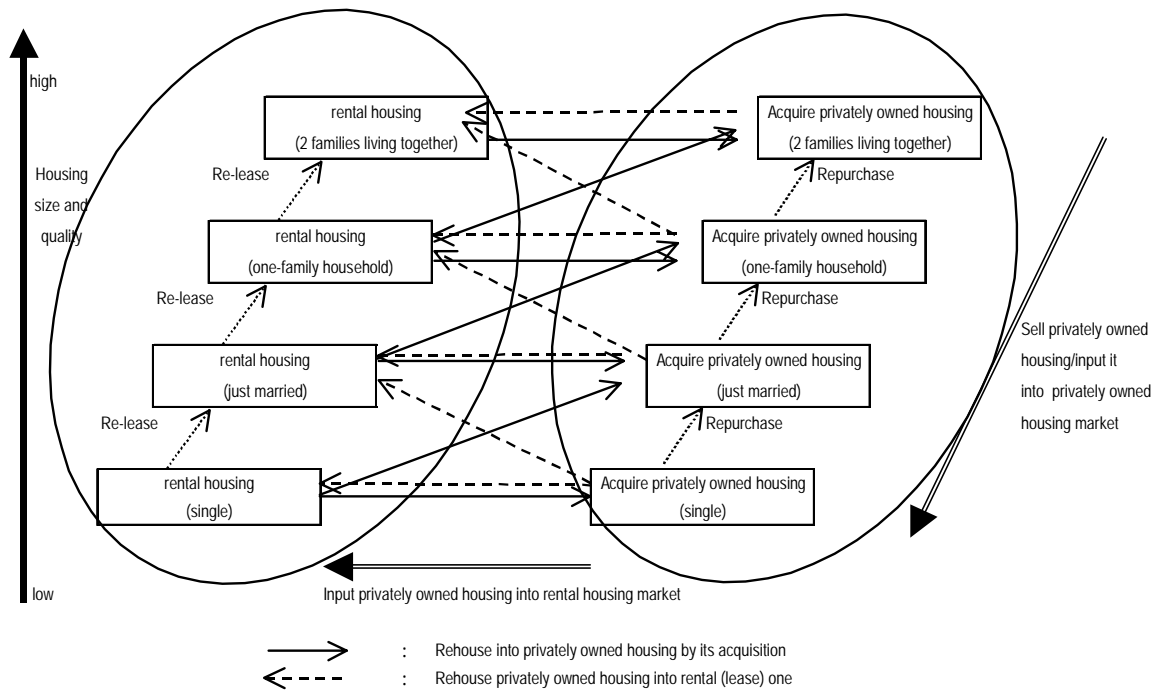
The players that form the housing market can be classified into three categories: the first is the demand principal, who “consumes” a house in the form of owning (using) it; the second the supply (construction) principal, who plans, constructs and sells/rentals commercial and/or rental housing; and the third the information/service provider to render services to both demand and supply principals that may bridge from time to time.

In China, the “demand principal” is now conspicuously changing its structure in line with the housing system reform. Outstanding cases follow. The residents of corporate housing of the publicly owned enterprises are becoming private owner households once their house is disposed. “Re-housing” takes place through the purchasing or moving to new commercial housing. The number of occupants of private rental housing is increasing due to the re-lease of the publicly owned housing or to private home input. The demand principal achieved an autonomous change in the form of new demand principals’ participation due to some environment-changing factors, such as an increase in overall population and in number of households and/or of the households having two or more-houses.

The supply (construction) principal, on the other hand, did not register remarkable changes. Those public enterprises' construction divisions and public (state-owned and local government-affiliated) developers, who have been supplying houses in the form of corporate housing construction (basic construction investment) so far, are now making inroads into the new commercial housing supply sector. It is difficult, however, to expressly say that they have been sufficiently able to address the new needs and structural changes of the demand principal in terms of their abilities to plan and develop a new product and/or to raise funds required. Furthermore, those information/service providers, who should furnish both demand and supply principals with a variety of services, including information transfer, are still in the initial stages of operations and are considered insufficient both qualitatively and quantitatively as far as their activities are concerned.

There are wide possibilities for a "filtering system to improve the dwelling level through re-housing" to be formed and developed if some activities are further sustained and vitalized by the players on the housing market. In Shanghai where housing is found through the market more than elsewhere, a filtering system has already been working and utilizing the existing/rental housing market. The progressive "changeover of the housing market to a market economy" happens at different speeds depending on income level and other urban features. However, when the Chinese housing market should be clear, institutional and political measures should be taken to foster the changeover. In the order of priorities, the status quo of the housing market should first be clarified and followed by the creation of projections for the future. For the system to materialize, it is important to design a filtering system and a policy/institution support for China to create such a system.

Figure 1-5 Filtering and Privately Owned/Rental Housing Market



Source: JICA Study Team

1.2. Features of the Housing Demand Principal and Trends of the Demand for Housing

Based on the findings of a questionnaire survey on the players of the housing market in the three cities used for model, the main features of the “demand principal” will be discussed in this section. Given in Table 1-5 is a summary of the characteristics of the surveyed (consumers).

The weighted average of the age of the surveyed was around middle forties when they bought housing. The number of household members did not show big differences from the macro-statistical numerical value. A two-generation family composed of husband, wife and children occupied approximately two-thirds of all the households in each of the cities surveyed. The percentage of the “no-child” family and household with “independent children” was significant (8-20% of the total). Changes in household structure were due to changes in the family structure shifting to nuclear families and the aging of the family members. More than 50% of all the households in both Wuhan and Chengdu had a per-household annual income of less than 20 thousand RMB. The 90% of the households in Wuhan and Chengdu, and the 80% in Shanghai earn an annual income less than 50 thousand RMB. On a weighted average basis, Wuhan and Chengdu had an annual income of 27-28 thousand RMB and Shanghai of 37 thousand RMB. Private housing owners represent a little lower percentage (48%) in Wuhan.

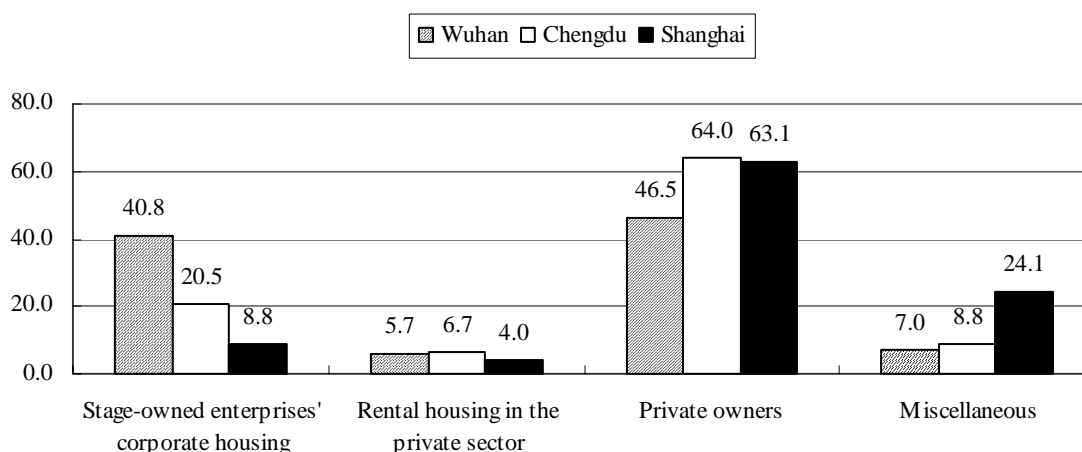
In Chengdu and Shanghai, however, approximately two-thirds of the municipal population own their housing to some extent is a result of the housing disposal. Considering that the housing size (commonly used portion only) is reckoned at a weighted average of around 63-73m² and that the number of household members is calculated at a weighted average of approximately 3, a per-capita effective dwelling space could be estimated at a mean value of approximately 10-15m².

Table 1-5 Main Attributes to Consumers (individuals and households) in Three Model Cities

Question number/attribute	Wuhan	Chengdu	Shanghai
F2. Answerers' age (weighted average: years old)	40.2	43.1	43.3
F3. Number of household members (weighted average: persons)	3.38	3.15	3.18
F4. Percentage of two generations (parent/children) living together	66.3	63.2	72.5
F5. Number of years elapsed after marriage (years)	17.2	18.4	15.4
F6. Ratio of employees in state-owned and public enterprises (%)	49.3	39.6	53.8
F7. Household annual income (weighted average: 0,000 RMB)	2.8	2.7	3.7
F8. Provident Fund reserves (weighted average: RMB)	-	5,600	16,400
F9. Private homeowner ratio (%)	46.5	64.0	63.1
A5. Housing size (including space shared, weighted average: m ²)	67	73	63

Source: Findings in questionnaire survey by JICA Study Team

Figure 1-6 Housing Usage according to Questionnaire



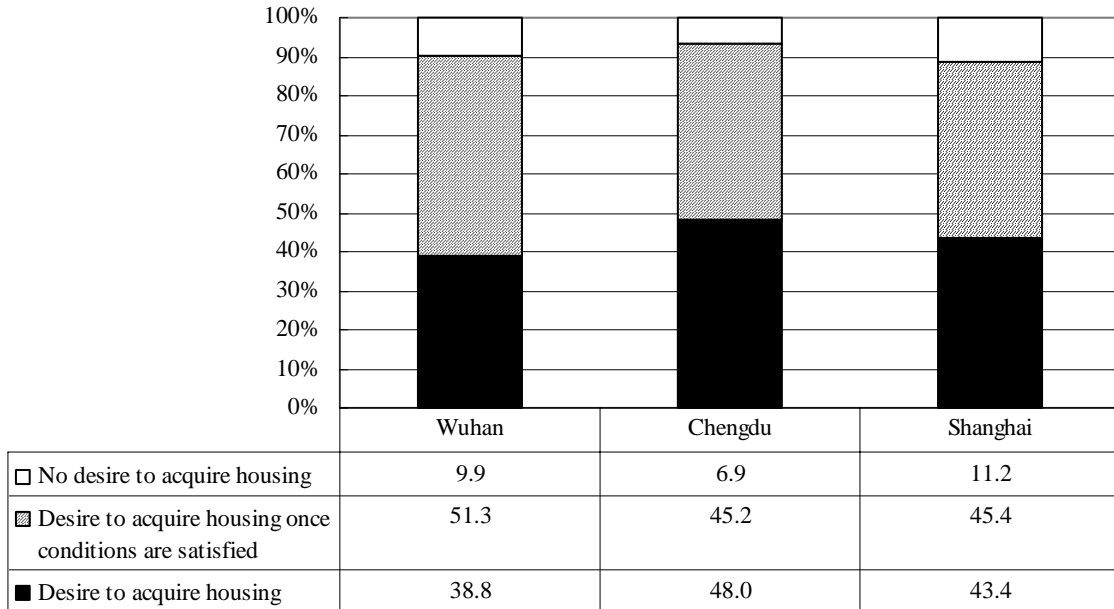
Source: Findings in questionnaire survey by JICA Study Team

A detailed breakdown of housing users (refer to Figure 1-6) tells us that the largest number is the Wuhan municipality population but is also the smallest number of the Shanghai municipality occupying state-owned enterprises' corporate housing. Basically, the housing disposal has been delayed in Wuhan where there are a large number of state-owned leading enterprises to pushed more to restructure. This may explain the differences of Wuhan from

other cities. Although, it can be also due to a deflection of the sampling, however difficult, can likewise be determined correctly. As far as the “private rental housing” is concerned, all of the three cities show a share stable at a single-digit level indicating that the rental housing market has lagged behind remarkably. Shanghai showed the smallest share of private rental housing regardless the fact that the housing market is more developed compared to the other model cities. This might be related to the fact that 55% of the surveyed in Shanghai, the highest percentage in all of the three model cities, was “state-owned and public enterprises’ personnel (including the management).”

Regarding the “intention to acquire housing”, those that answered “Desire to acquire housing” reached a maximum of 11% only, in Shanghai too. The majority answered “Desire to acquire housing once some conditions have been satisfied” and “Do not desire to acquire housing at all.” (Refer to Figure 1-7.) It shows a very cautious attitude in buying housing or, it reflects the “high number of already owned private housing” as referred to before. The implementation of the housing disposal satisfies the needs of the majority to acquire housing. The current housing boom may be predicted not to last for such a long a time. Hence, the following actualization of the housing needs depends on a how it successfully attracts individuals who may decide to acquire housing, “resorting entirely to conditions.” There is concern that the housing acquisition will not take place unless determining conditions are created to enhance this possibility, therefore it may be essential to develop mechanisms that would help the potential housing consumers to actualize the purchase. This mechanism should work through the involvement of the housing market and the housing finance systems.

Figure 1-7 Intent to Acquire Housing

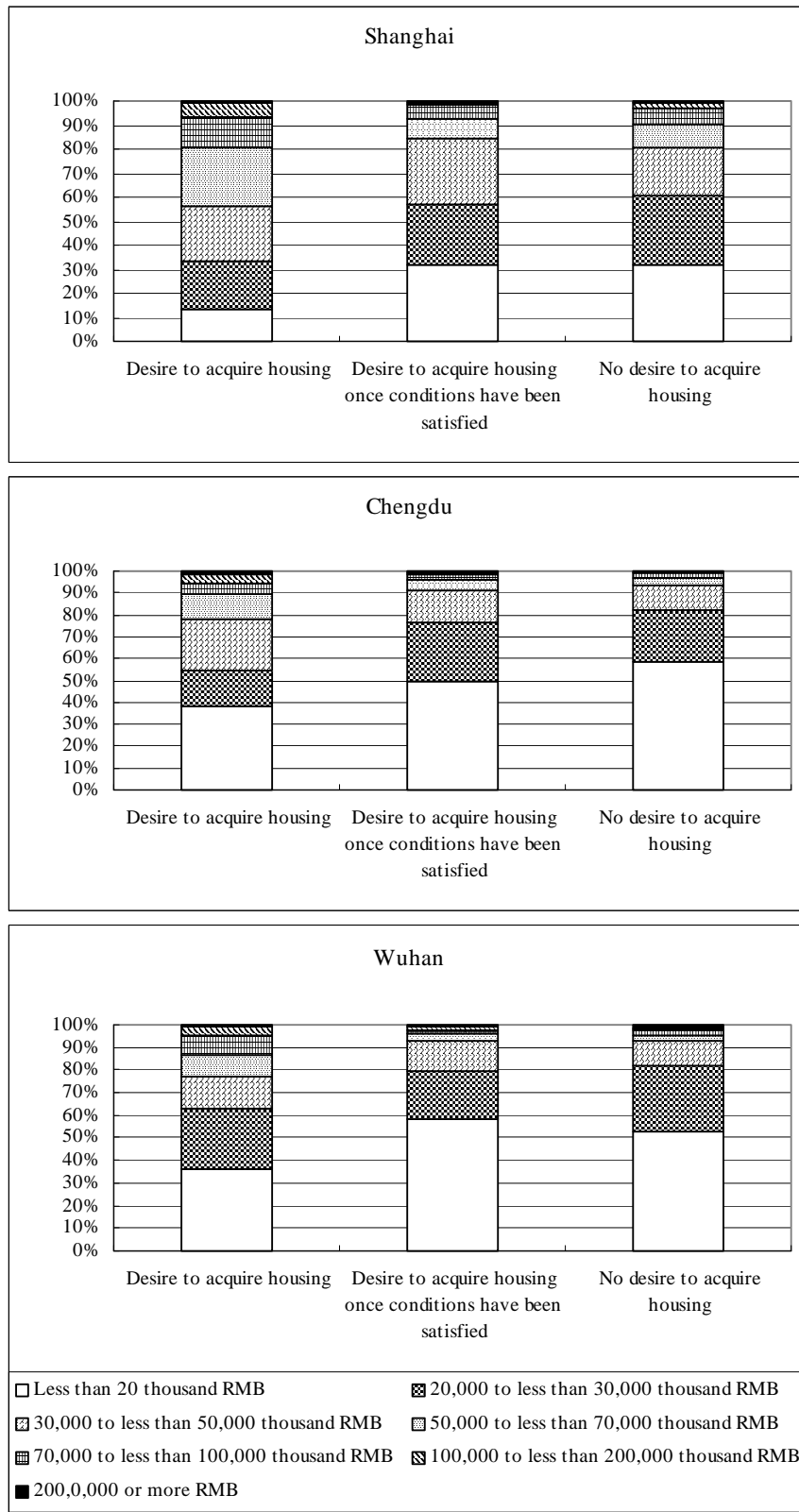


Source: Questionnaire Survey by JICA Study Team

The majority in the group who answered “Desire” or “Depending entirely on conditions” (80-90%) want to buy housing as soon as possible or within the next five years. Their motivations lie mainly in the “Desire to live in a better house,” and “Now is the time to purchase due to institutional, economic and environmental conditions.” This reveals the extent of the consumers’ reaction to institutional inputs as measures taken to stimulate the housing demand as well their desires for a quality housing.

If the age factor is taken into consideration (refer to Figure 1-8), the households with an annual income ranging from 50 to 200 thousand RMB in Shanghai and Wuhan are most likely to buy house, while in Chengdu, those having an annual income ranging from 100 to 200 RMB in Chengdu. Households with a mean annual income of 25-40 thousand RMB put limits affirming the “Desire to acquire housing once conditions have been satisfied.” Therefore, to maintain active the housing market the purchasing capability of the potential consumers has to be enhanced.

Figure 1-8 Housing Acquisition Intent by Annual Income



Source: Questionnaire Survey by JICA Study Team

In the three model cities the choice of the style and areas where the house should be located differ widely. (Refer to Table 1-6.) For example, the area of housing in the overall weighted averages was of 94.5m² in Wuhan and 101.4m² in Chengdu. In Shanghai, the area had a weighted average narrowed at 86.3m² as an indication of a more realistic approach to the purchase of a house available at higher prices. Moreover, in Shanghai the group that expressed the desire to buy an existing housing had a higher percentage (14.5%) compared to Wuhan (4.0%) and Chengdu (10.5%). To be noted that those who desire to acquire existing housing refer to housing with a smaller area than the new built ones thus the area is reduced in the weighted average. In Shanghai where changeover to a market economy is more pronounced, the demand principal has expressed a realistic intent in the housing acquisition, either used or narrower, in line with the own economic capability.

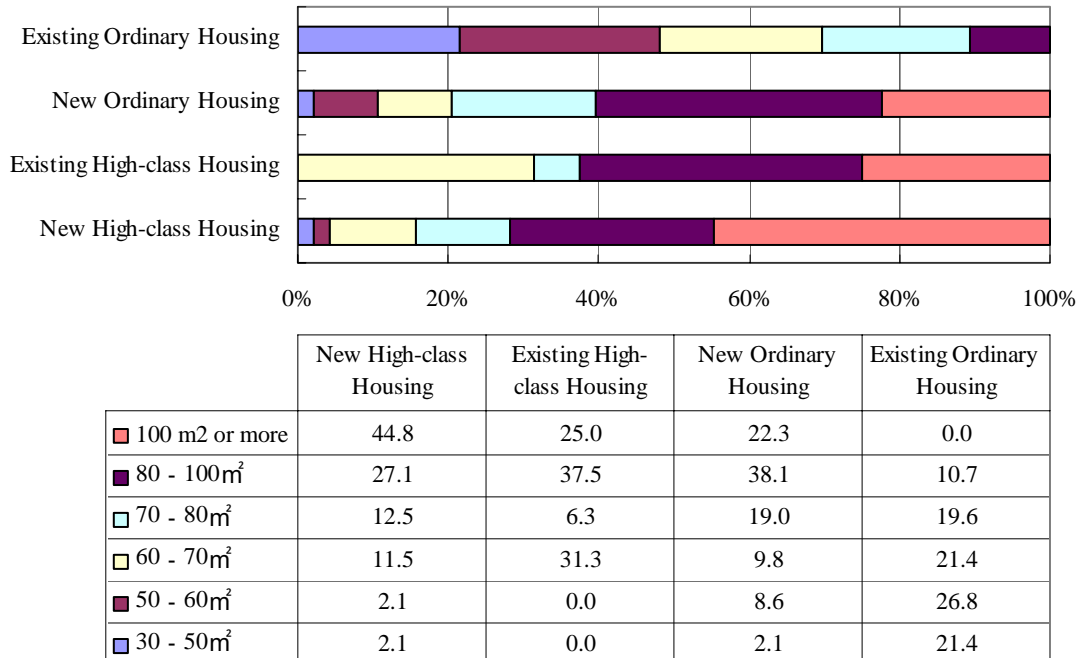
Table 1-6 Area of Housing Desired (m², weighted average)

	Wuhan	Chengdu	Shanghai
Newly constructed housing	95.6	101.9	89.3
High-class dwelling	104.6	108.1	96.9
Ordinary dwelling	90.0	98.2	87.3
Existing dwelling	86.0	85.1	67.8
High-class dwelling	99.3	95.9	88.8
Ordinary dwelling	71.4	71.7	61.6
Total	94.5	101.4	86.3

Source: Questionnaire Survey by JICA Study Team

In Shanghai, the group who desire to acquire housing narrow to less than 80m² have occupied 89.2% for existing ordinary housing, 39.5% for new ordinary housing and 28.2% for new high-class housing. Thus, it very important to note that the demand principal differentiates widely its needs in terms of size. (Refer to Figure 1-9.)

Figure 1-9 Area of Housing Desired to Acquire by Style in Shanghai



Source: Questionnaire Survey by JICA Study Team

It was also analyzed the financial instruments used to sustain the purchase of the housing. They referred to the “down-payment (funds in hand) 30 to 40%,” “Housing Provident Fund loan 30 to 50%” and “commercial loan 20 to 30%.” The “a loan as prerequisite” makes the fund raising plan very realistic. However, “In China, the “idea of housing loan” is not yet accepted and an allegedly tendency to refute borrowing has been observed.” Nevertheless the group actually planning to acquire housing has based the purchase of the housing on a loan as a prerequisite related to the “shortage for down-payment (funds in hands)”

The “Housing Provident Fund reserves have been saved” “A down-payment is available thanks to the housing disposal” “The Housing Provident Fund loan offers a low interest rate,” “A national subsidy is available” linked to the political factors, such as the Housing Provident Fund system and the more recent measures to stimulate the demand, etc., have been efficacious incentives to create a sound economic backgrounds. It is worth noting that the “proceeds from selling the real estate, such as existing housing, etc.,” were mentioned as possible sources of the fund for down-payment by 13% of the surveyed in Wuhan, the 22% in Chengdu and the 22%, Shanghai. These answers indicate that housing, included disposed

houses, is increasingly recognized as an asset and that a housing asset will be fluidized more and more in the future. The challenge for the existing housing distribution is to lead the diversification and maturation of the housing market and at the same time to enhance the living condition through “re-housing.”

A review of the issues involved in the planning of the purchase of housing shows that the reluctant attitude is mainly due to: “Only a small amount of funds only is available in hand.” “The economy depression has caused a decrease in income.” “It is a feeling of uneasiness to contract a long-term loan.” “There is a fear that the interest rate may rise.” “ Employment remains unstable under the depressed economy” and so on. These answers indicate a feeling of significant uneasiness in asking for a loan due to the actual and future employment/income situations and similar attitudes were observed in considering the purchase of housing. The most significant reason given was “it is not economic feasible to purchase a house.” Therefore the “expectations” that the economy will grow at a stable pace and that the employment and income’s situations will improve should be steadily reared. Besides, housing should be conceived as an asset value. The financial burden of a housing loan should be lightened disposing of funds in a more flexible way and the feeling of uneasiness in contracting a housing loan should be overcome.

Table 1-7 Issues in Planning to Purchase Housing (most significant five answers: %answer)

	Wuhan	Chengdu	Shanghai
1. Funds in hand scarcely available	23.5	24.5	17.7
2. Income decreased under the economy depression	19.9	17.6	19.6
3. Uneasiness felt in contracting a long-term loan	15.9	18.2	15.0
4. Fear about possible hikes of interest rates	14.2	14.6	14.4
5. Employment unstable with economy depressed	14.8	10.1	11.9

Note: Answers shown above are subject to the descending order of percentages in totals by city.

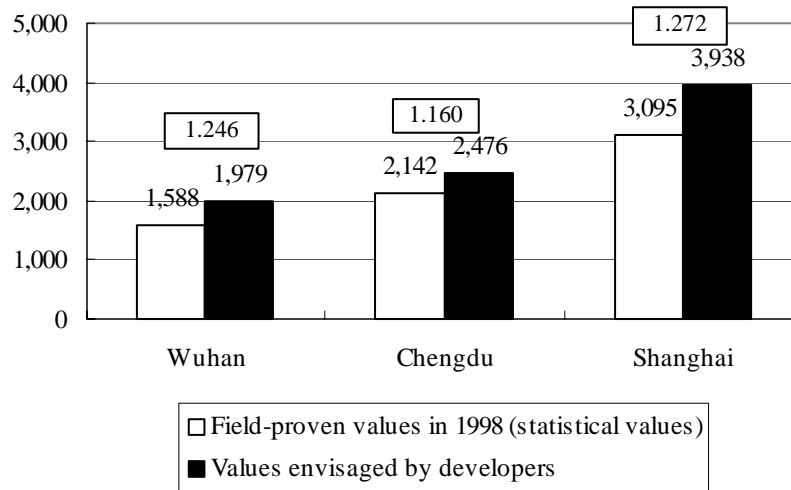
Source: Questionnaire Survey by JICA Study Team

1.3. Features of the Housing Supply/Distribution Principals (developer/enterprise) and Trends of Housing Supplies

In the housing market of the three model cities, some major players composed the housing supply principal (developer). In the questionnaire survey, the private enterprises, including foreign capital were approximately the 40%, while the remaining 60% were public enterprises, including state-owned corporations. In the 1990s the consumers changed their way to purchase housing remarkably, while the suppliers did not change at the same extent.

The “housing area with the highest demand on the market” as envisaged by the developers has a weighted average of approximately 100m² in the three cities. And the “price zone with the highest demand on the market” had a weighted average ranging from the lowest level around 2 thousand RMB/m² in Wuhan and the highest of 4 thousand RMB/m² in Shanghai. In the three model cities, the unit prices were numerically higher than the 1998 commercial housing price by the 16% (Chengdu) and 27% (Shanghai). The prices that remained unchanged in the last two years may have been set by the developers at their selling prices in line with their conventional sales strategies or high-class-oriented policy.

Figure 1-10 Comparison of “Better Selling” Price Zone Envisaged by Developers, and their Comparison with Field-proven Values in 1998



Note: Numerical values enclosed in squares stand for “a ratio of developer-envisaged value to ‘98 field-proven value.”

Source: Questionnaire Survey by JICA Study Team

In the elaboration of a future housing supply plan, a higher percentage of suppliers envisioned a higher demand in “commercial housing” and “ordinary housing.” The developers expected an expansion of housing consumers’ outskirts. (Refer to Table 1-8.) Nevertheless, there were many developer enterprises mainly concentrated in Shanghai, which indicated “high-class apartment” showing that the sales strategies aiming at a high-income group with buying power still last. “Economical housing” and “rental housing,” were in a low position, “Recover funds as far as practicable, with well-selling commercial housing mainly constructed” because of financial elements, such as low profitability (economical housing) and slow rate of fund recovery (rental housing).

Table 1-8 Most Significant Five Housing Supply Plans in the Future by Developers (%answer)

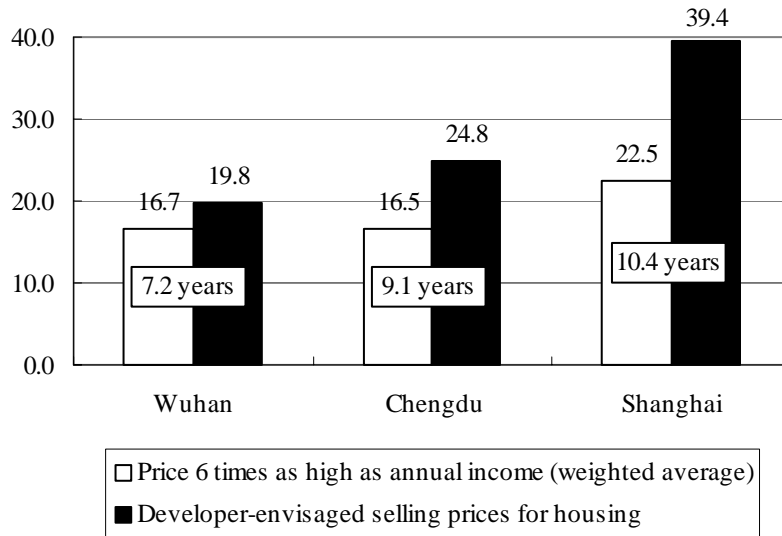
Priority product	Wuhan	Chengdu	Shanghai
1. Commercial Housing	31.0	25.6	25.4
2. Ordinary Housing	21.8	20.7	21.9
3. High-class Apartment	12.6	9.9	18.4
4. Development in Suburbs	6.9	19.0	11.4
5. Developments at Urban Centers	14.9	9.9	9.6
(Reference) Economical Housing	8.0	11.6	5.3
(Reference) Rental Housing	1.1	0.8	2.6

Note: Answers enumerated above are subject to the order of totals in three cities.

Source: Questionnaire Survey by JICA Study Team

The relations between developers' housing sales strategies and demand principal's annual income in the three cities will be reviewed related to a weighted average of annual income as found in the questionnaire survey. (Refer to Figure 1-11.) The "developer-envisaged selling prices for housing" were obtained multiplying 100 m² for a numerical value representing the "housing price zone of with the highest demand on the market." The developers indicated 100 m² as the weighted average of the "housing area with the largest demand on the market." In addition, the figure 2-11 indicates the numerical value equivalent to "6 times the weighted average of annual income" in the three model cities. The "6 times the annual income" was set as the upper limit prices to buy housing in developed countries. As shown in the figure, the developer-envisaged selling prices for housing exceeded the six times the annual income by approximately 17% (Wuhan) and 75% (Shanghai.) If in the calculation, other indicators were applied the developer-envisaged selling prices for housing, they were found to be equivalent to 7.2 years in annual income in Wuhan and to 10.4 years in Shanghai. Basically, the envisioned selling prices did not match the realities of the annual income of the group of households on which the developers argued they base their sales.

Figure 1-11 Gaps between 6 Times Annual Income and Developer-envisaged Selling Prices for Housing in Findings of Questionnaire Survey

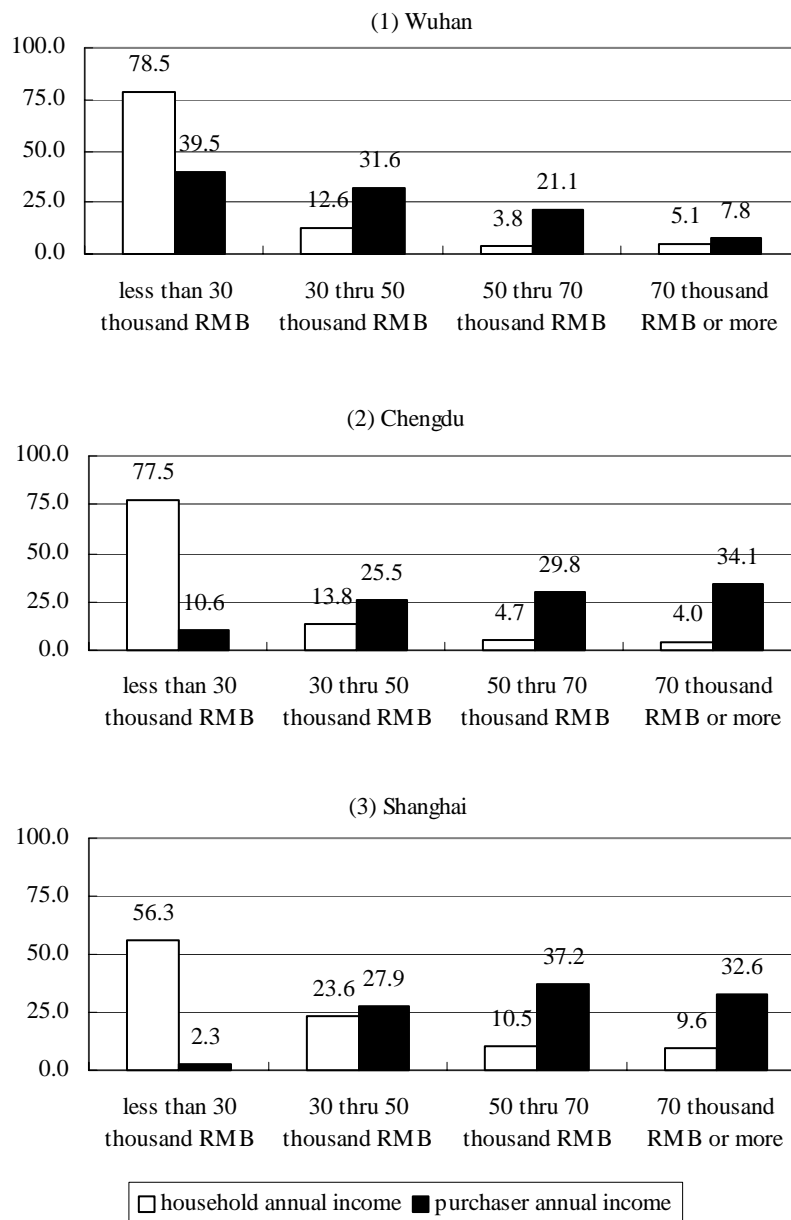


Note: Numerical values enclosed in squares above stand for a magnification of the annual income that satisfies the “developer-envisaged selling prices for housing.”

Source: Prepared by JICA Study Team, based on the findings in its questionnaire survey

The distribution of annual income among the ordinary commercial housing purchasers was deduced from the answers given from the developers to the questionnaire and it was superimposed on a distribution of annual income among consumers. As a consequence, a group of purchasers may have deviated to the higher income group rather than being concentrated around those households, the majority, with an annual income less than 30 thousand RMB. The purchaser group of the ordinary housing had an annual income of 45 thousand RMB in Wuhan, 76 thousand RMB in Chengdu and 70 thousand RMB in Shanghai. These numerical values related to the most prevailing price zone envisaged by developers indicate a price zone of 4/6 times higher the average annual income in the purchasing group. Thus, the price for housing might be considered reasonable to a certain extent. In other words, housing suppliers think about developments with their focus narrowed down on a medium/high income group rather than targeting a low/middle-income group.

Figure 1-12 Gaps between Distributions of Annual Income among Households and of Annual Income among Ordinary Housing Purchaser Households according to Findings in Questionnaire Survey

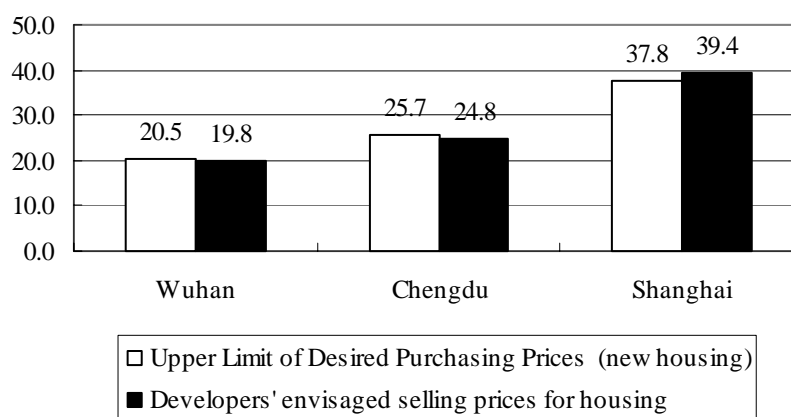


Source: Questionnaire Survey by JICA Study Team

Many argued that it would not be applicable in China to set “a price up to the 6 times an annual income as the upper limit of housing price.” The actual level of savings and/or income is higher than those statistically quantified and a significant financial assistance from parent can be expected in the single child generation. In addition, the disposed housing does exist as a result of the housing system reform. It is necessary, therefore, to take into account

that the capital gained by selling the disposed housing would be temporally effective. As far as the household annual income levels in the findings of the questionnaire survey is concerned, experts in each of the cities have recognized that the reported levels would be almost reasonable or a little lower than in reality (10-20%). It should also be considered that a question about annual income may have been deflected downward in a questionnaire survey. This possible downward deflection might have determined a not so large a gap between consumers' needs and suppliers' assumptions regarding the prices for housing in Figure 1-11. Among the surveyed manifesting a desire to acquire housing, the upper limit of their purchasing prices matched the developer-envisaged selling price for housing in each city. (Refer to Figure 1-13.)

Figure 1-13 Upper Limits of Consumers' House-purchasing Prices, and Developer-envisaged Selling Prices for Housing (in 0,000 RMB)

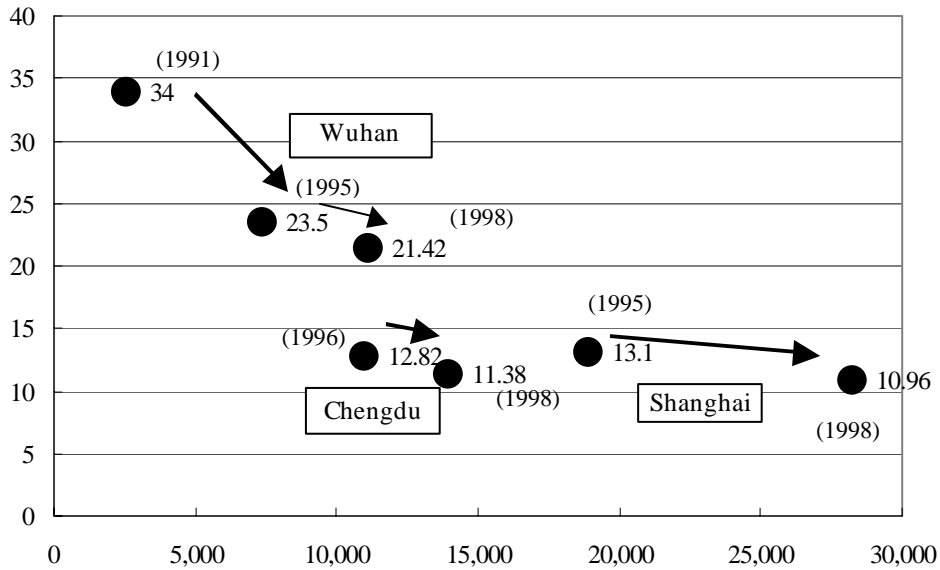


Source: Questionnaire Survey by JICA Study Team

A “housing acquisition adequacy-annual income magnification conversion coefficient” in China should take into account the annual income and the owned fund gained from the selling of the housing disposed, the financial assistance from parent and savings. It should be assumed that the Chinese coefficient would be at least larger 6 times the world standard, at a level of 7-10 times that shown in Figure 1-13. How to actualize the demand for housing of this group of potential purchasers is a critical challenge. At the same time, this task should not lessen the importance of improving the consumers' ability to acquire housing and reducing the prices of the housing suppliers through efficacious mechanisms.

In the three model cities, the commercial housing prices have been practically declining in comparison with the per-capita GDP. Nevertheless, there is still significant gap with a mean income level. (Refer to Figure 1-14.)

Figure 1-14 Time-Series of Changes in Per-capita GDP and Housing Price Index–

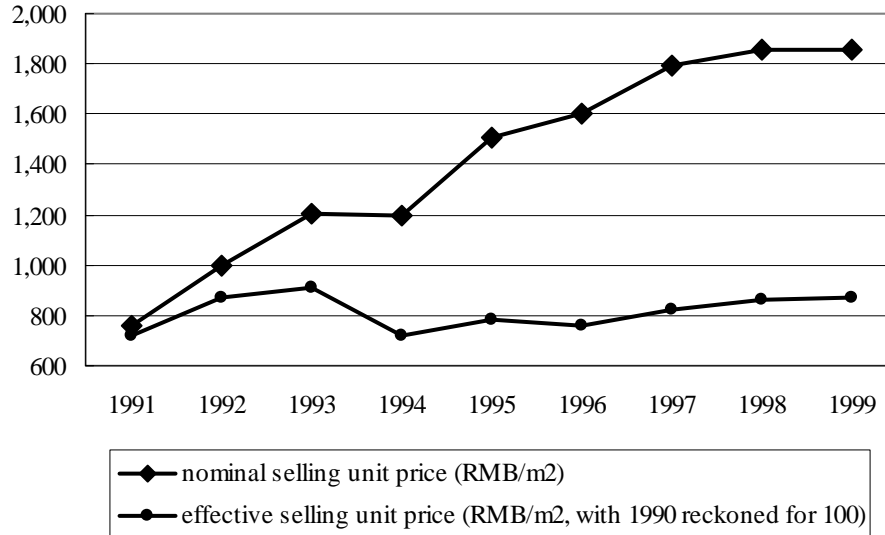


Note: "Housing Price Index" was arithmetically obtained under Expression (Commercial Housing Selling Unit Price (RMB/m²) x 100 m²/per-capita GDP).

Source: Prepared by JICA Study Team, based on its questionnaire survey, etc.

The commercial housing unit prices (nominal value) were standardized with an urban CPI growth rate to obtain an effective unit price (RMB/m²). The changes in these effective unit prices stabilized or registered a gradual increase from 1991 to 1999. (Refer to Figure 1-15.) The housing unit prices that are partially related to the land user price and/or with a housing quality could not be discussed in general terms. The actualization of a latent demand for housing acquisition through a further reduction of the unit prices and an improved suppliers productivity should be promoted to enhance the efficiency in development, design, construction and selling.

Figure 1-15 Time-Series of Changes in Commercial Housing Prices (unit prices) all over the Chinese Territory



Note: “Effective Unit Price” was arithmetically obtained under Expression “Unit Price/Urban CPI (with 1990 = 100)”

Source: Prepared by JICA Study Team, based on China Statistics Yearbook 2001, etc.

At present, the consumers and developers are more likely “inclined to a larger-sized dwelling.” Moreover, the needs for commercial housing of higher quality and of higher added-value with an area class of 50-80m² is more pronounced for the single and husband/wife household use, related to the progress in maturation and needs` diversification in the housing market. The housing market trends should be prevented from a possible “mismatch” of demand and supply in pricing, size and quality. To extend the boundaries of the housing market and keeping it always active, the housing prices should definitively diminished supplying a variety of products tailored on the consumers` needs and according to enhancement of the middle- and low-income group purchasing ability.

According to the findings in the questionnaire survey, the “incentives to developers include mainly “a wave of prosperity,” “an activation of the real estate distribution market,” and “an improvement (stabilization) of income factors for purchasers.” (Refer to Table 1-9.) In addition, the ability in fund raising and the national/local government policies were considered critical factors. Hence, developer can greatly contribute if sustained by the central and local government policy, guidelines, regulations and incentives. In the future, it is considered important to set the guidelines relating to “What should be the commercial housing development/construction promoted and what demand group, based on what medium-term

housing policy/program should be targeted?” Under these guidelines special attention should be paid to the measure to activate the supply side.

Table 1-9 Most Significant Five Inductive Factors in Housing Developed as Pointed out by Developers (%answer)

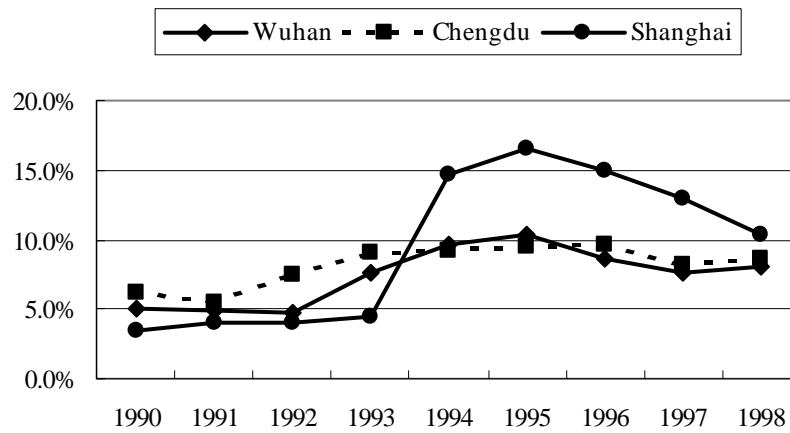
	Wuhan	Chengdu	Shanghai
1. Active economy (a wave of prosperity)	16.9	24.2	20.0
2. Activating the real estate distribution market	19.1	24.2	17.0
3. Improving (stabilizing) income factors for purchasers	10.1	16.8	13.0
4. Trends in national policies	11.1	12.6	12.0
5. Able to raise sufficient funds	13.5	8.4	8.0
6. Trends in local governments	10.1	2.1	9.0

Note: Factors enumerated above are subject to the order of totals in three cities

Source: Questionnaire Survey by JICA Study Team

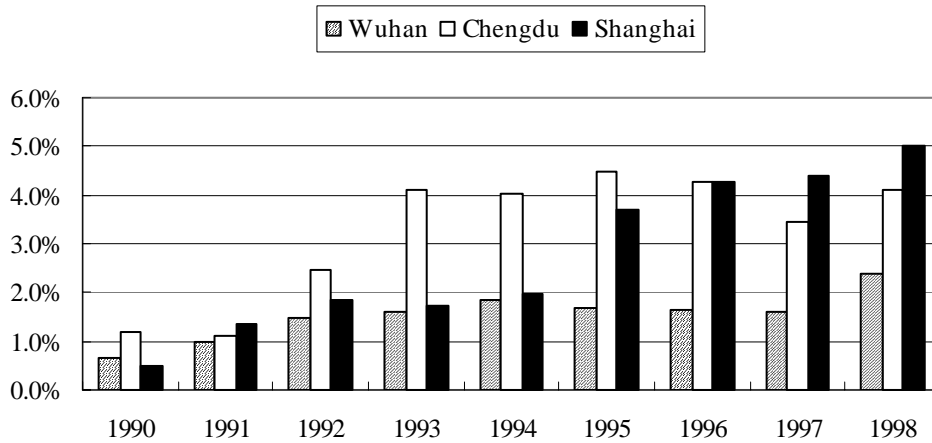
To know what is the positioning of the housing investments in the framework of the Chinese economic growth plans in the whole territory and in each city is a prerequisite for the developers. In the three model cities, the housing investments` nominal GDP ratio increased from 4-8% of the early 1990s to 8-11% in the late 1990s. (Refer to Figure 1-16.) The real estate industry`s nominal GDP share reached the 4-6% in Chengdu and Shanghai. (Refer to Figure 1-17.) The promotion of housing development and construction by the real estate industry proved to be quite effective in the process of the housing system reform to support of the housing demand. The developers should participate in the elaboration of the housing investments, institutions and policies to better address the market needs and to promote products tailored to the realities of the housing consumer group as “an extension of the purchasing group` outskirts.” As part of such incentives, needless to say, some measures should be designed to support the aspects concerning the financing system.

Figure 1-16 Time-Series of Changes in Ratio of Housing Investment (value) to Nominal GDP



Source: Prepared by JICA Study Team, based on municipal statistics yearbooks

Figure 1-17 Nominal GDP Share in Real Estate Industry



Source: Prepared by JICA Study Team, based on municipal statistics yearbooks

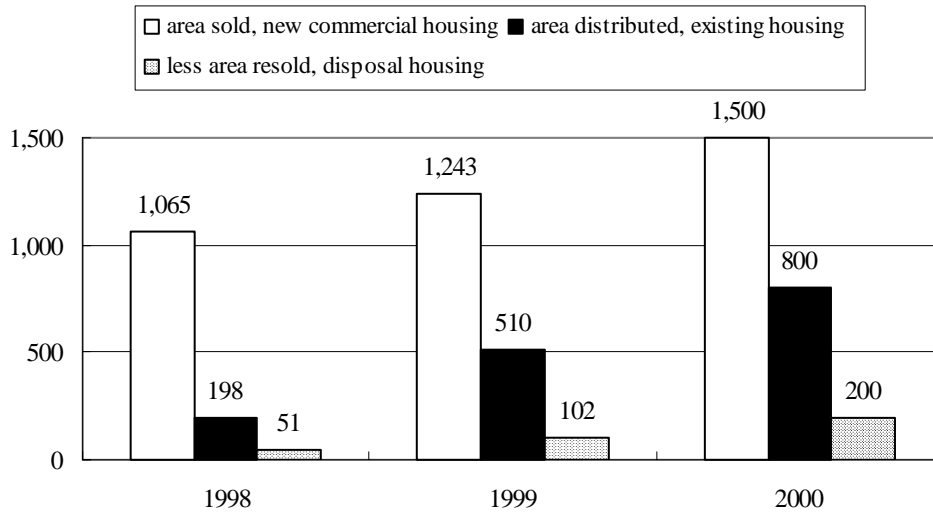
1.4. Status Quo of Existing Housing, Economical Housing and Rental Housing of the Housing Market

1.4.1. Status Quo and Challenges on Existing Housing

In the three model cities, the construction and the sales of new housing have been growing at a steady pace. The sales and the area distributed of the existing housing have also been showing a steady growth playing an essential role in the progress of filtering in the housing market. In Shanghai, the existing housing area sold and purchased was the 18% of the total sold in 1998 and it was around the 50% of the new housing area sold since 1999. That is, the turnover in two years quadruplicated. The share of the disposed housing was around the

25-30% of the existing housing area sold and purchased playing an active role in the housing market. (Refer to Figure 1-18.)

Figure 1-18 Distribution of Existing Housing in Shanghai (0 thousand m²)



Source: Prepared by JICA Study Team, based on Shanghai Real Estate Statistic Yearbook and hearings, including some estimations

19,711 disposed houses were really resold in Shanghai in 1999, almost the double compared to the previous year. Their total sales amounted to 2.23 billion RMB. A house with a mean area of 51.4m² was sold at a price of 113 thousand RMB (at a unit price of approximately 2.2 thousand RMB/m²). In addition, it has been reported that 90% or more of the resellers purchased new housing at an additional mean expense of 170 thousand RMB (total 280 thousand RMB) and that the housing area increased as averaged at 41.5m² (or purchased the housing with a mean area of 92.9m²).

In Wuhan and Chengdu, the existing housing sales and purchases occupy an important position on the housing market. (Refer to Table 1-10.) Nevertheless, the existing housing distribution environments have to face new challenges on the housing market, such as the difficulties in Wuhan and Chengdu to obtain the numerical values relating to existing housing distribution in detail from the statistics currently available.

Table 1-10 Positioning Existing Housing Sales on Housing Market

	Wuhan (Year 2000)	Chengdu (Year 1999)	Shanghai (Year 2000)
Existing Housing Area Sold/Purchased (0,000 m ²)	154	205	800
Unit price per m ² (RMB/m ²)	1,000	1,256	1,600
Less, new housing	1,790	1,309	-
Less, existing housing	200	367	-
Ratio to housing stock *	2.4%	4.1%	4.1%
Ratio to new housing area sold **	-	-	53.3%

Note: * Ratio to housing stock = existing housing area sold/housing stock area constructed

** Ratio to new housing area sold = existing housing area sold/new housing area sold

Source: Prepared by JICA Study Team, based on municipal statistic yearbooks and hearings, including some estimations m²

The Urban Socioeconomic Investigation Taskforce, National Statistics Bureau, has conducted a sampling survey on 150 thousand households living in cities all over China. According to the findings in this survey, 55.7% of the surveyed households bought housing, its 86.9% purchased housing (disposed), 9.7% commercial housing and 3.3% other housing. And it has been estimated that 65.8% of urban housing was privately owned (Li Xuefen: *Zhongwaifang dichan tongbao*, 1st half, 2000). The disposed publicly owned housing was estimated to reach an area of 1 billion m², which would amount to 100 billion RMB calculated at a disposal unit price of 100 RMB/m². If it is totally resold at 1 thousand RMB/m², there are possibilities that the private homeowner sector may earn a resale profit reaching 900 billion RMB. It is equivalent to approximately 10% of the nominal GDP in China. It is considered that all of the houses to be disposed would not be owned 100% privately, and that there are many disposed houses of poor quality unsuitable for resale. Nevertheless, private homeowners would enhance their “expectations” of resale profit or rental earnings and would stimulate the consumption. In this sense, the disposal would be significantly effective. The housing disposal policy would cause national wealth to transfer from the governmental sector to the individual sector. This may be considered as an effort to stimulate the internal demand by making most of the actualization of the capital gain. This fact, on the other hand, might generate a temporary “shake” of the autonomous growth durability intrinsic to the housing market. A transfer of the national wealth to the individual sector amounting to 10% of the nominal GDP and an actualization of its capital gain could be considered effective enough to raise the housing demand over a period of 5-10 years to come. During this period, it is very important to establish those mechanisms that permit the housing market to develop autonomously.

There are high possibilities that the currently new housing purchaser group may be concentrated in the medium/high-income class and that the group who had received the

disposed housing of high quality and easy to distribute might resell the same and would purchase new housing of better quality. Reportedly, most of the disposed housing is unsuitable for the existing housing distribution from the viewpoint of size and/or quality. In addition, the right to transfer the ownership of a shared portion is liable to raise a problem. There is a fear, therefore, that the disposed housing resale/distributor may peak out in a certain stage. On the other hand, there are an increasing number of those disposed housing owners who do not resell their disposed housing but lease it to another group, including the population inflow. In line with the progress of urbanization, an increase is predicted in the rental needs mainly among the population inflow. Under such circumstances, it is a critical challenge to protect the fluidization of disposed housing (existing stock of housing), including a changeover to rentals.

The new commercial housing, moreover, has had both construction and sales experience a time-series of steady changes. From now on, the housing stock of higher quality is considered to gradually increase its input as existing housing onto the market. According to the findings in the questionnaire survey by JICA Study Team, those desiring to acquire housing did not always adhere to the obtainment of new housing. There are a large number of the group that have been purchasing existing housing as long as it is advantageous in terms of size, pricing, location and so on. To make the housing market structured so that filtering can smoothly function, it is considered necessary to give full consideration to the buildup of proceedings for registering, transferring new and existing housing, the buildup and smooth offer of the information relating to the housing market, demand and supply to the demand principal.

1.4.2. Status Quo and Challenges on Economical Housing

As far as the economical housing, one of the housing policy stays to date, is concerned, the share that it occupies in the commercial housing area sold (area ratio) was as low as 8% in Shanghai (1999). On the other hand, Wuhan (as a whole for 1998) and Chengdu (entirely for 1999), respectively, had the economical housing occupy a significant share of 31%, thus taking a great position in terms of the housing demand/supply flow. From the viewpoint of economical housing unit prices (RMB/m²) proven in the field, both Wuhan and Chengdu had this housing sold at approximately 70% of the prices for commercial housing in general. Thus, the economical housing may be deemed to have a certain effectiveness to fill up a gap between the housing needs and the supply needs of the development principal purchasing power gap. On the housing market all over China, moreover, the economical housing has been positioned at a given share of approximately 20%, or has been occupying an important position, in any of housing completion investment, area of housing with construction started and commercial housing area sold.

Table 1-11 Economical Housing Constructed all over China (a portion of the housing developed in real estate development)

	1997	1998	1999
Hosing Completion Investment (000 million RMB)	1,539	2,082	2,638
Less economical housing	186	271	437
Share (%)	12.1%	13.0%	16.6%
Housing area with construction started (0,000 m ²)	10,997	16,638	18,798
Less economical housing	1,721	3,466	3,970
Share (%)	15.6%	20.8%	21.1%
Commercial housing area sold (0,000 m ²)	7,864	10,827	12,998
Less economical housing	1,212	1,667	2,701
Share (%)	15.4%	15.4%	20.8%
Commercial housing selling unit price (RMB/m ²)	1,790	1,854	1,857
Less economical housing	1,097	1,035	1,093

Source: China Statistics Yearbook 2000

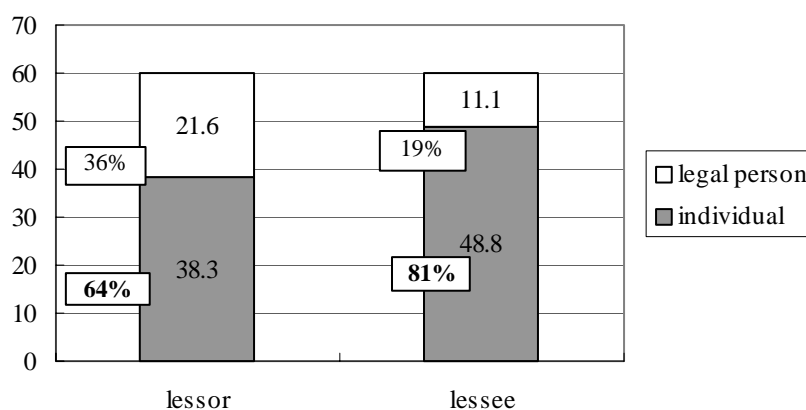
As gathered from the findings in the developer questionnaire survey, however, the housing supply principal has been extremely reluctant to develop the economical housing because its profit rate is mandatory controlled. As gathered from the Shanghai case, it is predicated that the economical housing will encounter difficulties in being supplied/consumed autonomously on a completely free housing market or on the housing market, whose changeover to a market economy has been made only to a certain level. As far as the economical housing as a means of supporting a low/medium-income group to purchase commercial housing in general is concerned, it should be concentrated on those cities whose income level has remained low. Besides, the effectiveness and limitation of the economical housing should be assessed fully on a city-by-city basis. It is considered necessary to review the system design in the housing policies as a whole as tailored to the characteristics of each city, including a partial substitution for a rental housing entry support or the like.

1.4.3. Status Quo and Challenges on Rental Housing Market

The private rental housing is expected to take a critical position on the Chinese housing market in the future. It is, however, still in the process of forming a market. A housing developer has not been developing any rental housing nor has any full-scale rental housing operation company been existing. The sources of private rental housing supply currently available in China, therefore, are either an individual or legal person, who has owned its own housing. According to the data in Shanghai, private homeowners have occupied approximately 64% and legal persons 38% of about 600 thousand m² as rental housing registered on the market reportedly. (Refer to Figure 1-19.) In Shanghai, however, it is said that approximately 80 thousand rental houses are available. If this numerical data is correct, it means that the rental housing market provides an area as small as 7.5m² per house. In reality,

it could be assumed that a rental house in Shanghai does not have a so small area. In China, however, a rental house generally gives us a strong image of narrow and poor quality. In addition, the 80 thousand rental houses already registered plus an equal or larger number of underground rental houses are reportedly available. The transparency and wholesomeness of a rental housing market has not been established yet even in Shanghai. In Wuhan, furthermore, the number of publicly owned houses rented has been growing at an annual rate of 10% or more. In 1998, it reached approximately 65 thousand houses. (Refer to Figure 1-20.) It is equivalent to the 3% on the total number of households in Wuhan, and to approximately 4% on the number of households in municipal wards.

Figure 1-19 Status Quo of Rental Houses Registered on the Market in Shanghai (0,000 m²)

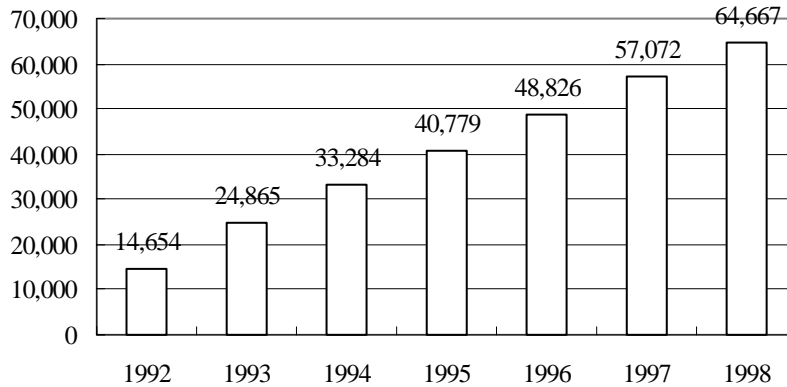


Source: Prepared by JICA Study Team, based on Shanghai Real Estate Statistics Yearbook

According to the JICA Study Team's questionnaire given to housing consumer households, on the other hand, 4-7% of the surveyed replied that they were resident in the private rental housing. Market rentals have begun to be gradually normalized by standardizing the substitution or sublease of publicly owned housing while taking measures to promote the registration when turning owned housing to market rentals. A mature housing market is essentially required to keep the existing and rental housing markets transparent enough. To promote the rental housing registration apt to be latent and to standardize and visualize the rental housing market, the Shanghai municipality has issued the "Housing Rentals Regulations" (July 2000) to institutionalize housing rentals. At the same time, the municipality has taken a tax-reduction measure on the rent income taxation. Including these measures, the mean housing rental fees in Shanghai have risen up to 30.6 RMB/m² from 3.2 RMB/m² and it is considered as one of the achievements in commercializing the rentals. Registering a rental would benefit both lessor and lessee so that both can be legally protected. Although reduced,

however, the registration cost and miscellaneous taxes are incurred on registration. It is said, therefore, that a large number of rental houses, mainly low priced at a rent of 500-700 RMB/month, have still remained unregistered.

Figure 1-20 Number of Publicly Owned Houses Sublet in Wuhan (cumulative)



Source: Wuhan Statistics Yearbook 1999

In every municipality, discussions have been being made about the necessity of and how to supply “low-priced rental housing” to a low-income group unable to obtain housing. Housing policies in China at present may be grasped in three main streams; “For middle/high-income group obtain new commercial housing,” “For low/medium-income group to obtain the economical housing” and “For an extremely low-income group to lease low-priced rental housing.” From now on, it is necessary to expressly position the low-priced rental housing where in a design of the overall housing system/housing market together with the merchantable rental housing in general.

According to the findings in the JICA Study Team’s questionnaire, most are generally inclined to be private homeowners because “An asset could be owned,” “Broad and well equipped,” “well located” and so on, answering to the question “Which do you prefer, homeowner or rental housing?” Besides, either homeowner or lessee are acceptable as long as conditions are satisfied: “If a desired property is available at an acceptable price,” “If the property is inexpensive enough,” “If a desired area is satisfied,” and so on. Basically, the Chinese people have a very realistic idea toward “housing.” At present, however, there is no development in the housing on a private rental basis except for some high-class apartment targeting foreigners or high-income group and for some single-room flats. To address the rental needs more and more diversified, however, either supply development system or institutional framework to support such development system, including financial support, are

considered to have lagged behind. The rental housing for low/medium-income group, moreover, has some negative potential aspects, such as “a house remaining unsold” and “a house narrow and of poor quality.” It is considered important to cultivate the wholesome private rental housing market from the viewpoint of evaluation, distribution and information buildup after recognizing the private rental housing as “quality housing stock forming the housing market.” At present, in particular, the rental housing market is managed by private homeowners who lease their privately owned housing. It is necessary, therefore, to change this situation to make it fully operational and offer quality rental housing. To this end, it is considered necessary to study the feasibility of a system to promote such conditions. In developed countries, including Japan, the rental housing has occupied an established position on the housing market, thereby contributing to an activation of the housing market through smooth filtering. (Refer to Table 1-12.) In China today, a “temporary shake,” such as an input of some privately owned houses into the rental housing market, has taken place with the housing ownership concentrated in the individual sector due to a blanket disposal of state-owned or publicly owned housing. (Refer to Figure 1-12.) To activate the housing market far more than ever in the future, it will be important to try to cultivate the rental housing market as a business where the size economy can perform an active role in supplying quality rental housing.

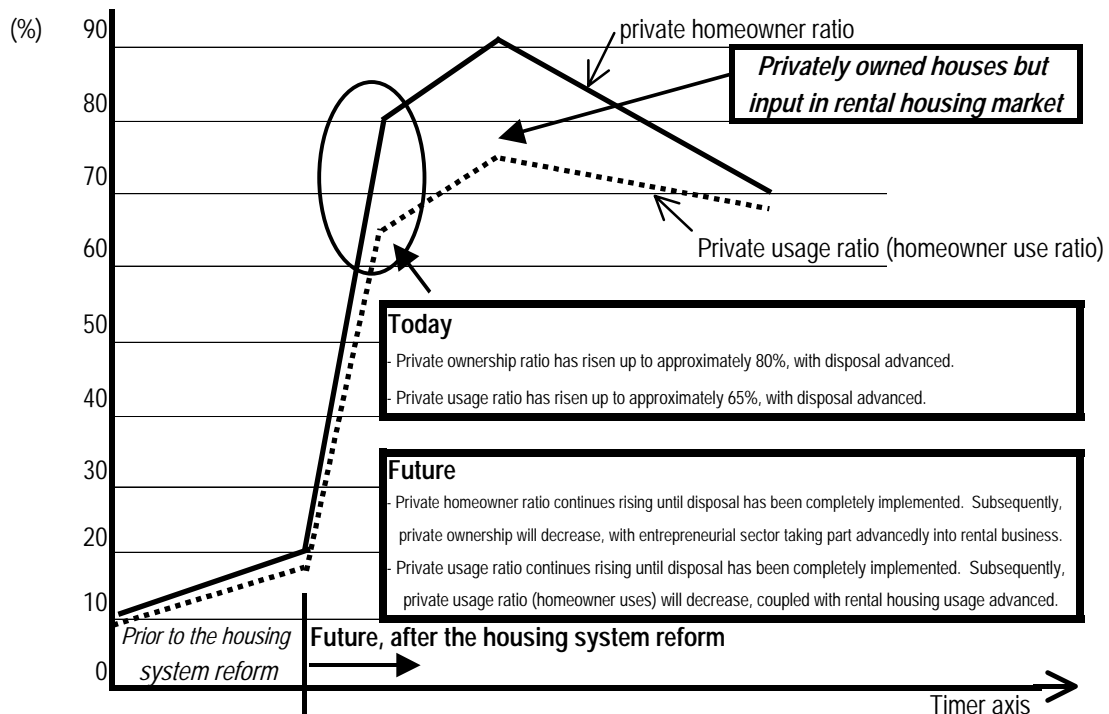
Table 1-12 Positioning Rental Housing in Developed Countries

	Japan	U.S.A.	U.K.	France	Germany
Homeowner	59.8	58.3	67.7	54.3	38.0
House to let	38.5	30.3	32.3	39.7	60.4
Private rental housing	26.5	-	-	-	-
Publicly managed housing	7.0	-	-	-	-
Public organization/public corporation housing	8.0	-	-	-	-
Private cooperate housing	5.0	-	-	-	-

Note: Numerals given above stand for the number of houses by type of ownership as the share occupied in the housing stock (based on number of houses).

Source: Overseas Housing Data Now 2001, Government Housing Loan Corporation

Figure 1-21 Private Ownership Ratio in Housing Stock, China, and Private Usage (homeowner use) Ratio (image)



Source: JICA Study Team

According to the findings from the answers given from the enterprises to the questionnaire, the corporate housing supply principal believe that there were a small number of the enterprises that would think about “a future benefit of rental corporate housing to personnel.” Nevertheless, another tendency has emerged, “Some corporate houses may inevitably remain as leased (while maintaining the status quo).” This indicates how difficult it is to completely implement the disposal of corporate housing. Rental housing is really needed to host the population inflow. Besides, consideration on a welfare-oriented policy raised the issues of how to deal with the low-income group and the weakest in society. Therefore, the corporate housing (publicly owned rental housing) should continue to be leased considering who and how should control such rental housing. In this sense, an institutional system should be designed within the framework of overall housing policies to tackle the projects concerning the qualitative improvement of the existing corporate housing, including repairs and modifications, transfer of title to properties, rental subsidies and so on. After establishing this system, it will be necessary to study those measures that contribute to the formation and development of a desirable housing market by striving to build up and make effective use of the existing housing stock.

1.5. Issues Encountered by the Existing Housing Market (policy issues)

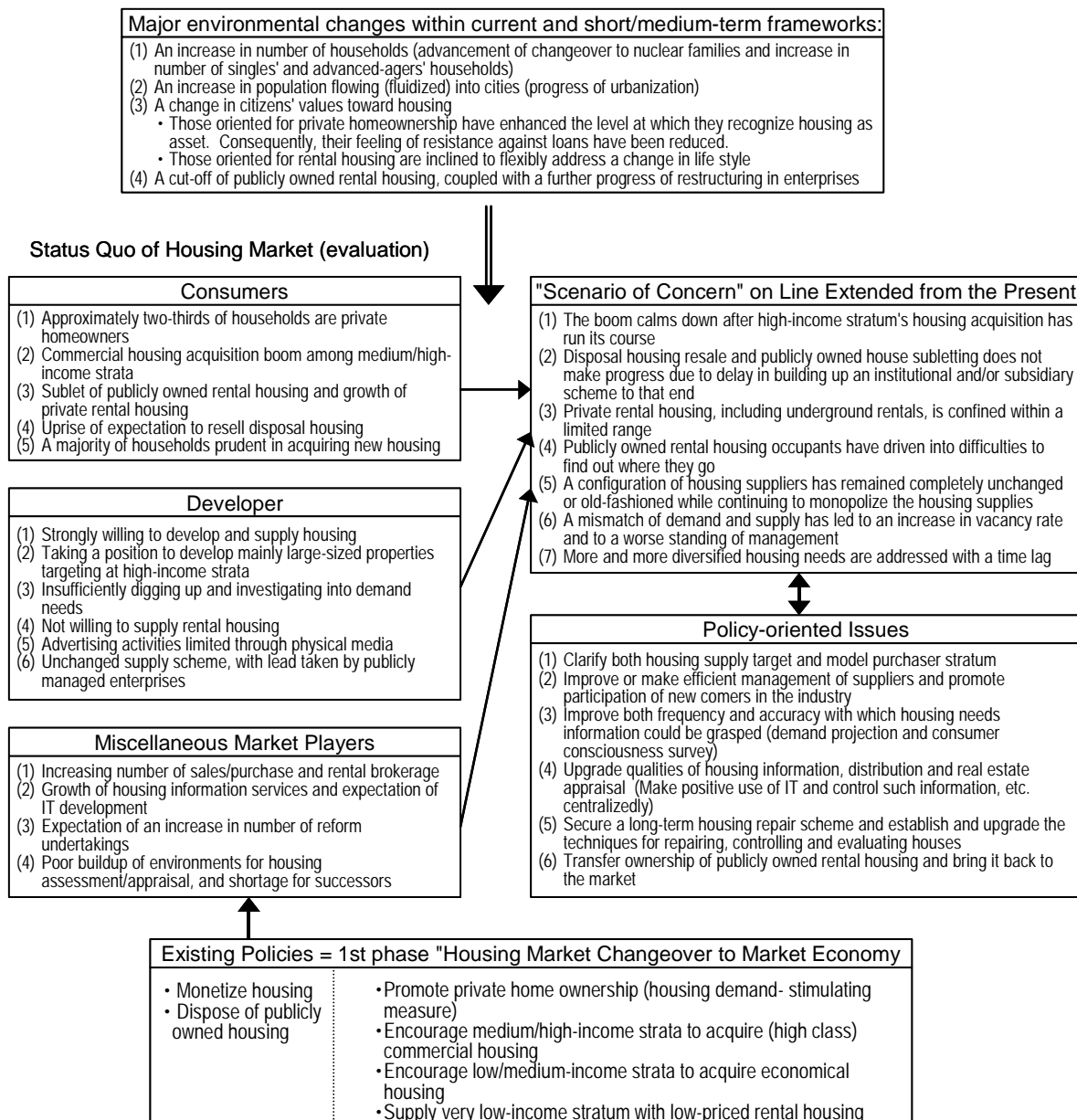
A summary of the main “environmental changes” and “policies” around the current Chinese housing market is given in Figure 1-22, including the eventual status quo evaluation of the housing market. Under the current housing policy that may be deemed as the first phase in changing the housing market over to a market economy, a commercial housing acquisition boom has taken place mainly in a high-income group. In this framework, China has started to diversify the housing market by reselling or leasing disposed houses, by subletting publicly owned housing and by increasing the number of rental properties in the private sector. Those environment-changing factors that accelerate such diversification of the housing market in China include: an increase in number of households due to the population inflow to the cities, a growth of nuclear family population and an incremental trend of singles/advanced-age households as well as a different conceptualization of housing values. The consumers, the developers and the other market players have been taking action and measures reflecting such environmental changes and policy factors.

Assuming that these environment-changing factors and policies last, “a scenario of concern” has been developed an extension of the status quo to address the problems the Chinese housing market may face.

(1) Boom Calming After Housing Acquisition By High-income Group Has Run Its Course

At present, the commercial housing is available at prices too far from the purchasable price zone of the majority of low/middle-income group. Once the housing consumption incentives to expand the internal demand and the purchasable commercial housing have been bought by the middle/high-income group, the new customers will belong to the middle/low-income group who have bought their housing thanks to the housing disposal system. Therefore, an exhaustion of the market is feared. To intervene at this point, a sustainable housing consumption by averaged households should be stimulated actualizing the latent housing demand. Hence it is essential to target a medium/long-term housing program/house supply plan and to clarify a model-purchasing group.

Figure 1-22 Status Quo and Challenges on Housing Market



Source: JICA Study Team

(2) Disposed Housing Resale and Publicly Owned House Subletting not Making Progress Due To Delay In Building Up an Institutional and/or Subsidiary Scheme To That End

In the three model cities, it appears that the resale of disposed housing and a sublet of publicly owned housing have been making smooth progress. The current resale of disposed housing, however, may have to be reviewed from the viewpoint that properties of relatively high quality and fluidity are being resold on a “forerunner” basis in line with the high-income

group's new commercial housing acquisition boom. It is questionable, however, whether or not the disposed housing of averaged quality, which occupies a majority of the existing disposed housing, will be distributed as existing properties on the housing market at the pace similar to the current one. The publicly owned housing sublet-promotion policy, likewise, is considered to require a further buildup of its institutional/subsidiary scheme so that the publicly owned housing may have fluidity improved more than usual as part of the private rental housing business in the midst of the housing market petering out in terms of new and existing housing sales. As an optional solution to this problem, it may be necessary that the publicly owned rental housing, whose disposal involves difficulties, should have ownership transferred to a governmental organ, such as a rental housing supply public organization. Then, some measures need be taken to establish a rental subsidy system, under which rentals are subsidized as a financial aid to lessees according to their income level, including the population inflow.

(3) Limited Range of Private Rental Housing and Underground Rentals

Private rental housing increased according the housing consumption boom and its institutional normalization has been promoted. Nevertheless, it has not yet reached a stage, in which private rental housing takes a firm position on the housing market, considering that a certain portion of the private rental housing has not been declared to avoid taxation. The developers who should supply such private rental housing also remain insensitive to the increase in rental needs. From an institutional point of view, no means have been provided to activate the demand and supply of rental housing neither under the policy to promote private home ownership.

(4) Publicly Owned Rental Housing Occupants Driven Into Difficulties To Find Out Where They Go

Due to the increasing pressure on entrepreneurial restructuring mainly in state-owned companies, it is a big challenge for each entrepreneurial entity to implement completely the disposal of corporate housing. Besides, social problems, such as occupants' employment/income factors, have limited the disposal of the corporate houses and some group of people, unable to stand the increasing restructuring pressure, may have nowhere to go.

(5) Housing Supplier Configuration Remaining Completely Unchanged or Old-fashioned

Except for some foreign-capitalized developers in some large cities, many housing developers in China are state-owned or publicly managed enterprises of a conventional type. According to the findings in the questionnaire survey, a lot of developers have been selling houses by using direct sales promotion means, such as newspaper and outdoor ads, housing

exhibitions and so on. Only 20% of all the housing developers in China have been furnishing information on the real estate transacting market. Therefore, there is more room for the developers to improve their information on consumer needs and distributing marketing. Competition and collaboration should be promoted among the suppliers and the increasing number of newcomers in the housing industry directed to improve their productivity and reduce the costs in implementing new design and architectural technique. An institutional framework may be established to ease this competition/ collaboration.

(6) Delay in Addressing the Housing Needs Diversified More than Ever, with a Mismatch of Demand and Supply Leading to an Increase in Vacancy Rate and to a Worse Standing of Management

As already pointed out, the current housing acquisition boom has arisen from the demand in the high-income group while the medium/low-income group have been showing a poor ability to acquire housing. Developers, on the other hands, have been engaged exclusively in the development of commercial products aimed at the high-income group. They have not developed neither the property to address the demand in medium/low-income group nor attended the new demand needs, including rentals. Once the housing acquisition boom in the high-income group has run its course, there are possibilities that the market demand-supply gap may be actualized and an increase in the rental vacancy rate can lead to sluggish market conditions worsening the management of the developer enterprises.

(7) Stalemate of Housing Provident Fund, Nucleus of the Future Housing Market in China

Only the Housing Provident Fund system is big enough to sustain a majority of the housing acquisition prospects, including the ones of the medium/low-income group. This system, however, is considered to make it very difficult for this group to make the down-payment savings and loan settings that might allow them contract a reasonable financial burden. It is considered necessary to establish a mechanism helpful to reduce the consumers' burden and improve of their housing acquisition through the Housing Provident Fund system.

1.6. Outlook of Future on Housing Market

1.6.1. Requirements to Be Provided by the Chinese Housing Market in the Future

To materialize and maintain a housing market activated on a medium/long-term basis in China, it is important for the players on the market as summarized in the figure 1-22 to carry on their positive activities undertaking improvement workings of the dwelling level of the

demand principal through smooth filtering. To materialize this, the housing market should satisfy the following requirements:

- (1) There should be no bi-directional information gap about the needs between demand and supply principals: It is necessary for the supply principal to fully grasp the different needs of the various demand principals, such as housing ownership form (privately owned home or rental housing), size, room arrangement, and the like generation by generation or according to a difference in income and the like. It is important, furthermore, for the demand principal (developers) to easily access and own the information about the trends of privately owned and leased housing product developments and about the planning, engineering and pricing abilities of each enterprise. In this sense, it is essential to improve those services to the buildup, distribution and propagation of the market information by real estate brokers as the critical players to support an activated housing market. The IT utilization helped to a rapid development of the housing information (properties and prices) services mainly in Shanghai. It is very important to study and build up such “information infrastructure” surrounding the housing market to distribute fair and proper market information to housing suppliers and distributors and designate the media that should pass it to the housing buyers,
- (2) The demand principal can occupy the housing according to their needs and/or ability to acquire: According to the demand principals’ different needs to occupy housing and/or abilities to acquire or to contract rentals, (1), it is necessary that a wide variety of residential houses diversified in terms of difference in location, size and room arrangement, either commercial or rental, are supplied and provided in sufficient quality and quantity on the market.
- (3) Risk information must be highly disclosed, with a high degree of freedom to avoid or take risk on consumers’ own responsibilities: It is important for the demand principal to have sufficient information and to get a high degree of freedom in taking risk guaranteed concerning the basic information involving the ownership of a residential house (register information, quality, future regional development idea and so on), and the rights and risks that may arise in the process ranging from the introduction of a property to the execution of a purchase contract as well as the rights and obligations involved in financial goods (loan) used when purchasing a residential house. In case of rental housing, likewise, it is necessary to build up those environments that permit both lessor and lessee to set their own responsibilities on the base of sufficient information.
- (4) Deregulation must have made progress (administrative authorities scarcely intervene either normally or eventually): Once a medium/long-term housing program, law and institutional systems have been designed, it is important that a sufficient deregulation is

implemented within their framework while the market mechanisms are autonomously functioning. If the central or local government changes the system or intervenes administratively, either demand/supply principals or information service providers will be unable to judge or decide properly in the autonomous market growth process. It will preclude the market players from activating the housing market through their long-term activities.

1.6.2. Direction of Action Intended to Activate the Housing Market

To enhance the housing market, the following actions should be taken:

- (1) Foster and strengthen information service providers and build up an IT-applied information-sharing/propagating system.
- (2) Build up an institutional design certification system to enhance developers' abilities to develop products and to improve housing quality. Stimulate incentives to construct different housing systems (rental housing, advanced-age housing, etc.).
- (3) Clarify the rules, provisions and regulations relating to the disclosure of information, such as register/house construction, regional development ideas, ownership, sales/purchase contracts and so on. Secure the transparency of such information by implementing IT-applied information disclosure, etc.
- (4) Clarify and disclose medium/long-term systems and regulations, and promote deregulation.

Serious efforts should be made toward continuous, medium- to long-term revitalization of the housing market with utmost emphasis on the creation and vitalization of a market for existing housing and one for private rental housing. In this connection, it is important to discuss and develop a system for facilitating the process of such work.

III-2.

Changes in Environment Surrounding Housing Market and Their Effects on Demand for Housing

2. Changes in Environment Surrounding Housing Market and Their Effects on Demand for Housing

2.1. The Demand for Housing

The demand for housing can be approached by choosing one of the following three elements:

- (1) The Quantitative Element,
- (2) The Qualitative Element
- (3) The Accessibility Element.

2.1.1. Quantitative Demand for Housing

The demand for housing can be quantified referring to the area available per house and number of houses as discussed in detail in “3. Outlook of Future in Demand for Housing.” To quantify the demand for housing and how the housing stock will change, the housing that is going to be rebuilt or renewed should be imagined and fixed at a certain amount.

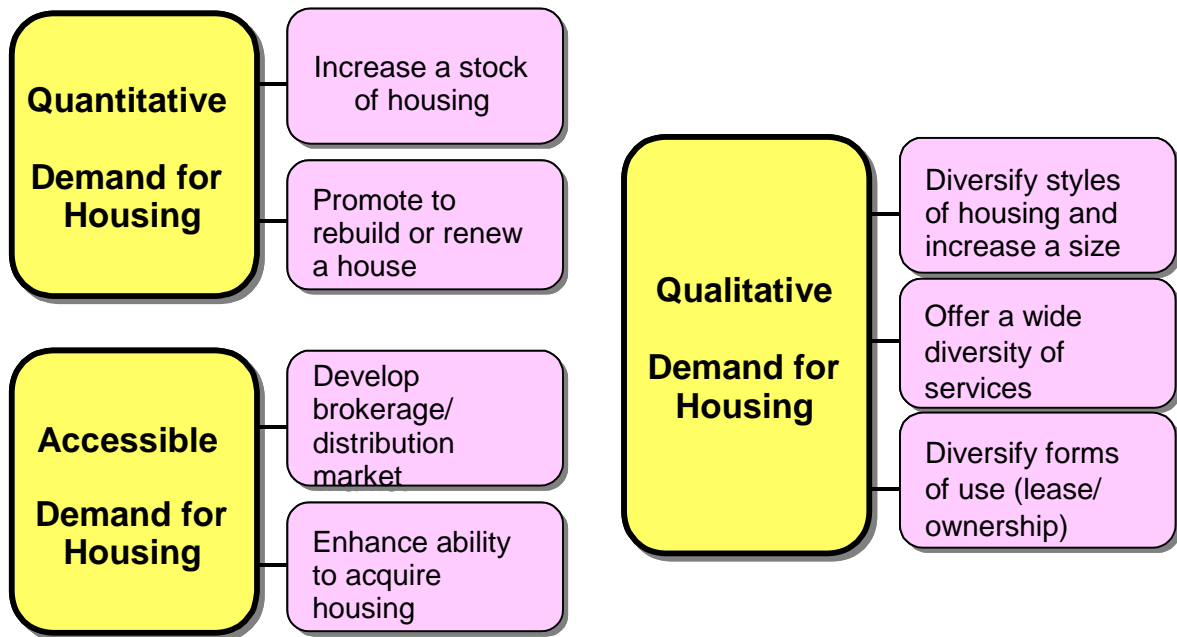
2.1.2. Qualitative Demand for Housing

The qualitative analysis of the demand for housing does not refer only to the size, area, number of house and similar concerns. It should refer also to the type of house people, as end users would like to build or have already available, what the services provided, and in what form.

2.1.3. Accessibility to Housing

An accessible housing means that it is possible to find a house spending a reasonable time. Therefore it is essential to have a well-working distribution network that connects the demand to the supply very easily, and the financial resources are made available to whomever wants to build or move to a new house.

Figure 2-1 The Demand for Housing



Source: JICA Study Team

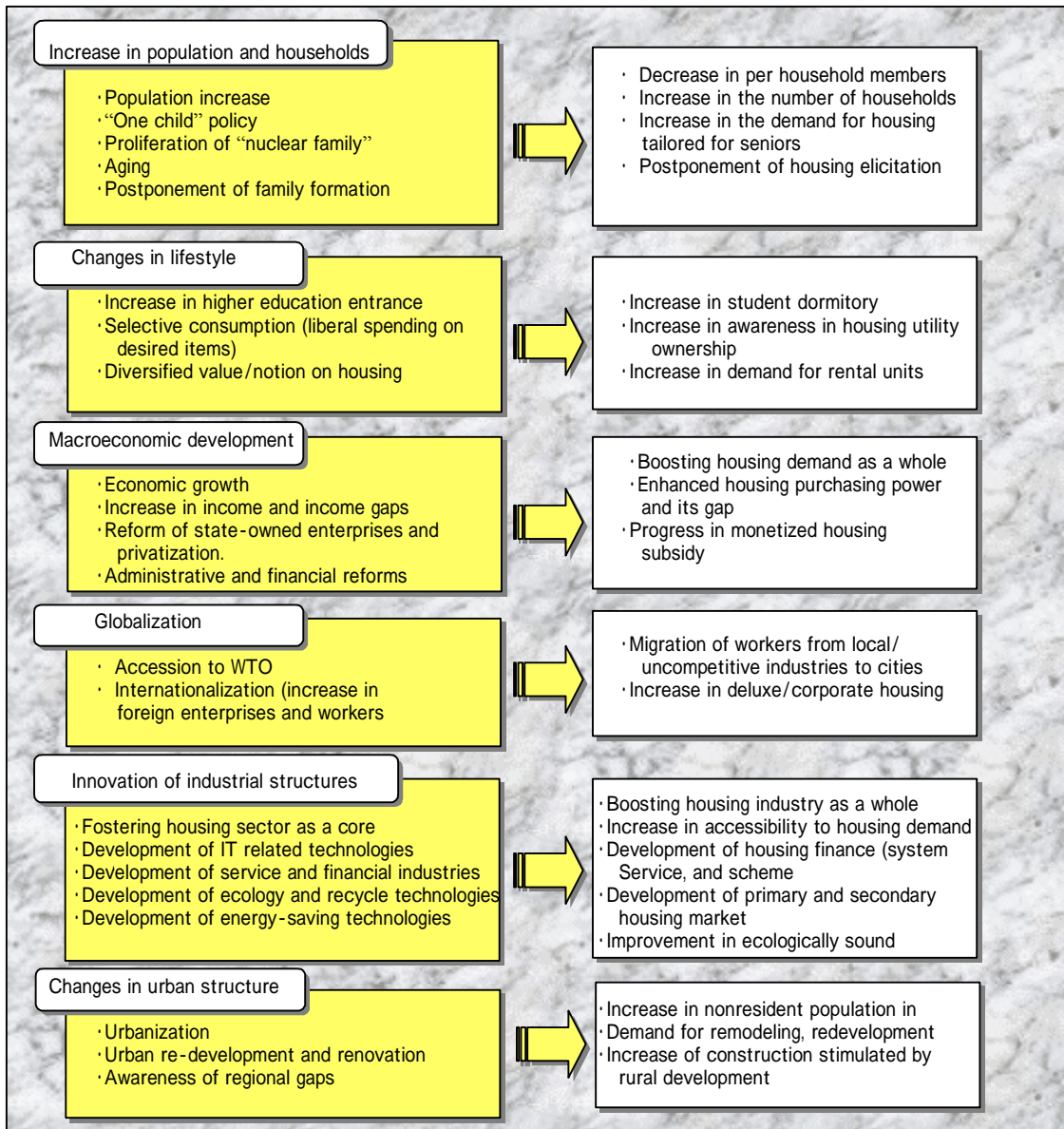
2.2. Changes in Environment surrounding Housing Market and Their Effects on Demand for Housing

The environment that surrounds the housing market can change due to:

- (1) An increase in population/number of households,
- (2) A shift in the living structure,
- (3) A development of the macro-economy,
- (4) A progress in internationalization,
- (5) An upgrade of the industrial structure and
- (6) An environmental change in the urban structure.

The following pages were dedicated to the study of each factor of change and how it affects the housing market.

Figure 2-2 Changes in Environment surrounding Housing Market and their Effects on Demand for Housing



Source: JICA Study Team

2.2.1. Increase in Population and in Number of Households

(1) Increase in Population

In 2000 China had a population of 1.29 billion expected to increase to 1.32 billion in 2005 and 1.38 billion in 2010. The country has an annual population growth rate of 1.06% which is lower the worldwide average (1.52%), as a consequence of the single child policy adopted by the Chinese Government. The single child policy has been strongly asserted also in the 10th five-year plan urging to a “Strict Control to leave the Population unchanged”. The single child policy will determine a decline in the Chinese population after the maximum of

1.54 billion is reached in 2040. The provisional figures of the population until 2010 are as reported below.

Table 2-1 Nationwide Population Projection

(100 million persons)

Year	Total population, People's Republic of China	Labor-age Population	Population aged at 60 or more years	% Population aged
2000	12.69	8.61	1.32	10.4%
2001	12.80	8.74	1.34	10.5%
2002	12.91	8.88	1.36	10.5%
2003	13.01	9.01	1.40	10.8%
2004	13.12	9.13	1.43	10.9%
2005	13.22	9.25	1.46	11.0%
2006	13.32	9.36	1.51	11.3%
2007	13.43	9.46	1.55	11.5%
2008	13.54	9.55	1.60	11.8%
2009	13.65	9.65	1.66	12.3%
2010	13.77	9.73	1.73	12.6%

Source: "Chinese Population News Center," 2000

Wuhan is expected to have a mean population growth rate of 0.6%, Chengdu of 0.7% and Shanghai of 0.3%. These rates are estimated based on the growth rates of the registered population in the past years. (Refer to table below.) The permanent populations of the three cities is assumed to have the mean growth rates estimated at 1.1% for Wuhan, 1.3% for Chengdu and 0.8% for Shanghai.

Table 2-2 Population Projections in Three Cities

(10 thousand persons)

Year		2000	2001	2002	2003	2004	2005
Wuhan	Registered population	746	750	755	760	764	768
	Permanent population	831	839	848	856	865	878
Chengdu	Registered population	1,020	1,027	1,034	1,041	1,048	1,056
	Permanent population	1,140	1156	1171	1188	1203	1,220
Shanghai	Registered population	1,334	1,338	1,342	1,346	1,350	1,354
	Permanent population	1,664	1,677	1,691	1,704	1,717	1,729
Year		2006	2007	2008	2009	2010	
Wuhan	Registered population	773	778	782	787	792	
	Permanent population	889	897	907	916	927	
Chengdu	Registered population	1,063	1,071	1,078	1,086	1,093	
	Permanent population	1236	1252	1268	1285	1,300	
Shanghai	Registered population	1,358	1,362	1,366	1,370	1,375	
	Permanent population	1,742	1,757	1,771	1,786	1,800	

Source: JICA Study Team (gathered from Table 1-8)

(2) Aging Advancement

China shows a rapid increase in the aged population (60 or more years old) share. According to the definition of the Vienna World Advanced Age Issue Conference (1982)¹, China has joined the group of aged type nations since 1995 when its population of 60 or more years old reached an aged-to-total population ratio of 9.5%. According to the findings of the 1996-population fluctuation sample survey, one-third of the provinces all over the nation was classified as aged. Especially in the city of Shanghai, the 65 or more years old reached an aged-to-total population ratio of 7% or more. It is predicted that in China, starting from 10.4% in 2000 (130 million), the population of 60 or more years old will reach the 12.65% (170 million) in 2010 increasing up to 16.6% (240 million) in 2020.

¹ The term, nation of aged type, means that the aged 60 or more years old occupy a ratio of 10% or more to the total population or that the aged at 65 or more years occupy a ratio of 7% or more to the total population.

Among the three major cities, Shanghai aged at the fastest pace. Starting from the 17.9% (2.51 million) in 2000, Shanghai is estimated to have a population of 60 or more years old reaching the 19.5% (3.42 million) in 2010 up to the 33% (4.69 million) in 2025. The city is now dealing with an increase in the old dependent coefficient (retired population of 60 or more years old to labor-age population), and in the very old population ratio (population of 80 or more years old to population of 60 or more years old). According to the findings of the 1997 Shanghai municipality survey, it is predicted that in 2010, the aged who would like moving into an institution for the old people will be around 91 thousand, that is 3.1% of the aged population in the city. Among them, those able to pay the charges for such institution would be around 64 thousand, hence the 2.3% of the aged population in the municipality. As a consequence, the Shanghai municipal government has established the building of institutions for the old people to supply the 70% of the demand projected for 2010. In Chengdu, aging is slower than in Shanghai. The 60 or more years old population ratio of 8.2% (820 thousand persons) in 2000 is expected to increase up to 9.8% (1,080 thousand persons) in 2010 and reach 14.2% (1.63 million persons) in 2020. The aging growth rate is lower than the average of all the Chinese provinces.

In Wuhan, there is a relatively large number of old and middle aged workers partly due to the presence in the city of a traditional heavy industrial sector. As a consequence, the city has a higher aged population ratio than the average of all the Chinese provinces. From 11.5% (890 thousand persons) in 2000, it is predicated that the municipal aged population ratio will reach the 14.5% (1,200 thousand persons) in 2010.

Table 2-3 Projection of Aged Population in Three Cities

(in 10 thousand persons)

Year	2000	2001	2002	2003	2004	2005
Wuhan	89.4	92.1	94.9	97.8	100.7	103.7
(population ratio)	(11.5%)	(11.8%)	(12.0%)	(12.3%)	(12.6%)	(12.9%)
Chengdu	82.0	84.3	86.7	89.1	91.5	95.0
(population ratio)	(8.0%)	(8.2%)	(8.3%)	(8.5%)	(8.6%)	(8.9%)
Shanghai	251.2	260.7	270.7	280.9	291.6	302.7
(population ratio)	(17.9%)	(18.2%)	(18.5%)	(18.8%)	(19.0%)	(19.3%)
Year	2006	2007	2008	2009	2010	
Wuhan	106.8	110.0	113.3	116.7	120.2	
(population ratio)	(13.2%)	(13.5%)	(13.8%)	(14.2%)	(14.5%)	
Chengdu	97.5	100.0	102.6	105.3	108.0	
(population ratio)	(9.1%)	(9.2%)	(9.4%)	(9.6%)	(9.8%)	
Shanghai	310.3	318.0	326.0	334.1	342.5	
(population ratio)	(19.3%)	(19.4%)	(19.4%)	(19.4%)	(19.5%)	

Source: Prepared by JICA Study Team, with Estimation Added to Municipal Population Projections Partially Available

Table 2-4 Aged Dependent Coefficient and Aged Population Ratio in Shanghai

Year	Aged Dependent Coefficient	Aged Population Ratio
1990	26%	9.2%
1995	n.a.	10.2%
2000	n.a.	12.6%
2005	31%	15.5%
2010	39%	16.3%
2015	n.a.	n.a.
2020	70%	n.a.

Source: 6th term, 2000, Shanghai Overall Economy

According to various social surveys made in China, aging involves society in different ways. It increases the social security expenses, generation gap, and the lack of institutions for the old people and mental loneliness are some of the problems. All these issues should be taken into account in determining the supply of housing for the aged. In other words, if housing should be supplied accordingly to the needs, therefore there should be available a large family house for the aged-dependent or a nuclear family house for the exclusive use of the aged, or a nursery retirement house, and so on. More specifically, a house with 3 or 4 rooms may be reorganized in a house with 2 rooms + 1 room or 2 rooms + 2 rooms. It will be necessary to supply a maisonette type and to consider which can best meet the needs of the old people. Besides, the supply of housing to old people shows a growing tendency in a long-term perspective. Therefore the restructure of the social welfare institutions, the reparation of the unsold housing, the conversion of kindergartens and day nurseries into nursery for the old are measures to be included in the development of the new housing supply.

2.2.2. Changes in Living Structure

(1) Increase in Rate at which People Go to Schools of Higher Grade

In China, there is a growth in the demand for student dormitories (rooms and dormitories) due to an increase in the percentage of students who enter college or university. In Shanghai, for example, in August 1999 student dormitories have been completed for 330 thousand square meters, equivalent to one third of the 980 thousand square meters dedicated to student dormitories in the last 48 years. According to a questionnaire survey (with two or more answers allowed) disclosed by the National Bureau of Statistics in 1999, 44% of the Chinese are saving for the purpose of educating their children, 38% for their old age and 20% for the purchase of housing. Thus, the figure shows that Chinese savings are mainly directed to education. According to the findings of a survey made by the Peking Municipal Education Committee to 61 advanced education organs in 1998 40 thousand dormitory rooms were available for approximately 240 thousand students. One room was assigned either to four

undergraduate students, or to three graduate students or to two foreigners studying in China/doctor-course students. Around 140 thousand students, therefore, were accommodated in dormitories. (Approximately 60% of the students in school were accommodated in dormitories.) Therefore there was a shortage of more than 20 thousand rooms to accommodate the remaining students. Assuming 20 square meters for one room, it may be estimated that an area of approximately 650 thousand square meters is required to build dormitories.

The Government has included the construction of dormitories as one of the education facilities to be prioritized and financed with the issuance of national bonds. However the shortage of government financial resources makes it difficult for universities to build the dormitories. The students from middle or high-income families prefers to live in commercial houses and the number of students who prefer commercial housing on a one-per-room basis is expected to increase in ten year. Due to the fact that the higher educated population is constantly increasing, it can be assumed that the students choosing commercial housing and dormitories will have a ratio of 90 to 10%. Based on this assumption the demand for commercial housing and dormitories will increase, although at present the ratio is still 70 to 30%.

(2) Outlook of Highly Educated Population in the Future

In China the university admission ratio was 9% in 2000 and it will reach the 15% in 2010. The students entering schools of higher grade are expected to increase from 8.5 million to 13 million. An increase in gross expenditure for 2010 could be predicted as follows:

Table 2-5 Increase in Gross Expenditure for 2010

Increase in student population	(13 million persons - 8.5 million persons) = 4.5 million persons
Educational expenses	mean 4,000 RMB x 4.5 million persons = 18 billion RMB
Living expenses	mean 5,000 RMB x 4.5 million persons = 22.5 billion RMB
Housing expenses	mean 1,000 RMB (commercial housing lease) x 4.5 million persons x 50% (housing entrant ratio) = 2.3 billion RMB mean 500 RMB (dormitory fee) x 4.5 million persons x 30% (dormitory entrant ratio) = 0.7 billion RMB
Total	43.5 billion RMB (4.4 billion RMB as annually averaged)

Note: Housing expenses were estimated at the commodity prices prevailing in 1990 on the assumption that one student occupies one room in 2010, that 30% are accommodated in dormitories and that 20% of the students go to school from their family home.

Source: *Gao jiao zhang ji dui fang de chan chan ye de lian dong xiaoying*, August 2000

Highly educated populations in three cities could be predicted as referred below. It is assumed that housing and dormitories demands will grow respectively at 50% and 30% of the

annual increase in the highly educated population. The remaining 20% refers to the students going to school from the family home.

Table 2-6 Projection of Highly Educated Population in Three Cities

(10 thousand persons)

Year	2000	2001	2002	2003	2004	2005
Wuhan	18.9	19.7	20.4	21.3	22.2	23.2
(growth)		(+ 0.79)	(+ 0.80)	(+ 0.89)	(+ 0.90)	(+ 0.93)
Chengdu	10.8	11.2	11.7	12.2	12.7	13.2
(growth)		(+ 0.45)	(+ 0.47)	(+ 0.49)	(+ 0.51)	(+ 0.53)
Shanghai	20.8	21.6	22.5	23.4	24.4	25.3
(growth)		(+ 0.86)	(+ 0.89)	(+ 0.93)	(+ 0.96)	(+ 0.99)
Year	2006	2007	2008	2009	2010	
Wuhan	24.1	25.2	26.2	27.3	28.5	
(growth)	(+ 0.97)	(+ 1.01)	(+ 1.06)	(+ 1.10)	(+ 1.15)	
Chengdu	13.8	14.4	15.0	15.6	16.3	
(growth)	(+ 0.56)	(+ 0.58)	(+ 0.60)	(+ 0.63)	(+ 0.66)	
Shanghai	26.3	27.3	28.3	29.4	30.6	
(growth)	(+ 1.00)	(+ 1.04)	(+ 1.07)	(+ 1.12)	(+ 1.16)	

Source: Prepared by JICA Study Team, with Estimation Added to Municipal Population Projections Partially Available

2.2.3. Development of Macro-economy

(1) Growth of Economy

The outlook of the Chinese economy growth until 2010 would allow the prediction that it will be slightly lower than the growth rate in the 9th five-year plan period (1996 to 2000: mean real GDP growth rate of 8.3%) in the context of a decline in the world economy growth rate due to the US economy future downward trends. The Central Government has set the real GDP annual growth rate to approximately 7% (announced in March 2001) in the 10th five-year plan period (2001-2005). This projection however has been reduced significantly. According to Prime Minister Zhu's report on the 10th five-year plan, "There must be a certain allowance for the initial targets in the plan." Some regional governments, on the other hand, have set each province's 10th five-year plan at a little higher target. Thus, targets are not always balanced. In this study, it is assumed that the 10th five-year plan (2001-2005) will have a mean annual growth rate of 7.5% to 8.0% and the 11th five-year plan (2006-2010) will have a real GDP annual growth rate of 7.5% to 7.0%.

Moreover the evolution of the economy would cause the industrial structure in China to change. The primary industry will decline registering a growing shift towards the tertiary industry.

The importance of the secondary industry, however, will remain unchanged up to 2010 (table 2-7). This is because:

- 1) It is predicted that the domestic labor cost will be relative lower than the international wage averages until 2010 and afterwards there will be slight hikes in wages. The national level of monthly mean wage of US\$60 per person in 2000 will reach US\$150 in 2010. This wage level will be an advantage in terms of international competition as export leverage. Furthermore, the membership in the WTO will be translated to a reduction of import duties from export destination countries expanding even further the exports from labor-intensive industries, such as sewing, footwear, electronic components and so on.

On the other hand,

- 2) In the capital or technology intensive industries, such as machinery, motor vehicles, advanced electronic equipment and so on, the WTO membership will have negative consequences. The reduction of China's import duties would increase the imports of foreign goods very competitively with regards the Chinese production sold in the domestic market. As a result China is developing an import substitution industry to cope with this potential slowing down in the domestic production of machinery, motor vehicles and advanced electronics. These industrial sectors could be deployed as export industry starting 2010 or when China overcomes such competition. The tertiary industry is expected to attain a high rate of growth especially in sectors as IT, finance and insurance, real estate and so on. These growths of the labor-incentive type of secondary and tertiary industries will serve as recipient sectors in the urban areas to absorb the excess labor in rural areas, thereby influencing the demand for housing in the cities.

Table 2-7 Changes in Nationwide Industrial Structure

Year/Industrial Structure	Composition		
	1995	2000	2010
Primary Industry GDP/Total GDP	21%	17%	14%
Secondary Industry GDP/Total GDP	48%	52%	52%
Tertiary Industry GDP/Total GDP	31%	31%	34%
Primary Industry Workers/Total Workers	51%	49%	40%
Secondary Industry Workers/Total Workers	24%	24%	27%
Tertiary Industry Workers/Total Workers	25%	27%	33%

Source: "General Trends of Economy Growth in the 21st Century of China," 1991

In the following paragraphs the outlook of the economy growth of Wuhan, Chengdun and Shanghai will be examined until 2010. Wuhan will convert from the existing heavy

industry to the light industry. The iron, steel, oil, and tobacco industries, currently the leading sectors in Wuhan, will register a stable growth from 2000. The Chinese automotive industry is predicted to slow down under the influence of the WTO membership. The optical communication products, laser products, networks and digital mobile communications will register a very positive growth as a consequence of the introduction of foreign capital attracted by its geographical location. Wuhan is expected to have a real GDP projection (annual mean growth rate) of 8.0% from 2000 to 2005 and of 7.5% from 2006 to 2010. The GDP deflator has been estimated at an annual 2.0% in all of the three cities.

The GDP projection (annual mean growth rate) of Chengdu is estimated at 8.0% from 2000 to 2005 and at 7.5% from 2006 to 2010. (Refer to table 1-9) This projection is based on the developments of tourism, pharmaceuticals, foodstuffs, chemicals, knitting and other activities in the city. It is assumed, furthermore, that a preferential investment financing policy will be implemented to build up infrastructure thanks to the concentration of the Central Government investments and the governmental western region development plan.

In the 10th five-year plan of Chengdu (announced in February 2001), and in the 10th five-year plan of Wuhan (announced in January 2001), their nominal GDP annual mean growth rates were set at 10% or more. The real GDP projection (annual mean growth rate) obtained by subtracting a GDP deflator of (2%) could be deemed to fall within a range of the projection in the present study. The real GDP projection (annual mean growth rate) in Shanghai is estimated at 10.0% from 2000 to 2005, and at 9.0% from 2006 to 2010, both significantly higher than those of the other two cities due to the level of development of Shanghai. Shanghai is a center of international financing, international trade and international information and its role will be enhanced in view of the participation in the WTO. Even in the 9th five-year plan, Shanghai recorded a real GDP growth that is approximately by 2% higher than the nationwide average all over China. It may be deemed to fall within a range of the projection, considering that Shanghai has reckoned a real GDP (annual mean growth rate) of 9 thru 11% in the 10th five-year plan of the municipality (announced in April 2001).

Table 2-8 Prerequisites for Economic Growth Projection in Three Cities

	Real GDP		Nominal GDP	
	2001-2005	2006-2010	2001-2005	2006-2010
Wuhan and Chengdu	8.0%	7.5%	10.0%	9.5%
Shanghai	10.0%	9.0%	12.0%	11.0%

Source: Prepared by JICA Study Team, based on various references and hearings

The three cities have an economic growth projection as referred in the following table.

Table 2-9 Projection of Economic Growth in Three Cities

Wuhan (year)	2000	2001	2002	2003	2004	2005
Real GDP (00 million RMB)	1,207	1,304	1,408	1,520	1,642	1,773
Real GDP per capita (MRB)	14,525	15,542	16,604	17,757	19,182	20,194
Nominal GDP (00 million RMB)	1,207	1,328	1,460	1,607	1,767	1,944
Nominal GDP per capita (MRB)	14,525	15,828	17,217	18,773	20,643	22,141
Wuhan (year)	2006	2007	2008	2009	2010	
Real GDP (00 million RMB)	1,906	2,049	2,203	2,368	2,546	
Real GDP per capita (MRB)	21,440	22,843	24,289	25,852	27,465	
Nominal GDP (00 million RMB)	2,129	2,331	2,552	2,795	3,060	
Nominal GDP per capita (MRB)	23,948	25,987	28,137	30,513	33,009	
Chengdu (year)	2000	2001	2002	2003	2004	2005
Real GDP (00 million RMB)	1,310	1,415	1,528	1,650	1,782	1,925
Real GDP per capita (MRB)	11,491	12,240	13,049	13,889	14,813	15,779
Nominal GDP (00 million RMB)	1,310	1,441	1,585	1,744	1,918	2,110
Nominal GDP per capita (MRB)	11,491	12,465	13,535	14,680	15,943	17,295
Chengdu (year)	2006	2007	2008	2009	2010	
Real GDP (00 million RMB)	2,069	2,224	2,391	2,571	2,763	
Real GDP per capita (MRB)	16,739	17,764	18,856	20,008	21,254	
Nominal GDP (00 million RMB)	2,310	2,530	2,770	3,033	3,321	
Nominal GDP per capita (MRB)	18,689	20,208	21,845	23,603	25,546	
Shanghai (year)	2000	2001	2002	2003	2004	2005
Real GDP (00 million RMB)	4,551	5,006	5,507	6,057	6,663	7,329
Real GDP per capita (MRB)	27,350	29,851	32,567	35,546	38,806	42,389
Nominal GDP (00 million RMB)	4,551	5,097	5,709	6,394	7,161	8,020
Nominal GDP per capita (MRB)	27,350	30,394	33,761	37,523	41,706	46,385
Shanghai (year)	2006	2007	2008	2009	2010	
Real GDP (00 million RMB)	7,989	8,708	9,492	10,346	11,277	
Real GDP per capita (MRB)	45,861	40,562	53,597	58,026	62,650	
Nominal GDP (00 million RMB)	8,903	9,882	10,969	12,176	13,515	
Nominal GDP per capita (MRB)	51,108	56,243	61,937	68,175	75,083	

Note: GDP is based on pricing for 2000. GDP per capita was obtained, being divided by permanent population.

Source: Estimated by JICA Study Team, based on the economy plan in each city

(2) Household Income

The household income projections in the three cities (wards and municipal districts) were obtained (Tables 2-10) by multiplying the nominal per-capita GDP growth rate in each city by the value that was obtained multiplying the 2000 per-capita wage amount (original base) by the mean number of household income earners in October 2000 (1.57 persons for Wuhan, 1.43 persons for Chengdu and 1.64 persons for Shanghai). According to the table, Wuhan has a per-capita GDP, real or nominal, higher by approximately 20% Chengdu because Wuhan is more industrialized than Chengdu in the ward/municipal district and rural areas. The household income per family (ward/municipal district), is only slightly higher in Wuhan than in Chengdu. At a glance, table 2-9 appears contradictory to table 2-10 given below. In reality, however, it is not. The percentage of rural population is higher in Chengdu than Wuhan.

Industries decide unilaterally where to be located and in Chengdu their lower presence is reflected in the composition of the household income. The income from wages rather than agricultural product earnings (wards/municipal districts) is proportionally lower than in Wuhan (wards/municipal districts). The city of Wuhan was borne from three former cities, Wuchang, Hankou and Hanyang. All these three former cities were located along the basin of the Yangtze River and their know-how in ocean transportation has made convenient for the industries to locate themselves there.

Table 2-10 Household Income Projections in Three Cities (wards/municipal districts)

(RMB)

Year	2000	2001	2002	2003	2004	2005
Wuhan	11,979	13,054	14,202	15,480	17,220	18,258
Chengdu	12,038	13,061	14,184	15,390	16,714	18,134
Shanghai	22,498	24,995	27,770	30,852	34,276	37,773
Year	2006	2007	2008	2009	2010	
Wuhan	19,748	21,426	23,199	25,156	27,219	
Chengdu	19,603	21,191	22,907	24,740	26,769	
Shanghai	41,550	45,705	50,276	55,303	60,888	

Source: Estimated by JICA Study Team, based on the field-proven economies in each of the cities

2.2.4. Progress of Internationalization

(1) Participation in WTO

The effects of China's participation in the WTO on the construction industry, including real estate and housing, may be considered as follows:

- 1) A reduction in the agricultural product import duties would cause an increase in imports of agricultural products. The cotton and wool farmers, both less export-competitive, will partially get out of business and eventually move into the cities. As a result, the demand for housing in the cities will increase. In addition, it will lead to a supply of labor to the construction industry. Some restrictions on statistical data do not allow estimating the inflow in the three cities of who partially gave up to the own business in the agricultural industry.

Table 2-11 Export Competitiveness Indices on Sewing Materials in China

Year	Wool spinning	Cotton spinning	Jute spinning	Silk	Sewing	Chemical textile
1990	0.08	0.68	0.65	0.70	0.99	-0.67
1991	0.24	0.62	0.73	0.69	0.99	-0.72
1992	-0.05	0.28	0.65	0.59	0.95	-0.77
1993	-0.19	0.36	0.40	0.50	0.94	-0.82
1994	-0.12	0.31	0.52	0.64	0.95	-0.65
1995	-0.12	0.27	0.50	0.68	0.92	-0.68
1996	-0.12	0.12	0.47	0.58	0.92	-0.74
1997	-0.06	0.14	0.37	0.61	0.93	-0.63

Note: Export competitiveness index = (export - import) / (export + import)

Silk and sewing are strongly export-competitive. Jute, cotton and wool spinning and chemical textiles, on the other hand, have been reducing their export competitiveness.

Source: Prepared by JICA Study Team, based on "Spinning Textile News Center: 1999"

- 2) Import duties on construction materials (cement, sheet glass, etc.) will decrease from the existing level of 30% to 10%. As a consequence it may be expected that the prices for construction materials will drop or stabilize
- 3) The land pricing will rise while the demand for office buildings, hotels and commercial buildings owing to the investments and inroads of foreign capital will increase. Especially, the port/harbor and finance districts in Shanghai are expected to register land price hikes.
- 4) The demand for high-class residence will increase, also for the inroads of foreign capital.
- 5) Housing commodities will be developed more favorably and helped by the inroads of foreign construction companies.
- 6) A reduction of the motor vehicle import duties would accelerate the lowering of the prices for motor vehicles and making their use more popular. This consideration will lead to housing in the suburbs.

2.2.5. Advancement of Industrial Structure, and Technological Innovations

(1) Development of IT-related Engineering Fields and Industries

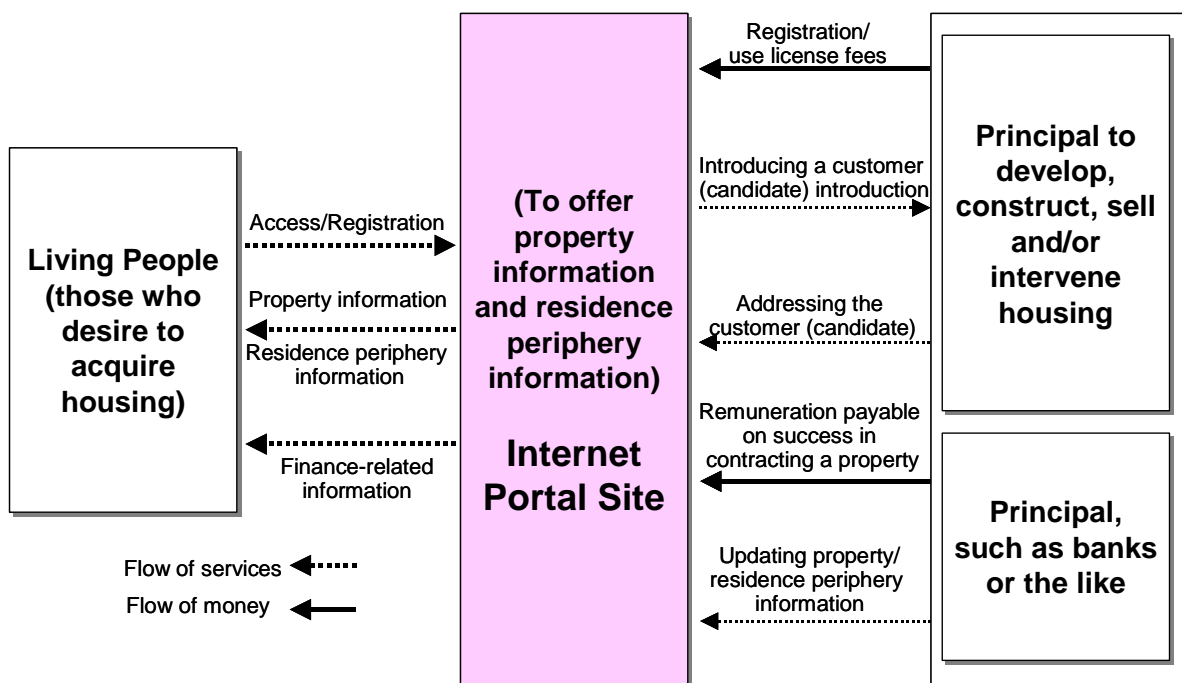
The progress of IT (information communication technology) diversifies the information services available to who wants to purchase housing, improving and upgrading the accessibility to the housing market. When a person chooses a house, this is often evaluated on the base of factors observed during a survey on site, except for house pricing (lease and selling price). Land-survey factors refer to the environments surrounding the house (street appearance, education environment, medical/welfare environment and regional grade/status and so on). Even if the property or house itself is purchasable and attractive, many refuse once they view

the inside as an unacceptable living condition. To meet the needs of those who desire to acquire a house, it is desirable to visit the site after obtaining and examining the environments beforehand and narrowing them down to some extent, if possible, as the “preliminary step” towards the purchase. In reality, however, those peripheral situations that could never be seen on a leaflet are known for the first time once on site and under the guidance of the real estate dealer. On a holiday, the number of properties that can be checked will be naturally limited.

To improve this situation, a study has been started in the attempt to provide information on the house environment through Internet. An Internet information system has built up a housing information map including information on the environment. Clicking the icon of a certain property, for example, will allow to visualize the adjacent housing (animation in some cases) and the room arrangement as well. At the same time, it is possible to obtain information around the periphery of the property (reputation of an infant clinic in the neighborhood, working hours of a health center, library services in detail, etc.)

This will greatly improve the accessibility to the market for housing (new, used and lease).

Figure 2-3 Image to Upgrade “Search for Housing” with Development of IT (information technology) related Techniques



Source: JICA Study Team

2.2.6. Changes in Urban Structures

(1) Progress of Urbanization and Increase in Non-registered Population

A progress of urbanization would not only contribute to an increase in family-registered population but also might lead to an increase in number of non-registered population. Mainly those farmers who work in an urban area without a permit from the government compose the non-registered population. They has been called “blind inflow”. More recently, however, in Shanghai for example, the blind inflow has been renamed “a tide of working people,” positively evaluated as new labor force taking part to the changeover to a market economy.

In China, the regional population is described according three categories: registered population, resident population, and real population. The resident population is equal to the registered population plus the resident for half a year, that moved to the city already for many year but without their family registered there. The real population accounts those resident for less than half a year, who moved to the city for a short term without their family register there, minus the non-resident for a short period with their family register in the city (short-term outflow population). The so-called floating population refers to a long-term and short-term inflow minus the short-term outflow population. To elaborate an effective housing policy in Shanghai, Wuhan and Chengdun is essential to quantify the floating population because its existence represents a potential demand for lease housing.

Based on a report “Ren kou xue yu ji hua sheng yu,” People’s University of China, February 2001, some features of the floating population are described below.

According to the floating population 1995 survey on a nationwide basis, the age group 15-34 years old occupied the 71% of the population inflow. In Shanghai this age group represented the 73%. The age group 15-39 years old represented the majority in the floating population 1990 survey as well (66%). As far as their original family register is concerned, the 80% of the floating population have been working in agriculture. Either in terms of time-series or on a region by region basis, therefore, an age group composed of young people working in agriculture has characterized the floating population. According to a floating population survey in the Chiangsu province as of 1998, 37% of workers slept and lodged at their working sites, 20% in hotels, 16% in lease housing and 13% at construction sites. Especially the long-term inflow population has a higher percentage of those engaged in trade, 47% of whom lived in lease housing, 24% in hotels and 13% in lease rooms. The short-term inflow population, on the other hand, had a higher percentage of construction workers, 50% of whom slept and lodged at their working sites, 13% at construction sites and 8% in lease housing. The inexpensive lease housing is highly needed. In the floating population 1997 survey, an annual per-capita income amounted to 6,630 RMB in the eastern region, 4,454 RMB in the middle

region and 4,158 RMB in the western region. In the eastern region, the inflow population earned a mean annual per-capita income estimated at a level of 80% relative the annual mean per-capita income for the registered population in the eastern region. With the annual mean per-capita income for the registered population in the western region reckoned as 100, it may be gathered therefrom that the floating population earned an annual mean income of 80 in the eastern region, 53 in the middle region and 50 in the western region. To build lease housing, therefore, it is necessary to take into account the difference in the income of floating population on a regional base.

According to the Central General Control Committee, the floating population on a nationwide basis, which exceeded one hundred million in 1997, will reach 130 million in 2005 and 160 million in 2010. Thus, approximately 5 million people are estimated to flow in cities every year. The three cities have populations and floating populations estimated as follows:

Table 2-12 Populations in Three Cities and Estimation of their Floating Populations

(10 thousand persons)

Year		2000	2005	2010
Wuhan	Family-registered population	746	768	792
	Floating population resident for six months or more	85	110	135
	Permanent population	831	878	927
	Floating population resident for less than six months	55	60	65
	Actual population	886	938	992
	Floating population total	140	170	200
Chengdu	Family-registered population	1,020	1,070	1,100
	Floating population resident for six months or more	120	150	200
	Permanent population	1140	1220	1300
	Floating population resident for less than six months	80	100	120
	Actual population	1,220	1,320	1,420
	Floating population total	200	250	320
Shanghai	Family-registered population	1,334	1,354	1,375
	Floating population resident for six months or more	306	350	400
	Statistical error	24	25	25
	Permanent population	1,664	1,729	1,800
	Floating population resident for less than six months	81	100	120
	Actual population	1,745	1,829	1,920
	Floating population total	387	450	520

Note: No outflow population has been disclosed. In 2000, however, approximately 140 thousand persons were estimated to flow in Shanghai.

The numerical values given for 2000 were the findings in an ordinary nationwide population survey recorded as of November 01, 2000.

The values for Wuhan and Chengdu were not disclosed as of April 2001 and estimated, accordingly.

The numerical values for 2005 and 2010, furthermore, were estimated, based on the hearings from population-problem experts in the three cities.

Source: Prepared by JICA Study Team, based on various references and hearings.

2.3. Objective of Predicting Demand for Housing

Under the present study, a demand for housing is predicted, first of all, for the purpose of establishing the technique to quantify the outlook of a demand for housing in the future (building and operating a model). Secondly, the housing demand prediction aims at (1) establishing and improving various housing finance systems, including the Housing Provident Fund system and (2) Evaluating the effectiveness of the measures introduced on the long-term perspective to promote the supply of rental housing, to foster the existing housing market, to support the supply of economical housing in the relational structure of a demand for housing. Thirdly, the demand prediction also aims to indicate the housing statistical information items needs to be updated continuously. The prediction will be provided in detail in the Final Report in conjunction with outcomes of housing policies and housing finance policies.

2.4. How to Grasp Demand for Housing, and Structure of Demand Prediction Model

2.4.1. Main Factors Composing Demand for Housing

The quantitative demand for housing is based on the following three factors:

“Population/Number of Households”, “Administrative District Demarcation” and “Reconstruction/ Redevelopment.”

(1) Population/number of households

The demand for housing arises from an increase or decrease in population (natural increase or decrease, social increase or decrease, fluidized population inflow or outflow, and so on) and from a division of household (mainly with children independent). Especially in an urban area, an increasing number of population have been flowing from the suburbs and rural areas, thereby generating a new demand for housing. Discussions hereunder was made, with consideration given to some inflow-population measures taken in the three cities surveyed.

In relation to the population/number factor there are another two factors that express a quality of housing in terms of size and space allowance. One is the number of members per household and the other a per-capita dwelling area. These factors are significantly influential over the demand for housing, therefore they need to be reviewed to analyze the present and future trends.

1) Administrative District Demarcation

As the city grows and its economic activities progress, the municipal administrative demarcation varies. The city grows in incorporating its suburbs into the “municipality/ward” newly subject to urban planning. This, however, does not always lead to the creation of a new demand for housing because “the district that was not a municipality or a ward until yesterday is incorporated today in a municipality/ward in terms of administrative proceedings and of statistical numerical values only.” An increase in population or number of households on a statistical document due to “an incorporation into a municipality/ward on urban planning,” therefore, might apparently contribute to an increase in housing stock from a statistically numerical point of view. In reality, however, it should be noted that such incorporation would not contribute to the creation of a demand for housing.

2) Reconstruction/Redevelopment

Reconstruction and/or redevelopment should be noted as critical factors that form a demand for housing though they do not contribute to an increase in housing stock.

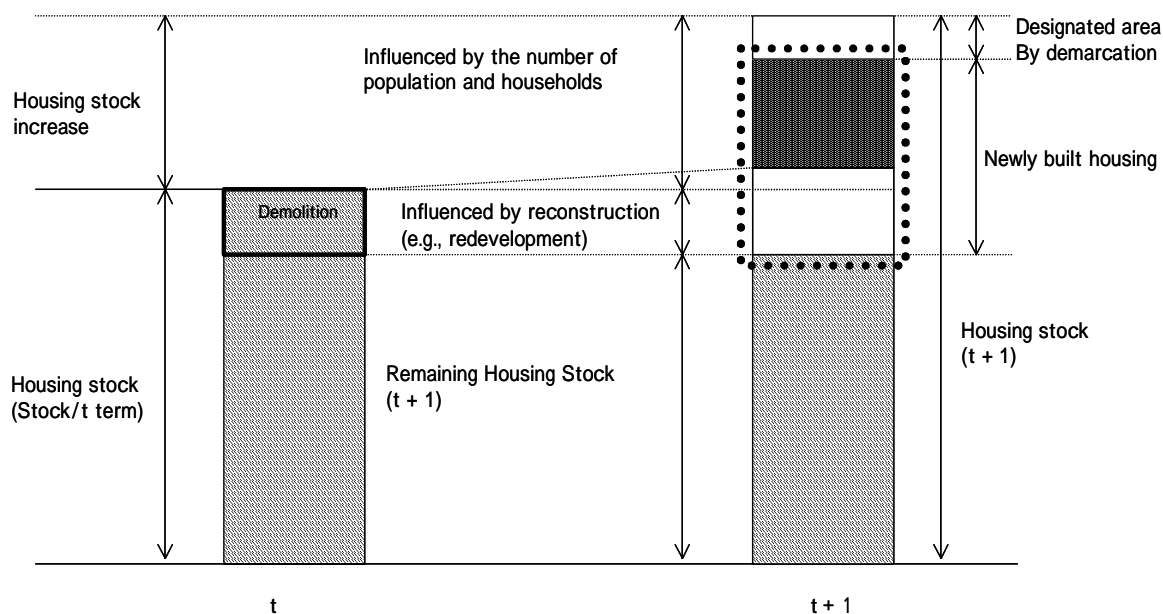
An existing house may be demolished because it is too old or because the area falls in a district to be mandatory redeveloped. If in the site new dwelling opportunities are constructed, a demand for housing will appear. In the redevelopment of an urban area, the new housing often has a wider area compared with the previous housing because of a more efficient usage (housing area growth rate 1.0 or more).

2.4.2. Definition of Demand for Housing

The main factors that compose the demand for housing will be used to define the demand for housing as follows: (Refer to the illustration below.)

<p>Demand for housing = Population/Number of Households growth factor + Reconstruction/Redevelopment factor Population/Number of Households growth factor = Increase in housing stock - Administrative District Demarcation factor</p>

Figure 2-4 Housing Demand Configuration Factors



Source: JICA Study Team

To clarify an outlook of the demand for housing in the future, therefore, it is necessary to get the more accurate picture of the above-mentioned three factors: Population/Number of Households, Administrative District Demarcation, Reconstruction/Redevelopment in the future.

2.5. Handling Factors Individually, and Outlook in the Future

2.5.1. Population/Number of Households

(1) Time-series of changes in total population, and outlook in the future

The registered population, referred to in Chapter 1 of Part I, is applied here again. Changes in Environment surrounding Housing Market, and their Effects on Demand for Housing” has been used for a time-series of predicted changes in total population for each of the three cities, including a future outlook. (Refer to the table given below.) For the registered municipal total population in each of the cities for 2010, Shanghai is expected to have a population of 13.75 million, Chengdu 10.93 million and Wuhan 7.92 million.

Table 2-13 A Time-Series of Changes in Population of the Three Cities, and Estimations for the Future (reinserted)

(0,000 persons)

Year	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997
Shanghai	1,217	1,232	1,250	1,262	1,276	1,283	1,287	1,289	1,295	1,299	1,301	1,304	1,305
Chengdu	863	875	887	899	909	920	928	937	947	960	972	981	989
Wuhan	608	620	629	642	653	670	677	685	692	700	710	716	724
Year	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Shanghai	1,307	1,320	1,334	1,338	1,342	1,346	1,350	1,354	1,358	1,362	1,366	1,370	1,375
Chengdu	997	1,004	1,020	1,027	1,034	1,041	1,048	1,056	1,063	1,071	1,078	1,086	1,093
Wuhan	732	739	746	750	755	760	764	768	773	778	782	787	792

Source: Prepared by JICA Study Team, based on various data

(2) Time-series of changes in municipal ward population

A time-series of changes in municipal ward population from 1985 onward are shown in the table below.

Table 2-14 A Time-series of Changes in Municipal Ward Population of all the Three Cities (reinserted)

Year	1985	1986	1987	1988	1989	1990	1991	1992
Shanghai	698	710	722	733	778	783	786	793
Chengdu	258	264	269	274	278	281	284	288
Wuhan	384	394	402	410	417	425	429	433
Year	1993	1994	1995	1996	1997	1998	1999	
Shanghai	948	953	957	961	1,019	1,071	1,109	
Chengdu	293	301	308	317	322	326	330	
Wuhan	438	444	450	517	524	530	—	

Source: Prepared by JICA Study Team, based on municipal statistics yearbooks and others

2.5.2. Population per House (number of members per house) and Per-capita Housing Area (effective construction area)

(1) Time-series of changes in per-capita housing area (effective construction area)

Shown in a table below are a time-series of changes in per-capita housing construction area (effective construction area) in each of the three cities surveyed. Reflecting the recent growth of the economy and the housing quality-enhancing measures taken by the administration, the per-capita housing area (effective construction area) has generally tended to grow in all of the cities.

Table 2-15 Time-series of Changes in Per-capita Housing Area (effective construction area)

(in square meters per person)

Year	1985	1986	1987	1988	1989	1990	1991
Shanghai	9.23	10.34	10.68	11.04	10.97	11.36	11.68
Chengdu	7.79	8.13	8.43	8.76	8.88	9.14	9.18
Wuhan	7.92	9.32	9.43	9.53	9.80	10.01	10.26
Year	1992	1993	1994	1995	1996	1997	1998
Shanghai	11.92	10.81	11.59	12.45	13.67	14.84	16.27
Chengdu	10.30	10.18	10.02	11.22	12.09	13.04	13.95
Wuhan	10.43	10.53	10.89	11.31	10.30	10.62	11.00

Source: Prepared by JICA Study Team, based on municipal statistics yearbooks and others

Expected future figures are only reflected when the targets for 2005 in the 10th five-year plan are made clear. As gathered from the findings, the growth of per-capita housing area (effective construction area) from 2005 and on is going to slow down slightly compared to the figures given in the 10th five-year plan. The future values have been estimated in line with the following principles:

Shanghai: Based on the per-capita effective construction area and per-capita dwelling area from 1980 to 1998, a function will be elaborated to convert a per-capita dwelling area to a per-capita effective housing construction area. This function used to convert 14.00 m²/person, per-capita dwelling area (target) for 2005 in the 10th five-year plan, to a per-capita effective housing construction area, thereby gives 22.06 m²/person. Considering the findings from interviews with experts and specialist of the housing market, it is obtained a per-capita dwelling area of 17.00 m²/person (converted to a per-capita effective construction area of 26.57 m²/person) for 2010. With the per-capita dwelling area growth rate reaching the peak in 2005, the area growth rate will be reduced gradually and the area should reach 17.00 m²/person in 2010.

Chengdu: Based on the per-capita effective construction area and per-capita dwelling area from 1980 to 1998, a function will be elaborated to convert a per-capita dwelling area to a per-capita effective housing construction area. This function used to convert 14.30 m²/person, per-capita dwelling area (target) for 2005 in the 10th five-year plan, to a per-capita effective housing construction area, thereby gives 20.20 m²/person. Considering the findings from interviews with experts and specialist of the housing market, it is obtained a per-capita dwelling area of 16.70 m²/person (converted to a per-capita effective construction area of 24.05 m²/person) for 2010. With the per-capita dwelling area growth rate reaching the peak in 2005, on the other hand, the area growth rate will be reduced gradually and the area should be increased to reach 16.70 m²/person in 2010.

Wuhan: Based on the per-capita effective construction area and per-capita dwelling area from 1980 to 1998, a function will be elaborated to convert a per-capita dwelling area to a per-capita effective housing construction area. This function used to convert 14.00 m²/person, per-capita dwelling area (target) for 2005 in the 10th five-year plan, to a per-capita effective housing construction area, thereby gives 16.10 m²/person. Considering the findings from interviews with experts and specialist of the housing market, it is obtained a per-capita dwelling area of 17.30 m²/person (converted to a per-capita effective construction area of 18.74 m²/person) for 2010. With the per-capita dwelling area growth rate reaching the peak in 2005, on the other hand, the area growth rate is to be reduced gradually and the area is to be increased to reach 17.30 m²/person in 2010.

Table 2-16 Outlook of Per-capita Housing Area (effective construction area) in the Future

(m²/person)

Year	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Shanghai	18.07	18.99	19.96	20.98	22.06	23.08	24.06	25.01	25.88	26.57
Chengdu	16.28	17.19	18.15	19.15	20.20	21.24	22.20	23.00	23.65	24.05
Wuhan	13.09	13.75	14.47	15.25	16.10	16.72	17.28	17.80	18.28	18.74

Source: JICA Study Team

It should be noted that the per-capita housing area (effective construction area) obtained here is the overall mean value of the total, including the existing houses.

(2) Time-series of changes in population per house (number of members per house)

The table given below shows a time-series of changes in population per house in each of the three cities. The population per house tended to decline year by year also due to the progress of the nuclear family. Almost all the large cities, including Shanghai, have had a per-house population of less than 3 persons/house (1.83 persons/house as of 1998). A similar tendency is observed in Chengdu but with a per-house population still kept at a level of 3.19 persons per house in 1999. Wuhan had a per-house population level of 3.41 persons/house in 1998.

Table 2-17 Time-series of Changes in per-House Population (number of members per house) in Municipal Wards (field-proven)

(persons/house)

Year	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989
Shanghai	3.81	3.77	3.73	3.69	3.63	3.54	3.44	3.34	3.24	3.18
Chengdu	3.94	3.95	3.90	3.85	3.78	3.74	3.71	3.65	3.59	3.51
Wuhan	4.23	4.11	4.03	3.96	3.88	3.82	3.77	3.69	3.65	3.58
Year	1990	1991	1992	1993	1994	1995	1996	1997	1998	
Shanghai	3.13	3.03	2.98	2.98	2.94	2.90	2.86	2.85	2.83	
Chengdu	3.46	3.44	3.39	3.39	3.36	3.32	3.27	3.22	3.19	
Wuhan	3.53	3.43	3.40	3.38	3.38	3.39	3.44	3.43	3.41	

Source: Prepared by JICA Study Team, based on municipal statistics yearbooks and others

For a future outlook of the per-house population (number of members per house) in the municipal wards, the values have been estimated on the following principles:

The per-house effective construction area from 1980 to 1998, the findings from interviews with experts and specialist of the housing market, yearly data have been set looking at the trends of effective new demand of construction area per house for the decade of 2001/2010.

While preparing the data, it has been noted that the demand for housing (area and number of houses) from 2001 onwards will gradually decrease.

Table 2-18 Outlook of per-House Population (number of members per house) in Municipal Wards in the Future (prediction)

(persons/house)

Year	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Shanghai	2.71	2.67	2.64	2.60	2.56	2.53	2.49	2.46	2.42	2.39
Chengdu	3.05	3.04	3.02	3.00	2.98	2.97	2.95	2.93	2.92	2.90
Wuhan	3.33	3.30	3.28	3.25	3.23	3.20	3.17	3.15	3.12	3.10

Source: JICA Study Team

2.5.3. Handling Administrative District Demarcation, and Outlook of Population in Municipal Wards in the Future

(1) How to grasp administrative district demarcation factor

As far as the population in municipal wards is concerned, it is necessary to take into consideration the administrative district demarcation factor already referred to in addition to the natural increase/decrease (birth/death) and the social increase/decrease (move-in/out). The

tables given in the following pages show a time-series of changes in municipal ward population and municipal ward area in each of the three cities. From the tables, it may be gathered that Shanghai and Wuhan had a remarkable increase in municipal ward area and a significant growth rate of municipal ward population as compared with the previous year almost simultaneously.

This fact should suggest that a district outside the municipal ward was newly incorporated, (leading to a significant increase in municipal ward area) and that the municipal ward population statistically increased in a great measure. The population incorporated administratively into the municipal ward was already lodged, therefore this incorporation does not lead directly to a new demand for housing.

Table 2-19 Changes in Municipal Ward Population and in Municipal Ward Area

Year	Shanghai				Chengdu				Wuhan			
	Municipal Ward Population	Municipal Ward Population Growth Rate as compared with	Municipal Ward Area	Increase in Municipal Ward Area	Municipal Ward Population	Municipal Ward Population Growth Rate as compared with	Municipal Ward Area	Increase in Municipal Ward Area	Municipal Ward Population	Municipal Ward Population Growth Rate as compared with	Municipal Ward Area	Increase in Municipal Ward Area
	0,000	%	km ²	km ²	0,000	%	km ²	km ²	0,000	%	km ²	km ²
1980	601				228		1,450					
1981	613	2.0%			243	6.3%	1,450	0				
1982	625	1.9%			247	1.8%	1,450	0				
1983	639	2.2%	330		251	1.3%	1,450	0				
1984	688	7.7%	349	119	254	1.4%	1,450	0				
1985	698	1.5%	351	2	258	1.7%	1,382	-68	384	1.5%	1,557	
1986	710	1.7%	375	24	264	2.3%	1,382	0	394	2.7%	1,610	53
1987	722	1.6%	375	0	269	2.0%	1,382	0	402	2.1%	1,610	0
1988	733	1.5%	749	373	274	1.6%	1,382	0	410	2.0%	1,610	0
1989	778	6.2%	749	0	278	1.5%	1,382	0	417	1.7%	1,610	0
1990	783	0.7%	749	0	281	1.1%	1,382	0	425	1.7%	1,610	0
1991	786	0.3%	750	1	284	1.2%	1,382	0	429	1.0%	1,627	17
1992	793	0.8%	793	43	288	1.4%	1,382	0	433	1.0%	—	—
1993	948	19.6%	2,057	1,264	293	1.8%	1,382	0	438	1.0%	2,718	—
1994	953	0.5%	2,057	0	301	2.8%	1,382	0	444	1.4%	2,718	0
1995	957	0.4%	2,057	0	308	2.1%	1,382	0	450	1.3%	2,718	0
1996	961	0.5%	2,057	0	317	3.0%	1,382	0	517	15.1%	4,727	2,009
1997	1,019	6.0%	2,643	586	322	1.5%	1,418	36	524	1.9%	4,727	0
1998	1,071	5.1%	3,249	606	326	1.3%	1,418	0	530	1.2%	4,727	0
1999	1,109	3.5%										

Source: Prepared by JICA Study Team, based on municipal statistics yearbooks, Shanghai, Chengdu and Wuhan

To study an outlook of the demand for housing in the future, therefore, it is necessary to exclude the Administrative District Incorporation factor.

(2) Outlook of municipal ward population in the future, with administrative district incorporation factor taken into consideration

An outlook of the municipal ward populations in the future has been given, with administrative ward incorporation factors in each of the three cities taken into consideration.

Shanghai: The data given in 3.3.1(1) should be used to determine a future numerical value of the municipal total population from 2000 to 2010. A municipal ward population has been obtained “on the assumption that no district will be incorporated in any administrative

ward in the future.” Based on the data collected in the past, a municipal ward population has been set at 0.5% on the assumption that, without administrative district incorporation, the nearest population can grow from 2000 to 2010 at an annual growth rate of 0.5%. In addition, the value of the future “ratio of municipal ward population to total population” is determined considering possible administrative district incorporation plan. As far as Shanghai is concerned, however, sufficient information has been currently unavailable. Based on the trends in the past, therefore, it has been assumed that Shanghai will have a municipal ward population occupy 85% of the municipal total population in 2010, which has been term-interpolated. From the “municipal ward population with a future administrative district incorporation plan taken into account” obtained as referred above, the “municipal ward population without any administrative district incorporated in the future” is subtracted so that it is obtained a “population with an administrative district incorporated.”

Chengdu: As far as Chengdu is concerned, any full-scale administrative district incorporation (a significant increase in municipal ward area) has not been experienced so far. With the future municipal ward population growing at a rate of 2.0%, based on the field problem data collected in the past, a “municipal ward population without any administrative district incorporation in the future” has been obtained while letting the population continue growing over a period from 2000 to 2010. With an evolving possibility as the base city for a full-scale exploration in the west taken into account, however, Chengdu has been considered to have its administrative districts in the suburbs incorporated in line with the municipality growth. The value to be set in the future as “ratio of municipal ward population to municipal total modulation” in 2010, therefore, has been set at 4.86%, based on the General Regulations in Wuhan City (Chengdu People’s Government, July 1999), which has been in turn term-interpolated and obtained as “population with a future administrative district incorporation program taken account”. Similarly to Shanghai, “the municipal ward population without any administrative district incorporated in the future” has been subtracted from the “municipal ward population with future administrative district incorporation programs taken into account”, to obtain a “population with an administrative district incorporated.”

Wuhan: As far as Wuhan is concerned, the municipal ward population without any administrative district incorporation (a significant increase in municipal ward area) has been set at a growth rate of 1.1%, based on the field data collected in the past. A “municipal ward population without any administrative district incorporation in the future” has been obtained on the assumption that the population continues growing at 1.1% a year from 2000 to 2010. Based on such information as the General Regulations in Wuhan City (Wuhan People’s Government, February 1999), a ratio of municipal ward population to municipal total population” in 2010 has been set at 75.0%, which has been in turn term-interpolated and

obtained as “population with a future administrative district incorporation program taken account. Similarly to Shanghai and Chengdu, “the municipal ward population without any administrative district incorporated in the future” has been subtracted from the “municipal ward population with future administrative district incorporation programs taken into account,” to obtain a “population with an administrative district incorporated”.

Table 2-20 Outlook of Municipal Ward Population in the Future, with Administrative District Incorporation Factor Taken into Account

Shanghai					
Year	Municipal Total Population	Municipal ward Population 0.5% up, without Taking Administrative District Demarcation into Consideration	Municipal Ward Population Ratio Set to 85% in 2010 (81.9% for '98)	Municipal Ward Population with Administrative District Demarcation Taken into Consideration (overall)	(less) Population Incorporated in Municipal Wards as Result of Administrative District Demarcation
Year	0,000	0,000	%	0,000	0,000
1999	1,320	1,076	82.2%	1,085	9
2000	1,334	1,081	82.4%	1,100	19
2001	1,338	1,087	82.7%	1,107	20
2002	1,342	1,092	83.0%	1,113	21
2003	1,346	1,098	83.2%	1,120	22
2004	1,350	1,103	83.5%	1,127	24
2005	1,354	1,109	83.7%	1,134	25
2006	1,358	1,114	84.0%	1,141	26
2007	1,362	1,120	84.3%	1,148	28
2008	1,366	1,125	84.5%	1,155	29
2009	1,370	1,131	84.8%	1,161	30
2010	1,375	1,137	85.0%	1,169	32

Chengdu					
Year	Municipal Total Population	Municipal ward Population 2.0% up, without Taking Administrative District Demarcation into Consideration	Municipal Ward Population Ratio Set to 48.6% in 2010 (32.9% for '99)	Municipal Ward Population with Administrative District Demarcation Taken into Consideration (overall)	(less) Population Incorporated in Municipal Wards as Result of Administrative District Demarcation
Year	0,000	0,000	%	0,000	0,000
1999	1,004	330	32.9%	330	0
2000	1,020	337	34.1%	348	11
2001	1,027	344	35.3%	363	19
2002	1,034	351	36.6%	378	28
2003	1,041	358	37.9%	395	37
2004	1,048	365	39.3%	412	47
2005	1,056	372	40.7%	430	58
2006	1,063	379	42.2%	448	69
2007	1,071	387	43.7%	468	81
2008	1,078	395	45.3%	488	93
2009	1,086	403	46.9%	509	107
2010	1,093	411	48.6%	531	121

Wuhan					
Year	Municipal Total Population	Municipal ward Population 1.1% up, without Taking Administrative District Demarcation into Consideration	Municipal Ward Population Ratio Set to 75% in 2010 (72.5% for '98)	Municipal Ward Population with Administrative District Demarcation Taken into Consideration (overall)	(less) Population Incorporated in Municipal Wards as Result of Administrative District Demarcation
Year	0,000	0,000	%	0,000	0,000
1999	739	536	72.7%	537	1
2000	746	542	72.9%	544	2
2001	750	548	73.1%	548	0
2002	755	554	73.3%	554	0
2003	760	560	73.5%	560	0
2004	764	566	73.7%	566	0
2005	768	572	73.9%	572	0
2006	773	579	74.1%	579	0
2007	778	585	74.4%	585	0
2008	782	591	74.6%	591	0
2009	787	598	74.8%	598	0
2010	792	605	75.0%	605	0

Source: Prepared by JICA Study Team, based on various data

Based on the principles mentioned in the previous pages, a future stock population has been estimated as contributing to the demand for housing in each of the cities and then the total demand in the future. As a result, Shanghai will have a municipal ward population increase by 620 thousand for a decade, from 11.07 million persons in 2001 to 11.69 in 2010. In Chengdu, 3,63 million in 2002 will increase to 5.31 million in 2010, a growth by 1.68 million for the decade. In Wuhan, the decade will have an increase of 0.57 million in municipal ward population, or from 5.48 million in 2001 to 6.05 million in 2010.

2.5.4. Outlook of Housing Area Stock (effective construction area) and Number-of-houses Stock in the Future

(1) Outlook of housing area stock (effective construction area) and stock in number of houses in the future

A per-capita housing area (effective construction area) from 2001 to 2010 has been discussed in 3-2-2 while a municipal ward population without any administrative district demarcation taken into account has been studied in 3-3-3. Multiplying the effective building area by this municipal ward population gives a future value of the housing area (stock) in terms of Population/Number-of-Households factor. As a result, the “housing area without administrative district demarcation” contributing to the demand for housing in Shanghai is estimated to grow from 196.42 million m² to 392.01 million m², showing an increase by approximately 105.59 million m² for the decade. In Chengdu, this housing area is expected to grow from 55.95 million m² in 2001 to 98.76 million m² in 2010, showing an increase by 42.1

million m² for the decade. In Wuhan, the housing area without administrative district demarcation is predicted to grow from 71.7 million m² in 2001 to 113.29 million m² in 2010, showing an increase by 41.59 million m².

Table 2-21 Outlook of Housing Stock Area (effective construction area) in the Future

Year	Shanghai			Chengdu			Wuhan		
	Housing Area, without Administrative District Demarcation	Housing Area with Administrative District Demarcation Taken into Consideration (overall)	(less) Housing Area Incorporated in Municipal Wards as Result of Administrative District Demarcation	Housing Area, without Administrative District Demarcation	Housing Area with Administrative District Demarcation Taken into Consideration (overall)	(less) Housing Area Incorporated in Municipal Wards as Result of Administrative District Demarcation	Housing Area, without Administrative District Demarcation	Housing Area with Administrative District Demarcation Taken into Consideration (overall)	(less) Housing Area Incorporated in Municipal Wards as Result of Administrative District Demarcation
	0,000 m ²	0,000 m ²	0,000 m ²	0,000 m ²	0,000 m ²	0,000 m ²	0,000 m ²	0,000 m ²	0,000 m ²
1999	17,618	17,770	151	4,817	4,817	0	6,379	6,389	10
2000	18,601	18,920	319	5,193	5,361	168	6,758	6,779	21
2001	19,642	20,001	359	5,595	5,908	313	7,170	7,173	3
2002	20,744	21,146	402	6,027	6,507	481	7,619	7,619	0
2003	21,911	22,359	449	6,488	7,165	676	8,106	8,106	0
2004	23,146	23,646	499	6,983	7,885	902	8,636	8,636	0
2005	24,454	25,009	554	7,513	8,683	1,170	9,214	9,214	0
2006	25,716	26,327	611	8,059	9,523	1,464	9,677	9,677	0
2007	26,940	27,608	669	8,592	10,391	1,799	10,111	10,111	0
2008	28,141	28,870	729	9,081	11,228	2,147	10,530	10,530	0
2009	29,269	30,057	789	9,521	12,046	2,525	10,933	10,933	0
2010	30,201	31,054	853	9,876	12,774	2,898	11,329	11,329	0

Source: JICA Study Team

(2) Outlook of number of houses (stock) by population/number-of-households factor

A future value of the municipal ward population discussed in 3-3-3 has been divided by the per-house population (number of members per house) to obtain the number of houses (stock) in terms of Population/Number of-of-Households factor. In Shanghai, therefore, it will grow from 4.01 million houses in 2001 to 4.76 million houses, showing an increase by 750 thousand houses for the decade. In Chengdu, the stock is expected to grow from 1.13 million houses in 2001 to 1.42 million in 2010, showing an increase by 290 thousand houses for the decade. In Wuhan, it will grow from 1.65 million houses in 2001 to 1.95 million in 2010, showing an increase by 300 thousand houses for the decade.

Table 2-22 Outlook of Number-of-Houses in the Future

Year	Shanghai			Chengdu			Wuhan		
	Municipal Ward Population (except for Administrative District Demarcation factor)	Number of Houses in Municipal Wards	Population per House in Municipal Wards (mean growth rate since '98, with Year 2010 Value Established)	Municipal Ward Population (except for Administrative District Demarcation factor)	Number of Houses in Municipal Wards	市区部戸数当り人口 (80～99年迄の1.27%が継続すると設定)	Municipal Ward Population (except for Administrative District Demarcation factor)	Number of Houses in Municipal Wards	Population per House in Municipal Wards (mean growth rate since '98, with Year 2010 Value Established)
	0,000 persons	0,000 houses	persons/house	0,000 persons	0,000 houses	persons/house	0,000 persons	0,000 houses	persons/house
1999	1,076	386	2.79	330	107	3.09	536	158	3.38
2000	1,081	393	2.75	337	110	3.07	542	162	3.36
2001	1,087	401	2.71	344	113	3.05	548	165	3.33
2002	1,092	409	2.67	351	115	3.04	554	168	3.30
2003	1,098	416	2.64	358	118	3.02	560	171	3.28
2004	1,103	424	2.60	365	122	3.00	566	174	3.25
2005	1,109	433	2.56	372	125	2.98	572	177	3.23
2006	1,114	441	2.53	379	128	2.97	579	181	3.20
2007	1,120	449	2.49	387	131	2.95	585	184	3.17
2008	1,125	458	2.46	395	135	2.93	591	188	3.15
2009	1,131	467	2.42	403	138	2.92	598	191	3.12
2010	1,137	476	2.39	411	142	2.90	605	195	3.10

Source: JICA Study Team

2.5.5. Outlook of Housing Area (flow) and Number of Houses (flow) by Reconstruction/Redevelopment Factor

(1) Specifying an area to reconstruct

It was difficult to obtain the information about the redevelopment (with growth rate owing to an area ratio or the like taken into consideration) out of the statistic information relating to redevelopment factors. According to the hearing from the Ministry of Construction, moreover, the reconstruction/redevelopment area (flow) is generally said to occupy less than 2% (approx. 1.5%) of the preceding year's effective construction area. At present, the 1.5% of the "housing area stock without administrative district demarcation" will be used as reconstruction/redevelopment area (flow). In Chengdu and Wuhan, likewise, 2.0% of the "housing area stock without administrative district demarcation" is used for reconstruction/rebuilding.

(2) Prediction of reconstruction area/redevelopment area

The table 3-11 shows the results of predicting a reconstruction/redevelopment area (flow) in the future city by city. Shanghai will have a reconstruction/redevelopment area increasing from 2.29 million m² in 2001 to 4.39 million m²/year, showing an annual growth rate of approximately 210 m²/year during the decade. In Chengdu, 1.04 million m² in 2001 will grow to 1.9 million m² in 2010, showing an increase by approximately 0.92 million m². In Wuhan, 1.35 million m² in 2001 will grow to 2.3 million m² in 2010, an increase by 0.84 million during the decade.

Table 2-23 Prediction of Reconstruction/Redevelopment Area in the Future

	Shanghai	Chengdu	Wuhan
	0,000m ² /year		
1999	261	91	117
2000	264	96	128
2001	279	104	135
2002	295	112	143
2003	311	121	152
2004	329	130	162
2005	347	140	173
2006	367	150	184
2007	386	161	194
2008	404	172	202
2009	422	182	211
2010	439	190	219

Source: Prepared by JICA Study Team, based on various statistics and on the hearings from the Ministry of Construction

(3) Housing area per house

To convert the above-mentioned housing area by Reconstruction/Redevelopment factor to the number of households, the “per-capita stock area (effective construction area)” is multiplied by a “population per house” to arithmetically obtain a “housing area per house.” It should be noted, moreover, that the area is a mean value of all the houses, including the existing ones.

Table 2-24 Prediction of Housing Area per House in the Future

	Shanghai	Chengdu	Wuhan
	m ² /house		
1999	45.6	45.0	40.2
2000	47.3	47.3	41.8
2001	49.0	49.7	43.6
2002	50.8	52.2	45.4
2003	52.6	54.8	47.4
2004	54.5	54.5	49.6
2005	56.5	60.3	51.9
2006	58.3	63.0	53.5
2007	60.0	65.5	54.9
2008	61.5	67.5	56.1
2009	62.7	69.0	57.1
2010	63.5	69.7	58.1

Source: JICA Study Team

(4) Outlook of number of houses (flow) by reconstruction/redevelopment

The found housing area combined with the reconstruction/redevelopment factor, has been divided by the above-mentioned housing area per house to obtain arithmetically the future value of the number of houses (flow) according the Reconstruction/Redevelopment factor. Consequently, it is expected that Shanghai will have a demand for housing at a rate of 56-69 thousand houses per year in concomitance with the reconstruction/redevelopment activities. Likewise, Chengdu is expected to have a demand for housing at 20-27 thousand houses/year and Wuhan 29-38 thousand houses a year and reconstruction/redevelopment activity.

Table 2-25 Outlook of Number of Houses (flow) by Reconstruction/Redevelopment Factor

	Shanghai	Chengdu	Wuhan
	0,000 houses/year		
1999	5.7	2.0	2.9
2000	5.6	2.0	3.0
2001	5.7	2.1	3.1
2002	5.8	2.1	3.2
2003	5.9	2.2	3.2
2004	6.0	2.4	3.3
2005	6.1	2.3	3.3
2006	6.3	2.4	3.4
2007	6.4	2.5	3.5
2008	6.6	2.5	3.6
2009	6.7	2.6	3.7
2010	6.9	2.7	3.8

Source: JICA Study Team

2.6. Outlook of Housing Demand Area and Number of Houses Demanded (summary)

2.6.1. Demand Prediction Results (base case)

In the following tables there is a summary of the predictions on the housing demand area and the number of houses demanded in three cities until the 2010.

Shanghai is expected to have a housing demand of approximately 151.79 million m² or about 1.45 million houses from 2001 to 2010. Chengdu is expected to have a housing demand of approximately 61.44 million m² or about 560 thousand houses from 2001 to 2010. Wuhan is expected to have a housing demand of approximately 63.46 thousand m² or about 680 thousand houses.

The demand area flow of 151.79 m² divided by the demand flow of 1.45 million houses in Shanghai gives 105 m² per house. The “housing area per house” already referred to is predicted to reach 60.7 m² per house in 2010. This is a mean value of the total stock, including the existing houses.

To raise the total stock average of 47.8 m²/house (converted to a per-capita dwelling area of approximately 10 m²/per person) in 2001 to a total stock average of 60.7 m²/house (converted to a per-capita dwelling area of approximately 16 m²/person) within the 2010, it is obviously necessary to actualize a housing demand flow of 105 m²/house on a construction area basis during this period.

The surveyed developers answered that their apartment sales for the last year, regardless the city, showed a housing demand concentrated on the sizes of around 100-120 m² for an apartment and approximately 90 m² for an ordinary house. The above-mentioned demand prediction results reflect the market trends at the bottom.

Table 2-26 Outlook of Housing Demand Area and Housing Demand Number of Houses (Shanghai)

Shanghai	Municipal Total Population	Municipal Ward Population with Administrative District Demarcation Taken into Consideration (overall)	(less) Municipal Ward Population without Taking Administrative District Demarcation into Consideration	(less) Population Incorporated in Municipal Wards as Result of Administrative District Demarcation	Per-capita Housing Stock Area (effective construction area)	Housing Area, with Administrative District Demarcation Taken into Consideration (overall)	(less) Housing Area without Administrative District Demarcation (overall)	(less) Housing Area Incorporated in Municipal Wards, with Administrative District Demarcated	Reconstruction/Redevelopment Flow	Per-house Population in Municipal Wards (on the assumption that -1.64% from '80 thru '98 will last)	Number of Houses in Municipal Wards, with Administrative District Demarcation Taken into Consideration	(less) Number of Houses Stock in Municipal Wards, without Taking Administrative District Demarcation	(less) Number of Houses Incorporated in Municipal Wards, with Administrative District Demarcated	Number of Houses Reconstructed/Re developed
	0,000 persons	0,000 persons	0,000 persons	0,000 persons	m ² /person	0,000m ²	0,000m ²	0,000m ²	0,000m ²	persons/house	0,000 houses	0,000 houses	0,000 houses	0,000 houses
1985	1,217				9.2					3.54				
1986	1,232				10.3					3.44				
1987	1,250				10.7					3.34				
1988	1,262				11.0					3.24				
1989	1,276				11.0					3.18				
1990	1,283				11.4					3.13				
1991	1,287				11.7					3.03				
1992	1,289				11.9					2.98				
1993	1,295				10.8					2.98				
1994	1,299				11.6					2.94				
1995	1,301				12.4					2.90				
1996	1,304				13.7					2.86				
1997	1,305				14.8					2.85				
1998	1,307				16.3					2.83				
1999	1,320	1,085	1,076	9.2	16.4	17,770	17,618	151	261	2.79	389	386	3.3	5.7
2000	1,334	1,100	1,081	18.5	17.2	18,920	18,601	319	264	2.75	400	393	6.7	5.6
2001	1,338	1,107	1,087	19.8	18.1	20,001	19,642	359	279	2.71	408	401	7.3	5.7
2002	1,342	1,113	1,092	21.2	19.0	21,146	20,744	402	295	2.67	417	409	7.9	5.8
2003	1,346	1,120	1,098	22.5	20.0	22,359	21,911	449	311	2.64	425	416	8.5	5.9
2004	1,350	1,127	1,103	23.8	21.0	23,646	23,146	499	329	2.60	434	424	9.2	6.0
2005	1,354	1,134	1,109	25.1	22.1	25,009	24,454	554	347	2.56	442	433	9.8	6.1
2006	1,358	1,141	1,114	26.5	23.1	26,327	25,716	611	367	2.53	451	441	10.5	6.3
2007	1,362	1,148	1,120	27.8	24.1	27,608	26,940	669	386	2.49	460	449	11.2	6.4
2008	1,366	1,155	1,125	29.1	25.0	28,870	28,141	729	404	2.46	470	458	11.9	6.6
2009	1,370	1,161	1,131	30.5	25.9	30,057	29,269	789	422	2.42	479	467	12.6	6.7
2010	1,375	1,169	1,137	32.1	26.6	31,054	30,201	853	439	2.39	489	476	13.4	6.9

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Source: JICA Study Team

Table 2-27 Outlook of Housing Demand Area and Housing Demand Number of Houses (Chengdu)

Chengdu	Municipal Total Population	Municipal Ward Population with Administrative District Demarcation Taken into Consideration (overall)	(less) Municipal Ward Population without Taking Administrative District Demarcation into Consideration	(less) Population Incorporated in Municipal Wards as Result of Administrative District Demarcation	Per-capita Housing Stock Area (effective construction area)	Housing Area, with Administrative District Demarcation Taken into Consideration (overall)	(less) Housing Area without Administrative District Demarcation (overall)	(less) Housing Area Incorporated in Municipal Wards, with Administrative District Demarcated	Reconstruction/R edevelopment Flow	Per-house Population in Municipal Wards (on the assumption that -1.27% from '80 thru '99 will last)	Number of Houses in Municipal Wards, with Administrative District Demarcation Taken into Consideration	(less) Number of Houses Stock in Municipal Wards, without Taking Administrative District Demarcation	(less) Number of Houses Incorporated in Municipal Wards, with Administrative District Demarcated	Number of Houses Reconstructed/Re developed
	0,000 persons	0,000 persons	0,000 persons	0,000 persons	m ² /person	0,000m ²	0,000m ²	0,000m ²	0,000m ²	persons/house	0,000 houses	0,000 houses	0,000 houses	0,000 houses
1985	863				7.8					3.74				
1986	875				8.1					3.71				
1987	887				8.4					3.65				
1988	899				8.8					3.59				
1989	909				8.9					3.51				
1990	920				9.1					3.46				
1991	928				9.2					3.44				
1992	937				10.3					3.39				
1993	947				10.2					3.39				
1994	960				10.0					3.36				
1995	972				11.2					3.32				
1996	981				12.1					3.27				
1997	989				13.0					3.22				
1998	997				14.0					3.19				
1999	1,004	330	330	0.0	14.6	4,817	4,817	0	91	3.09	107	107	0.0	2.0
2000	1,020	348	337	10.9	15.4	5,361	5,193	168	96	3.07	113	110	3.6	2.0
2001	1,030	363	344	19.2	16.3	5,908	5,595	313	104	3.05	119	113	6.3	2.1
2002	1,040	378	351	28.0	17.2	6,507	6,027	481	112	3.04	125	115	9.2	2.1
2003	1,050	395	358	37.3	18.1	7,165	6,488	676	121	3.02	131	118	12.3	2.2
2004	1,060	412	365	47.1	19.1	7,885	6,983	902	130	3.00	137	122	15.7	2.4
2005	1,070	430	372	57.9	20.2	8,683	7,513	1,170	140	2.98	144	125	19.4	2.3
2006	1,076	448	379	68.9	21.2	9,523	8,059	1,464	150	2.97	151	128	23.2	2.4
2007	1,082	468	387	81.0	22.2	10,391	8,592	1,799	161	2.95	159	131	27.5	2.5
2008	1,088	488	395	93.3	23.0	11,228	9,081	2,147	172	2.93	166	135	31.8	2.5
2009	1,094	509	403	106.8	23.6	12,046	9,521	2,525	182	2.92	175	138	36.6	2.6
2010	1,100	531	411	120.5	24.0	12,774	9,876	2,898	190	2.90	183	142	41.6	2.7

Source: JICA Study Team

Table 2-28 Outlook of Housing Demand Area and Housing Demand Number of Houses (Wuhan)

Wuhan	Municipal Total Population	Municipal Ward Population with Administrative District Demarcation Taken into Consideration (overall)	(less) Municipal Ward Population without Taking Administrative District Demarcation into Consideration	(less) Population Incorporated in Municipal Wards as Result of Administrative District Demarcation	Per-capita Housing Stock Area (effective construction area)	Housing Area, with Administrative District Demarcation Taken into Consideration (overall)	(less) Housing Area without Administrative District Demarcation (overall)	(less) Housing Area Incorporated in Municipal Wards, with Administrative District Demarcated	Reconstruction/Redevelopment Flow	Per-house Population in Municipal Wards (on the assumption that -1.14% from '80 thru '99 will last)	Number of Houses in Municipal Wards, with Administrative District Demarcation Taken into Consideration	(less) Number of Houses Stock in Municipal Wards, without Taking Administrative District Demarcation	(less) Number of Houses Incorporated in Municipal Wards, with Administrative District Demarcated	Number of Houses Reconstructed/Re-developed
	0,000 persons	0,000 persons	0,000 persons	0,000 persons	m ² /person	0,000m ²	0,000m ²	0,000m ²	0,000m ²	persons/house	0,000 houses	0,000 houses	0,000 houses	0,000 houses
1985	608				7.9					3.82				
1986	620				9.3					3.77				
1987	629				9.4					3.69				
1988	642				9.5					3.65				
1989	653				9.8					3.58				
1990	670				10.0					3.53				
1991	677				10.3					3.43				
1992	685				10.4					3.40				
1993	692				10.5					3.38				
1994	700				10.9					3.38				
1995	710				11.3					3.39				
1996	716				10.3					3.44				
1997	724				10.6					3.43				
1998	732				11.0					3.41				
1999	755	537	536	0.9	11.9	6,389	6,379	10	117	3.38	159	158	0.3	2.9
2000	779	544	542	1.7	12.5	6,779	6,758	21	128	3.36	162	162	0.5	3.0
2001	784	548	548	0.2	13.1	7,173	7,170	3	135	3.33	165	165	0.1	3.1
2002	788	554	554	0.0	13.8	7,619	7,619	0	143	3.30	168	168	0.0	3.2
2003	793	560	560	0.0	14.5	8,106	8,106	0	152	3.28	171	171	0.0	3.2
2004	798	566	566	0.0	15.3	8,636	8,636	0	162	3.25	174	174	0.0	3.3
2005	803	572	572	0.0	16.1	9,214	9,214	0	173	3.23	177	177	0.0	3.3
2006	808	579	579	0.0	16.7	9,677	9,677	0	184	3.20	181	181	0.0	3.4
2007	813	585	585	0.0	17.3	10,111	10,111	0	194	3.17	184	184	0.0	3.5
2008	818	591	591	0.0	17.8	10,530	10,530	0	202	3.15	188	188	0.0	3.6
2009	823	598	598	0.0	18.3	10,933	10,933	0	211	3.12	191	191	0.0	3.7
2010	829	605	605	0.0	18.7	11,329	11,329	0	219	3.10	195	195	0.0	3.8

Source: JICA Study Team

2.7. How to Define “Re-housing Behavior” and “Fluidized Population” in Demand for Housing

2.7.1. How to Define “Re-housing Behavior”

In this section, the findings in the questionnaire survey was used to analyze the demand for housing, in light of the concept of “re-housing,” “from rental housing to private home owner or vice versa.” The illustration given on the next page is a schematic concept of re-housing by residents between privately owned house and rental housing. The housing stock has been classified into privately owned and rental housing by the residents in the questionnaire. (Refer to the illustration given below.)

Table 2-29 Types of Ownership in Dwellings Currently Occupied

Type of Housing Ownership	Wuhan	Chengdu	Shanghai
1. State-owned enterprises' corporate housing	40.8	20.5	8.8
2. Private enterprises' corporate housing	0.8	0.6	0.8
3. Foreign capital corporate housing	0.6	0.1	1.7
4. Private rental housing	5.7	6.7	4.0
5. Private ownership	46.5	64.0	63.1
6. Miscellaneous	5.6	8.1	21.6
Total	100.0	100.0	100.0

Source: Questionnaire, JICA Study Team

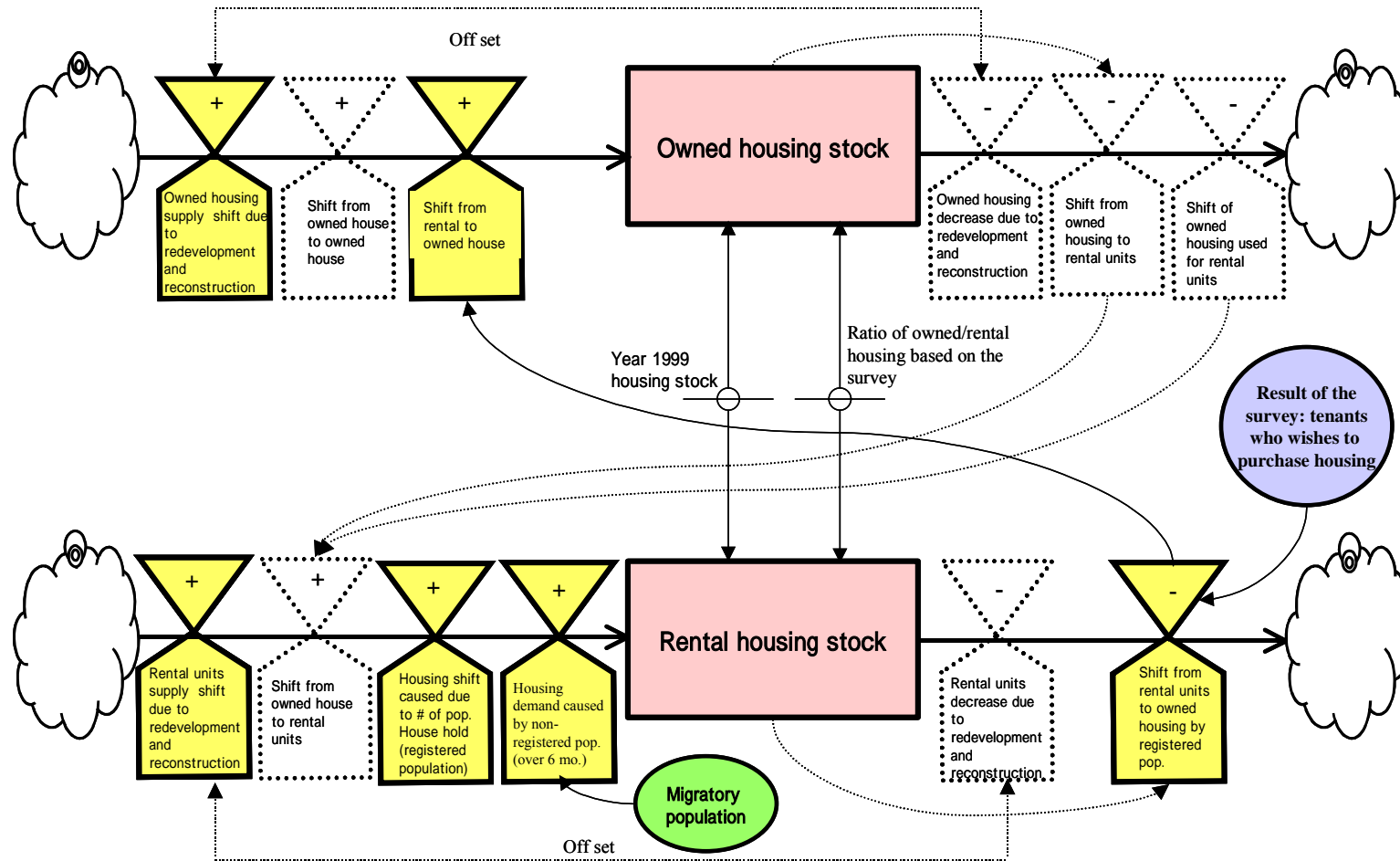
The housing demand arising from an increase in population or in number of households represents young couples’ demand for housing addressed through rentals. Every year, a “flow of re-housing from rentals to privately owned housing” comes from the rental housing stock. In other words, this flow is excluded from the rental housing stock and it is directly supplied by the privately owned housing stock as a “flow of re-housing from rental to privately owned housing”. The questionnaire survey findings was used to determine the ratio of who is living in rental housing but desire to own a private housing. This ratio is used to determine a re-housing transfer probability.

Table 2-30 Re-housing Transfer Probability from Entails to Privately Owned Housing

		1. Desire to acquire	2. Acquire with conditions satisfied	3. No desire to acquire	Total
Shanghai	1. Rental housing	11.0%	55.9%	33.1%	100.0%
	2. Owned housing	12.1%	40.7%	47.2%	100.0%
	Total	11.9%	43.7%	44.5%	100.0%
Chengdu	1. Rental housing	8.4%	51.8%	39.8%	100.0%
	2. Owned housing	6.1%	42.2%	51.8%	100.0%
	Total	6.8%	45.1%	48.1%	100.0%
Wuhan	1. Rental housing	10.9%	60.4%	28.7%	100.0%
	2. Owned housing	9.1%	43.3%	47.6%	100.0%
	Total	10.0%	51.8%	38.2%	100.0%

Source: Questionnaire, JICA Study Team

Figure 2-5 How to Grasp Privately Owned and Rental Housing, with Re-housing Behavior and Inflow Population Reflected (Image Schematic)



The privately owned housing and the rental housing had a stock in 1999 in a quantity proportional to the private leases and rentals found in the questionnaire (on a fifty-to-fifty basis). The reconstruction/redevelopment flow was equally distributed (to a proportional ratio of 50 to 50%).

The housing supply flow in combination with reconstruction and redevelopment is offset by the housing stock flow with reconstruction and redevelopment (without contributing to an increase in stock). It is necessary, however, to count both flows to define the demand for housing.

The rental housing stock obtained should be multiplied annually by the probability with which rentals move to privately owned housing, subtracted from the rental housing stock, and then added to the privately owned housing stock.

In addition, another flow, such as “Privately owned housing is supplied as rentals rather than sold,” can be considered but it involves difficulties in grasping its specific numerical value and it has not been included in the calculation reported herein.

Besides, a privately owned housing stock may be theoretically considered to have a flow due to the transfer from privately owned housing to rentals or supply of privately owned housing as rentals, however, such flow is also difficult to be numerically quantified.

2.7.2. How to Grasp Demand for Rental Housing, in the Context of a Fluidized Population

This section focused on the demand for rental housing and the increase in population inflow. As referred previously, the inflow population has been showing a numerical incremental tendency in all of the cities. The non-registered workers (fluidized population) contribute in supporting urban activities and they should be provided of adequate dwelling facilities.

Findings based on talks with specialists and experts of the housing market, have proven that housing administration authorities have not currently taken adequate measures to implement any housing measures for the fluidized population to let them to refer to the market.

Assumed that at least the long-term resident (staying for approximately 6 months as non-registered) of the fluidized population has their “demand for housing actualized”, it is classified as a latent demand whether or not administrative measure or other kind of measures may be taken.

According to the findings in the fluidized population survey made in the province of Chengdu in 1998, approximately half (47%) of the inflow long-term staying population lived in rental housing. Consequently, it has been set herein that 50 percent of the long-term resident in each city demand for housing. More specifically, the registered population stock is subtracted from a permanent resident population stock to obtain a stock of the residents staying for a long

term of six months or more on a city by city basis. Now, it has been set that fifty percent of them have the demand for one rental house. Then, a difference between number of houses and stock every year has been obtained to calculate the number-of-demanded-houses flow.

The long-term residents working away from home are in an independent situation in many cases. It is fully likely that two or more workers away from home may dwell in one rental house. As far as long-term residents are concerned, therefore, the number of members per rental house may well be deemed to exceed one person per house. Nevertheless, it is impossible to obtain accurate statistical data in this respect. So, the number of members per rental house for long-term residents has been set here to 1.5 persons per house. For the decade 2001/2010, therefore, it is expected that Shanghai will have a rental housing demand of 352 thousand houses, Chengdu 318 thousand and Wuhan 183 thousand houses.

Table 2-31 Outlook of Long-term Staying Non-registered Population and Demand for Rental Housing as Seen in Each City

Shanghai		Year	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Normally Resident Population	0,000 persons	1,677	1,690	1,703	1,716	1,729	1,743	1,757	1,772	1,786	1,800	
Registered Population	0,000 persons	1,338	1,342	1,346	1,350	1,354	1,358	1,362	1,367	1,371	1,375	
Long-term Staying and Nonregistered Population	0,000 persons	339	348	357	366	375	385	395	405	415	425	
Number of Demanded Rental Houses flow (nonregistered)	0,000 houses/year	3.0	3.0	3.0	3.0	3.0	3.3	3.3	3.3	3.3	3.3	

Chengdu		Year	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Normally Resident Population	0,000 persons	1,156	1,172	1,188	1,204	1,220	1,236	1,252	1,268	1,284	1,300	
Registered Population	0,000 persons	1,027	1,034	1,042	1,049	1,056	1,063	1,071	1,078	1,086	1,093	
Long-term Staying and Nonregistered Population	0,000 persons	129	138	146	155	164	173	181	190	198	207	
Number of Demanded Rental Houses flow (nonregistered)	0,000 houses/year	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	

Wuhan		Year	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Normally Resident Population	0,000 persons	840	850	859	869	878	888	898	907	917	927	
Registered Population	0,000 persons	750	755	759	764	768	773	778	782	787	792	
Long-term Staying and Nonregistered Population	0,000 persons	90	95	100	105	110	115	120	125	130	135	
Number of Demanded Rental Houses flow (nonregistered)	0,000 houses/year	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	

Note: A flow of the number of houses demanded has had the demand set to 1.5 houses per long-term non-registered resident.

Source: JICA Study Team

2.7.3. Outlook of Privately Owned Housing and Rental Housing in the Future, with Re-housing Behavior and Fluidized Population Reflected

The stock of the rental housing has been predicted using the following flows:

- “Supply rental housing in response to an increase in population/number of households.”
- “Transfer from rentals to privately owned housing (primary acquisition).”
- “Demand for rental housing out of long residents in the fluidized population.”
- Besides, the stock of privately owned housing has been predicated using:
- “Transfer from rentals to privately owned housing.

A difference in stock between privately owned housing and rentals plus a flow of housing supplies coupled with reconstruction/redevelopment have been taken for a housing demand flow. (Refer to Table 3-21 given in the following page.)

According to the results of the prediction, Shanghai has the demand for privately owned housing estimated at approximately 1,128 thousand houses and for rental housing at about 636 thousand houses, both for the decade of 2001/2010. Likewise, Chengdu has the demand for privately owned housing estimated at roughly 406 thousand houses and for rental housing at nearly 442 thousand houses. Wuhan has the demand for privately owned housing estimated at approximately 801 thousand houses and for rental housing at about 42 thousand houses.

Table 2-32 Outlook of Privately Owned Housing and Rental Housing in the Future, with Re-housing Behavior and Fluidized Population Reflected

		Privately Owned Housing						Rental Housing								
		Flow: Transfer from Rentals to Privately Owned Housing, number of houses	(less) new apartment houses	(less) existing apartment houses	(less) new ordinary houses	(less) existing ordinary houses	Privately Owned Housing Stock, number of houses	Privately Owned Houses in Reconstruction and Redevelopment	Privately Owned Housing	Population/Number of Households, number of houses	Demand for Housing by Those Staying more than 6 Months	Transfer from Rentals (registered) to Privately Owned Housing, number of houses	Rental Housing (registered), number of houses	Privately Owned Portion of Houses Rebuilt and	Privately Owned Housing (registered)	Demand for Rental Corporate Housing
		0,000 houses														
Shanghai	1999	-	-	-	-	-	315.9	2.9	-	-	-	-	75.8	2.9	-	-
	2000	8.4	1.6	0.3	5.6	0.9	324.3	2.8	11.2	7.4	3.5	8.4	74.9	2.8	1.8	5.4
	2001	8.3	1.5	0.3	5.5	0.9	332.6	2.8	11.1	7.5	3.0	8.3	74.1	2.8	2.1	5.1
	2002	8.2	1.5	0.3	5.5	0.9	340.7	2.9	11.1	7.7	3.0	8.2	73.6	2.9	2.4	5.4
	2003	8.1	1.5	0.3	5.4	0.9	348.9	3.0	11.1	7.8	3.0	8.1	73.3	3.0	2.7	5.7
	2004	8.1	1.5	0.3	5.4	0.9	357.0	3.0	11.1	8.0	3.0	8.1	73.2	3.0	2.9	5.9
	2005	8.1	1.5	0.3	5.4	0.9	365.0	3.1	11.1	8.1	3.0	8.1	73.3	3.1	3.1	6.1
	2006	8.1	1.5	0.3	5.4	0.9	373.1	3.1	11.2	8.3	3.3	8.1	73.5	3.1	3.3	6.7
	2007	8.1	1.5	0.3	5.4	0.9	381.2	3.2	11.3	8.4	3.3	8.1	73.8	3.2	3.6	6.9
	2008	8.1	1.5	0.3	5.4	0.9	389.4	3.3	11.4	8.6	3.3	8.1	74.3	3.3	3.7	7.1
	2009	8.2	1.5	0.3	5.5	0.9	397.6	3.4	11.6	8.8	3.3	8.2	74.8	3.4	3.9	7.3
2010	8.3	1.5	0.3	5.5	0.9	405.8	3.5	11.7	8.9	3.3	8.3	75.5	3.5	4.1	7.5	
		81.5	15.2	2.7	54.5	9.1		31.3	112.8	82.2	31.7	81.5		31.3	31.9	63.6
Chengdu	1999	-	-	-	-	-	75.9	1.0	-	-	-	-	33.1	1.0	-	-
	2000	2.8	1.0	0.1	1.6	0.1	78.6	1.0	3.8	2.8	2.8	2.8	33.1	1.0	1.0	3.8
	2001	2.8	1.0	0.1	1.6	0.1	81.4	1.0	3.8	2.8	2.9	2.8	33.1	1.0	1.1	4.0
	2002	2.8	1.0	0.1	1.6	0.1	84.2	1.1	3.9	2.9	2.9	2.8	33.3	1.1	1.2	4.1
	2003	2.8	1.0	0.1	1.7	0.1	87.0	1.1	3.9	3.0	2.9	2.8	33.5	1.1	1.3	4.2
	2004	2.8	1.0	0.1	1.7	0.1	89.8	1.2	4.0	3.1	2.9	2.8	33.7	1.2	1.4	4.4
	2005	2.8	1.0	0.1	1.7	0.1	92.6	1.2	4.0	3.1	2.9	2.8	34.0	1.2	1.5	4.4
	2006	2.9	1.0	0.1	1.7	0.1	95.5	1.2	4.0	3.2	2.9	2.9	34.4	1.2	1.6	4.4
	2007	2.9	1.1	0.1	1.7	0.1	98.4	1.2	4.1	3.3	2.9	2.9	34.8	1.2	1.6	4.5
	2008	2.9	1.1	0.1	1.7	0.1	101.3	1.3	4.2	3.4	2.9	2.9	35.3	1.3	1.7	4.6
	2009	3.0	1.1	0.1	1.8	0.1	104.3	1.3	4.3	3.5	2.9	3.0	35.8	1.3	1.8	4.7
2010	3.0	1.1	0.1	1.8	0.1	107.3	1.4	4.4	3.6	2.9	3.0	36.4	1.4	1.9	4.8	
		28.6	10.5	0.6	17.0	0.5		11.9	40.6	31.9	29.0	28.6		11.9	15.2	44.2
Wuhan	1999	-	-	-	-	-	81.1	1.4	-	-	-	-	80.3	1.4	-	-
	2000	8.7	2.9	0.5	4.9	0.4	89.8	1.5	10.3	3.0	1.7	8.7	74.6	1.5	-4.2	-2.5
	2001	8.1	2.7	0.5	4.6	0.4	97.9	1.6	9.7	3.1	1.7	8.1	69.6	1.6	-3.5	-1.8
	2002	7.6	2.5	0.4	4.3	0.4	105.5	1.6	9.1	3.1	1.7	7.6	65.1	1.6	-2.8	-1.2
	2003	7.1	2.4	0.4	4.0	0.3	112.6	1.6	8.7	3.2	1.7	7.1	61.2	1.6	-2.3	-0.6
	2004	6.7	2.2	0.4	3.7	0.3	119.2	1.6	8.3	3.3	1.7	6.7	57.8	1.6	-1.8	-0.1
	2005	6.3	2.1	0.4	3.5	0.3	125.5	1.7	8.0	3.3	1.7	6.3	54.9	1.7	-1.3	0.4
	2006	6.0	2.0	0.3	3.4	0.3	131.5	1.7	7.7	3.4	1.7	6.0	52.3	1.7	-0.9	0.8
	2007	5.7	1.9	0.3	3.2	0.3	137.2	1.8	7.4	3.4	1.7	5.7	50.0	1.8	-0.5	1.2
	2008	5.4	1.8	0.3	3.1	0.3	142.6	1.8	7.2	3.5	1.7	5.4	48.1	1.8	-0.1	1.5
	2009	5.2	1.7	0.3	2.9	0.2	147.8	1.8	7.1	3.6	1.7	5.2	46.5	1.8	0.2	1.9
2010	5.0	1.7	0.3	2.8	0.2	152.9	1.9	6.9	3.6	1.7	5.0	45.1	1.9	0.5	2.1	
		63.1	20.9	3.7	35.5	3.0		17.0	80.1	33.5	16.7	63.1		17.0	-12.5	4.2

Source: JICA Study Team

2.7.4. Re-housing Behaviors Actualized

A flow of the transfer from rentals to privately owned housing has been calculated on the assumption that the “Desire to Acquire Privately Owned Housing” expressed in each of the three cities in the JICA Questionnaire Survey could be realized.

Even if the “desire to acquire privately owned housing” should be really cherished, the transfer may be practically unfeasible due to the limitation in fund raising as discussed in “4-2-4 Calculating wholesome Housing Demand”. Calculated here, however, is a requirement for houses demanded, with the actualization ratio tentatively set to 50%.

According to the results of predication, Shanghai has the demand for privately owned housing estimated at 826 thousand houses and for rental housing at 938 thousand houses for a the decade of 2001/2010. As compared with the above-mentioned case at an actualization ratio of 100%, the rentals have increased by 302 thousand (with a flow of the transfer from rentals to privately owned housing decreased by approximately 302 thousand houses).

Likewise, Chengdu has the demand for privately owned housing estimated at 291 thousand houses and for rentals estimated at 557 thousand. As compared with the case at an actualization rate of 100%, rentals have increased by approximately 115 thousand houses (as flow of the transfer from rentals to privately owned housing decreased by approximately 115 thousand houses).

Wuhan has the demand for privately owned housing estimated at 577 thousand houses and for rentals at about 265 thousand. As compared with the case at an actualization rate of 100%, rentals have increased by approximately 224 thousand houses (with a flow of the transfer from rentals to privately owned housing decreased by approximately 224 thousand houses).

Table 2-33 Outlook of Demand for Housing in the Future, with Re-housing Taken into Consideration (with the transfer from rentals to privately owned housing actualized at 50%)

		Privately Owned Housing						Rental Housing						Demand for Rental Corporate Housing		
		Flow: Transfer from Rentals to Privately Owned Housing, number of houses	(less) new apartment houses	(less) existing apartment houses	(less) new ordinary houses	(less) existing ordinary houses	Privately Owned Housing Stock, number of houses	Privately Owned Houses in Reconstruction and Redevelopment	Privately Owned Housing	Population/Number of Households, number of houses	Demand for Housing by Those Staying more than 6 Months	Transfer from Rentals (registered) to Privately Owned Housing, number of houses	Rental Housing (registered), number of houses		Privately Owned Portion of Houses Rebuilt and	Privately Owned Housing (registered)
		0,000 houses														
Shanghai	1999	-	-	-	-	-	315.9	2.9	-	-	-	-	75.8	2.9	-	-
	2000	4.2	0.8	0.1	2.8	0.5	320.1	2.8	7.0	7.4	3.5	4.2	79.0	2.8	6.0	9.5
	2001	4.4	0.8	0.1	2.9	0.5	324.5	2.8	7.2	7.5	3.0	4.4	82.2	2.8	6.0	9.0
	2002	4.5	0.8	0.1	3.0	0.5	329.0	2.9	7.4	7.7	3.0	4.5	85.4	2.9	6.0	9.0
	2003	4.7	0.9	0.2	3.2	0.5	333.7	3.0	7.7	7.8	3.0	4.7	88.5	3.0	6.1	9.1
	2004	4.9	0.9	0.2	3.3	0.5	338.6	3.0	7.9	8.0	3.0	4.9	91.6	3.0	6.1	9.1
	2005	5.1	0.9	0.2	3.4	0.6	343.6	3.1	8.1	8.1	3.0	5.1	94.6	3.1	6.1	9.1
	2006	5.2	1.0	0.2	3.5	0.6	348.9	3.1	8.4	8.3	3.3	5.2	97.7	3.1	6.2	9.5
	2007	5.4	1.0	0.2	3.6	0.6	354.3	3.2	8.6	8.4	3.3	5.4	100.7	3.2	6.3	9.6
	2008	5.6	1.0	0.2	3.7	0.6	359.8	3.3	8.8	8.6	3.3	5.6	103.8	3.3	6.3	9.7
	2009	5.7	1.1	0.2	3.8	0.6	365.5	3.4	9.1	8.8	3.3	5.7	106.8	3.4	6.4	9.7
2010	5.9	1.1	0.2	3.9	0.7	371.4	3.5	9.4	8.9	3.3	5.9	109.9	3.5	6.5	9.8	
		51.3	9.5	1.7	34.3	5.7	31.3	31.3	82.6	82.2	31.7	51.3	31.3	62.1	93.8	
Chengdu	1999	-	-	-	-	-	75.9	1.0	-	-	-	-	33.1	1.0	-	-
	2000	1.4	0.5	0.0	0.8	0.0	77.3	1.0	2.4	2.8	2.8	1.4	34.5	1.0	2.4	5.2
	2001	1.4	0.5	0.0	0.9	0.0	78.7	1.0	2.5	2.8	2.9	1.4	35.9	1.0	2.4	5.4
	2002	1.5	0.6	0.0	0.9	0.0	80.2	1.1	2.6	2.9	2.9	1.5	37.3	1.1	2.5	5.4
	2003	1.6	0.6	0.0	0.9	0.0	81.8	1.1	2.7	3.0	2.9	1.6	38.7	1.1	2.5	5.5
	2004	1.6	0.6	0.0	1.0	0.0	83.4	1.2	2.8	3.1	2.9	1.6	40.1	1.2	2.6	5.6
	2005	1.7	0.6	0.0	1.0	0.0	85.1	1.2	2.8	3.1	2.9	1.7	41.6	1.2	2.6	5.5
	2006	1.7	0.6	0.0	1.0	0.0	86.8	1.2	2.9	3.2	2.9	1.7	43.1	1.2	2.7	5.5
	2007	1.8	0.7	0.0	1.1	0.0	88.6	1.2	3.0	3.3	2.9	1.8	44.6	1.2	2.7	5.6
	2008	1.9	0.7	0.0	1.1	0.0	90.5	1.3	3.1	3.4	2.9	1.9	46.1	1.3	2.8	5.7
	2009	1.9	0.7	0.0	1.1	0.0	92.4	1.3	3.3	3.5	2.9	1.9	47.6	1.3	2.9	5.7
2010	2.0	0.7	0.0	1.2	0.0	94.4	1.4	3.4	3.6	2.9	2.0	49.2	1.4	2.9	5.8	
		17.2	6.3	0.4	10.2	0.3	11.9	11.9	29.1	31.9	29.0	17.2	11.9	26.7	55.7	
Wuhan	1999	-	-	-	-	-	81.1	1.4	-	-	-	-	80.3	1.4	-	-
	2000	4.4	1.4	0.3	2.5	0.2	85.4	1.5	5.9	3.0	1.7	4.4	79.0	1.5	0.2	1.8
	2001	4.3	1.4	0.2	2.4	0.2	89.7	1.6	5.8	3.1	1.7	4.3	77.7	1.6	0.3	2.0
	2002	4.2	1.4	0.2	2.4	0.2	94.0	1.6	5.8	3.1	1.7	4.2	76.6	1.6	0.5	2.2
	2003	4.2	1.4	0.2	2.3	0.2	98.1	1.6	5.8	3.2	1.7	4.2	75.7	1.6	0.6	2.3
	2004	4.1	1.4	0.2	2.3	0.2	102.2	1.6	5.7	3.3	1.7	4.1	74.8	1.6	0.8	2.4
	2005	4.1	1.3	0.2	2.3	0.2	106.3	1.7	5.7	3.3	1.7	4.1	74.1	1.7	0.9	2.6
	2006	4.0	1.3	0.2	2.3	0.2	110.3	1.7	5.7	3.4	1.7	4.0	73.4	1.7	1.1	2.7
	2007	4.0	1.3	0.2	2.2	0.2	114.3	1.8	5.8	3.4	1.7	4.0	72.9	1.8	1.2	2.9
	2008	4.0	1.3	0.2	2.2	0.2	118.3	1.8	5.8	3.5	1.7	4.0	72.4	1.8	1.4	3.0
	2009	3.9	1.3	0.2	2.2	0.2	122.2	1.8	5.8	3.6	1.7	3.9	72.1	1.8	1.5	3.1
2010	3.9	1.3	0.2	2.2	0.2	126.1	1.9	5.8	3.6	1.7	3.9	71.8	1.9	1.6	3.3	
		40.7	13.5	2.4	22.9	1.9	17.0	57.7	33.5	16.7	40.7	17.0	9.9	26.5		

Source: JICA Study Team

2.8. Challenges in the Future and Direction of Action

2.8.1. Challenges to Improve the Prediction Accuracy and Direction of Action

Accordingly to the variety of constrains on the availability of data and others elements, some predictions are made, but to improve their accuracy the understanding of the following points should be enhanced:

(1) Accurate definition of administrative district demarcation

It is practically difficult to predict if the incorporation into a municipal ward will take place. To increase the prediction accuracy, therefore, it is desirable to obtain the correct information relating the incorporation of any district under urban planning as much as possible in cooperation with the competent authorities. It has been assumed that an incorporation of districts in a municipal ward would not create a new demand for housing, however it could. To define this information correctly, it is necessary to conduct a series of stock survey on a continuous and periodical base.

- (2) Correctly determined dwelling characteristics of a fluidized population (especially long-term residents)

The information in relation to the attribute characteristics (age, annual income, etc.) and dwelling characteristics (living house attributes, household configuration and others on those “long-term non-registered residents), should be periodically and continuously updated. It is desirable to make an effective use of the information on the fluidized population-related surveys prepared by the National Statistics Bureau and Security Authorities.

- (3) Correct quantification of a loss of housing, coupled with reconstruction/redevelopment

The housing demand arising from reconstruction and redevelopment would not contribute to an increase in new stock. This information, however, is indispensable for grasping a demand flow. The loss of housing, coupled with reconstruction and redevelopment, has come to be described more frequently in statistical documents too. Desirably, these should be provided on a regular basis. At the same time, it is desirable to accumulate the supply information supplementing a loss, too.

- (4) Correctly determine a demand for housing, associated to reconstruction and redevelopment activities (including a capture of the grow rate caused by a redevelopment)

The demand for housing, associated to reconstruction and redevelopment activities, has been based on an “empirical value” of 1 or 2% on the stock for the preceding year. In this regard, correct information should continue to be accumulated accurately enough to eliminate the dependence upon an empirical value.

- (5) Clarify the grounds on which a variety of consumption units (per-capita effective construction area, number of household members per house, etc.), and reflect them on housing policies

A per-capita effective construction area, number of household members per house and other elements have been used for their influential role in the prediction of a demand. Concerning these numerical values disclosed as policy targets under the 10th five-year plan, however, it was impossible to clarify in what process they had been set and how they had been effectively utilized in deploying specific measures for housing. In the present study, the numerical values have been determined according hearings from specialists and experts concerned with the workings of the market and based on the numerical data disclosed as policy targets under the 10th five-year plan lasting until 2005. A highly accurate prediction should know the backgrounds that lead to the formulation of the housing policies and their targets.

- (6) Correctly grasp those factorial variables that reflect the re-housing behaviors

The structure of re-housing between privately owned housing and rentals has been extremely simplified by applying the findings in the JICA Study Team's questionnaire. Only a "flow of the transfer from rentals to privately owned housing" has been applied. In the future, it is desired to improve the present questionnaire should be improved and grasp the consumers' re-housing behaviors in more details.

- (7) Accurately determine the rate at which desires to acquire housing and to re-house have come true (actualization rate)

No re-housing actualization ratio could be reflected without obtaining a product under Re-housing Desire Probability. Re-housing Feasibility. In the future, the questionnaire should be upgraded to grasp the information relating not only to re-housing desires but also to re-housing feasibility so that the data can be integrated in the prediction process.

2.8.2. Housing Demand Prediction Process and Effective Utilization of Prediction Results

The demand prediction results will be discussed later in "4. Housing Fund Demand Prediction." The merits of a housing demand prediction are recognized when (1) establishing and improving various housing finance systems, including the Housing Provident Fund, and (2) Evaluating the effectiveness of policy incentives in a long-term deployment process after grasping policy options to promote rental housing supplies and popularize the existing housing market, and a structure of relations with demand for housing.

The methods of evaluating the effectiveness of policy measures and incentives to establish and upgrade the various new housing finance systems, popularize rental and existing housing markets and promote economical housing supplies, will be addressed in the following parts. To this end, some examples will be provided (e.g. relations between the Housing Construction Five-year Plan in Japan and housing demand prediction, between national housing policies and logical government housing demand prediction process, etc.)